Salinas Broadband Master Plan

Final – May 2024

Kimley»Horn
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Document Control Log			
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Contents

1. Comprehensive Vision and Introduction

1.1. Comprehensive Vision

Broadband facilitates people's access to the shared wealth of educational, cultural, and informational resources. Access to these resources is dependent on quality broadband infrastructure, which is now also critical to many of the everyday activities that people take part in. To keep up with the demands of the digital space and to ensure equitable access to resources for all, quality and reliable broadband infrastructure must be prioritized. The City of Salinas understands how important it is to invest in quality and reliable broadband access for its residents. As such, they have sought financial resources to ensure that they are able to maintain a competitive edge in the current digital landscape and to achieve universal broadband access to all of its residents.

The primary objective of the Broadband Master Plan is to create an actionable strategy that the City can use to achieve universal broadband access. By empowering the City to pursue competitive federal, state, and local broadband funding sources with a strategic approach, the City can secure crucial investments for its broadband infrastructure. Many of these funding opportunities require applicants to have clearly defined projects, high-level construction cost estimates, and potential partnerships, which this Broadband Master Plan will provide.

1.2. Purpose of the Document

The Broadband Master Plan is a strategy for the City of Salinas to establish a City-wide fiber network that prioritizes underserved and unserved communities and local economic development opportunities.

The City of Salinas obtained state funding through the Local Agency Technical Assistance (LATA) program; this funding award stipulated that the City had to create a plan for infrastructure upgrades to support broadband deployment in the Alisal neighborhood and also create a plan to expand broadband deployment to the rest of the City in the future. Additionally, the funding included provisions for the development of construction plans for broadband infrastructure within the Alisal neighborhood. The Alisal Neighborhood fiber network design was completed and submitted in January 2024 for permitting. It is important to note that the LATA funding allows for planning of future broadband infrastructure but does not include funding for construction activities. The preliminary planning for a public Wi-Fi network plan in the Alisal Neighborhood is also included in this Broadband Master Plan.

The Broadband Master Plan continues the City's ongoing efforts to improve connectivity by investing in broadband infrastructure that will support residential, business, and governmental needs. In 2015, the City of Salinas adopted a Broadband Plan to develop local broadband infrastructure and encourage local economic growth in targeted areas. Since 2015, the City of Salinas has adopted broadband-friendly policies in order to increase broadband availability and upgrade broadband infrastructure. The City has deployed fiber at the Salinas Police Department Headquarters that goes to Hartnell College, providing connections to City facilities, including City Hall. Hartnell College connects to the Connected Central Coast fiber route, which connects to major Internet hubs.

Despite having some existing fiber assets, the City of Salinas currently relies heavily on private companies for telecommunications infrastructure, resulting in an inequitable distribution of broadband

services. A 2019 study conducted by the City determined that there was a disparity in broadband infrastructure and service quality among residents dependent on their income[1].

The Broadband Master Plan will provide a framework for fundable projects that the City can pursue to create a foundation to bridge the digital divide for its residents, stimulate the local economy, and recommend actions to prepare the City for the everchanging digital landscape of the future.

1.3. Overview of this Report

The Broadband Master Plan is organized into the following sections:

- Section 2: Existing Conditions and Polices
- Section 3: Needs Assessment
- Section 4: Gap Analysis
- Section 5: Proposed Project List
- Section 6: Alisal Neighborhood Public Network
- Section 7: Available Funding
- Section 8: Implementation
- Section 9: Final Recommendation

[1] City of Salinas Broadband Plan Update (May 24, 2019)

2. Existing Conditions and Policies

The first step in developing a Broadband Master Plan is determining what fiber assets the City of Salinas has today. Documentation shows that the City has a limited fiber network that runs from the Salinas Police Department to Hartnell College; this fiber segment was outlined in the 2015 Preliminary Broadband Plan and only includes City facilities and infrastructure. Any future fiber assets should leverage existing fiber assets to facilitate connection to City buildings, infrastructure, and to get access to the internet. In addition to understanding existing fiber assets, it is important to identify any policies or programs that support or facilitate the installation of additional fiber.

2.1. Existing Fiber Network

The City's existing fiber network is currently concentrated near Downtown Salinas. Its major nodes include Hartnell College (internet access), City Hall, and the Police Department. The City's fiber network assets are summarized below:

- 288 strand fiber trunk cable, along West Alisal Street between Homestead Avenue and Work Street
- 288 strand fiber trunk cable, along Homestead Avenue between West Alisal Street and Central Avenue
    - Coiled for future use at Central Avenue/Homestead Avenue
- 288 strand fiber trunk cable, along Church Street connecting City Hall to the West Alisal Street trunk line
- 12 strand fiber branch cable, along Main Street connecting the Gabilan Street/Main Street intersection to the West Alisal Street trunk line
- 12 strand fiber branch cable, along Main Street connecting St Luis Street/Main Street intersection to the West Alisal Street trunk line
- Empty conduit, along Main Street between Gabilan Street/Main Street intersection to Central Avenue/ Main Street intersection

2.2. Alisal Fieldwork Summary

A preliminary investigation was conducted to examine the existing conditions of City-owned facilities in the Alisal area and their potential for use as network hubs. This study was only conducted in the Alisal area, but these conditions can be used as a foundation for understanding existing conditions City-wide across other City-owned facilities. This preliminary study:

- Included a field walkthrough of project buildings to review building fiber access points, building cabling/routing, and space for communications equipment.
- Evaluated existing fiber network assets and traffic signal cabinet infrastructure for potential use

The field walkthrough of project buildings with City IT was conducted on April 28, 2023. During the walkthrough of the project buildings, building fiber access points, building cabling/routing, and placement for major communications equipment were noted. Installation of fiber equipment requires space and a controlled environments (i.e., air conditioning). Deficiencies in regards to these two factors were noted during the walkthrough. The City-owned buildings have existing communications equipment providing internet service to the facility. The project scope only included the evaluation of City-owned buildings, excluding non-City-owned buildings that provide community services, including schools. The following buildings were selected for the field walkthrough, as shown in **Figure 1**:

- Salinas Police Department (312 E Alisal St, Salinas, CA 93901)
- Salinas Municipal Airport
  - Administrative Office (342 Airport Blvd, Salinas, CA 93905)
  - Terminal Building (30 Mortensen Ave, Salinas, CA 93905)
- Firehouse Recreation Center (1330 E Alisal St, Salinas, CA 93905)
- Salinas Fire Department Station 4 (308 Williams Rd, Salinas, CA 93905)
- Breadbox Recreation Center (745 N Sanborn Rd, Salinas, CA 93905)

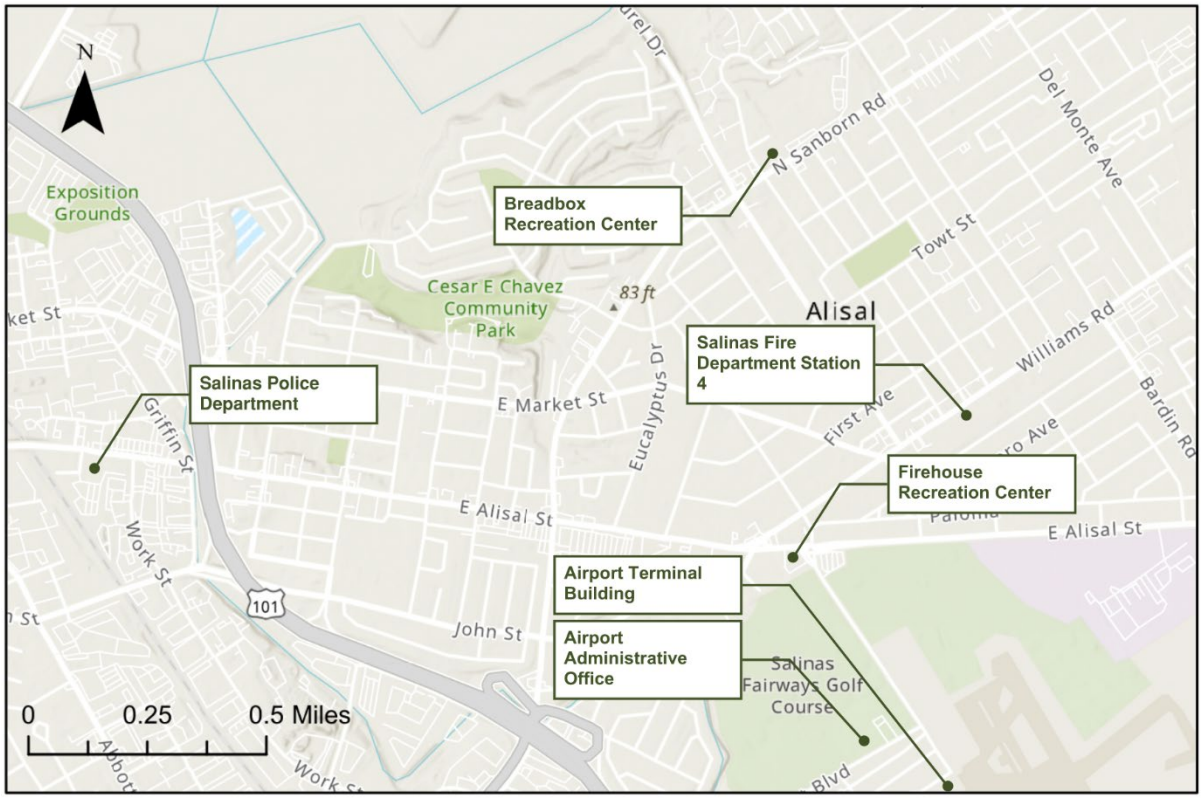


Figure 1: City of Salinas Buildings Visited

2.2.1 Salinas Police Department

The Salinas Police Department main point of entry (MPOE) is in the server room, located on the first floor. Six racks are free; four on the secure side (protected by a fence) and two on the unsecure side. These racks were mostly empty at the time of the field walkthrough of the facility. Seven 4" conduits enter the server room to the secure side via underground connection from a pull box located in the northeastern

driveway of the police department. Running through the City conduit is 288-strand fiber cable (City's fiber trunkline to City Hall and Hartnell College). Currently, there are only fiber connections to servers on the secure side.

According to City IT, the secure side is firewalled. Any proposed improvements will need to be in the two empty racks on the unsecure side of the server room.

2.2.2. Salinas Municipal Airport

Two sites at the Salinas Municipal Airport are being considered:

- Administrative Office
- Terminal Building

Salinas Municipal Airport Administrative Office

The administrative office is a recent addition to the Salinas Municipal Airport, which is an existing facility that has been repurposed. Its MPOE is located in the building garage.

City servers are in a small overhead cabinet in the wall area connecting the reception area and the printer room. Overhead telecommunication cables enter via a pole on the eastern corner of the building. One inch conduit enters the reception area cabinet containing the City servers. This conduit appears to run through the ceiling, also entering the garage. An AT&T panel has been installed in the garage, located in the western area. The telecommunications conduit connects to the AT&T panel.

Most of the printer room is taken up by a large printer and a base cabinet that appears to be installed into the wall. While the area is secured and air conditioned, there is not much room for the installation of racks and other necessary equipment to facilitate new fiber network connections. The garage has more space in comparison, but the area is exposed to the elements.

Salinas Municipal Airport Terminal Building

The terminal building MPOE is in a small room in its northeast corner. This room is used for electrical and water utilities and supply storage. An AT&T panel is located near the entrance of the utility room along the northernmost corner. This panel coincides with what appears to be telephone equipment. The utility room is not an ideal option due to lack of space, exposure to elements, and the presence of other utilities.

Six conduits come into the room from underground and at least one of the lines feeds into the utility room ceiling. These conduits run through a telecommunications pull box just outside of the utility room. The conduit is fed across the building via the roof to the conference rooms and front desk area in its western half. There, the conduit drops into the ceiling and appear to route to the conference room, the City server, and the break room. The break room is mostly filled with office and kitchen supplies, which could be moved to make space for new racks.

The City server is located in the closet of an office space adjacent to the break room. It is connected to CAT 5 cables that come in from the ceiling. A City server equipment rack is in the break room and connected to conduit that drops from the ceiling. The server closet is mostly empty, only containing a first aid kit and fire alarm controls. However, the space is relatively small, so any racks and other equipment may need to be installed in the office space outside.

2.2.3. Firehouse Recreation Center

The MPOE of the Firehouse Recreation Center is in the center of the building within a designated telecommunications closet. Besides telecommunications, the closet is also used for the storage of recreational supplies and equipment.

A City server equipment rack and AT&T panel are located within the telecommunications closet, on the left and right sides respectively. One inch conduit feeds into the City server from the ceiling, but it is unknown how it runs through the rest of the building. There is no evidence of the conduit elsewhere inside the building. A fiber cable runs from the AT&T panel into the wall. Along East Alisal St, overhead telecommunications lines go underground and run through an AT&T pull box south of the pole and north of the recreation center entrance. The conduit may go directly from the pull box to the telecommunications closet, but it does run up through the ceiling based on observation.

Even if the supplies stored in the closet are moved, the limited space and storage needs of the facility may prohibit the installation of new equipment at the existing MPOE location.

2.2.4. Salinas Fire Department Station 4

The Salinas Fire Department Station 4 MPOE is in a utility closet containing both telecommunications and electrical equipment. The utility closet is in the west side of the building towards its center.

A City server equipment rack is located above an AT&T panel. Both pieces of equipment are located on the right side of the room relative to the door. Seven conduits come from underground in the following order:

- Three 1” conduits
- One 3” AT&T conduit
- Three 1” conduits

It appears that the conduits run through the telephone pull box just outside of the entrance and directly to the MPOE. Additionally, it seems that at least one of the cables is labeled as fiber and runs into either the City or AT&T equipment.

The utility closet is half full due to electrical and telecommunications equipment and stored supplies. There is not enough room for installation of new communications equipment. Additionally, while the facility appears to have air conditioning, the small size of the closet and existing utilities may require more temperature control.

2.2.5. Breadbox Recreation Center

The MPOE of the Breadbox Recreation Center is located within the ceiling crawlspace of the facility. Access to this crawlspace and the nearest room to the MPOE is a supply closet located at the southwestern corner of the facility.

An AT&T panel is located on the western wall of the crawlspace. Outside of the recreation center, overhead telecommunication lines are observed entering through the southwestern corner. This is approximately the same area that the AT&T panel is located.

Although the ceiling crawl space of the Breadbox appears to be relatively spacious, the facility itself is not completely sealed from outside conditions, as evidenced through apparent openings in the crawlspace. Additionally, to access the space, a ladder is required. Installing new racks and equipment at this site would require other improvements to the facility for accessibility and environmental control.

2.2.6. Traffic Signal Cabinet Infrastructure

In addition to the City buildings, traffic signal cabinet infrastructure along a potential fiber loop was examined; these traffic signal cabinet locations are shown in **Figure 2**. Inventory images of the traffic signal cabinets taken by the City of Salinas in 2020 and 2021 were used to record observations.

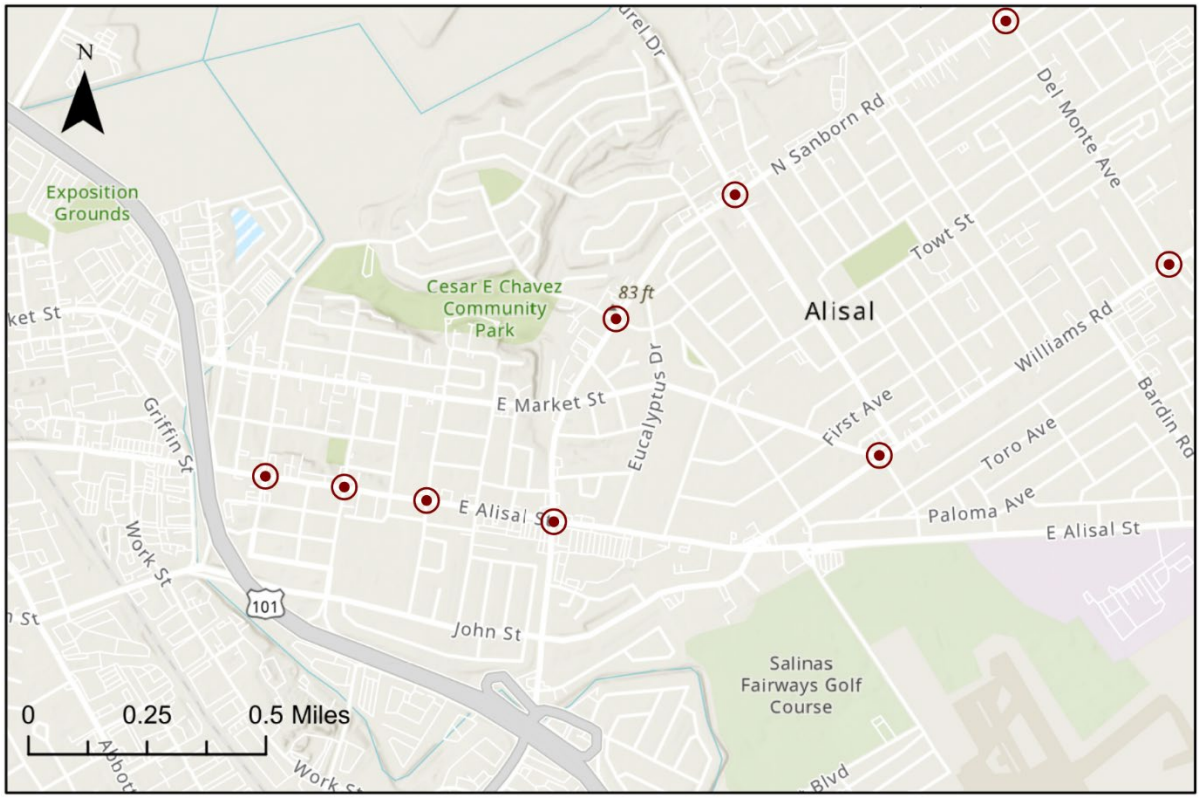


Figure 2: City of Salinas Traffic Signal Cabinets Reviewed

P and M (stretch P) cabinets are located along the potential fiber loop. A typical P cabinet set up is shown in **Figure 3**. The top and bottom shelves are typically filled with existing equipment. Typically there is some available space for additional equipment on the second shelf. As part of the fiber design, cabinet space will be needed for the installation of equipment to support the operation of the fiber network.

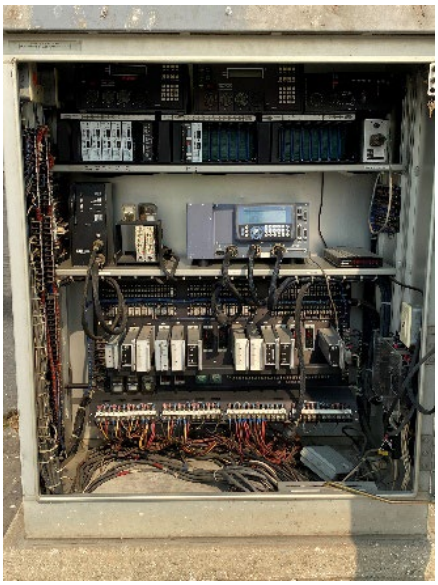


Figure 3: P Cabinet at Market Street and Williams Road.

The typical M, or “stretch” P, cabinet set up is shown in **Figure 4**. The second and bottom shelves are typically filled with existing equipment. Some space is usually available on the top and third shelf. Generally, the top shelf has a display monitor, and the third shelf has the controller and signal monitor.

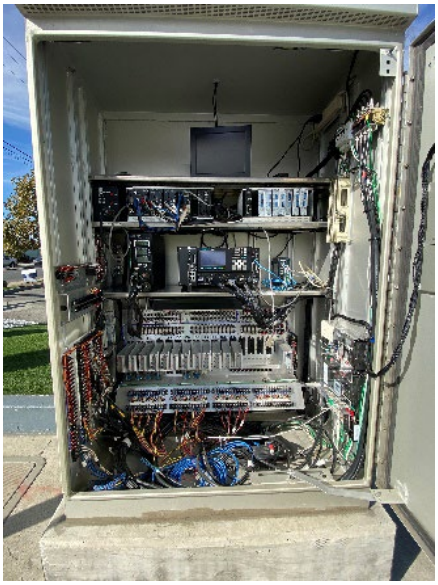


Figure 4: M Cabinet at Sanborn Road and Laurel Drive.

These types of cabinets are also present City-wide. As the average capacity of these cabinets have been observed to be limited due to the amount of equipment already present, there is no space to allow these cabinets to house the new equipment necessary to be used as hubs for the fiber network. These cabinets also lack the environmental controls needed to sustain the operations of fiber network hub equipment.

2.3 City-wide Fiber Infrastructure Opportunities

City fiber is only present within Downtown Salinas along Alisal Street and Main Street. The majority of the fiber present in Salinas belongs to private ISPs. These ISPs are a mix of incumbents and smaller providers that do not currently provide broadband connections to significant portions of the City, namely its northern areas. The City only has conduit leasing agreements with a selection of the providers that have existing broadband assets. These agreements allow the City to utilize conduit and fiber along Sanborn Road that spans the length of the Alisal and along a few major corridors in South Salinas.

2.4 Existing Policies

The City previously adopted a Broadband Plan in 2015 that sought to develop its broadband infrastructure and encourage local economic growth in specific areas. This Broadband Plan led to the adoption of policies that promote the implementation of conduit and broadband infrastructure.

2.4.1. Alisal Vibrancy Plan

The City adopted the Alisal Vibrancy Plan as a strategic planning document in November 2019. The Vibrancy Plan provides a framework for the future of the Alisal Neighborhood via goals, actions and policies that were developed through community input. Among the items discussed within the Vibrancy Plan were those pertaining to broadband infrastructure and improvements to Internet accessibility.

The Alisal Vibrancy Plan identified upgrading broadband services as one of the key areas of improvement for the Alisal Neighborhood Revitalization Area. The Vibrancy Plan found that upgrading broadband services could bridge the digital divide by providing access to telecommunication, improving education, and stimulating economic growth. To do so, the City needs to invest in modern Internet connections and collaborations with Internet Service Providers (ISPs) to build capacity and support future growth within Alisal. These improvements are outlined in Goal TI 3, specifically in Policy TI 3.1 within the Vibrancy Plan.

There are also adjacent goals and policies listed in the Alisal Vibrancy Plan that can enhance and be enhanced by the benefits of the development of improved broadband infrastructure. These include housing development efforts that implement affordable multi-family residences, mixed-use development goals, business financial assistance, educational opportunities, and the promotion of the Alisal Neighborhood as a cultural and tourist destination.

2.4.2. Chinatown Revitalization Plan

The City adopted the Chinatown Revitalization Plan in December 2019 as a strategic planning document. Similar to the Alisal Vibrancy Plan, the Revitalization plan provides a framework for the future of the Chinatown Neighborhood driven by the community in order to maintain its unique cultural identity throughout the proposed improvements. Among the items discussed within the Revitalization Plan were those pertaining to broadband infrastructure and improvements to Internet accessibility.

Included within the Revitalization Plan is a policy (TI 4.1) to upgrade above and underground infrastructure to support business activity and new developments. Communications infrastructure upgrades, specifically upgrading broadband services, are a priority for the City in this area.

2.4.3. Dig Once Policy

The Salinas City Council approved a “dig once” ordinance on November 15, 2016, that requires all underground utility construction activities to notify telecommunications companies so that they may add their own conduit for future use. It was enacted to modernize the communication infrastructure of historically underserved areas of the City that leverages construction activities within City right of way to

minimize public inconvenience. This enables the City to simultaneously pursue projects that can aid the installation of fiber, especially in unserved and underserved areas.

2.4.4. General Plan Update (Visión Salinas 2040)

Visión Salinas 2040 is an update to the City's General Plan that lays out a blueprint for the City's future development that reflects the priorities and values of the community. The installation of fiber is supported by the principles that guide the update and help in achieving the goals of the update. Improvement of equitable access to resources, improving existing City infrastructure, increasing community engagement, supporting the education of youth, and stimulating the local economy are all enhanced by the increased connectivity provided by fiber. This update is expected to be considered for adoption at the end of 2024.

2.4.5. 2017 Economic Development Element

The 2017 Economic Development Element (EDE) is intended to be a guide for the development of City policy through action priorities identified by economic development needs. One of the improvements proposed by the EDE is the improvement of communication infrastructure with the installation of dark fiber throughout the City in order to attract new businesses and jobs to the community.

2.4.6. Microtrenching Standard

Standard Detail 16B was adopted in 2022 by the City as a standard for microtrenching. The standard detail provides provisions for installing fiber in a more shallow depth conduit. The adoption of this standard will encourage more fiber development due to the relative lower cost of installing fiber using this method.

3. Needs Assessment

Prior to developing a plan and future projects to support broadband deployment in the City, it is important to understand what the City and its residents actually need. The City-wide fiber network must address and meet the needs of the City's various stakeholders. These stakeholders include the various City departments, City residents, businesses, and community-based organizations (CBOs). The various City stakeholders were engaged through meetings, surveys, and workshops. Their expressed needs have been recorded in order to guide the development of the broadband network.

3.2. Salinas Department Head Survey

Following the Steering Committee meeting, a survey was distributed to City of Salinas department heads to gather additional information for the development of the Broadband Master Plan.

The following City departments responded to the survey:

- Library & Community Services
- Police
- Development Engineering
- Fire Department
- Community Development

3.2.1. Broadband Needs

Responders identified that low-cost, high speed broadband services to unserved and underserved businesses and residential communities are the highest priority need. This is aligned with the needs identified by the Alisal community in the Alisal Vibrancy Plan.

3.2.2. Future Expansion

Almost all parties that responded to the survey agreed that broadband in the City of Salinas should be expanded to cover the entire City. Public safety departments like the Salinas Police Department and Fire Department both currently utilize existing broadband networks. Survey responses from both departments indicated that the expansion of modern broadband services for Salinas could improve public safety overall as this will enhance their monitoring and response capabilities. During the Steering Committee meeting, members of different City departments expressed interest in using broadband infrastructure to improve digital literacy and to provide better digital tools.

While the specific grant that is funding the Broadband Master Plan does not stipulate defining ways to close digital literacy gaps, the projects defined as part of the Master Plan can be used to leverage opportunities to close digital literacy gaps through deployment. Some of these opportunities include identifying grant funding opportunities to fund construction efforts, which would mean faster deployment of broadband. Additionally, the Master Plan encourages expansion of broadband coverage through partnerships with local providers.

In the early part of the design for the Alisal neighborhood fiber network, the City identified specific facilities they wanted to connect to the future broadband network. These facilities included recreational centers and spaces for senior citizens to gather. With the deployment of faster and more reliable broadband, these public spaces can be used to provide different opportunities for citizens for all ages to learn how to better use the digital tools that exist today. As an example, the City or other interested

parties could host classes at some of the public spaces to teach community members how to leverage tools to learn new languages or learn how to communicate and collaborate more with programs like Google Docs or Zoom.

3.2.2. Community Outreach

Public outreach was key to the development of the Broadband Master Plan. From conversations with City staff, programs to provide low-income households with broadband services (e.g., Comcast Internet Essentials) were identified. However, as noted in the Steering Committee meeting, the City of Salinas wants to improve outreach efforts to expand residents' knowledge of these programs.

Previously completed community outreach efforts indicated that residents and key community members in the City have identified community workshops and social media campaigns as the most effective means of community engagement and to spread awareness of projects to residents. Additionally, some of the survey responders indicated that they currently partner with community organizations for outreach and are willing to leverage their existing relationships with these groups for the purposes of the Broadband Master Plan.

3.3. Salinas General Plan Steering Committee Meeting

A City of Salinas General Plan Steering Committee meeting was held on May 31st, 2023, to discuss the Salinas Broadband Master Plan. Various City departments were present at this Steering Committee and were able to provide the following considerations for its development.

- The high-quality broadband services provided in identified key areas (i.e., Alisal, Chinatown, Downtown) of the City of Salinas should be expanded to the rest of the city due to the current inconsistent service
- Community areas and gathering spaces are key locations to provide high-quality broadband services
- The City is not interested in being an Internet Service Provider (ISP) and will continue to work with local carriers for broadband deployment
- Improving digital literacy and the provision of digital tools are key facets of bridging the digital divide is important to the City
- Some concern was raised regarding providing free broadband services in community areas due to a possibility of decreased human interaction.
- Consider future outreach efforts to inform residents about existing programs for low-income households

3.4. Data Collection

The City-wide broadband network was informed by the location of existing unserved communities. To determine these locations, the following resources were used:

- The California Advanced Services Fund (CASF) Eligible and Priority Eligible locations shown in the California Interactive Broadband Map
- The California Public Utilities Commission (CPUC) Federal Funding Account (FFA) Public Map unserved mass market locations.

These maps as available at the time of this report are provided in *Appendix A* and *B*.

Clusters of unserved locations can be found evenly across the City which largely overlap across both maps. The City-wide lack of adequate broadband services is indicative of the need for a modern fiber network to provide high-speed connections to the City's residents.

4. Gap Analysis

There is currently a significant difference between the City's broadband infrastructure and the needs of the community. The City has some fiber coverage in the Downtown area and some leasing agreements with ISPs in other parts of the City. A significant investment is needed to provide more continuous and quality broadband coverage throughout the entire City. The City is seeking to bridge the digital divide by providing its residents a network that will address community needs at homes, in the workplace, and at various community spaces. By identifying these gaps, the network can be designed to address them.

4.1. Unserved and Underserved Communities

Per CPUC Decision 22-04-055, the following qualify a location for being designated as unserved or underserved:

- For a location to be considered unserved, it must have Internet download speeds of less than 25 Mbps and upload speeds of less than 3 Mbps.
- To be considered underserved, a location must have Internet download speeds between 100 Mbps and 25 Mbps and upload speeds between 10 Mbps and 3 Mbps.

The California Interactive Broadband Map (*Appendix A*) indicates residential and mixed-use broadband serviceable locations that are unserved. These locations are classified as "eligible" or "priority eligible." "Eligible" locations are those that fall under the definition of being unserved. If a location has Internet download speeds of less than 10 Mbps and upload speeds of less than 1 Mbps, the location is designated as "priority eligible". The Interactive Broadband Map shows a large number of "priority eligible" locations that are distributed relatively evenly across the City. However, there are large clusters of eligible and priority eligible locations in the following areas:

- Downtown Salinas
- Los Olivos Village Condominium Complex and Cambridge Village Townhouses (South Salinas)
- North Main Street from Alvin Drive to Boronda Road
  - Including Willowood Townhomes and Palm Court Apartments
- South Main Street from John Street to Blanco Road
- Lamplighter Salinas and California Hawaiian Mobile Estates (northwest Salinas)
- Rancho Salinas Mobile Park and Sherwood Lake Mobile Home Park (near Downtown Salinas)
- Alisal Neighborhood (as defined by the Alisal Vibrancy Plan)
- Monte Bella Neighborhood homes along Marsala Way

The CPUC FFA map (*Appendix B)* similarly shows unserved locations aggregated into groups (hexbins), using the same definition provided by the CPUC for unserved locations. There is significant overlap between the two maps, as all locations listed for the Interactive Broadband Map also have clusters of hexbins in the CPUC FFA map. However, there areas within Salinas that show large clusters of unserved locations in the CPUC FFA map that are not included within the Interactive Broadband Map. For this reason, both maps were used when determining priority areas for broadband deployment. Both maps are also currently being used to validate funding needs so it is important to align City needs with areas that have already been identified by the CPUC.

4.2. Community Spaces

Community spaces, including City-owned buildings, libraries, schools, and parks can help bridge the digital divide by providing free Wi-Fi and educational services that are accessible online. However, several of these community centers are also designated as unserved or underserved locations or within an area with reduced broadband service. Poor Internet connection reduces these facilities' capability to serve the community in meaningful ways as it limits the resources available to users.

The fiber network also requires hubs to provide redundancy and reduce points of failure within the network. Community spaces can become the locations of these hubs granted that they can be furnished with new fiber equipment (e.g., racks and servers). However, not all of these facilities can accommodate this equipment due to the conditions needed to properly hold and maintain it. The proposed equipment requires space for installation and controlled environments for sustained operation. Space also determines the configuration of the new equipment and the degree of temperature control needed. Additional environmental control equipment (e.g., air conditioning units) require additional space. Of the City facilities that were part of the preliminary study in the Alisal Neighborhood, neither of the community centers (the Breadbox and the Firehouse Recreation Center) had adequate spaces to serve as a hub.

4.3. City Operations

Current City operations are hindered by the lack of modern broadband infrastructure. Fiber connections increase the security of data being transferred across the City, the relative speed.at which data is being transferred, and the efficiency of system-wide operations. Currently, only a few City departmental buildings and City equipment within the limited span of the existing fiber network are being serviced by fiber, which results in unequal connectivity across these City facilities.

4.3.1. City Department Facilities

Two of the six City buildings that were part of the preliminary study were found to be ideal for new fiber equipment: the Salinas Municipal Airport Terminal Building and the Salinas Police Department. The other buildings did not have adequate facilities to become fiber hubs, as they did not have space for new fiber equipment, sufficient temperature control equipment, or both.

4.3.2. City Traffic Signal Cabinets

The traffic signal cabinets surveyed in the Alisal Neighborhood along the proposed fiber network have been found to be mostly full. The proposed equipment does not require a large amount of space, but some cabinets are completely full or organized in a way preventing the installation of proposed fiber equipment.

5. Proposed Project List

A City-wide fiber optic network can be costly and challenging to deploy. Factors such as installation costs, project segments, overall benefits, funding options, and operations and maintenance have to be considered when planning for deployment and operation of this type of network. This Broadband Master Plan includes an Implementation Plan which serves as the roadmap for the deployment of the City-wide fiber optic network. It is anticipated that this fiber optic network will be divided into segments that will be deployed gradually because of its overall size and overall cost. As a result, the proposed network was divided into different segments that are recommended to be built in different phases depending on potential partnerships or available funding. The order of deployment for the segments was determined using a prioritization criteria developed with in collaboration with project stakeholders. These segments, phases, the prioritization methodology used to determine these segments, and their deployment timeline are described within this document.

5.1. Project Segments

The proposed City-wide fiber network is a total of 55.1 miles long. Due to the size and high cost of implementation of the overall network, it was divided into smaller segments. Dividing the network into smaller segments allows the network to be built out through smaller projects that are within the typical limits of available local, regional, state, and federal funding resources for broadband infrastructure. Multiple new funding sources are now available for broadband projects, especially those that benefit underserved and unserved communities. Considering the typical funding limits of these available resources, the following criteria were used to make funding and construction of the City-wide fiber network more feasible:

- Network segments are between zero to five miles long
- Each segment reaches as many Multiple Dwelling Units (MDUs) as possible
- Each segment connects to as many City facilities and traffic signals as possible

By applying these criteria to the fiber network, a total of 32 segments were developed. Each segment can be treated as a standalone project that will gradually comprise the overall City-wide network. Each of these projects can be funded separately or in phases by any available funding source. **Figure 5** shows a map of the proposed project segments and a summary of the projects is provided in **Table 1** below.

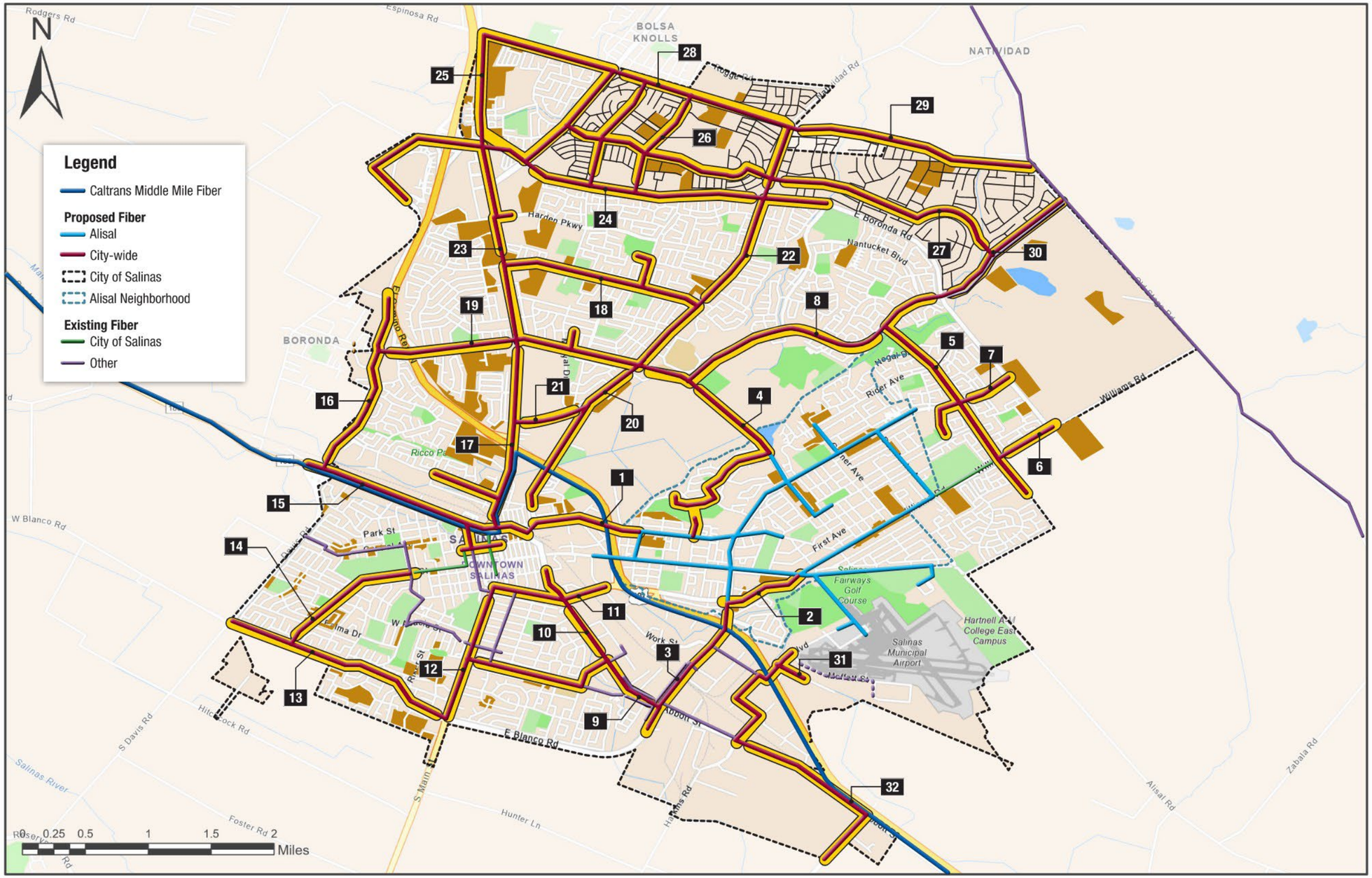


Figure 5: Proposed City-wide Fiber Network Implementation Segments

Table 1: Fiber Project Summary		
Project ID	**Project Name**	**Project Description**
1	E Market St	Segment from E Market St and E Front St - E Market St and N Madeira Ave
2	John St - Alisal	Segment from S Sanborn Rd and John St - E Alisal St and John St
3	S Sanborn Rd	Segment from S Sanborn Rd and John St - E Blanco Rd and Gabilan Rd
4	E Laurel Dr & Cesar Chavez Community Park	Segment from E Laurel Dr and Constitution Blvd - N Madeira Ave and St Helen Way, and E Market St and N Hebbron Ave - Cesar Chavez Community Park
5	Freedom Pkwy	Segment from Williams Rd and Del Monte Ave - Constitution Blvd and E Boronda Rd
6	Williams Rd	Segment from Williams Rd and Freedom Pkwy - Williams Rd and E Boronda Rd
7	N Sanborn Rd	Segment from N Sanborn Rd and Freedom Pkwy - N Sanborn Rd and E Boronda Rd
8	Constitution Blvd	Segment from E Laurel Dr and Natividad Rd -Constitution Blvd and Freedom Pkwy
9	E Romie Ln	Segment from E Romie Ln and Abbott St - Romie Ln and S Main St
10	Abbott St	Segment from John St and Abbott St - Abbott St and Malarin St
11	John St - Downtown	Segment from John St and S Main St, John St and Work St
12	S Main St	Segment from S Main St and John St - S Main St and E Blanco Rd
13	W Blanco Rd	Segment from E Blanco Rd and S Main St - Blanco Rd and Davis Rd
14	W Alisal St	Segment from W Alisal St and W Blanco Rd - W Alisal St and Homestead Ave
15	W Market St	Segment from W Market St and W Market Cir - E Market St and E Front St
16	N Davis Rd	Segment from N Davis Rd and Westridge Pkwy - N Davis Rd and W Market St

Table 1: Fiber Project Summary		
Project ID	**Project Name**	**Project Description**
17	N Main St & W Rossi St	Segment from N Main St and E Market St - N Main St and Laurel St, as well as N Main St and Rossi St - W Rossi St and Rico St
18	Natividad Neighborhood	Loop made by E Laurel Dr, N Main St, E Alvin Dr, and Natividad Rd
19	W Laurel Dr	Segment from W Laurel Dr and N Davis Rd - W Laurel Dr and N Main St
20	Sherwood Dr	Segment from Sherwood Dr and Calle Cebu - Natividad Rd and E Laurel Dr
21	E Bernal Dr	Segment from E Blanco Rd and S Main St - Blanco Rd and Davis Rd
22	Natividad Dr	Segment from Natividad Rd and E Alvin Dr - E Boronda Rd and Independence Blvd
23	N Main St & N Davis Rd	Segment from N Main St and Boronda Rd - N Main St and Alvin Dr, as well as part of Harden Pkwy starting from N Main St and Madrid St/Harden Pkwy
24	E Boronda Rd	Segment from E Boronda Rd and Natividad Rd - E Boronda Rd and San Juan Grade Rd
25	Santa Rita Neighborhood	Loop formed by E Boronda Rd, San Juan Grade Rd, Russell Rd and N Main St
26	Boronda Rd Neighborhood West	Along road within Boronda Rd residential developments
27	Boronda Rd Neighborhood East	Along road within Boronda Rd residential developments
28	Russel Rd Extention West	Along Russel Road extension into the Boronda Rd residential developments
29	Russel Rd Extention East	Along Russel Road extension into the Boronda Rd residential developments
30	Constitution Blvd	Segment from Constitution Blvd and Freedom Pkwy - City Limits
31	Airport Blvd Extention	Airport Blvd and Moffett St - Abbott St and Harkins Rd
32	Abbott St/Harris Rd	Abbott St and Harkins Rd - Harris Road

5.2. Prioritization

Once the segments were split up into projects described in Section 2, it was important to apply prioritization criteria so that the City could determine which projects would provide the highest overall benefit through construction. The criteria and methodology also serves to determine construction phasing for the proposed projects. Additionally, the prioritization allows the City to be competitive when applying for funding sources that are currently available and that could become available in the future.

The following prioritization methodology criteria was created with input from Project Stakeholders:

The quality and reliability of present broadband, determined by the overlap of the California Advanced Services Fund (CASF) Eligible and Priority Eligible locations shown in the California Interactive Broadband Map and the California Public Utilities Commission (CPUC) Federal Funding Account (FFA) Public Map unserved mass market locations, which are provided in *Appendix A* and *B.* For this criterion, overlap between the two maps show a greater need for improved broadband services in the area.

The current availability of broadband options that can be used by the public. The proximity of each proposed network segment to existing fiber assets was determined using existing communications network data provided by the City. The number of existing fiber assets adjacent to the proposed network segments are proxy indicators of broadband service costs in the area. The greater the number of fiber assets provided by different parties show a wider range of choices available to customers and more potential competition, which can be an indicator of reduced broadband costs.

Facilitation of economic growth through potential connections to businesses within the vicinity of the proposed network segment. Local businesses now require greater connectivity to participate in the online marketplace and access tools and resources that will help their business grow. The City wants to maximize the number of businesses that can be potentially connected to the City-wide fiber network, making network segments that capture more businesses along their routes a higher priority.

Segments that connect to public spaces (i.e., libraries, community centers, and parks) where broadband will serve large populations. The main challenge new broadband infrastructure funding sources hopes to resolve is closing the digital divide. Public spaces that allow people to access high-speed Internet for free is a City priority and will benefit several groups of people, especially families that cannot afford these services at home.

Percentage of school-aged population within Census block groups (between 5-17 years old) that will be users of the future network. A lack of Internet access puts children at an educational disadvantage as more tools to help students thrive become accessible online. By prioritizing segments that impact the most students at the K-12 level, the City can address bridging the digital divide in education more effectively.

Supports existing City operations (i.e., traffic signals, emergency response, and transit operations) **and uses existing City-accessible conduits and fiber.** Integrating City infrastructure with the proposed fiber network has the potential of improve traffic operations system-wide by allowing the use of real-time monitoring and improved coordination through high-speed communications. This can also allow the City an opportunity to implement innovative smart city applications.

Each project was then ranked out of 100 possible points using the criteria described. The criteria were weighted based on their overall benefit to City residents. These weights are as follows:

Table 2: Prioritization Criteria Weights	
Criteria	**Weight (out of 100)**
Quality and availability of broadband	35
Available broadband options	25
Facilitates connections to public spaces	15
Facilitates economic growth	10
Percentage of K-12 age population	10
Supports existing City operations	5

Table 3 presents a summary of the recommended prioritization of the project segments by overall score. *Appendix C* shows the detailed scoring matrix, which includes the scores of each project across each criterion.

Table 3: Network Segment Prioritization			
Project Rank	**Project ID**	**Project Name**	**Overall Project Score**
1	12	S Main St	**82**
2	23	N Main St & N Davis St	**81.8**
3	18	S Main St	**77.2**
4	25	N Main St & N Davis Rd	**76.2**
5	15	Natividad Neighborhood	**75.8**
6	17	Santa Rita Neighborhood	**75**
7	8	W Market St	**70.7**
8	16	N Main St & W Rossi St	**68.7**
9	1	Constitution Blvd	**67.8**
10	19	N Davis Rd	**66**
11	2	E Market St	**65.3**
12	20	W Laurel Dr	**63.7**
13	13	John St - Alisal	**63.3**
14	21	Sherwood Dr	**61.7**

Table 3: Network Segment Prioritization			
Project Rank	**Project ID**	**Project Name**	**Overall Project Score**
15	22	W Blanco Rd	**61.2**
16	11	E Bernal Dr	**60.8**
17	24	Natividad Dr	**59.5**
18	14	John St - Downtown	**58.8**
19	28	E Boronda Rd	**58.3**
20	30	W Alisal St	**56.8**
21	29	Russel Rd Extension West	**56.2**
22	6	Constitution Blvd	**55.9**
23	32	Russel Rd Extension East	**54.4**
24	9	Williams Rd	**53.8**
25	26	Abbott St/Harris Rd	**53.5**
26	27	E Romie Ln	**53.5**
27	4	Boronda Rd Neighborhood West	**53.3**
28	10	Boronda Rd Neighborhood East	**53.2**
29	5	E Laurel Dr & Cesar Chavez Community Park	**52.7**
30	31	Abbott St	**50.9**
31	3	Freedom Pkwy	**43.3**
32	7	Airport Blvd Extension	**42.3**

5.3. Project Cost

Understanding the cost of each project is integral to the planning of the full network deployment. To develop costs for each network segment, an estimated cost per mile of fiber being installed was compiled. The construction cost estimates included connections to City buildings and/or traffic signals, new pull boxes for access to the proposed fiber cable, new conduit for housing the proposed cable, and end equipment needed for the operation of the network. To expedite fiber installation and to reduce costs, most of the network will be installed in conduit placed in the ground using microtrenching techniques. Microtrenching typically uses a shallower trench compared to regular trenching for fiber optic cable which reduces initial installation costs and is less invasive than using other trenches. This installation type and its associated cost savings are reflected in the price per mile that was developed for the high-level

planning estimate. The City has also recently developed a standard for microtrenching that makes it easier to build out fiber using this method. Pricing for each of the elements included in the planning cost estimate is subject change, so it is recommended that the estimate be updated every few years to reflect present market conditions.

In addition to the construction costs, a construction contingency and design costs were also added to the planning level cost estimate. These costs were included in order to provide the City a comprehensive estimate of the implementation of each project. The contingency applied is 30% of the overall construction cost to account for price fluctuations. It includes items that may impact construction bid, such as unforeseen site conditions discovered during design, inflation of equipment costs, inflation of Contractor labor costs, and unexpected construction costs after bid that are not allocated on any specific bid item. The contingency does not include “soft costs” such as design, project management, inspection, and system integration. The cost for the design of the network is typically 10% of the overall construction cost.

Using design assumptions and the current unit costs, the estimated cost of the fiber installation per mile is **$783,000**. *Appendix D* details the specific elements that comprise this overall cost for construction and the assumptions that were made.

The estimated cost per mile was then applied to each segment of the City-wide fiber network. **Figure 6** shows a map of the proposed project segment prioritization and **Table 4** below summarizes the costs to build-out the fiber network outside of the Alisal area.

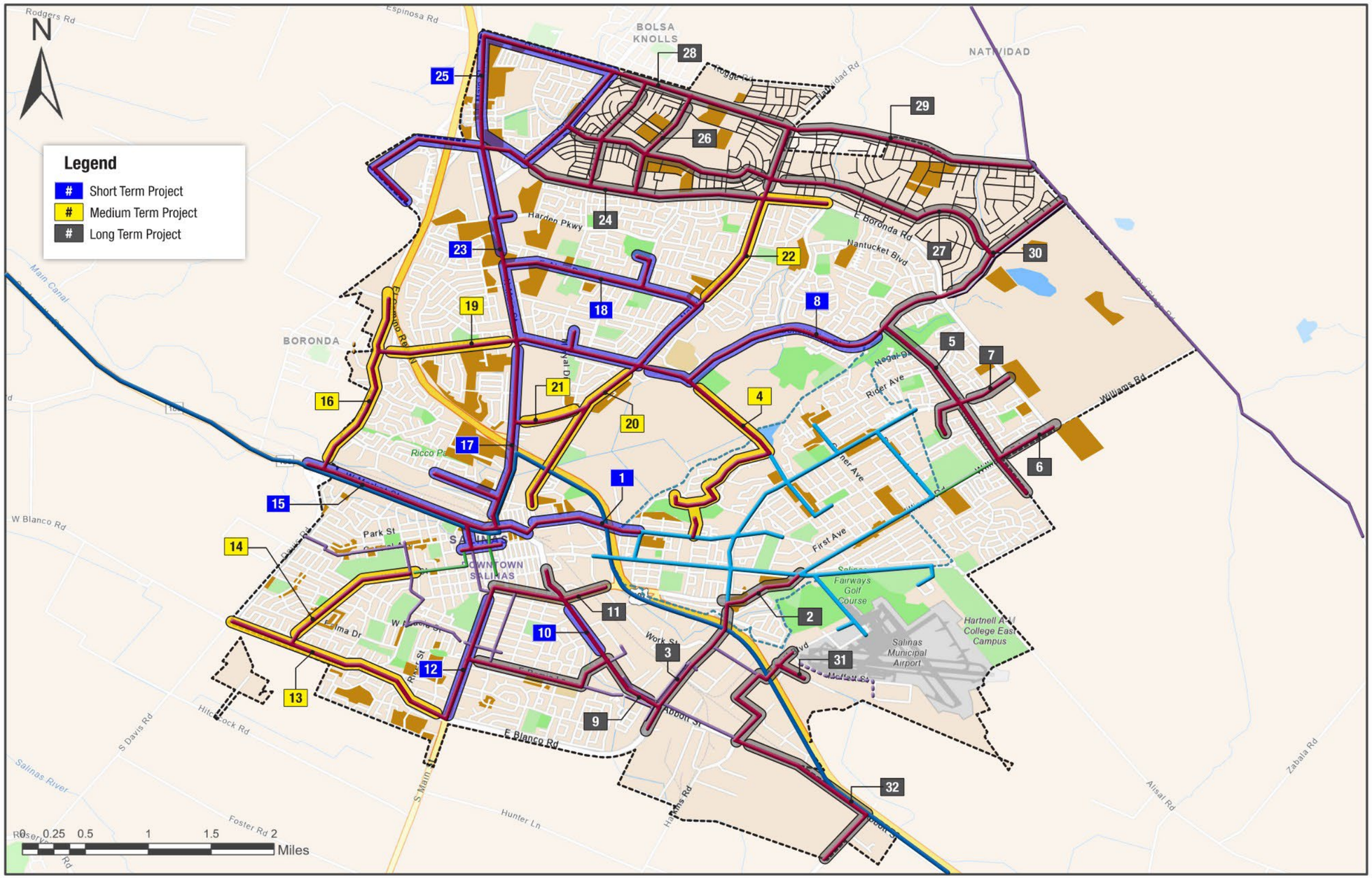


Figure 6: Proposed City-wide Fiber Network Segment Phasing

Table 4 – Network Segment Cost Estimates					
Project ID	**Project Name**	**Fiber Installation Cost ($)**	**30% Contingency ($)**	**10% Design Costs ($)**	**Planning Level Cost Estimate ($)**
1	E Market St	$783,000	$234,900	$101,790	**$1,119,690**
2	John St – Alisal	$469,800	$140,940	$61,074	**$671,814**
3	S Sanborn Rd	$939,600	$281,880	$122,148	**$1,343,628**
4	E Laurel Dr & Cesar Chavez Community Park	$1,487,700	$446,310	$193,401	**$2,127,411**
5	Freedom Pkwy	$2,114,100	$634,230	$274,833	**$3,023,163**
6	Williams Rd	$391,500	$117,450	$50,895	**$559,845**
7	N Sanborn Rd	$313,200	$93,960	$40,716	**$447,876**
8	Constitution Blvd	$1,722,600	$516,780	$223,938	**$2,463,318**
9	E Romie Ln	$1,409,400	$422,820	$183,222	**$2,015,442**
10	Abbott St	$469,800	$140,940	$61,074	**$671,814**
11	John St – Downtown	$939,600	$281,880	$122,148	**$1,343,628**
12	S Main St	$861,300	$258,390	$111,969	**$1,231,659**
13	W Blanco Rd	$1,487,700	$446,310	$193,401	**$2,127,411**
14	W Alisal St	$861,300	$258,390	$111,969	**$1,231,659**
15	W Market St	$1,800,900	$540,270	$234,117	**$2,575,287**
16	N Davis Rd	$1,174,500	$352,350	$152,685	**$1,679,535**
17	N Main St & W Rossi St	$1,644,300	$493,290	$213,759	**$2,351,349**
18	Natividad Neighborhood	$3,366,900	$1,010,070	$437,697	**$4,814,667**
19	W Laurel Dr	$861,300	$258,390	$111,969	**$1,231,659**
20	Sherwood Dr	$1,644,300	$493,290	$213,759	**$2,351,349**

Table 4 – Network Segment Cost Estimates					
Project ID	**Project Name**	**Fiber Installation Cost ($)**	**30% Contingency ($)**	**10% Design Costs ($)**	**Planning Level Cost Estimate ($)**
21	E Bernal Dr	$548,100	$164,430	$71,253	**$783,783**
22	Natividad Dr	$1,174,500	$352,350	$152,685	**$1,679,535**
23	N Main St & N Davis St	$1,800,900	$540,270	$234,117	**$2,575,287**
24	E Boronda Rd	$1,566,000	$469,800	$203,580	**$2,239,380**
25	Santa Rita Neighborhood	$2,583,900	$775,170	$335,907	**$3,694,977**
26	Boronda Neighborhood West	$2,818,800	$845,640	$366,444	**$4,030,884**
27	Boronda Neighborhood East	$1,566,000	$469,800	$203,580	**$2,239,380**
28	Russel Rd Extention West	$1,174,500	$352,350	$152,685	**$1,679,535**
29	Russel Rd Extention East	$1,487,700	$446,310	$193,401	**$2,127,411**
30	Constitution Blvd*	$1,331,100	$399,330	$173,043	**$1,903,473**
31	Airport Blvd Extention	$1,017,900	$305,370	$132,327	**$1,455,597**
32	Abbott St/Harris Rd	$1,331,100	$399,330	$173,043	**$1,903,473**

The total cost of the proposed City-wide fiber network is **$61,694,919**. Each project is estimated to cost between $500,000 and $5M, with an average cost of approximately $1M.

The design of the Alisal Neighborhood Fiber Network was completed using the same LATA funding that the City was awarded. The total length of the proposed Alisal neighborhood network is 10.2 miles. The estimated cost for the implementation of the Alisal Neighborhood Fiber Network is shown below:

Table 5 – Alisal Neighborhood Fiber Network Cost Estimate					
Project ID	**Project Name**	**Fiber Installation Cost ($)**	**30% Contingency ($)**	**10% Design Costs ($)**	**Planning Level Cost Estimate ($)**
-	Alisal Neighborhood	$7,986,600	$2,395,980	$1,038,258	**$11,420,838**

6. Alisal Neighborhood Public Network

Additional broadband coverage in the City can be used for a variety of different applications. As we focus on closing the digital divide, providing residents access to a free Wi-Fi network is something that can be implemented by the City or a third-party broadband provider. The City of Oakland used emergency funds distributed during the height of the COVID-19 pandemic to offer free public Wi-Fi to residents in unserved and underserved areas through the use of existing City fiber. In Salinas, a public Wi-Fi network could be deployed in City buildings and in outdoor recreational spaces such as parks by leveraging the proposed broadband network.

6.1 Wireless Technology Research

To determine the feasibility of implementing a public Wi-Fi network consideration was given to equipment that would be required to support this public network including their cost, where this equipment would be mounted, and how the equipment would be connected.

6.1.1 Equipment

At a high-level, equipment that supports a public network includes the following:

Fiber Switches

Fiber switches manage and route fiber optic signals within an optical network infrastructure. This enables multiple devices to communicate over fiber optic cables by receiving data packets from one device and forwarding them to the destined device. Unlike traditional copper-based Ethernet switches, fiber switches are designed specifically to handle fiber optic connections. This allows for Internet connection through the network with higher bandwidth and low latency.

Wi-Fi Access Points

Fiber switches establish connections to the Internet using Wi-Fi access points (APs). These wireless network devices serve as a central hub for wireless communication within a local area network (LAN). By transmitting and receiving wireless signals connectivity between a network to other devices (e.g., smartphones and laptops), APs enable access the Internet.

Wi-Fi Repeaters

Wi-Fi repeaters amplify and retransmit an AP's signal, effectively expanding the coverage area of the network. The placement of repeaters can affect network performance and should be positioned to prevent signal interference and guarantee uninterrupted connectivity.

6.1.2. Network Topology

Network topology, or the equipment layout, is important to the overall operation of a system and the equipment that comprises it. The City must consider which network topology to implement for its public network.

Point-to-Point

One topology that can be utilized is a point-to-point network that establishes direct connections between 2 endpoints without intermediary devices. For this project, point-to-point networks would facilitate direct wireless communication between various APs and the central network infrastructure. This would reduce the amount of equipment and the expense of operating the network. However, point-to-point networks are limited in their coverage area and lack redundancy.

Mesh

Another method that can be used is a mesh network, which is more decentralized than a point-to-point network. Rather than a unidirectional or bidirectional flow of data between 2 points, a mesh network operates with each node acting as both a transmitter and receiver, forming a distributed system where data travels from node to node to reach its destination. Though this arrangement requires more equipment and consequently, more time and cost towards installation and maintenance, implementing a mesh network ensures better coverage over a large area, is easily scalable, and results in more reliable data transmission due to redundancy.

6.1.3. Equipment Installation

Once the number of devices and the way in which they will be connected (i.e. topology) are identified, the next step should be to consider how these devices will be installed and where. Equipment that supports a public Wi-Fi network is typically mounted on existing traffic signal poles, existing street lighting poles, existing buildings or other structures, and sometimes on completely new structure. As such, installation should also consider what types of permits or approval may be needed for the mounting of these devices.

City of Salinas Resolution No. 20810

Per City of Salinas Resolution No. 20810, a Wireless Service Facility Encroachment Permit must be issued by the City before any wireless broadband components are installed. The conditions for obtaining permit approval vary based on the type of structure where the wireless facility will be installed.

When applying for this permit, applicants should be prepared to provide written documentation that the wireless facilities follow federal emission standards, as well as proof of insurance complying with City specifications. Applicants must also obtain all approvals required under the California Environmental Quality Act (CEQA). When these facilities need to be replaced, upgraded, relocated, or modified, a new permit will need to be issued, unless the City Engineer or their designee deems it as minor.

If the network design proposes an AP or repeater to be mounted on a utility pole, the pole owner must grant authorization to either use or replace that pole, and the applicant must give proof that the facility follows the design and co-location restrictions of the pole owner. The City of Salinas is not allowed to install poles solely for the purpose of supporting a public Wi-Fi network.

Streetlights are the most viable option to mount APs and repeaters since they can help carry signals at heights with minimal obstruction and can connect from a traffic signal cabinet to a park. Before installing a device on these poles, applicants must go through a reservation process set up by the City. A flowchart outlining this process is included in Appendix E.

Applicants should also refer to City of Salinas Standard Plans 49 – Streetlight Foundation, 51 – Streetlight Base Details and Pull Box Installation, and 52 – Streetlight Pole and Arm for specific requirements when installing new poles.

City of Salinas Resolution No. 21080

Another City directive that should be considered when installing equipment to support a public Wi-Fi network is City Resolution No. 21080. It lists conditions that must be met in order to excavate in City right-of-way. An excavation project may only occur once on a given City street within a 5-year timeframe. Additionally, telecommunications service providers must be notified about the project at least 30 days before it starts in order to have the opportunity to install, upgrade, co-locate, repair and/or improve their facilities. However, providers are responsible for covering their expenses, including permitting. A permit for excavation is also required. The Director of Public Works (or their designee) may exempt projects from

these requirements when the project is deemed not practical or feasible, though this would require a written request for an exemption.

6.2. PG&E Outreach

Another option for device mounting includes poles or other infrastructure owned by Pacific Gas and Electric Company (PG&E). Requirements for co-locating equipment to support public Wi-Fi are different for PG&E as compared to private owners and the City. Coordination with PG&E will also likely be required to power up the devices that support the public Wi-Fi network. Some of the specific requirements that must be considered are listed below.

6.2.1 CPUC General Order 95

California Public Utilities Commission (CPUC) General Order 95 provides requirements and specifications for design of any overhead lines, construction, and maintenance for all overhead electrical supply and communications facilities. The order outlines specific requirements related to distances between co-located utilities as well as maximum weights that are allowed to be placed on poles from onset or through future modifications (i.e. Installing equipment to support a public Wi-Fi network). PG&E states that whenever any poles are being used to co-locate telecommunications devices, they will be subject to all of the requirements and specifications laid out by CPUC GO 95.

6.2.2 Other Requirements

PG&E outlines specific requirements that must be met in order to co-locate telecommunications equipment on new or existing facilities. Most of these are outlined in the “Electrical & Gas Service Requirements” book also known as the “Green Book.” PG&E has “pole rate” agreements that they will enter into with telecommunications carriers and cable TV companies to allow their existing infrastructure to be used; these rates are approved by CPUC.

At a high-level, PG&E requires the following when agreeing to allow third parties to use their infrastructure (namely poles) for the mounting of communications equipment:

- The existing street light pole (or other facility) must be able to support the number of proposed devices to be mounted on the pole, a PG&E service meter, and a disconnect switch
- The installation of third-party equipment and PG&E required equipment must meet all of the requirements set forth by PG&E and CPUC General Order 95
- Third-party communications equipment must have an ownership label with contact information, site identification information, and a disconnect switch that will shut off RF transmission
- Third-party communications equipment and all required materials need to be furnished by the company requesting the installation
- Inspection and approval are required by a qualified PG&E inspector
- Any changes to an existing installation which require the pole to be replaced require the third-party company to meet all requirements set forth by PG&E
- Installation of specific wiring and circuit breakers
- No loads greater than 68 amps for any proposed equipment

6.3. Wireless Network Design

The City of Salinas expressed interest in providing a public Wi-Fi network within the Alisal neighborhood and also at select locations throughout the City. These locations were typically City buildings or recreational facilities such as parks. Utilizing the proposed Citywide fiber network, the City or a third-party provider can implement a point-to-point network, a mesh network, or a direct network. As an example, the

Alisal neighborhood fiber network provides direct connections to all City buildings and recreational facilities within the Alisal neighborhood. This means that the fiber network will support the Wi-Fi network directly. Otherwise, most parks are close to traffic signal cabinets where Wi-Fi network infrastructure could potentially be installed.

The table below summarizes the needs for each location and the type of network topology that could be used.

Table 6 – Wi-Fi Equipment Requirements

Location	Fiber Access Point	Area (sq ft.)	Max. # of APs	Cost
Salinas Police Department	In building	44,400	23	$115,000.00
Salinas Municipal Airport Administrative Office	In building	30,000	15	$75,000.00
Salinas Municipal Airport Terminal Building	In building	11,400	6	$30,000.00
Firehouse Recreation Center	In building	8,500	5	$25,000.00
Salinas Fire Department 4	In building	7,200	4	$20,000.00
Breadbox Recreation Center	In building	14,000	7	$35,000.00
		Subtotal Alisal Neighborhood		***$300,000.00***
Closter Park	In building	89,000	45	$450,000.00
Azahel Cruz Park	In building	34,000	17	$170,000.00
Myrtle Court Park	Adjacent traffic signal	30,000	15	$150,000.00
Cesar Chavez Community Park	Adjacent traffic signal	20,000	10	$100,000.00
La Paz Park	Nearby traffic signal – need additional infrastructure	72,000	36	$360,000.00
Los Padres Neighborhood Park	Adjacent traffic signal	70,000	35	$350,000.00
Salinas Fairways Golf Course	Nearby traffic signal	23,000	12	$115,000.00
Laurel Heights Park	Nearby traffic signal – need additional infrastructure	130,000	65	$650,000.00
Cesar Chavez Community Park – Basketball Court	Nearby traffic signal – need additional infrastructure	15,000	8	$80,000.00
El Gabilan Park	Need additional infrastructure	21,000	11	$110,000.00
Jaycee's Tot Lot	Need additional infrastructure	30,000	15	$150,000.00

Table 6 – Wi-Fi Equipment Requirements				
Location	**Fiber Access Point**	**Area (sq ft.)**	**Max. # of APs**	**Cost**
El Sausal Middle School Yard	Need additional infrastructure	1,240	2	$20,000.00
Sanborn Park	Nearby traffic signal – need additional infrastructure	86,000	43	$430,000.00
			Subtotal City-wide	***$3,140,000.00***
			Total	***$3,440,000.00***

There are four separate fiber access point scenarios described in the table above:

- In-building: the fiber access point is directly in the building. This is true for locations that are in the Alisal neighborhood.
- Adjacent traffic signal: a traffic signal is close to one of the boundaries of the park or building so fiber could be accessed here for public wi-fi deployment
- Nearby traffic signal – need additional infrastructure: a traffic signal is somewhat close to one of the boundaries of the park or the building but additional conduit and fiber may be needed to reach the park or building
- Need additional infrastructure: park or building location is not close to any traffic signals or other fiber access points so fiber and conduit need to be extended to provide public Wi-Fi; higher project costs

Based on the above high-level cost estimate, a public Wi-Fi network in the Alisal neighborhood would cost around $300,000. The citywide public Wi-Fi network would have a cost of $3,140,000. Both values and locations that comprise each of the figures are summarized in Table 6.

7. Available Funding

7.1. Financing

There are currently many different funding sources and mechanisms that can be used to build out fiber optic networks. The Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law, passed in 2021 resulted in the development of multiple funding sources that fund broadband infrastructure projects to benefit underserved and unserved communities. The expenses that the City will incur by implementing a large City-wide fiber network can be offset by these grants. The grant programs summarized in the following table are potential sources that can fund the construction of network segments in order of their determined priority.

Table 7: Potential Funding Sources

Program Name	Funding Source	Types of Projects Funded	Important Dates
SMART Grants Program	United States Department of Transportation (USDOT)	Eligible public sector agencies for the demonstration of projects focused on advanced smart community technologies and systems that improve transportation efficiency and safety; $100 million disbursed annually from 2022-2026	7/12/2024 (annually)
Broadband Public Housing Account (CASF)	California Public Utilities Commission (CPUC)	Free broadband service for residents of low-income communities (including other housing developments and mobile home parks)	7/1/2024 & 1/1/2025 (semi-annually)
Broadband Adoption Account (CASF)	California Public Utilities Commission (CPUC)	Digital inclusion and publicly available/after-school broadband access projects	7/1/2024 & 1/1/2025 (semi-annually)
Broadband Infrastructure Grant Account (CASF)	California Public Utilities Commission (CPUC)	Middle-mile and last-mile infrastructure	4/1/2024 (annually)
Last Mile Federal Funding Account	California Public Utilities Commission (CPUC)	Last mile broadband infrastructure projects to connect unserved and underserved Californians	(Next phase to be announced)

Table 7: Potential Funding Sources			
Program Name	**Funding Source**	**Types of Projects Funded**	**Important Dates**
		with high-speed broadband service	
Lifeline Support for Affordable Communications	Federal Communications Commission (FCC)	Program that provides qualifying low-income consumers a monthly discount per household on qualifying D30 telephone service, broadband Internet service, or bundled voice-broadband packages from participating providers (wireline or wireless)	(Ongoing)
E-Rate; Universal Service Program for Schools and Libraries	Federal Communications Commission (FCC)	Program to make telecommunications and information services more affordable for eligible schools and libraries	(Funding year (FY) 2024 deadline is 3/28/2024; next round to be announced)
Broadband Equity, Access, and Deployment (BEAD) Program	California Department of Technology (CDT)	Expansion of high-speed internet access by funding planning, infrastructure deployment, and adoption programs	(To be announced)
Digital Equity Capacity Grant Program/Competitive Grant Program	California Department of Technology (CDT)	Implement State Digital Equity Plan to address the gaps in digital equity by promoting digital inclusion projects at the state and local level (state)	(To be announced)

Additional means of funding the project include financing options like the Broadband Loan Loss Reserve Fund, which enhances credit related to the financing of local broadband infrastructure development, and private financing options. The City may also consider funding opportunities that can facilitate fiber or conduit installment via adjacent improvements. These opportunities may not be applicable to stand-alone fiber optic projects, but projects that install fiber in conjunction with another infrastructure project component can be competitive. These options may be considered in the case that public funding sources are not enough to fund the deployment of the full network.

8. Implementation

8.1. Project Phasing

The prioritization criteria was used to identify which projects would result in the highest overall benefit to the City of Salinas and its residents, however, building out projects in the order in which they were prioritized is not the most effective way to implement the network. For example, some of the projects that are high priority are not near any existing fiber infrastructure, City-owned or privately owned. Fiber networks still require access to the internet through nodes that are leased at certain locations. To achieve full benefits of the fiber network, construction of the projects must be done in phases. The phases will focus on projects that can leverage connections to existing infrastructure first and build out areas that are not close to any existing infrastructure last. These phases can be best defined as the following:

- Short-term: 0 – 10 years
- Medium-term: 10 – 20 years
- Long-term: 20+ years

8.1.1. Short-Term Projects

The segments recommended to be completed in the short-term include the following projects: **1, 8, 10, 12, 15, 17, 18, 23, & 25**. These projects will be recommended to be completed by the City first. They are located along Main Street, extend from Main Street, and serve corridors within the Downtown area of the City. After evaluating the City-wide network, these segments are in areas that scored high according to the prioritization criteria. This is due to their proximity to existing fiber infrastructure that the City can connect to, high densities of unserved and underserved populations in the vicinity, and potential to connect to several institutions key to the growth of the City. These segments will create the backbone of the greater network as it extends throughout the whole north-south span of the City and begins to extend to other areas.

8.1.2 Medium-Term Projects

The segments recommended to be completed in the medium-term consists of the following projects: **4, 13, 14, 16, 19, 20, 21, & 22**. These projects are located in West Salinas and north of the Alisal. They will extend the fiber network to parts of the City that also experience high need, but either require the projects listed as short-term to be constructed prior to their installation or are less critical to the construction of the overall network.

8.1.3. Long-Term Projects

The segments recommended as long-term projects include: **2, 3, 5, 6, 7, 9, 11, 24, 26, 27, 28, 29, 30, 31, 32**. These projects are mostly located in East Salinas, including the new developments along Boronda Road, and in South Salinas. These projects have lower densities of underserved and unserved populations within their vicinity. The new developments along Boronda Road in northeast Salinas may be subject to new City initiative and policies that install fiber or conduit, which makes evaluating the availability of broadband options and quality of broadband services difficult. Due to being new developments, it is also unknown what other facilities and institutions may be added to the area. As a result of these factors and their distance from the existing City-accessible infrastructure, the future areas of growth in northeast Salinas are relegated to being long-term projects.

8.2. Operations & Maintenance

The implementation of a fiber network includes costs and responsibilities outside of construction and design. Once completed, the fiber network requires that appropriate measures must be taken to ensure that equipment continues to operate properly. These measures include preventative maintenance to mitigate future failures within the network, timely responsive maintenance, and necessary end-of-life replacements and upgrades in the case that equipment costs more to maintain rather than replace.

The implementation of the City-wide fiber network requires collaboration and partnership among multiple City departments, Internet Service Provider(s), and other external partner agencies. Each party must have clearly defined roles and responsibilities, which will be crucial to the maintenance of the fiber network. These will be more comprehensively defined once a governance structure has been decided.

Installation of fiber infrastructure using microtrenching techniques may result in the fiber optic cable being impacted by future construction in the area of installation. This can result in more costs due to required replacement of fiber optic cable. To reduce any costs incurred by damaging the City-wide network or to prevent the damaging of the network, an inventory of installed fiber should be developed. This inventory can be used to positively identify fiber network locations for contractors to be aware of during construction projects.

Equipment located within traffic signal cabinets, including switches and termination panels, also require monitoring and maintenance. These pieces of equipment require more frequent maintenance than the fiber optic cable. This includes visual checks of equipment at regular intervals and scheduled maintenance. The monitoring and maintenance of equipment located within traffic signal cabinets should be conducted by the properly assigned stakeholder.

8.3. Governance

When deciding the governance structure by which the City and possible private partners that will operate and maintain the proposed fiber network, it is critical to consider the model's efficacy in serving the needs of the City. This includes determining ownership of the network, operational responsibilities, and the partners that the City may use to achieve its broadband goals. The considerations for the governance and operation of the network are provided in the following section.

8.3.1. Ownership and Operational Considerations

Ownership

Network ownership grants the assigned party more power regarding decisions made for the network, including the ability to determine the overall shape of the network and agreements with other parties. Under municipal ownership, the City will have the most control regarding the locations that the proposed fiber network will be able to provide service to. This also means that the City is responsible for the costs of conduit and fiber installation. The size and high cost of implementing the overall network presents a large financial risk for the City which necessitates the pursuit of funding sources to help pay for its installation.

In the case that a private party is given ownership of the City-wide fiber network, the City is released from the responsibility of installing fiber and the costs associated with it. However, the City will have limited, if any, control over many decisions made with the network. If the City pursues a private partnership that results in the private ownership of the network, the City must reach an agreement that will align the priorities of the private partner with its own.

Operation

As the network operator, the City (as a utility provider) is accountable to its subscribers (i.e. residents) via an election cycle which empowers their subscribers to influence outcomes related to and services provided by the network. In this case, bridging the digital divide remains a top priority and enforces equitable pricing and services as this model is owned and driven by the community. However, operating the network requires considerable resources that the City may not have the availability to allocate. These operational costs include the hiring of personnel to operate and maintain the network, which requires the City to enter a competitive labor market.

In a privately-operated model, the private partner will handle network operation and maintenance with already-present resources and personnel. The ISP will take on some or all of the operational and maintenance costs depending on the structure of its agreement with the City, reducing the financial burden placed on the City. However, private ISPs are incentivized by maximizing the profits from the network, resulting in services being priced more expensively. Depending on the structure of the agreement between the City and the partnered ISP, the ISP may wield significantly more power over the City that prevents the needs of its residents from being sufficiently met. However, in the scenario that the City owns the network and the ISP operates it, the needs of residents will be considered alongside profits, resulting in a middle ground that may be desirable for both parties.

8.3.2. Business Models

Closed Network

In this model, only a single ISP would be present on the network. This ISP can be the City or a private company owning and operating the network. The price and services provided by the ISP will be entirely dictated by key stakeholders. In the case of a privately owned and operated network, the key stakeholders will be investors, reducing subscriber agency and influence regarding the network and services provided. In the case of a municipally owned and operated network, the community will have greater influence on outcomes affecting the network as the City is accountable to them both residents and subscribers.

Open Access Network

An open-access network allows multiple ISPs to provide Internet services to subscribers that can choose their preferred provider. Open access networks provide greater choice for subscribers and encourage competition, but there are significant differences in subscriber experience depending on the open access model used.

In a dark fiber open access model, the City will own and operate the common segments of the network and ISPs will then connect to the home. The ISP will only operate, maintain, and pay for these segments, reducing the costs that they incur. However, the City must have enough fiber strands to meet the demand and require more infrastructure to connect to the home if the subscriber decides to switch ISPs. Manual and automated open access models provide subscribers the choice among different providers as well, but do not require additional connections to the home. In these models the network provider will provide the last mile connections to residences and facilitate provision selection and switching either manually or through a cloud-based marketplace.

9. Final Recommendations and Next Steps

9.1 Final Recommendations

Successful implementation of the Broadband Master Plan will require both time and collaboration between different City staff and departments. Understanding that broadband implementation is costly, the City should focus on finding the right partner to deploy broadband within the City limits. Additionally, aligning with the current push to deploy more quality broadband nationwide, the City should focus on applying for and being knowledgeable about the various funding sources that can be used to meet the goals of this Broadband Master Plan. Another important element to consider is the adoption of policies that can streamline the implementation of broadband in the City. These recommendations are expanded upon in the sections below.

Update Citywide Policies to Support Broadband

The City General Plan Update (Visión Salinas 2040) is expected to be considered for adoption in late 2024. Many elements outlined within it promote or will benefit from the implementation of broadband infrastructure. The City General Plan currently includes no explicit language that targets the development of broadband infrastructure. The City should consider including policies within the City General Plan to promote the addition of infrastructure to help more easily expand connections to unserved areas. Policies could include creating obligations for developers to use practices that could require the addition fiber-ready conduit to new developments. This is in line with the goals set in the Monterey County Broadband Strategic Plan, which encourages municipalities to build partnerships to deploy broadband infrastructure.

Identify a Champion for Broadband Deployment

In preparation for the implementation of the fiber network, the City must also determine which department or departments will be responsible for tracking City efforts being undertaken to realize the City-wide fiber network. This role will allow the City to aggregate materials and information crucial to the implementation of the fiber network and to coordinate on the City's behalf with potential partners. The Community Development Department Economic Development Division has been offered as a potential "champion" for City broadband efforts.

Focus on Available Funding Opportunities

Due to the current national focus on expanding the broadband infrastructure with a focus on fiber connections across the country, there are several funding programs that present the City with opportunities to fund the implementation of the City-wide fiber network. Many cities in California are already preparing materials to apply for broadband infrastructure funding or have already applied to already existing programs, like the CASF accounts. Upcoming programs like the California Broadband Equity, Access, and Deployment Program (BEAD) have not released their Notices of Funding Opportunity (NOFOs), however, they are large budget programs that can fund significant portions of the City-wide network.

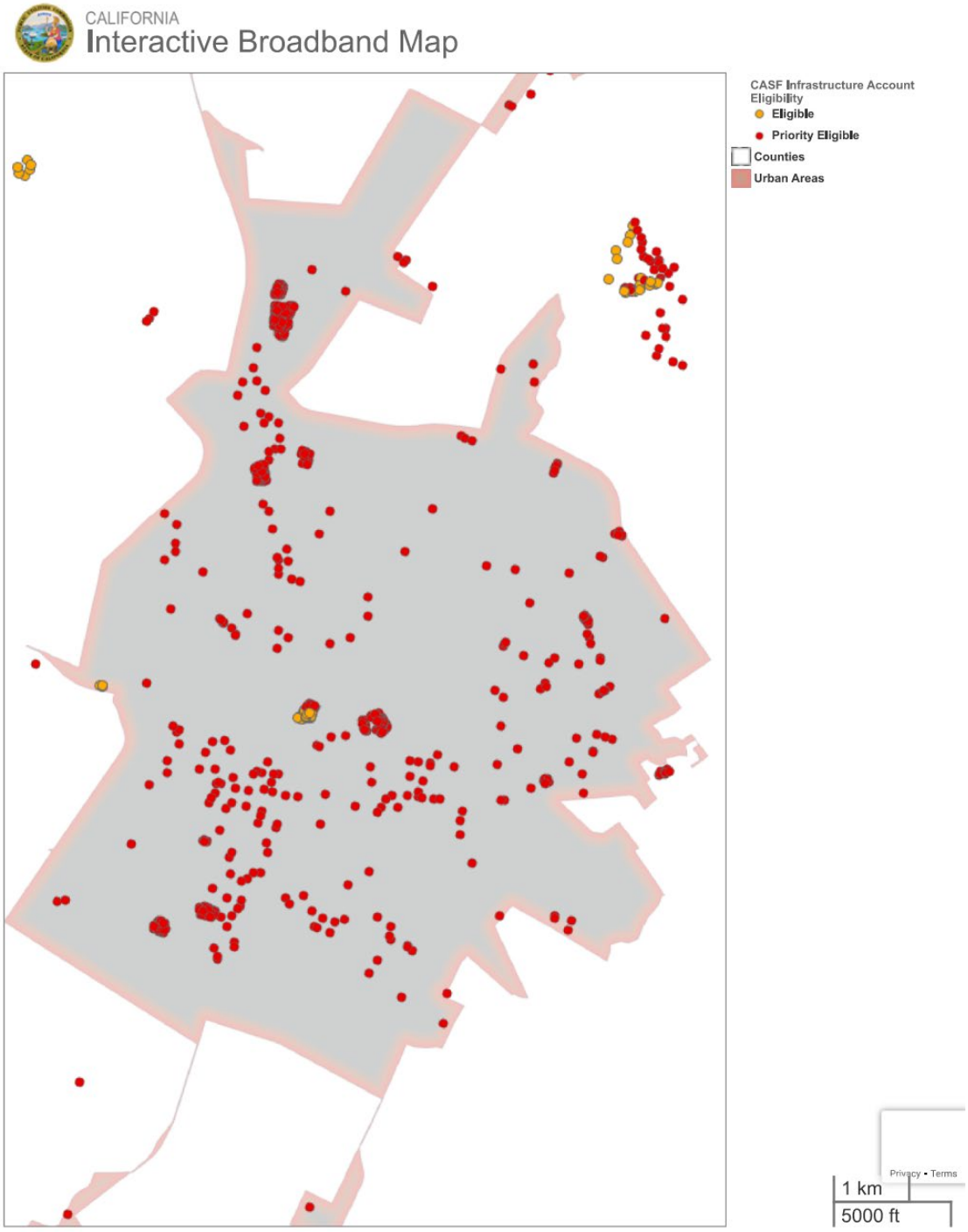
9.2. Next Steps

The Broadband Master Plan provides a roadmap for the deployment of a City-wide fiber network. It allows the City to effectively engage with the opportunities provided by the renewed national focus on bridging the digital divide to benefit its citizens. The City of Salinas may use this document to engage and inform stakeholders, select future projects, and apply for funding sources.

It should be recognized that the landscape of broadband infrastructure is rapidly evolving. In 2021, Senate Bill 156 was signed to create an open-access middle mile network to increase internet connectivity across California. A portion of the proposed statewide middle mile network will run through the City along US 101 and Route 183. This network could be leveraged in the future for access by the city depending on policies and pricing determined by the state. Additionally, the distribution of unserved and underserved populations as shown on the CASF and CPUC FFA maps may change in the coming years as these resources are updated. The City should consider updating the Broadband Master Plan every few years to ensure that the evolving needs of the City are reflected.

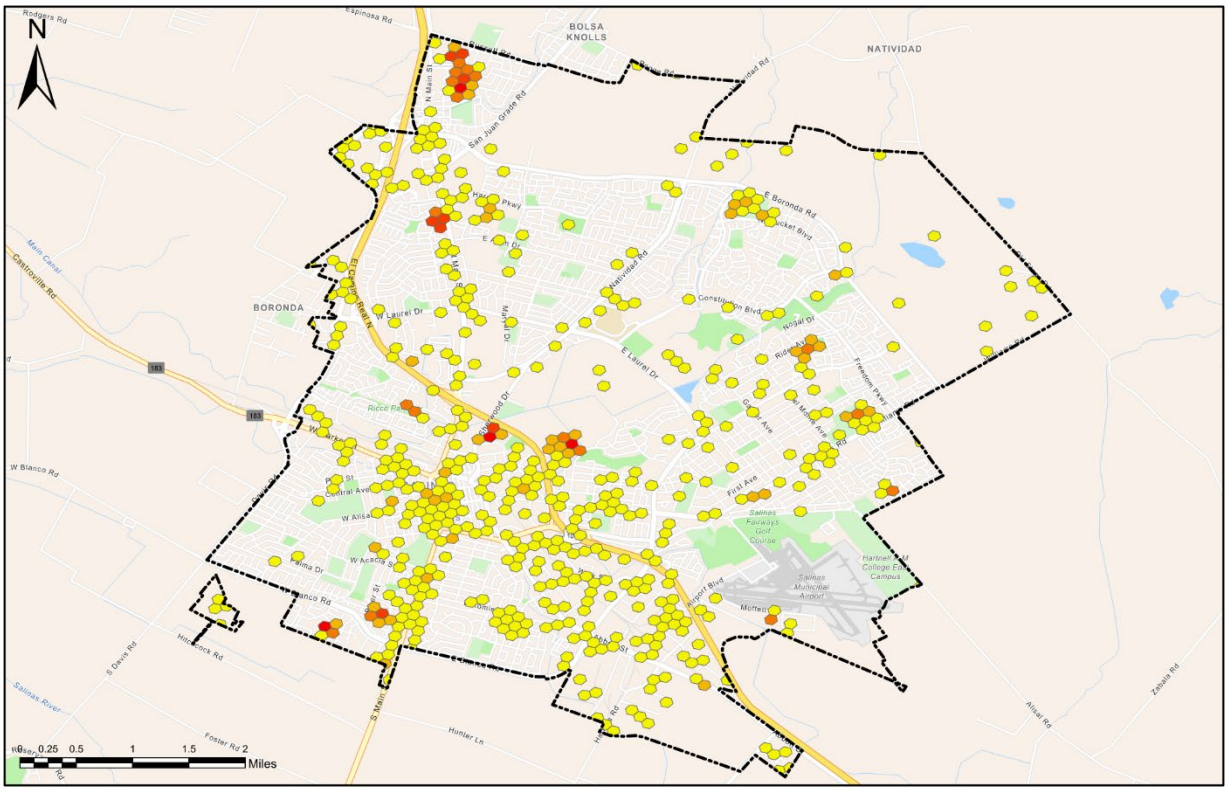
10. Appendix

Appendix A. California Interactive Broadband Map



(Downloaded on March 25, 2024)

Appendix B. CPUC FFA Unserved Mass Market Locations



(Data last updated April 7, 2023)

Appendix C. Overall Project Scoring Matrix

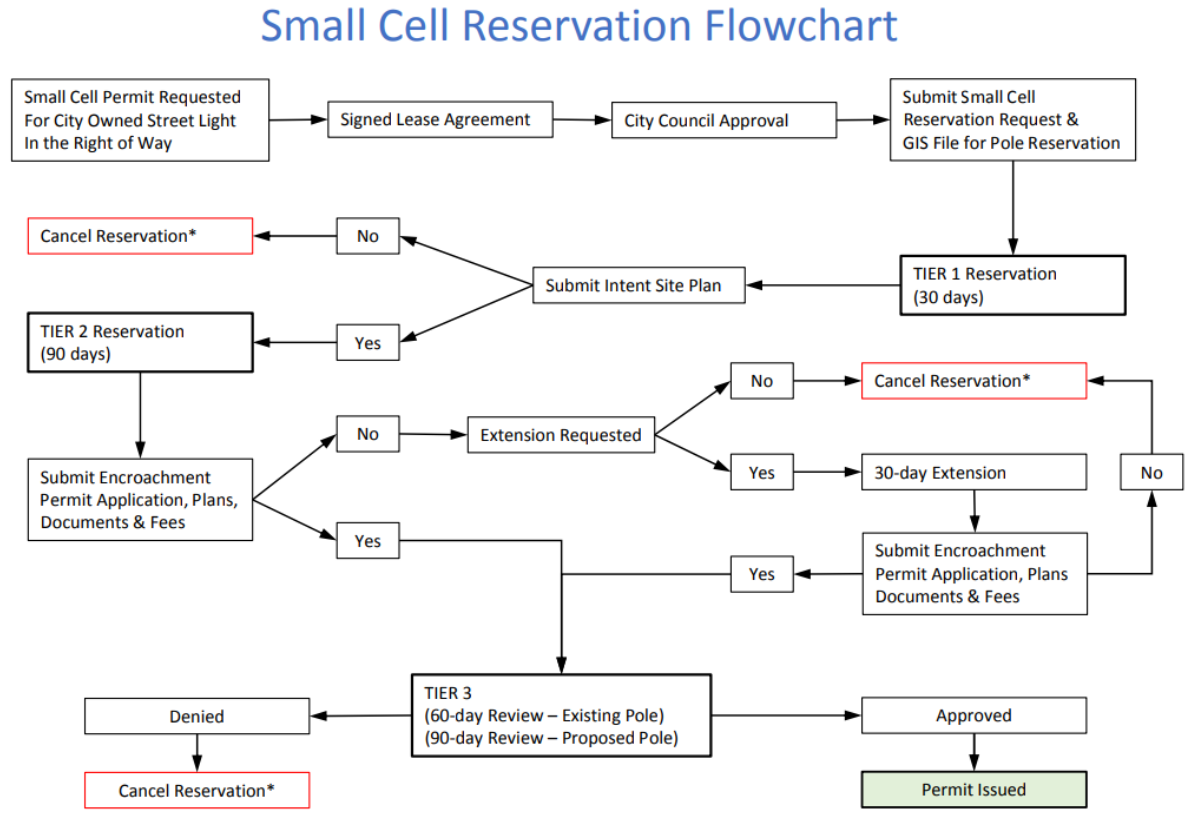
Overall Project Scoring Matrix									
Project Rank	Project ID	Project Name	Quality and reliability of broadband	Available broadband options	Facilitates connections to public spaces	Facilitates economic growth	Percentage of students in census tracts	Supports existing infrastructure	Total Project Score
			35	25	15	10	10	5	100
1	12	S Main St	34	17	8	9.8	8.2	5	**82**
2	23	N Main St & N Davis Rd	33	20	8	7	9	4.8	**81.8**
3	18	Natividad Neighborhood	28	20	9.5	6	9.2	4.5	**77.2**
4	25	Santa Rita Neighborhood	33	13	9	9	9.2	3	**76.2**
5	15	W Market St	33	11	8	9.8	9	5	**75.8**
6	17	N Main St & W Rossi St	26	17	9	9.8	9.2	4	**75**
7	8	Constitution Blvd	19	24	8.5	7	9.2	3	**70.7**
8	16	N Davis Rd	21	21	6	7.5	9.2	4	**68.7**
9	1	E Market St	21	20	5	9	8.8	4	**67.8**
10	19	W Laurel Dr	21	18	8	7	9.2	2.8	**66**
11	2	John St - Alisal	26	17	8.5	1	9.8	3	**65.3**
12	20	Sherwood Dr	23	20	8	2	9.2	1.5	**63.7**
13	13	W Blanco Rd	28	13	7.8	3	8	3.5	**63.3**
14	21	E Bernal Dr	21	20	9	0.5	9.2	2	**61.7**
15	22	Natividad Dr	23	17	6	3	9.2	3	**61.2**
16	11	John St - Downtown	19	18	1	9.8	8.5	4.5	**60.8**
17	24	E Boronda Rd	18	20	6.8	2	9.5	3.2	**59.5**
18	14	W Alisal St	19	13	9.8	6	8	3	**58.8**
19	28	Russel Rd Extension West	18	15	6.8	5	9.5	4	**58.3**
20	30	Constitution Blvd	18	15	5	5	9.8	4	**56.8**
21	29	Russel Rd Extension East	18	15	5	5	9.2	4	**56.2**

Overall Project Scoring Matrix									
Project Rank	Project ID	Project Name	Quality and reliability of broadband	Available broadband options	Facilitates connections to public spaces	Facilitates economic growth	Percentage of students in census tracts	Supports existing infrastructure	Total Project Score
			35	25	15	10	10	5	100
22	6	Williams Rd	18	23	4	0.1	9.8	1	**55.9**
23	32	Abbott St/Harris Rd	18	19	0.2	6	9.2	2	**54.4**
24	9	E Romie Ln	25	4	8.2	4	7.8	4.8	**53.8**
25	26	Boronda Rd Neighborhood West	18	15	5	2	9.5	4	**53.5**
26	27	Boronda Rd Neighborhood East	18	15	5	2	9.5	4	**53.5**
27	4	E Laurel Dr & Cesar Chavez Community Park	12	22	9.5	0.1	9.2	0.5	**53.3**
28	10	Abbott St	21	16	1	4	8	3.2	**53.2**
29	5	Freedom Pkwy	11	19	8	0.5	10	4.2	**52.7**
30	31	Airport Blvd Extension	18	13	0.2	6	9.2	4.5	**50.9**
31	3	S Sanborn Rd	21	4	1	4	8.8	4.5	**43.3**
32	7	N Sanborn Rd	2	23	4	2.5	9.8	1	**42.3**

Appendix D. Fiber Equipment Installation Costs per Mile

Appendix D: Fiber Installation Cost per Mile				
Capital Cost – Construction	**Unit Cost ($)**	**Unit**	**Quantity**	**Line Item Total ($)**
3" Underground Conduit	100	ft	5280	$528,000
Fiber Trunk Cable (288 SMFO)	18	ft	5280	$95,040
FO Pull Boxes	3500	ea	5	$17,500
Termination Panel	1000	ea	5	$5,000
Fiber Switch and Transceiver	8000	ea	5	$40,000
Make/test splices and terminations	200	ea	160	$32,000
Splice Vault	4000	ea	10	$40,000
Splice Closure	2500	ea	10	$25,000

Appendix E. Small Cell Reservation Flowchart



** Canceled reservations may not be requested within 30 days for the same pole.*