



City of Palo Alto

City Council Staff Report

(ID # 4203)

Report Type: Action Items

Meeting Date: 10/28/2013

Summary Title: Fiber-to-Premise and Wireless Network Plans

Title: Technology and the Connected City Committee Recommendation to Develop Master Plan to Build Out the City's Fiber Optic System to Provide Fiber-to-the-Premise and Develop Complementary Wireless Network Plan

From: City Manager

Lead Department: City Manager

Recommendation

The Technology and the Connected City Committee recommends that the City Council direct staff to:

1. Develop a Fiber-to-the-Premise Master Plan and conduct a request for proposals to build out the existing dark fiber optic backbone system in Palo Alto.
2. Develop a Wireless Network Plan with a near-term focus on WiFi, and a long-term consideration of other wireless technologies.

Background

The Technology and the Connected City Committee (Committee) held its first meeting on May 14, 2013. Staff provided an overview of the history of the fiber system and the attempts to expand the system for citywide use. Attachment A provides a summary of the City's dark fiber optic backbone system expansion. The Committee recommended the development of a work plan to evaluate the feasibility of building out a citywide Fiber-to-the-Premise (FTTP) Network in Palo Alto and appointment of a Citizen Advisory Committee to assist in the evaluation. Staff also provided an update on the City's upcoming technology initiatives. On June 24, 2013, the Council approved the Committee's recommendations to direct staff to develop a work plan and requested the City Manager to appoint a Citizen Advisory Committee.

On September 17, 2013, the Committee met to review staff's recommendation that the City proactively develop a Master Plan and conduct a RFP to build out the fiber system for FTTP, in

addition to developing a complementary Wireless Network¹ Plan in a sequence that addresses both near term and long term objectives. The Committee approved by unanimous vote to forward the recommendations in the staff report to the City Council for approval. Attachment B provides the staff report and meeting minutes from the September 17, 2013 Committee meeting.

Discussion

Fiber-to-the-Premise Master Plan and RFPs

To develop the Fiber-to-the-Premise (FTTP) Master Plan, staff recommends conducting an RFP (RFP #1) to retain a consulting firm with expertise in developing plans and RFPs for government agencies contemplating building broadband networks. Once the Master Plan is developed an RFP (RFP #2) would be issued for a third party telecommunications service provider to build and operate the network.

The estimated cost to develop the Master Plan and conduct the RFPs is approximately \$150,000 - \$350,000 (depending largely on the level of required environmental review) and will include facilitating an engineering study to develop a network design and cost estimate to build the FTTP Network, evaluate legal and regulatory issues, and complete the environmental review. The estimated timeframe to develop the Master Plan and conduct RFP #1 and RFP #2 is nine months and will require the time of approximately 1.75 FTEs over the nine month period. This accelerated timeline is an estimate based on City-managed processes being prioritized over other work and for vendor capability to meet the expedited timeline. In addition, unknown at this time is an accurate timeline to complete the CEQA requirements. Attachment C provides both a high level and a detailed schedule to develop the Master Plan and conduct the RFP process.

Wireless Network Plan and RFP

In addition to developing a Master Plan and conducting an RFP for FTTP, wireless solutions should also be evaluated. Staff recommends conducting an RFP (RFP #3) to retain professional services from a wireless communications consulting firm with experience working with local governments to develop the options and plans to build a wireless network. Staff estimates the cost will be up to \$100,000 and will take six to nine months to complete the Wireless Network Plan. As with the FTTP work, this accelerated timeline is an estimate based on City-managed processes being prioritized over other work and for vendor capability to meet the expedited timeline. Attachment C provides both a high level and a detailed schedule to develop the Wireless Network Plan.

¹ The term “wireless” includes a large set of technologies that support cellular, radio and WiFi. WiFi is a single specific technology.

Upon completion of the Wireless Network Plan, the findings and recommendations will be submitted to the Committee and the Council to assist the Council members with formulating a final vision and direction for the deployment of a wireless network. Staff estimates the cost to build a citywide wireless network to be in the range of \$3 to \$5 million. The projected ongoing support and maintenance cost to operate the network will also be addressed in the Wireless Network Plan.

Citizen Advisory Committee Formation

An Advisory Committee will be appointed by the City Manager to provide objective advice, from a citizen perspective, to the City Manager and the Technology Committee. The primary role of the advisors is to work with the Committee, City Manager and City staff to develop the Master Plan and support the work necessary to develop recommendations for FTTP and wireless deployments to the Committee and City Council.

To date, eight members of the community have expressed interest in sitting on an Advisory Committee. The City Manager will select candidates based on their knowledge of the telecommunications industry and applicable technologies; familiarity with municipal broadband initiatives in Palo Alto and other communities; understanding of the various business models for deploying fiber and wireless networks, and an interest in the public policy issues affecting government owned and operated broadband networks.

Resource Impact

Licensing dark fiber is a financially successful enterprise for the City and generates a steady revenue stream that can support the City’s goal of becoming a “leading digital city.” The Fiber Optics Fund Rate Stabilization Reserve had a balance of \$15.3 million as of the end of fiscal year 2013. There is also a \$1.0 million Emergency Plant Replacement Reserve for the fiber system to cover the liability insurance deductible amount if there is an unforeseen emergency requiring equipment to be repaired or replaced. Staff recommends leveraging the Fiber Optics Fund Rate Stabilization Reserve to develop the FTTP Master Plan and the Wireless Network Plan. The City Attorney has indicated that the Fiber Optics Fund Rate Stabilization Reserve can be used for fiber and wireless communication services, including developing a FTTP Master Plan, as well as planning for building and operating wireless network services. Cost estimates are as follows:

FTTP Master Plan	\$150,000-\$350,000 (depending on required environmental review)
Wireless Network Plan	\$100,000 (up to)
Total	\$250,000-\$450,000

Following the requests for proposals, staff will return with a budget amendment ordinance to allocate funding from the Fiber Optics Fund Rate Stabilization Reserve for the associated consultant agreements.

Policy Implications

This recommendation is consistent with the Telecommunications Policy adopted by the Council in 1997, to facilitate advanced telecommunications services in Palo Alto in an environmentally sound manner.

Reference CMR: 369:97 Proposed Telecommunications Policy Statements.

Environmental Review

The development of an FTTP Master Plan and a Wireless Network Plan are not projects under the California Environmental Quality Act (CEQA) as feasibility and planning studies are exempt under CEQA Guidelines Section 15262. The City plans on conducting a full CEQA review as soon as the project is defined enough to permit a sufficient review.

Attachments:

- Attachment A. Summary of Dark Fiber Optic Backbone System Expansion (DOC)
- Attachment B. 9-17-2013 Staff Report (PDF)
- Attachment C. Schedule (PDF)

Summary of Dark Fiber Optic Backbone System Expansion

- In 1999, the City issued a Request for Proposal (RFP) for the “*High-Speed Universal Telecommunications Project.*” No viable bids were received.
- From 2000 to 2005, a Fiber-to-the-Home (FTTH) trial was conducted at sixty-six (66) homes in the Community Center neighborhood. The trial proved technical feasibility.
- From 2002 to 2004, staff and a consulting firm developed a FTTH business plan. The plan demonstrated that a FTTH utility could be “economically viable” over a 20-year construction bond period, assuming the Electric Fund would issue the revenue bonds. However, upon further legal analysis by the City Attorney, the Electric Utility could not continue to fund the FTTH project. If bonds were issued to build a citywide FTTH network, they could not be backed by revenues from City of Palo Alto Utilities (CPAU).
- In 2006, the City issued a Request for Proposal (RFP) for the construction and operation of a “City-wide Ultra-High Speed Bandwidth System.” The RFP process resulted in negotiations with a “Consortium” of three firms to build a citywide FTTP network. Ultimately the City was unwilling to raise the amount of capital that the Consortium wanted from the City to participate. Additionally, with the economic downturn in 2008, the Consortium’s ability to obtain their own financing was severely impacted and they withdrew from participation in early 2009.
- In 2009 and early 2010, at Council’s direction, staff worked to evaluate the feasibility of submitting a federal stimulus grant application for FTTP under the National Telecommunication and Information Administration’s (NTIA) Broadband Technology Opportunities Program (BTOP). Once the NTIA issued its project funding criteria, staff concluded that a municipal FTTP project would not qualify for a grant since Palo Alto did not meet the definition of a community “unserved” or “underserved” by broadband service providers.
- In February 2010, Council directed staff to submit a response to Google’s *Fiber for Communities* Request for Information (RFI) to build and test “ultra-high speed broadband networks.” In 2011, Google selected Kansas City, Kansas, and Kansas City, Missouri for their first network deployments and have since announced plans to expand their network into the surrounding suburbs of each city. In April 2013, Google announced plans to deploy a network in Austin, Texas and also announced the purchase of an existing municipal FTTP network in Provo, Utah.
- In 2011, staff and a consulting firm developed a two phase “conceptual plan” which proposed using the Fiber Optics Fund reserve to construct broadband telecommunications hub sites at the City’s nine (9) electric substations (Phase 1), and expanding network access from these hub sites to eighty-eight (88) neighborhood access points or “nodes” (Phase 2). The plan was proposed to establish an economic incentive for a private FTTP firm to

Attachment A: Summary of Dark Fiber Optic Backbone System Expansion

construct the “last mile” of the network to serve residential and commercial premises. The plan was reviewed by the Utilities Advisory Commission (UAC) on June 1, 2011 and the Finance Committee on November 15, 2011.

- In 2012, staff and two consultants evaluated a “user-financed” FTTP business model, which relied on homeowners to pay on a voluntary basis for some or all of the cost to build out the existing dark fiber network into residential neighborhoods. Based on the findings of a community survey and a financial analysis, it was determined that a fully user-financed citywide FTTP system is not possible to achieve. An opt-in FTTP network could be built using a combination of upfront user fees and City financing; however, there is a low probability of the debt being repaid by operating revenues. Ongoing subsidies would be required, very likely in excess of surpluses in the Fiber Optics Fund reserve from licensing dark fiber for commercial purposes. The findings of the user-financed FTTP business model were reviewed by the UAC on June 6, 2012.
- On June 6, 2012, Utilities staff recommended to the UAC to: (1) continue the current business model for licensing dark fiber service connections to commercial customer, (2) discontinue efforts to evaluate and implement phased initiatives to build out the fiber system for residential Fiber-to-the-Premise using the fiber fund reserve, and (3) initiate an evaluation to determine if the City should use the fiber fund reserve to finance the construction and operation of a wireless network which leverages and augments the City’s fiber system. The UAC voted 4-3 to accept staff’s recommendations.



City of Palo Alto

Technology Committee Staff Report

(ID # 4080)

Report Type:

Meeting Date: 9/17/2013

Summary Title: Master Plan to Provide Fiber-to-the Premise and Wireless Network Plan

Title: Develop Master Plan to Build Out the City's Dark Fiber Optic System to Provide Fiber-to-the-Premise and Develop Complementary Wireless Network Plan

From: City Manager

Lead Department: City Manager

Recommendation

Staff recommends that the Technology and Connected City Committee recommend Council direct staff to:

1. Develop a Fiber-to-the-Premise Master Plan and conduct a request for proposals to build out the existing dark fiber optic system in Palo Alto.
2. Develop a Wireless Network Plan with a near-term focus on WiFi, and a long-term consideration of other wireless technologies.

Executive Summary

Progressive cities want to ensure their residents, businesses and anchor institutions have access to ubiquitous and reliable ultra high-speed¹ broadband connectivity. With this goal in mind, and in response to Council's directive, staff is recommending that the City proactively develop a Fiber-to-the-Premise (FTTP) Master Plan and a Request for Proposals (RFP) to build out the dark fiber optic system (fiber system) in Palo Alto. Staff also recommends developing a complementary Wireless Network² Plan in a sequence that addresses both near term and long term objectives.

The FTTP Master Plan will identify the design and specifications of the network. The City will

¹ "Ultra high-speed" broadband connectivity refers to a telecommunications network that would provide speeds in excess of 100 megabits per second (Mbps).

² The term "wireless" includes a large set of technologies that support cellular, radio and "WiFi." WiFi is a single specific technology.

also conduct any environmental review that may be needed in preparation for a subsequent competitive process to attract a third party telecommunications provider to build and operate the network. The Wireless Network Plan will provide a city-wide needs assessment, evaluate how the existing fiber system and other City-owned infrastructure can be fully leveraged to support a citywide multifunctional wireless network, recommend a network design that would best support the City, and provide a business plan with capital and operational cost estimates.

This staff report also provides an update on the creation of a Citizen Advisory Committee.

Background

The Technology and Connected City Committee held its first meeting on May 14, 2013. [Attachment A](#) provides meeting minutes. The Committee recommended that staff develop a work plan to evaluate the feasibility of building a citywide high-speed broadband FTTP network in Palo Alto, and create a Citizen Advisory Committee to assist in the evaluation. The City Council approved the Committee's recommendations on [June 24, 2013](#).

Discussion

Fiber-to-the-Premise Master Plan and RFP

Since the late 1990s, the City has worked to develop a viable business plan to expand the fiber system for residential use. From 2001 to 2005, these efforts included a FTTP trial to prove technical feasibility. The trial was successful in terms of proving technical feasibility, but when initial investment and overhead expenditures were included in the calculation for the business case, it did not appear that a citywide build-out would be economically viable. As a result, from 2002 to 2004, City of Palo Alto Utilities (CPAU) staff worked with a telecommunications consultant to develop a FTTP business case and business plan. The final business plan demonstrated that a FTTP utility could be "economically viable" over a 20-year construction bond period, assuming the Electric Fund would issue revenue bonds. However, upon further legal analysis by the City Attorney, it was determined that the Electric Utility could not continue to fund the FTTP Project. Additionally, no Electric or other Enterprise Utility Revenue Bonds could be issued, and financing costs would be greater than those assumed in the plan.

In 2006, the City issued a Request for Proposal (RFP) for the construction and operation of a "City-wide ultra-high speed bandwidth system." The RFP process resulted in negotiations with a "Consortium" of three firms to build a citywide FTTP network. Ultimately the City was unwilling to raise the amount of capital that the Consortium wanted from the City to participate. Additionally, with the economic downturn in 2008, the Consortium's ability to obtain their own financing was severely impacted and they withdrew from participation in early 2009.

At Council's direction, in 2009 and early 2010 staff worked to evaluate the feasibility of submitting a federal stimulus grant application for FTTP under the National Telecommunication and Information Administration's (NTIA) Broadband Technology Opportunities Program (BTOP). Once the NTIA issued its project funding criteria, staff concluded that a municipal FTTP project

would not qualify for a grant since Palo Alto did not meet the definition of a community “unserved” or “underserved” by broadband service providers. In February 2010, Council directed staff to submit a response to Google’s *Fiber for Communities* Request for Information (RFI) to build and test “ultra-high speed broadband networks.” In 2011, Google selected Kansas City, Kansas, and Kansas City, Missouri for their first network deployments and have since announced plans to expand their network into the surrounding suburbs of each city. In April 2013, Google announced plans to deploy a network in Austin, Texas and also announced the purchase of an existing municipal FTTP network in Provo, Utah.

Citywide Ultra High-Speed Broadband System Project

After the negotiations with the Consortium ended, Council directed staff to explore the use of the fiber fund reserve to independently proceed with a phased build-out of the existing fiber system. In response, staff developed a two-phased “conceptual plan” for the *Citywide Ultra High-Speed Broadband System Project*. The plan was reviewed by the UAC on June 1, 2011 and the Finance Committee on November 15, 2011.

User-Financed FTTP

In 2012, staff conducted a study of an alternative FTTP business model that relies on homeowners to voluntarily pay for some or all of the cost to build out the fiber system into residential neighborhoods with an “open access,” broadband-only service.³ To analyze the feasibility of the user-financed FTTP model, market research was developed based on a community survey conducted by RKS Research and Consulting, in addition to a financial assessment prepared by Tellus Venture Associates (TVA). The RKS survey results affirmed that residents view CPAU as a respected and competent provider of core utility services. A measurable number of homeowners are interested in adding telecom to the list of services they can purchase from CPAU, but a commitment to invest in a fiber connection is very limited.

TVA’s report concluded that a fully user-financed citywide FTTP network is not possible. An opt-in FTTP network can be built using a combination of upfront user fees and City financing, but there is very little probability of the debt incurred being repaid through operations. Ongoing subsidies would be required, almost certainly in excess of the surpluses generated by the licensing of dark fiber for commercial purposes. Based on the market research and financial analysis prepared for the conceptual plan and the assessment of the user-financed FTTP business model, staff concluded there was no reasonable fiscal basis to pursue either approach.

On June 6, 2012, by a vote of 4 to 3, the Utilities Advisory Commission (UAC) accepted staff’s recommendations to 1) continue the current business model for licensing dark fiber service connections to commercial customers, 2) discontinue efforts to evaluate and implement

³ In an open access, broadband-only service model the network owner treats the network as a common carrier (like public roads). The network owner invites multiple independent broadband service providers onto the network to compete for customers on the basis of service, price and quality. The network owner generates revenues by collecting network transport fees paid by the independent service providers to use the network for the delivery of voice, video and data services.

phased initiatives to build out the dark optical fiber backbone network, and 3) retain a wireless communications consultant to study the feasibility of using the fiber fund reserve to build a municipal wireless network.

FTTP Master Plan and RFP

The City has evaluated viable business plans/models to expand the fiber system for residential use since the late 1990s. Given the upturn in the economy, the City believes that there is a renewed interest from telecommunications service providers in building an advanced competitive broadband network in Palo Alto. Staff believes the best way to attract these providers is to develop a broadband Master Plan, including proactively designing the FTTP network, defining appropriate network specifications and conducting any necessary environmental review under the California Environmental Quality Act (CEQA) in preparation for an RFP.

To develop the Master Plan, staff recommends retaining a consulting firm with an expertise in developing plans and RFPs for government agencies contemplating building FTTP and wireless networks. Once the Master Plan is developed, the objective is to issue an RFP for a third party telecommunications service provider to build and operate the network. The estimated cost to develop the Master Plan and conduct the RFP is approximately \$150,000 - \$350,000 (depending largely on the level of required environmental review) and will include facilitating an engineering study to develop the infrastructure plan and estimate the cost to build the FTTP network, evaluate legal and regulatory issues, and complete environmental review. The estimated timeframe to develop the Plan and conduct the RFP is nine months and will require the time of approximately 1.75 FTEs over the nine month period.

If the environmental review for a FTTP Network results in a mitigated negative declaration, the cost would range from \$20,000 to \$50,000. If a full Environmental Impact Report (EIR) is required (based on a third party network builder using the rights-of-way for an FTTP Network and acknowledging potential legal challenges), the cost may range from \$200,000 to \$250,000. The California Environmental Quality Act contains advisory time schedules for completing environmental review. In general, mitigated negative declarations should be completed within six (6) months of receiving a complete application and EIRs within one year of a complete application.

Wireless Network Plan and RFP

In addition to developing a Master Plan and RFP for bring FTTP, wireless solutions should also be employed. The term “wireless” as defined here includes a large set of technologies that support cellular, radio and “WiFi.” The City’s fiber system has enough coverage and capacity to support an overlay of a multifunctional wireless network. Moreover, cities with fiber systems have an inherent advantage in deploying wireless networks since fiber provides essential

“backhaul”⁴ transmission links to support high data rates over wireless networks.

With appropriate design and sufficient budget, municipal wireless networks can support remote and mobile broadband needs for public safety personnel and other field-based staff, in addition to potentially offering WiFi Internet access for the general public. Furthermore, specialized uses such as a wireless communications system for smart grid applications can also be accommodated by a multifunctional wireless network with the proper design and technology.

Staff recommends issuing a Request for Proposal (RFP) to retain professional services from a wireless communications firm with experience working with local governments to develop the options and plans to build a wireless network. Staff estimates the cost will be \$100,000 and will take six to nine months to complete the Wireless Network Plan. The general scope of work for the Plan includes, but is not limited to, the following tasks and deliverables:

- Define the City’s wireless broadband goals and objectives based on conducting a “user group” needs assessment among all City departments, including public safety. This task would also include an assessment of the type of wireless communication system required to support future deployment of Smart Grid applications.
- Provide an assessment of how the general public and City could use the network for WiFi access to the Internet in the near term.
- Provide an analysis of using wireless data services from the commercial carriers as opposed to building a dedicated municipal network for a variety of wireless applications to support City services.
- Evaluate how the existing fiber system and other City-owned infrastructure and properties can be fully leveraged to support a citywide multifunctional wireless network.
- Assess the various technologies used to build municipal wireless networks and recommend which technologies and network design would best support end-user needs and the City’s present and future goals and objectives for wireless services.
- Prepare a preliminary business plan with capital and operational cost estimates.

Upon completion of the Wireless Network Plan, the findings and recommendations will be submitted to the Technology Committee and the Council to assist the Council members with formulating a final vision and direction for the deployment of a wireless network. Staff estimates the cost to build a citywide wireless network to be in the range of \$3 to \$5 million. The projected ongoing support and maintenance cost to operate the network will also be addressed in the Wireless Plan.

⁴ “Backhaul” is a term used to describe the transmission of customer usage data from a collection point in a wireless network back to a central point or network backbone. If a fiber network is in place, it can put wireless access points anywhere and offer each a dedicated amount of bandwidth in excess of what would be possible with a purely wireless network known as the “all radio approach.”

Other Potential Near-term WiFi Actions

Understanding the time that will be needed to develop both the Fiber Master Plan and WiFi Plan, in the interim, staff recommends evaluating and implementing where practical, near term solutions that are impactful to the community and municipal services. For example, expanding WiFi capabilities in additional parks, plazas, University and/or Cal Avenues, and/or identifying the most troubling dead zones in Palo Alto and deploying WiFi, etc.

Citizen Advisory Committee Update

An Advisory Committee will be appointed by the City Manager to provide objective advice, from a citizen perspective, to the City Manager and the Technology Committee. The primary role of the advisors is to work with the Technology Committee, City Manager and City staff to develop the Fiber Master Plan and support the work necessary to develop recommendations for FTTP and wireless deployments to the Technology Committee and City Council.

To date, eight members of the community have expressed interest in sitting on a Committee. The City Manager will select candidates based on their knowledge of the telecommunications industry and applicable technologies; familiarity with municipal broadband initiatives in Palo Alto and other communities; understanding of the various business models for deploying fiber and wireless networks; and interest in the public policy issues affecting government owned and operated broadband networks.

Resource Impact

Licensing dark fiber is a financially successful enterprise for the City and generates a steady revenue stream that can support the City's goal of becoming a "leading digital city." The fiber fund reserve is \$15.3 million as of the end of fiscal year 2013. There is also a \$1.0 million Emergency Plant Replacement Fund for the fiber system. The City Attorney has provided CPAU staff with an opinion that the fiber fund reserve can be used for fiber and wireless communication services, including developing a Fiber Master Plan, as well as planning for, building and operating wireless network services. Staff recommends leveraging the fiber reserve to develop the FTTP Master Plan and the Wireless Network Plan. Cost estimates are as follows:

FTTP Master Plan	\$150,000-\$350,000 (depending on required environmental review)
Wireless Network Plan	\$100,000 (up to)
Total	\$250,000-\$450,000

Policy Implications

This recommendation is consistent with the Telecommunications Policy adopted by the Council in 1997, to facilitate advanced telecommunications services in Palo Alto in an environmentally sound manner.

Reference CMR: 369:97 Proposed Telecommunications Policy Statements.

Environmental Review

The development of an FTTP Master Plan and a wireless services plan are not projects under the California Environmental Quality Act (CEQA) as feasibility and planning studies are exempt under CEQA Guidelines Section 15262. The City plans on conducting a full CEQA review as soon as the project is defined enough to permit a sufficient review.

Attachments:

- Attachment A. May 14, 2013 Committee Meeting Minutes (PDF)



TECHNOLOGY AND THE CONNECTED CITY MINUTES

Special Meeting
September 17, 2013

Chairperson Kniss called the meeting to order at 4:03 P.M. in the Council Conference Room, 250 Hamilton Avenue, Palo Alto, California.

Present: Klein, Kniss (Chair), Scharff, Shepherd

Absent:

AGENDA ITEMS

1. Update on Broadband Conference: "Bringing Together 21st Century Cities," New York City, September 10, 2013.

Chair Kniss announced she and Vice Mayor Shepherd attended the conference held in Kansas City, Missouri.

Jim Fleming, Management Specialist for the Utilities Department reported the Fiber to the Home Council Conference was held at the end of May 2013 in Kansas City, Missouri. Key factors to building a broadband network were: 1) community and local government leadership and support; 2) the review and approval requirements by permitting and defining expeditious processes; 3) use of existing infrastructure; 4) proactive improvement of infrastructure; and 5) use of building codes and community development plans to drive fiber deployment. He reviewed the various individual meetings held at the conference and much information was available through individual conversations, including think tanks and vendors.

Vice Mayor Shepherd indicated municipality participants were unusual at the conference. Google's project was having typical utility-municipality issues.

Chair Kniss understood an important feature of broadband was content.

Mr. Fleming attended the Broadband Conference in New York with Council Member Berman. The conference's purpose was to bring together leaders from cities to develop a variety of approaches to broadband deployment as well as those who were seeking gigabyte ultra-high speed connectivity. The

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agenda for the meeting focused on 1) how cities were able to lead high speed communities; 2) why cities faced challenging landscapes; 3) strategies that led to success; and 4) how cities were able to collaborate. He reviewed the main topics of the conference and shared comments made by conference speakers. The most significant challenge to building a fiber network was competition.

Chair Kniss inquired whether Austin, Texas government officials were present at that conference.

Mr. Fleming replied no...

Chair Kniss asked which of the cities present at the conference were successful in building a fiber network.

Mr. Fleming thought the latest projects were being constructed in Lafayette, Louisiana and Chattanooga, Tennessee. Those projects were successful in part because of community support for the projects.

Council Member Klein inquired about the number of people present at the New York conference.

Mr. Fleming reported 14 cities were represented, and perhaps 30-40 individuals were present.

Council Member Klein inquired whether the conference would be held annually.

Mr. Fleming said conference leaders would return with a method for participants to collaborate.

Council Member Klein asked if Provo, Utah was represented at the conference.

Mr. Fleming replied no.

Council Member Klein inquired whether Staff conferred with the three central coast counties.

Mr. Fleming answered no. Much of the area in those counties did not have access to broadband. The 395 Project in eastern California received a significant amount of funds to build the network. Those communities were underserved.

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Council Member Klein noted it was not unusual for residents of Santa Cruz to work in Palo Alto. He felt broadband had not been in the news since the Technology and the Connected City Committee (Committee) met last time.

Mr. Fleming believed communities were once again interested in broadband opportunities. Several municipalities were present at the Kansas City conference to learn about broadband. It was important for facilities and infrastructure to be ready to accommodate broadband.

Council Member Klein inquired whether the Kansas City conference would be an annual event.

Mr. Fleming replied yes. The Fiber to the Home Council held meetings throughout the year.

Chair Kniss explained that the Fiber to the Home Council was a trade group.

Mr. Fleming added that members were municipalities, smaller telecommunication companies, and vendors.

Vice Mayor Shepherd indicated the Google broadband project continued in the research and development stage. Google was having difficulty enrolling a sufficient number of residents to make the project viable in all neighborhoods.

Mr. Fleming understood Google's strategy for those neighborhoods was to offer a low-level tier of service.

Vice Mayor Shepherd added that some neighborhoods would not receive broadband service in the near future.

Mr. Fleming explained that Google needed a certain level of aggregate demand in fiberhood to build the network.

NO ACTION TAKEN

2. Develop Master Plan to Build Out the City's Dark Fiber Optic System to Provide Fiber-to-the-Premise and Develop Complimentary Wireless Network Plan.

James Keene, City Manager reported Staff's focus for the master plan was to be fiber-friendly and to prepare the way for fiber. Concurrently, Staff resurrected work prepared a few years ago on the issue of wireless connectivity. He mentioned that Staff would clarify the idea of non-wired

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connectivity and how that included both Wi-Fi and longer-term wireless considerations. Staff was concerned about adequate service in the community and did not wish to limit the community to only fiber services. Staff needed the Council's direction with regard to a Citizen Advisory Committee.

Jim Fleming, Management Specialist in the Utilities Department stated the overarching goal of the master plan was to ensure that residents, businesses, and anchor institutions receive access to ever-present and reliable high speed broadband connectivity. Staff believed telecommunication service providers were interested in building a network in Palo Alto. To attract providers, he thought the master plan should include an engineering study which created a design for the fiber-to-the-premise (FTTP) networking and that it should have defined appropriate network specifications for which it could be conducted in any necessary environmental review under the California Environmental Quality Act (CEQA). The master plan included estimating the total cost to build a network and evaluate legal and regulatory issues. Once the master plan was completed, Staff was able to develop a Request for Proposal (RFP) to facilitate a competitive process to attract third-party telecommunication service provider's to build and operate the network.

Council Member Klein did not think Staff should assume the RFP would be issued to attract a telecommunication service provider's, he suggested the City operate the network.

Mr. Fleming proposed that the Council review business models as part of developing the master plan. Three types of business models were: 1) closed access (the City would build and operate the system); 2) open access (the City would build the system and Internet Service Providers (ISP) operated the system); or 3) a partner or private party could build system. The master plan needed to focus on attracting outside parties.

Council Member Klein wanted the Council to discuss all business models, rather than just the master plan because he did not want to assume the use of just one model.

Mr. Keene indicated the network design within the environmental review process could allow Staff to provide recommendations to the Council. The environmental review enabled the City to operate the network and to certify it for a third-party use.

Council Member Klein needed to examine the various models utilized in other cities first.

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Mr. Keene inquired whether the plan design restricted the Council's review of models.

Mr. Fleming answered no. Staff recommended retaining a consulting firm to develop a master plan with respect to building broadband networks. The estimated cost to develop the master plan and to conduct the RFP process was \$150,000-\$300,000, depending on the level of required environmental review. If the environmental review resulted in a mitigated negative declaration, the cost for review was \$20,000-\$50,000. If a full Environmental Impact Report (EIR) was required, the cost changed to \$200,000-\$250,000. The estimated timeline to develop a master plan and conduct the RFP was nine months, and required the time of approximately 1.75 Full-Time Employees (FTE).

Vice Mayor Shepherd noted the City developed a business plan and technical analysis for dark fiber.

Mr. Fleming added RKS performed the market research survey.

Vice Mayor Shepherd asked if Staff was repeating work previously performed.

Mr. Fleming explained the core component of the master plan was an engineering study to determine cost and network specifications.

Vice Mayor Shepherd inquired whether the engineering study provided technical information rather than determine the model of the system.

Mr. Fleming responded yes. The City did not have a full engineering study to determine the various components and needs for building the system.

Vice Mayor Shepherd inquired about the motivation for building an FTTP network.

Mr. Fleming said the engineering study determined the type of network that could be built and the differences among services already in place. The study also provided exact costs for the community.

Vice Mayor Shepherd thought the engineering study was useful in determining the motivation for building a network.

Mr. Fleming added that the engineering study would also determine the assets the City had.

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Mayor Scharff asked if the next step was discussion of wireless.

Chair Kniss indicated that was the next part of the presentation.

Mr. Keene requested specific direction related to both fiber and wireless.

James Cook, Utilities Advisory Commission (UAC) explained that the UAC did not have guidance from the Council to pursue FTTP. Some of the Commissioners were skeptical of the costs estimated earlier. He asked if the City reviewed an EIR.

Chair Kniss responded yes.

Jeff Hoel recommended the method for choosing a consultant for the next study should be different. He suggested that the first step be to count the number of premises for each type, prior to hiring a consultant. Next, an auditor needed to review the previous studies to determine inaccuracies. He said the Council delayed consideration of wireless until a plan for fiber was ready, and he reminded the audience that a wireless network was implemented using the fiber infrastructure.

Andy Poggio felt it was premature to say in the master plan that a third party would build, operate, and own the FTTP network. He suggested reviewing the cost of building a FTTP network, then matching costs against dark fiber revenues, and then reviewing plans. Implementation of wireless technology needed to move slowly because a wireless overlay was easy and inexpensive once fiber was deployed. The next question was whether the FTTP network should supply video.

Herb Borock indicated that any RFP should be developed and approved by the Council. Previous City Attorneys showed the City should not own the optronics but could own the dark fiber. The City needed to allow citizens to design the network. He thought they could utilize the dark fiber fund to build the fiber plant, and then they could determine the network operator.

Chair Kniss was comfortable with Staff's recommendation for next steps.

Mayor Scharff supported Staff's recommendation with the exception of an outside party operating the network. Staff needed to perform the scope of work, retain the telecommunication consulting firm, and to conduct the environmental review.

MINUTES

Mr. Keene reported Staff would perform the basic work with consultant assistance. He explained that Staff would return to the Technology and the Connected City Committee (Committee) with a foundation for the network design, the scale, and the results of the environmental review.

MOTION: Mayor Scharff moved, seconded by Council Member Klein to recommend the City Council direct Staff to develop a Fiber-to-the-Premise Master Plan and conduct a request for proposals to build out the existing dark fiber optic system in Palo Alto.

Council Member Klein expressed concern about the timeline for initiating the RFP process.

Mr. Keene explained that Staff's estimate of nine months included environmental review and approval.

Council Member Klein hoped the City would not need an EIR for the project. He asked if the timeline could be reduced to six months, if a reduced negative declaration was possible.

Mr. Fleming responded yes.

Mr. Keene reported the timeline would be dependent on the scale of the environmental review.

Council Member Klein was concerned the City would be considering out-of-date technology because of the speed at which technology grew had changed.

Chair Kniss inquired whether Council Member Klein could accept six to nine months.

Council Member Klein noted the Motion did not contain a timeline.

Mr. Cook wanted to form a Citizen Advisory Committee; however, Staff was waiting for direction on that aspect.

Mr. Keene noted Staff was waiting for direction regarding a Citizen Advisory Committee and for the wireless subject to be discussed.

Chair Kniss indicated the wireless aspect was scheduled for discussion towards the end of the meeting.

MINUTES

Mayor Scharff wanted clarification on Staff's timeline for proceeding in six months with a reduced negative declaration and in nine months with a full environmental review.

Mr. Fleming stated the timeline was a guesstimate.

Mayor Scharff requested Staff provide updates.

Chair Kniss explained that the community would be aware of progress through the Committee's meetings.

Vice Mayor Shepherd believed an engineering study would provide technical information and costs regarding a network. The RFP process was outlined at the Kansas City Conference, and Staff appeared to be following that outline.

MOTION PASSED: 4-0

Mr. Keene indicated Staff was not opposed to fiber.

Jonathan Reichental, Chief Information Officer agreed with public comment regarding the evolving state of wireless technology. He believed that wireless and fiber should not be codependent because wireless was a series of technologies ranging from cellular to radio to Wi-Fi, and other emerging technologies. Staff was studying the diversity of wireless solutions and segregating near-term and long-term solutions. A fiber background provided a better quality of connectivity for wireless technology. He concluded that the scope of the proposed RFP ensured that Staff properly assessed the potential uses and costs of each solution because wireless technology was utilized to improve communication among Public Safety teams and in the event of a major catastrophe. Staff wanted to explore smart grid options and Wi-Fi as a public utility. He said the consultant would quantify uses and costs for the community and provide timelines for implementation.

Mr. Keene agreed the technical connection between fiber and Wi-Fi technology was key. He suggested that the existing dark fiber ring could be expanded to support wireless initiatives.

Mayor Scharff inquired about available wireless speeds.

Mr. Reichental established that Wi-Fi speeds were often slow or unavailable but that Wi-Fi should be high speed for both upload and download.

Mayor Scharff wanted connectivity speed to be better than cellular speeds.

MINUTES

Mr. Keene agreed that public Wi-Fi was often too slow for practical use.

Council Member Klein recalled the City of Mountain View's experience with Wi-Fi did not work out, and requested comments.

Mr. Reichental noted the free municipal Wi-Fi in Mountain View was not good enough to be used reliably.

Mr. Keene agreed the experiment did not work out well.

Mayor Scharff noted Santa Clara also had a Wi-Fi network operated from the utility network.

Mr. Fleming explained that the network began as a private venture, and the City bought the assets to use for smart grid communications.

Mayor Scharff inquired whether \$3-5 million provided a Wi-Fi network that operated more efficiently than cellular service.

Mr. Reichental indicated that \$3-5 million was an educated guess and included blended wireless solutions. To reach the best experience, the City needed to provide more funds to build out the fiber network and to cover more devices.

Vice Mayor Shepherd supported moving forward with wireless. She understood the main metric for wireless and fiber was broadband speed and asked how improved wireless benefited the quality of life in Palo Alto.

Mr. Reichental reported Wi-Fi could be beneficial to areas with a high number of people using smart phones and tablets.

Vice Mayor Shepherd wanted to understand how implementing fiber and wireless technology provided a savings to the City as a whole.

Mr. Reichental believed that more information could be provided by the study that was being done to determine the demand. He guessed the community would probably be interested in wireless availability in parks and plazas. Public Safety departments were able to utilize other wireless solutions for communications. The Utilities Department was able to explore smart grid solutions through fiber and wireless technology.

Vice Mayor Shepherd felt the purpose of the project was to build emergency preparedness and convenience.

MINUTES

Mr. Reichental reported that the Emergency Services Director explored a number of proposals that would potentially be available to the City if disaster happened.

Council Member Klein understood the Purchasing Department was often responsible for delays in releasing proposals and information.

Mr. Keene explained that complexity in review and procurement requirements resulted in proposals being returned to departments. Staff's ability to provide accurate timelines was affected by that delay.

Andy Poggio reported three factors affected wireless speed: fundamental technology, signal strength, and the number of people sharing an access point. Wireless speed improved by utilizing the latest hardware and providing more access points.

Mayor Scharff inquired whether an infinite number of access points could be utilized with fiber.

Mr. Poggio explained the number of frequencies limited the number of access points.

MOTION: Council Member Klein moved, seconded by Vice Mayor Shepherd to request that Staff develop a Wireless Network Plan with a near-term focus on Wi-Fi, and a long-term consideration of other wireless technologies.

Vice Mayor Shepherd felt the tension point would be Wi-Fi as a utility. She understood the fiber fund could be utilized for wireless technology.

MOTION PASSED: 4-0

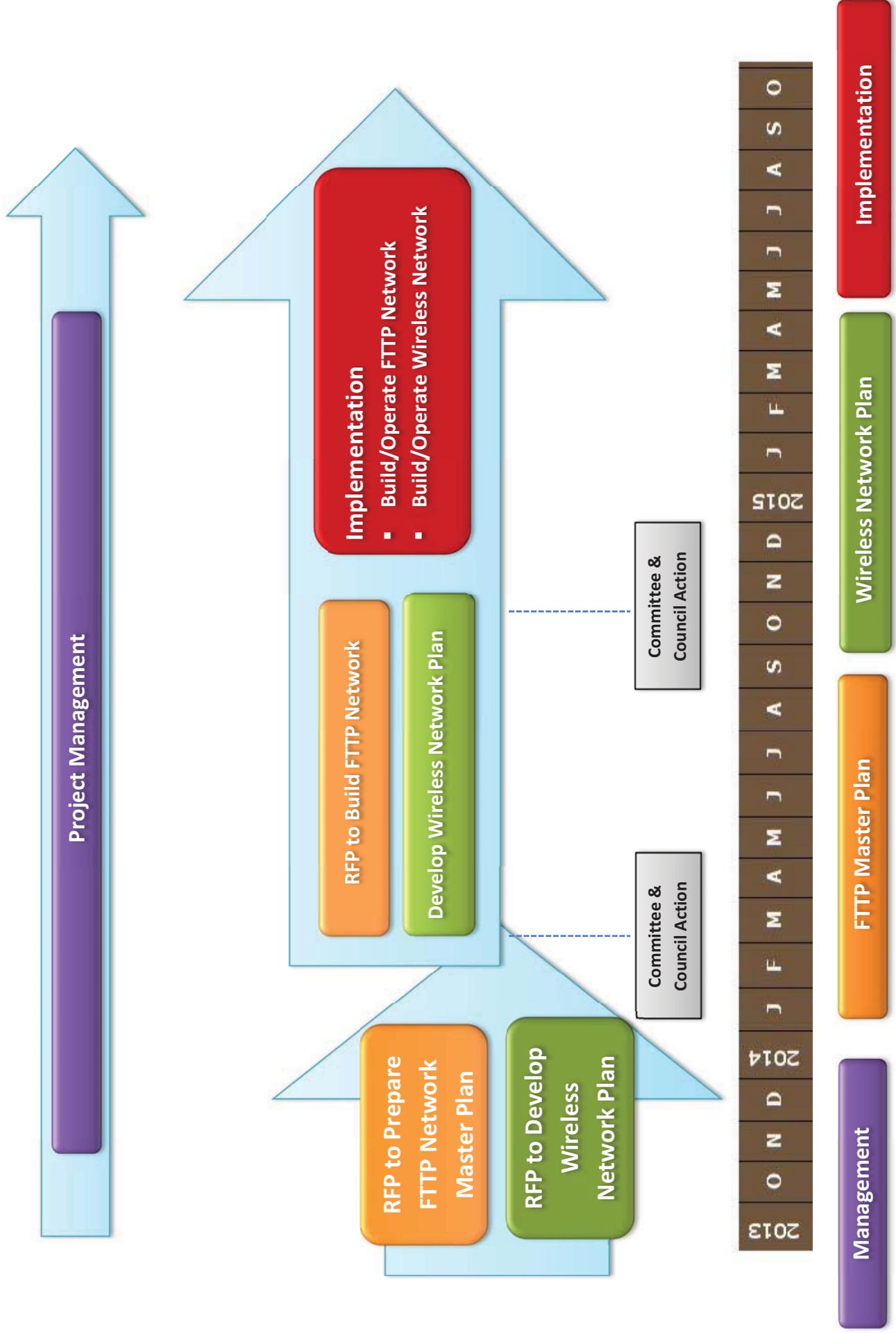
Mr. Keene suggested Staff return to the Committee in early November 2013 with an update. At that time, he planned on appointing a Citizen Advisory Committee.

Chair Kniss requested the City Manager proceed with the Citizen Advisory Committee.

Mr. Keene reported six to eight citizens expressed interest in serving on the Citizen Advisory Committee. He was not bound to place all citizens who volunteered on the Advisory Committee.

ADJOURNMENT: Meeting adjourned at 5:43 P.M.

Attachment C. High Level Plan and Schedule to Develop Fiber-to-the-Premise Master Plan & Wireless Network Plan



Schedule to Develop Fiber-to-the-Premise Master Plan

1. Milestones for conducting Request for Proposal (RFP #1) to retain consulting firm to develop Master Plan and develop Request for Proposal (RFP #2) to build out the City's fiber system to provide Fiber-to-the-Premise;
2. Milestones to conduct RFP #2 to select vendor to build and operate a FTTP Network;

Milestones

October 28, 2013

Receive Council approval to act on the recommendation from the Council Technology and the Connected City Committee to develop a Fiber-to-the-Premise Master Plan and conduct a Request for Proposal to build out the existing dark fiber optic system.

November 30, 2013

Conduct Request for Proposal (RFP #1) to retain consulting firm to prepare Master Plan for FTTP Network. *Note: the purpose of the Master Plan is to develop an engineering study and cost model for a FTTP Network. Based on the findings and recommendations in the Master Plan, the consulting firm will develop a Request for Proposal (RFP #2) for the purpose of attracting a third party telecommunications service provider to build and operate a FTTP Network in Palo Alto.*¹

January 15, 2014

Vendor responses due. Form panel to review vendor responses and conduct interviews

February 1, 2014

Conduct vendor interviews.

February 15, 2014

Select vendor to develop Master Plan and RFP #2 and make recommendation to the Council to award a contract.

March 1, 2014

Award contract to vendor.

March 15, 2014

Vendor work commences.

June 1, 2014

Vendor completes work and submits Master Plan Report and RFP #2 to staff for review and comments.

June 15, 2014

Planning and Environmental Services Department review Master Plan and determine if the proposed FTTP Network warrants a mitigated negative declaration or a full Environmental Impact Report (EIR).

¹ The FTTP engineering study and network design will be sufficient to meet review requirements under the California Environmental Quality Act (CEQA).

Schedule to Develop Fiber-to-the-Premise Master Plan

July 15, 2014

Contingent on the level of environmental review required, conduct RFP #2. The purpose of RFP #2 is to select a third party telecommunications service provider to build a FTTP Network. *Note: this milestone may be affected by the amount of time required to conduct the environmental review.*

October 1, 2014

Approval of CEQA documentation (longer if Environmental Impact Report required)

September 1, 2014

Vendor responses due. Form panel to review responses.

September 15, 2014

Conduct vendor interviews.

October 15, 2014

Select vendor to build and operate FTTP Network.

November 15, 2014

Recommend vendor contract award to Council.

Schedule to Develop Wireless Network Plan

Milestones

October 28, 2013

Receive Council approval to act on recommendation from the Technology and the Connected City Committee to develop a Wireless Network Plan with a near-term focus on WiFi, and a long-term consideration of other wireless technologies.

November 30, 2013

Issue Request for Proposal (RFP) to retain consulting firm to prepare Wireless Network Plan.

January 15, 2014

Vendor responses due. Form panel to review vendor responses and conduct interviews.

February 1, 2013

Conduct vendor interviews.

February 15, 2013

Select vendor to develop Wireless Network Plan.

March 1, 2014

Award contract to vendor.

March 31, 2014

Vendor begins work.

July 15, 2014

Vendor submits report for Wireless Network Plan.

August 1, 2014

Based on Wireless Network Plan, staff recommendation to the Technology and the Connected City Committee. Review and approval of the recommendation may also be required by Utilities Advisory Commission and Council Finance Committee.

September 2014

Committee recommendation to the Council.

October 2014

Based on Council approval of the recommendation and direction, staff develops action plan.

November 2014

Based on Council direction, issue Request for Proposal to retain vendor to build and operate wireless network.

Late 2015

Wireless network activated.