

(d) 3 - Community Wi-Fi Strategy Update

Smart Cities and Service Improvements Committee

November 07, 2019

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Agenda

- San José Community Wi-Fi Approach
- Wi-Fi Projects Timeline
- Community Wi-Fi RFI Insights
- Short Term Options and Recommendations
- Access Eastside Funding Options
- Summary and Feedback

San José Community Wi-Fi Strategy Approach

- Reliable, high speed, high capacity connectivity at home is increasingly essential for quality of life
- 100,000 San Jose residents are without internet access at home
- Wi-Fi in other outdoor gathering areas improves economic development, quality of life, and brand
- Existing free outdoor Wi-Fi networks are disparate, increasingly unfunded, and require upgrades
- School district partners believe Community Wi-Fi ongoing operations and maintenance should be City or jointly funded due to public benefit of an open network
- The City is executing a two-phased Community Wi-Fi Strategy to address these challenges

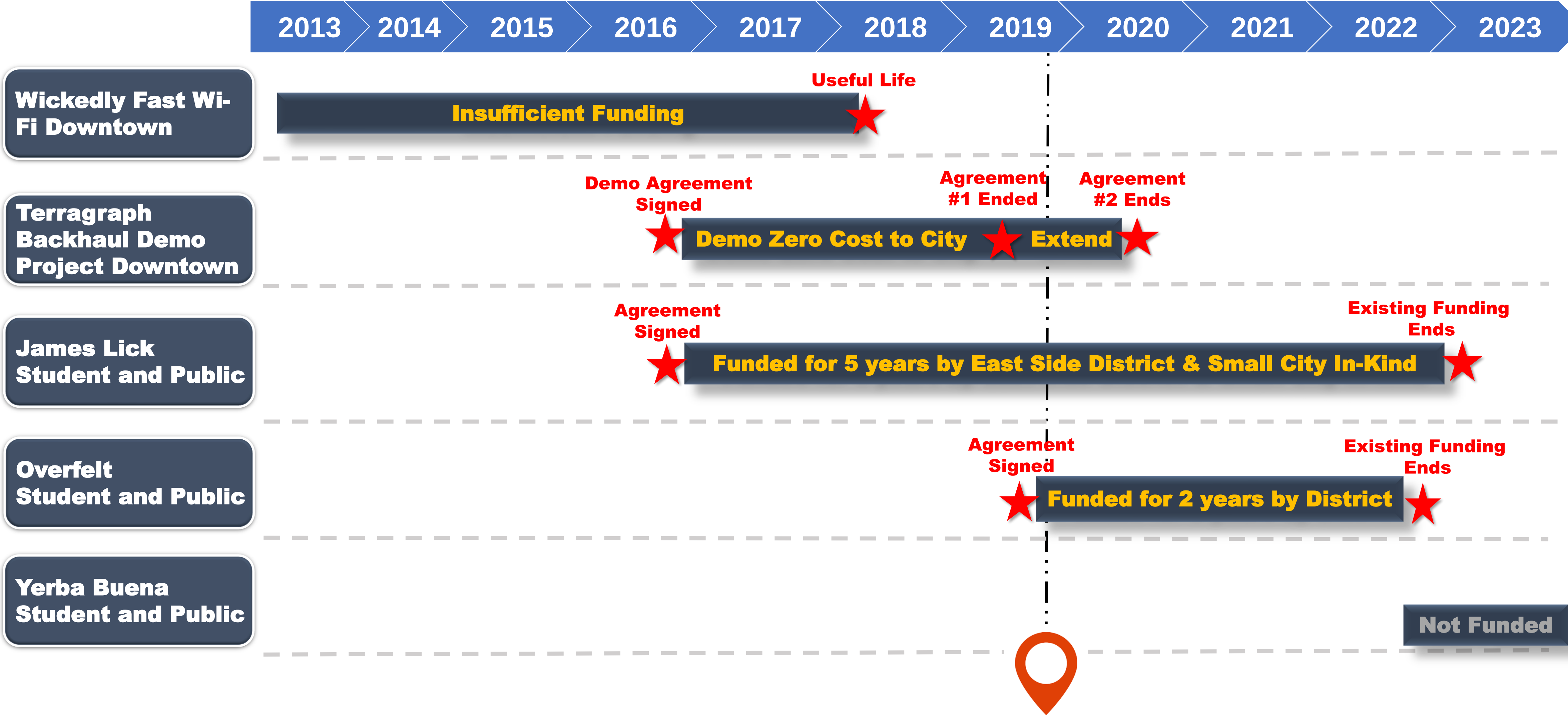
Phase I Goals – Sustain and Complete Foundation

- Upgrade Wi-Fi technology to current commercial versions
- Complete Facebook Terragraph backhaul demo project by optimizing the user experience and opening to public
- Confirm capable network operator to transition Terragraph
- Consider Terragraph expansion to San Pedro Square
- Generate sustainable revenue stream for 3-5 years for other Wi-Fi projects including Access East Side
- Build footprint, foundation, and thus value of future Wi-Fi network
- Understand interest & possible business models for the above

Phase 2 Goals – Expand and Scale

- Expand to other high priority areas for:
 - ✓ Digital Inclusion;
 - ✓ Economic development;
 - ✓ Possible Internet of Things support.
- Execution at scale
- Enhance public services and revenue by leveraging foundation as a platform for additional services (wi-fi offloading, premium internet access, IoT data connectivity, advertising, and more)
- Generate long term sustainable business model
- Phase 1 success required before Phase 2

Wi-Fi Projects Timeline



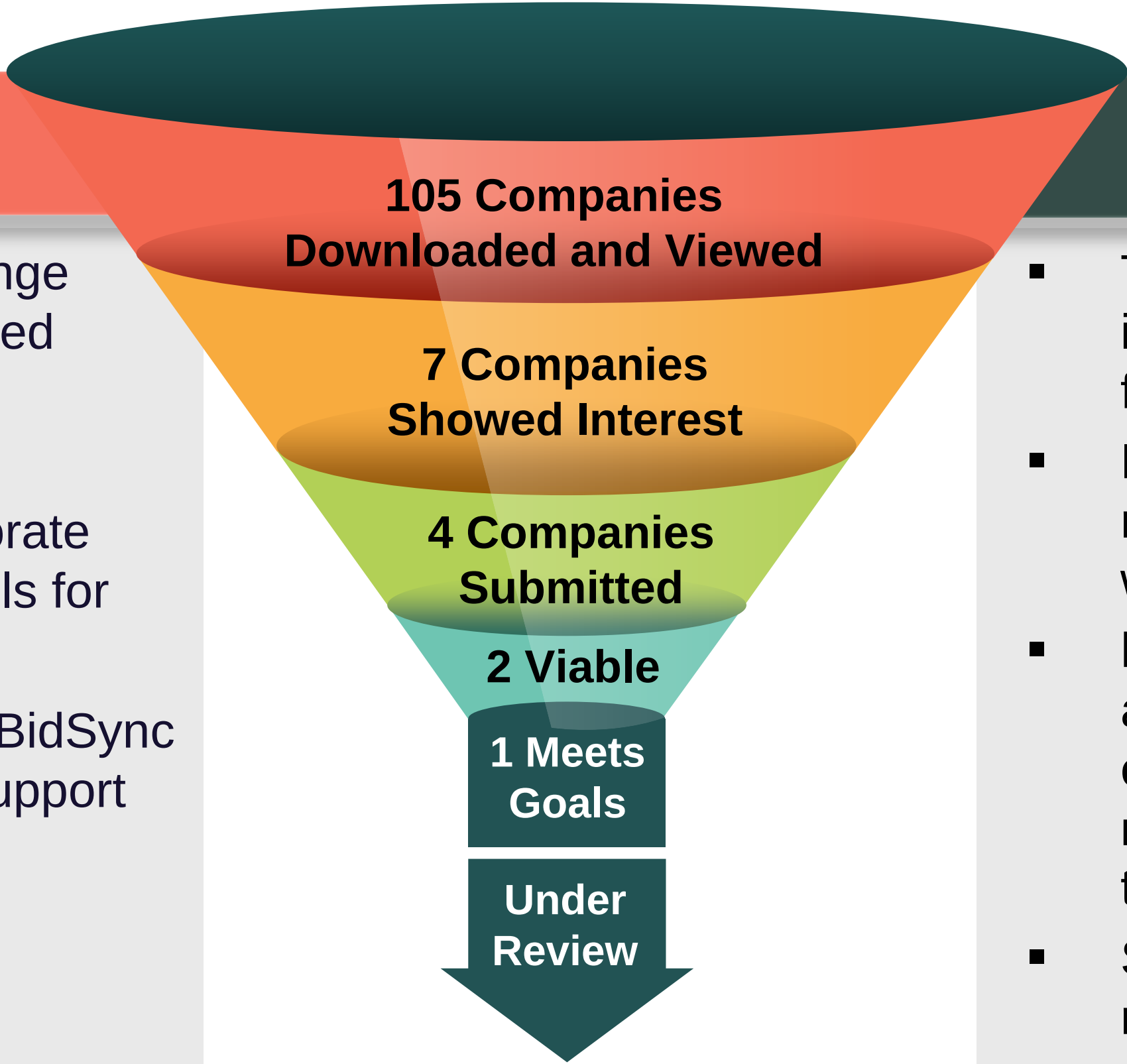
There is insufficient funding to support upgrades, expansion, operations and maintenance

*Five Years is Considered Useful End of Life.

Community Wi-Fi RFI Insights

Goal/What We Asked For:

- **Goal:** Validate ecosystem for value exchange through RFI before considering an elongated RFP process per recommendation of City Attorney's Office;
- Requested responder to identify and elaborate innovative value exchange business models for funding community Wi-Fi;
- Released Phase 1 RFI in August 2019 on BidSync and marketed through social media with support from Joint Venture Silicon Valley;
- Identified value exchange options:
 - ✓ Pole lease;
 - ✓ Rooftop lease;
 - ✓ Other City Assets;
 - ✓ Advertising revenue;
 - ✓ Future privacy policy compliant monetization of data;
 - ✓ Other innovative funding models.
 - ✓ Existing footprints and potential new areas
- Conducted responder conference call, answered high volume of questions, concluded RFI at the end of September 2019.



What We Learned:

- Telco strategy does not support large scale Wi-Fi in most cases and all telcos declined responding formally with informal possible interest in Phase 2;
- Existing telco agreements would need to be revisited to consider a different value exchange which is mutually undesirable;
- Larger network “foundation” needed before public and revenue enhancing services could be entertained [carrier WI-FI offloading, advertising revenue, Internet of Things (IoT) data other ‘over the top’ services];
- Significant interest in value trade on city owned rooftop lease for point to point antennas (not macros);
- One viable response from a consortium can meet Phase 1 goals if well negotiated;
- Consortium is systems integrator, neutral host provider, and wireless internet services provider (WISP);
- Introduces two new entrants into landscape.

Phase 1 Options and Recommendations

Option	Description	Pros	Cons
#1 Conventional Funding Stream	- City funds the Wi-Fi network largely through General Fund. - City seeks additional contributions from district for capex and partial opex. - City and district pursue grants.	- Well understood funding approach. - Fastest time to plan and execute except grants. - Significantly larger City investment than existing funding for existing Wickedly Fast Wi-Fi.	City funding use has no source (no council policy guidance) beyond existing funding for existing Wickedly Fast Wi-Fi and should be considered as part of the annual budget process.
#2 Value Exchange Funding Stream	- City negotiates successful value exchange with “consortium”. - City also seeks additional contribution from partners for capex and opex. - Staff return with recommendation to full council prior to January 30th	- Ideally no negative impact to the general fund. - Sustainable opex revenue for all four Wi-Fi footprints. - Provides confidence on sustainability and operator. - Similar in concept to telco small cell value exchanges.	- Complex negotiations and partner discussion need to happen quickly. - Negotiations could fail or actual demand could be less than projected demand.
#3 Decommission	- Declare Terragraph backhaul demo project a success, remove Terragraph equipment and leverage Wi-Fi access points for other projects. - Focus on Access East Side and existing Wickedly Fast Wi-Fi funding options.	- Frees up city’s pole assets downtown. - Terragraph Wi-Fi access points can be re-used.	- Negative public impact - reduced to no free wi-fi downtown (city buildings, convention center, airport not impacted). - Negative impact to brand image. - Need to resolve Access East Side Funding.

Staff Recommends Pursuing #2 Value Exchange Option to it’s logical conclusion

Access Eastside Potential Funding Options *

- Additional bond funding will be available per District Chief Technology Officer Randy Phelps at 10/22 Council Meeting
- Housing Department grant funding for Yerba Buena
 - CDBG (Community Development Block Grant)
- California Advance Services Fund (CASF)
- Value exchange previously recommended
- Alum Rock school district funding
- Grants
- Hybrid approach

* Reference from 10/22 Access East Council Recommendation Discussion

Summary

- Current and planned Community Wi-Fi footprint cannot be maintained without securing a sustainable revenue stream
- The City has a limited set of viable options in the first phase
- Staff recommends pursuing value exchange negotiations with the single RFI response consortium and better understanding additional Access East Side funding contribution to inform next steps on Terragraph
- Staff recommends referral to City council on January 7th with a recommendation that includes a negotiate and execute with the value exchange consortium to provide necessary confidence in path for operator and sustainable funding

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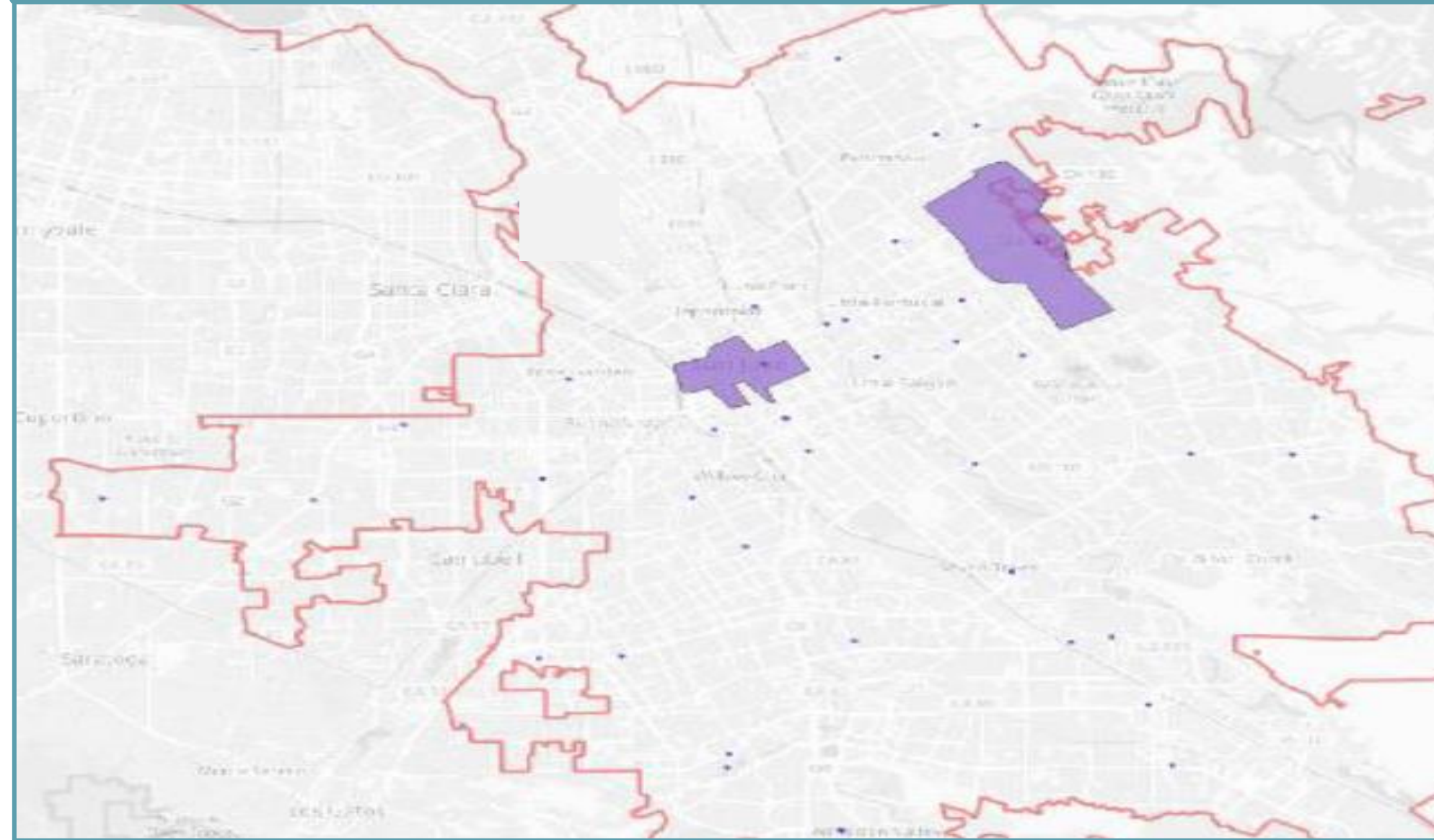
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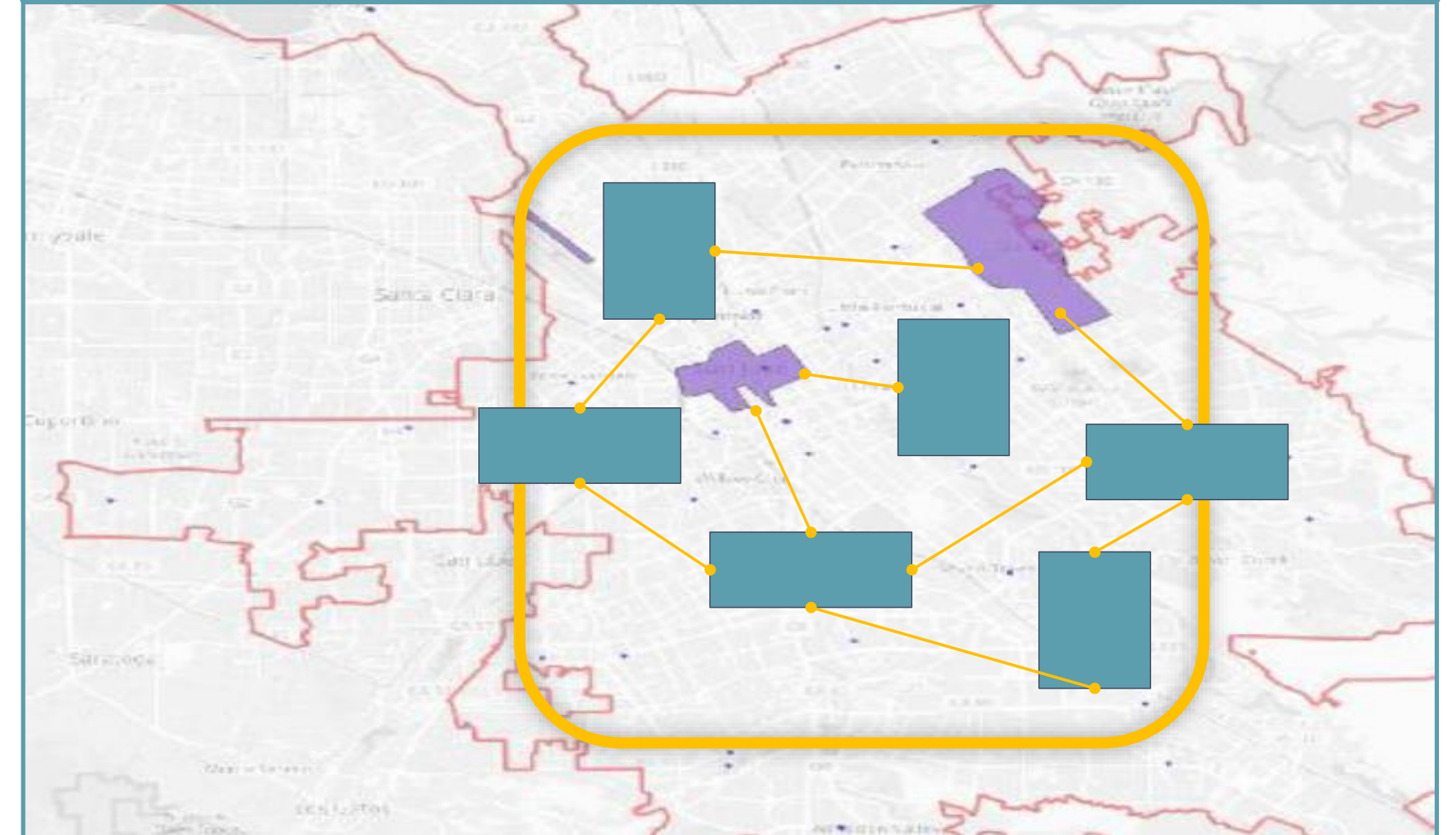
Appendix

Today and Possible Future

Current Scattered, Unfunded Wi-Fi Footprints



A consolidated, connected and dense Wi0Fi network that has potential to generate additional value



Downtown Pedestrian Volume



	Weekday			Weekend		
Location*	Aug	Dec	Annual	Aug	Dec	Annual
Paseo De San Antonio between Market and 1st Streets	1,728	2,526	1,948	2,752	4,238	2,769
1st Street between Santa Clara and San Fernando Streets	1,753	1,582	1,626	2,410	2,541	2,572
Paseo de San Antonio between 3rd and 4th Streets	2,078	2,017	2,473	1,755	2,028	1,618

Downtown Wi-Fi Survey

Click on Document to Open PDF

Facebook Terragraph - Network Densification Alternatives

David Reiff
Updated August 21, 2018

Introduction

The purpose of this document is to display analysis that was completed on resident demand for improve free public WiFi in the central downtown area. The analysis was completed using the results of a public survey designed and launched by Nancy Torres and David Reiff in the Mayor’s Office of Technology and Innovation throughout July and August 2018. It complements the Public Engagement plan completed by Nancy in June 2018 in providing insights about resident demand that inform a path forward for expanding use of the Facebook Terragraph network to the public.

[Please click here for the Facebook Terragraph Public Engagement Plan.](#)

Background (from Public Engagement Plan)

Facebook Terragraph is a multi-node wireless backhaul technology network that was installed as a demonstration project in downtown San Jose in 2016. Wireless backhaul refers to the network infrastructure that transmits data from end users or smaller networks to a central network. It can also be used as an alternative wireless route when the primary route is unavailable. Specifically, Terragraph is meant to be served as auxiliary infrastructure to improve connectivity in the city.

Before the Terragraph service can be opened to the public, it is important that the city determine its high-level community Wi-Fi strategy and that the Terragraph network is densified in intended high-usage areas accordingly. In particular, the city will need to decide on the use cases for public Wi-Fi as well as who will operate and maintain the main network. Terragraph may potentially need stronger coverage in popular outdoor areas in order to offer a reliable level of service to the public. Parallel to this process and prior to any large-scale public launch, the city hopes to test Terragraph with more users in the community to (1) better understand the demand and use cases for outdoor Wi-Fi service downtown and (2) to gather feedback for product and service level improvements. Terragraph is currently only being tested with 100 monthly active users across City of San Jose and Facebook employees. Hence, there is an opportunity to scale this testing to gather better data and more feedback on outdoor Wi-Fi use.

Current Network Coverage

Existing Unfunded Wi-Fi Footprint Capex and Opex

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	
One Time													
	Optimize Terragraph Footprint (Staff)	\$ 200,000	\$ 200,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 400,000
	Upgrade Terragraph to OEM Hardware (Staff)	\$ 200,000	\$ 200,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 400,000
	Decomission Legacy Wickedly Fast Wi-Fi	\$ -	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 25,000
	Yerba Buena Install	\$ -	\$ 1,400,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,400,000
	Subtotal One Time	\$ 400,000	\$ 1,825,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,225,000
Yearly Ongoing													
	Terragraph O&M	\$ -	\$ 62,000	\$ 62,000	\$ 62,000	\$ 62,000	\$ 62,000	\$ 62,000	\$ 62,000	\$ 62,000	\$ 62,000	\$ 62,000	\$ 620,000
	Overfelt O&M	\$ -	\$ -	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 400,000
	Yerba Buena O&M	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 500,000
	James Lick O&M	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 300,000
	Subtotal Yearly Ongoing	\$ -	\$ 112,000	\$ 112,000	\$ 162,000	\$ 162,000	\$ 212,000	\$ 212,000	\$ 212,000	\$ 212,000	\$ 212,000	\$ 212,000	\$ 1,820,000
Yearly Periodic													
	Downtown tech refresh	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500,000
	James Lick tech refresh	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 300,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 300,000
	Yerba Buena tech refresh	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 300,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 300,000
	Overfelt Tech refresh	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 300,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 300,000
	Subtotal Yearly Periodic	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,400,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,400,000
	Grand Total	\$ 400,000	\$ 1,937,000	\$ 112,000	\$ 162,000	\$ 162,000	\$ 1,612,000	\$ 212,000	\$ 212,000	\$ 212,000	\$ 212,000	\$ 212,000	\$ 5,445,000
												Check Sum	\$ 5,445,000
	Average annual including yerba buena		\$ 495,000		Average Annual		\$ 495,000						
	Average annual excluding yerba buena		\$ 367,727										
	Consortium revenue potential		\$ 435,000										
	Yearly Gap High		\$ 60,000										
	Yearly Gap Low (positive general fund)		\$ (67,273)										