SOLANO COUNTY FIBER OPTIC NETWORK HIGH-LEVEL DESIGN (HLD)

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EXECUTIVE SUMMARY

A refined high-level design and build cost estimate for a robust fiber network to connect Community Anchor Institutions (CAI) within Solano County is presented within this document. The work was completed under a California Public Utilities Commission (CPUC) Local Agency Technical Assistance (LATA) grant made to the County. Golden State Connect Authority oversaw the completion of the work on Solano County's behalf.

Golden State Connect Authority (GSCA) is providing this summary document as a courtesy to Solano County. GSCA is a joint powers authority comprised of forty rural California counties established for the purpose of increasing access to reliable, affordable high-

speed internet in those counties[1]. Solano County is a member county of GSCA. This summary document is not included under the work of the CPUC LATA grant.

The scope of work under the grant was to design a network that connected all CAIs across Solano County via a fiber network and to evaluate the technical and financial feasibility of such a project. Solano County and GSCA are using the information included in this report to evaluate the potential merits of GSCA deploying the proposed network (or a version thereof) that would connect Solano County CAIs via a bespoke fiber network at a high level of quality and redundancy and perhaps at a lower cost than the County of Solano currently pays. This evaluation is being done at the request of the County of Solano Information Technology Department.

A high-level design in the telecommunications industry is a computer-generated design that utilizes available street routing, address and utility pole locations, and geographic feature data to create a first draft design of a network. It includes a graphic representation of the network path and a bill of materials and labor that can be used to estimate costs, determine workflows, and advise the final design process.[2]

The comprehensive details of Solano County's CAI high-level design, bill of materials, and cost estimates have been provided to Solano County. The details of the aforementioned items are summarized in the following report.[3]

APPROACH

Solano County provided the locations of 170 CAIs across the county that would be designed to connect to the State of California Middle Mile Broadband Network (MMBN) through last-mile fiber infrastructure. The State MMBN is the fiber network "made up of high-capacity fiber lines that carry large amounts of data at high speeds over long distances," enabling internet connectivity to "homes, businesses and community institutions."[4] The designs completed under the Solano County LATA grant act as a blueprint for last-mile fiber infrastructure, connecting the State MMBN to individual CAI

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[1] "About Us," Golden State Connect Authority, https://goldenstateconnect.org/about-us/.
[2] Tilson Technology, "Falmouth, Massachusetts Fiber Optic Network High-Level Design," *Falmouth. Broadband*, March 15, 2022, https://falmouthbroadband.net/wp-content/uploads/2023/08/FalmouthNet-HLD-Report-Final.pdf.
[3] Tilson Technology, "Falmouth High-Level Design."
[4] "What is the Middle-Mile Broadband Network?," California Department of Technology, https://middle-mile-broadband-initiative.cdt.ca.gov/.

locations, or passings, through access points, or tie-in locations. In this way, each CAI location will have the opportunity to subscribe to high-quality broadband service.

In creating the high-level design, several factors requiring action or approval on the part of the County were accounted for. First, the specific path of the State Middle Mile is ever-changing as MMBN program representatives move toward finalizing all routes, but the State has promised a 2,500-foot tie-in standard, meaning there will be an access point for last-mile infrastructure every 2,500 feet across the MMBN. The design files contain coordinates for access points along the current MMBN map, updated on April 28, 2025, with the assumption of a 2,500-foot buffer for these coordinates. Second, railroad, canal, and Caltrans crossings or encroachments are identified with the knowledge that these occurrences will require permitting beyond city or county approval. Builds over private property or involving creek crossings are also identified, but with less concern due to fewer resources needed to obtain access.

HIGH-LEVEL DESIGN

The high-level design is clustered into ten sub-areas, denoting distinct project areas. Each project area is encompassed in a blue polygon. Within the project area boundary, the current State Middle Mile path is denoted by cyan lines, the last-mile fiber path is denoted by yellow lines, and each CAI to be served is denoted by a white placemark circle. Each project area involves one point of connection from the last-mile path to the Middle Mile path, indicated by a red star. Each project area also contains one double door cabinet location, denoted by a green outline of a structure. These cabinets, or huts, house important fiber network infrastructure, protecting it from the elements.[5][6]

Legend	
	Double Door Cabinet Location
	Middle Mile Tie-In Location / Access Point
	Served CAI Location / Passing
	Caltrans Crossing or Encroachment
	Railroad Crossing or Encroachment
	Canal Crossing
	Notes
	Civil Lines / Last-Mile Fiber Path
	State Middle Mile Path
	Project Area Polygon / Boundary

Caltrans crossings or encroachments are identified by red pins with a capital “C,” railroad crossings or encroachments by red pins with a capital “R,” and canal crossings with white

[5] “Model Code for Municipalities,” Federal Communications Commission, https://www.fcc.gov/sites/default/files/bdac-07-2627-2018-model-code-for-municipalities-approved-rec.pdf.

[6] Wen-Ping Chen et al., “Application of a Packaged Fiber Bragg Grating Sensor to Outdoor Optical Fiber Cabinets for Environmental Monitoring,” *IEEE Sensors Journal*, vol. 15, no. 2 (2015): 734-741, https://doi.org/10.1109/JSEN.2014.2353040.

pins containing a star icon. Portions of the last-mile route requiring more complex and difficult permitting processes are marked with notes, indicated by green stars.

Benicia

The Benicia project area consists of 18.31 miles of fiber build, serving 23 CAI locations. The double door fiber cabinet is located near the served location, Vallejo Fire Station 22. The project area Middle Mile connection point is found to the north of the cabinet.

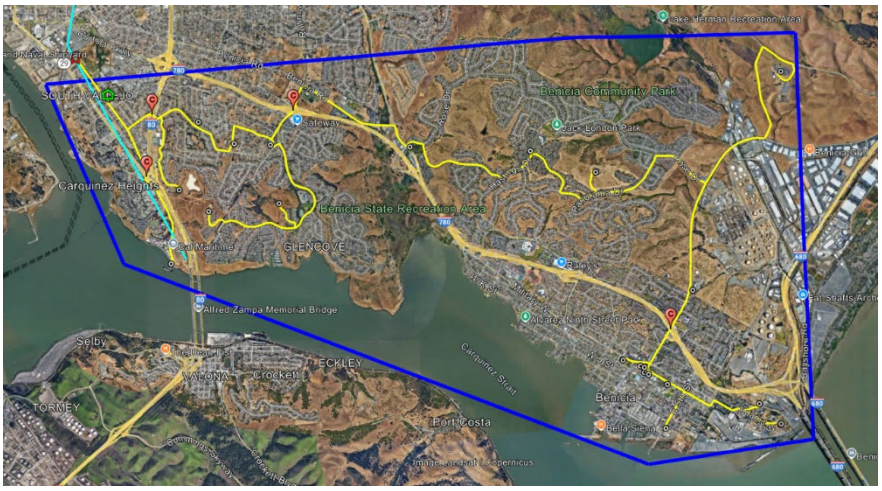


Figure 1: Benicia HLD

To reach the passing unit to the west of the Middle Mile path, the last-mile path crosses a Caltrans road. There is another Caltrans crossing across Highway 80 to reach the remaining 21 locations to the east of the Middle Mile. Finally, two Caltrans crossings across Highway 780 are found along the remaining fiber path.

Fire Station 22, along with Station 26 and a City of Vallejo Police Department location, are currently served by Air Fiber. Another passing location, the California Department of Insurance Fraud – Benicia, is served by AT&T switched ethernet, and the Cal Poly Maritime Academy Police Department provides their own broadband service. Other passings in this area include pump stations, water tanks, public safety stations and towers, a library, a senior center, and a community center.

Dixon

The Dixon project area connects eight CAI addresses with 2.47 miles of last-mile fiber. The fiber cabinet is centrally located, nearest to the Dixon Library CAI address. Below the cabinet, the east-west fiber route crosses both a railroad and the Caltrans road, Highway 113. To the south, a railroad encroachment is needed to reach the Middle Mile tie-in location. To reach the topmost passing, Dixon Fire Department Station 81, there is an encroachment on Highway 113.

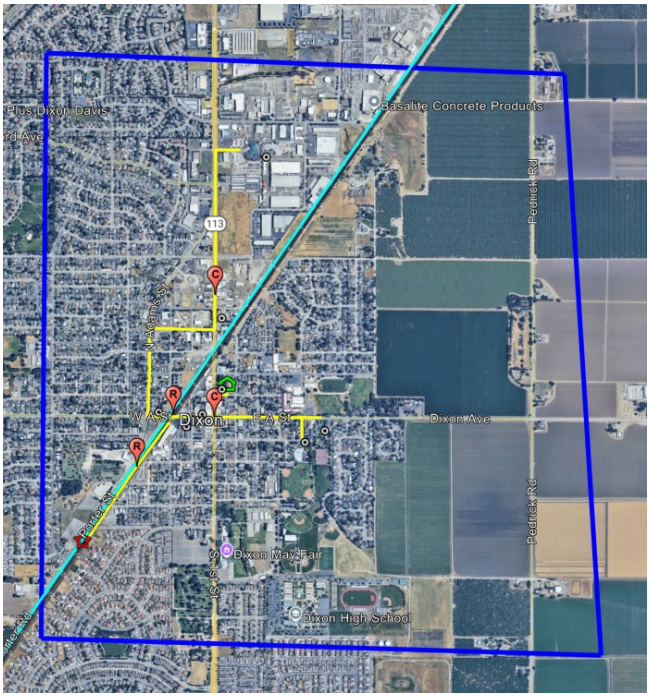


Figure 2: Dixon HLD

One CAI location, Dixon Corp Yard, is currently served by AT&T switched ethernet. Other passings include a youth center, an additional corporation yard, a senior / community center, and Dixon Community Hall.

Fairfield East

The Fairfield East subproject involves the most CAI addresses of any other for Solano County, serving 45 locations with 42 miles of fiber. The fiber cabinet for this project area is located nearest to the Fairfield Fire Station 37 passing, in the heart of Fairfield. The Middle Mile tie-in is also in a centralized location along a railroad, requiring a railroad crossing and railroad encroachment to reach the point with last-mile fiber. To the west of the fiber cabinet, the fiber path crosses Caltrans road, State

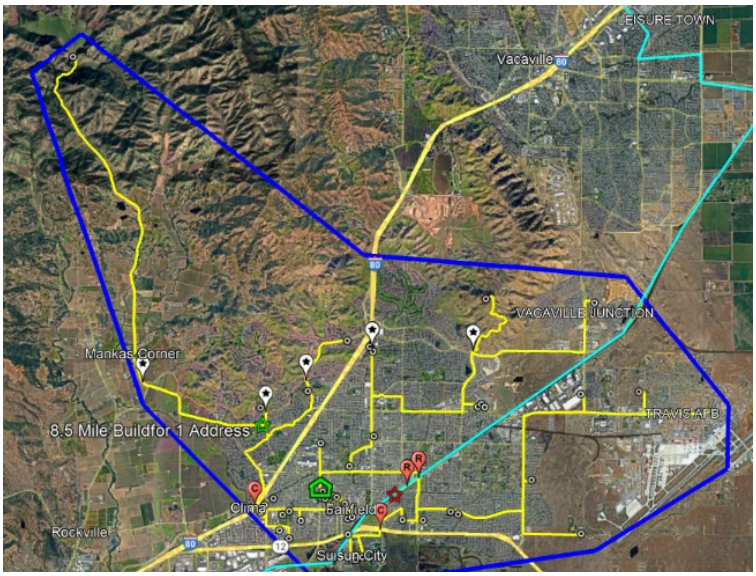


Figure 3: Fairfield East HLD

Highway 80, and to the southeast, the route crosses State Highway 12 to reach two dense clusters of CAI locations.

One unique note is that the Putah South Canal runs through this project area, leading to five canal crossing sites along the fiber path to the north of the fiber cabinet and Middle Mile connection point. Another point to note within the Fairfield East project area is the northmost CAI, the Lake Curry Dam, as this single passing will require 8.5 additional miles of fiber. This drives the cost for the project area, which will be expanded upon in the subsequent section of this report.

Nine of the 45 CAI locations are currently served by AT&T Internet, including the County Administration Center, public safety and legal institutions, a vocational center, and a library. The Travis Air Force Base water system / utility[7] receives T1, or wired[8], Internet service, along with LTE. Other CAIs to be served within this project area include city fire departments and stations, sports and recreation centers, community centers, a nature center, a corporation yard, and Fairfield City Hall.

[7] "Cal Water to operate Travis Air Force Base's water system," *Pump Industry Analyst*, Volume 2016, Issue 10 (2016): 3, https://doi.org/10.1016/S1359-6128(16)30309-3.
[8] Micah Pratt, "How Fast Is a T1 Internet Line and What Is It?," *business.org*, October 4, 2013, https://www.business.org/services/internet/fast-t1-internet-line/.

Fairfield West

The Fairfield West project area lies directly adjacent to the Fairfield East project area, connecting 20 CAI addresses with 27 miles of fiber. The fiber cabinet is found to the south of the project area, nearest to the City of Fairfield Fire Station 35 passing. Following the fiber route northward, a railroad crossing is required to reach 17 passings, followed by a railroad encroachment to meet the Middle Mile tie-in location to the west. Slightly east of the railroad crossing, the fiber path crosses the Caltrans road, I-680, to reach seven CAI locations, and a Caltrans crossing of I-80 is needed to reach the remaining locations for this project area.

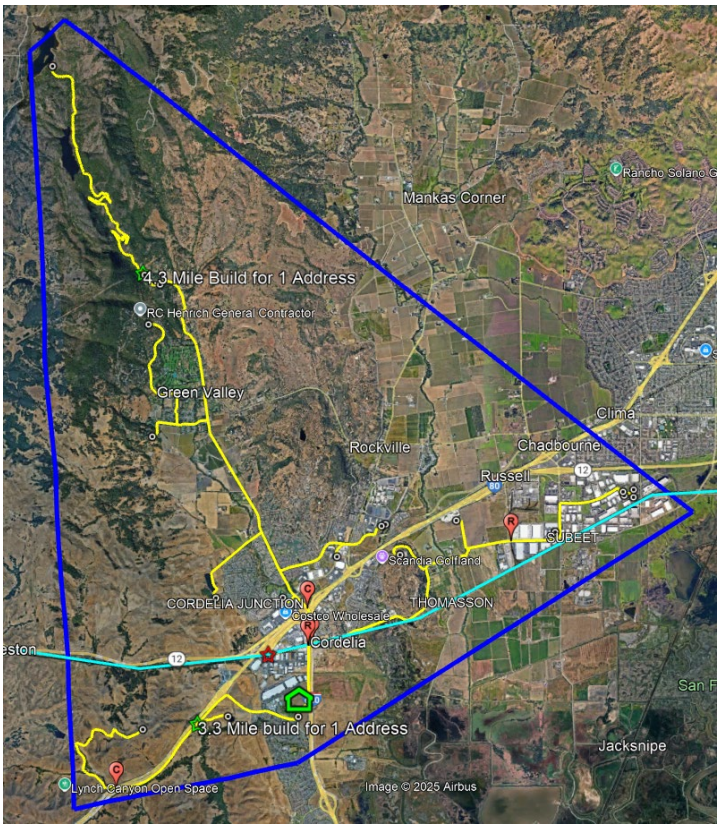


Figure 4: Fairfield West HLD

Two “outlier addresses” are also important to note. Toward the southwest corner of the polygon, the solitary Solano County Public Safety Tower Site would necessitate an additional 3.3 miles of fiber and an additional Caltrans crossing through I-80. Furthermore, to reach the northmost address, the City of Vallejo’s Wild Horse Reservoir, an additional 4.3 miles of last-mile fiber build is needed.

Four CAI addresses are served by AT&T switched ethernet, and one address is served by T1 Internet. Locations within this project area include pump stations, water treatment plants, and county health and social service offices.

Rio Vista

The Rio Vista project area will serve 7 CAI locations with 6 miles of fiber. The double door cabinet location is closest to the CAI address, Rio Vista Police Department. To reach four passings and the Middle Mile connection point, the fiber route crosses the Caltrans road, Highway 12.

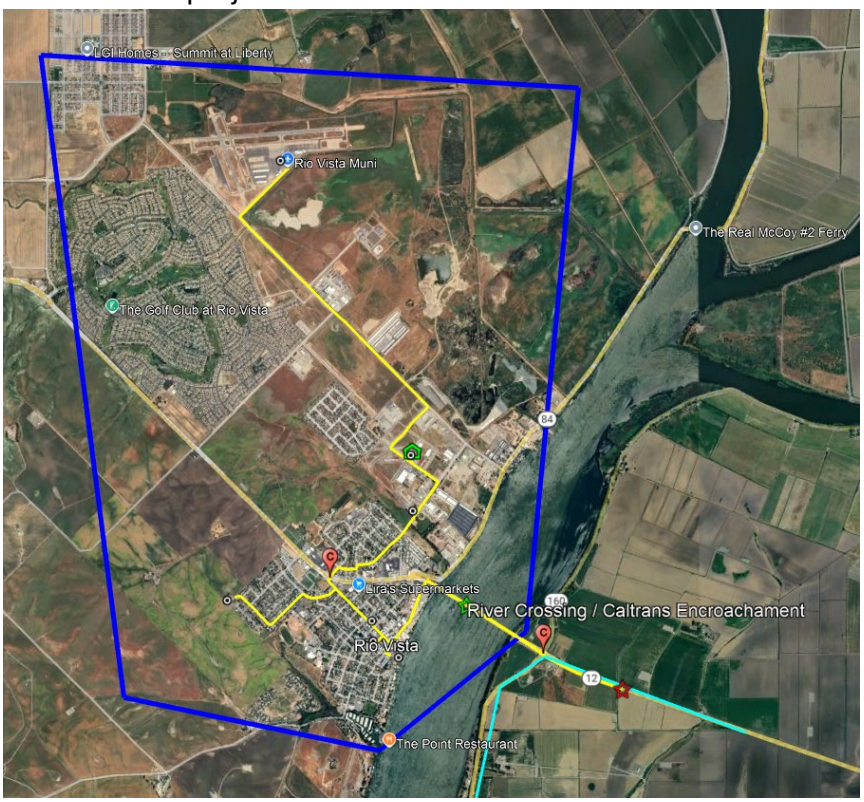


Figure 5: Rio Vista HLD

As there is only one Middle Mile connection point nearby this polygon, the last-mile path must cross the Sacramento River. This would involve an attachment along the Caltrans Rio Vista Bridge, which encroaches on Highway 12, requiring another Caltrans permit.

All CAIs in this project area are under the jurisdiction of the City of Rio Vista. In addition to law enforcement, these locations include the city's public works department, municipal airport, fire department, library, and city hall.

Vacaville

The Vacaville project area involves 34 miles of fiber build to serve 30 CAI addresses. The double door cabinet location for this subproject is near the City of Vacaville Fire Station 74. The Middle Mile connection point is found northward of the cabinet, near another CAI location, Fire Station 72.

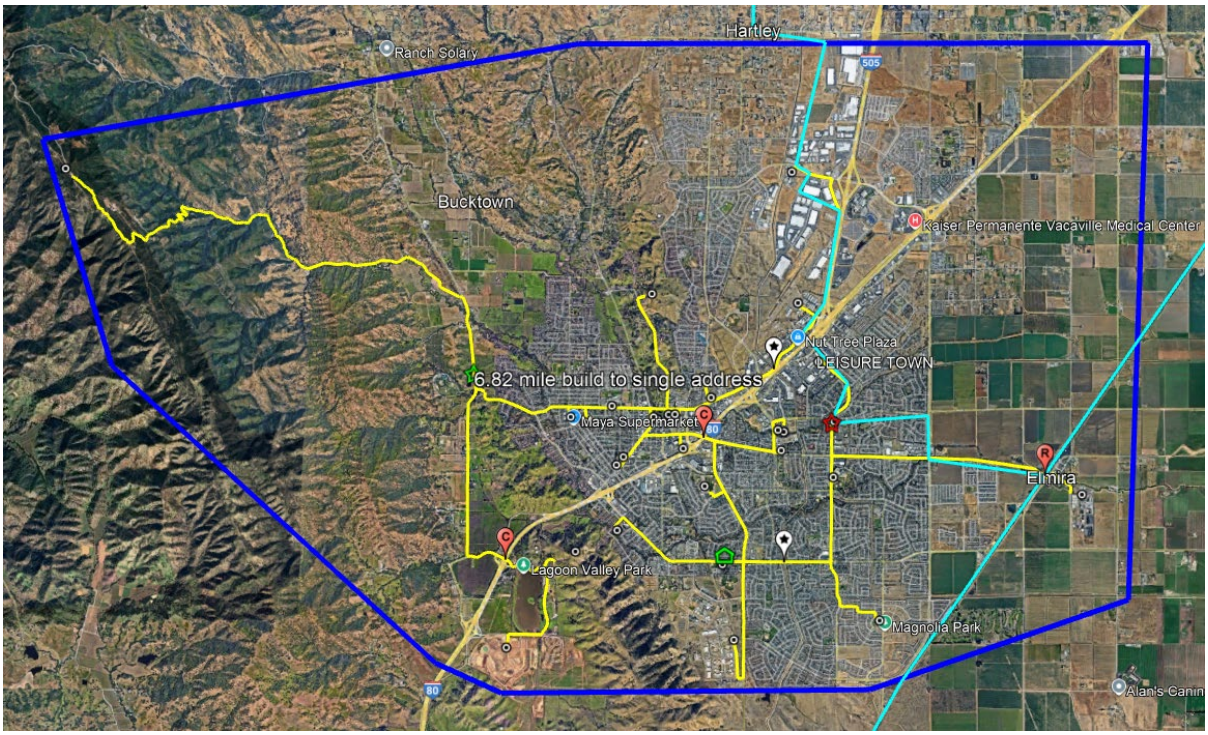


Figure 6: Vacaville HLD

To the east of the cabinet and northwest of the Middle Mile tie-in location, the fiber route crosses the Putah South Canal twice more. Additionally, there are two Caltrans I-80 crossings, one to the east of the cabinet location and one to the north. To reach the Easterly Wastewater Treatment passing toward the eastmost edge of the polygon, the last-mile route involves a railroad crossing. Finally, another "outlier address," requiring 6.82 miles of fiber alone, is found near the northwest corner of the polygon. This location corresponds to a public safety tower site near Mt. Vaca.

AT&T currently serves the Nut Tree Airport, Wiliam J. Carroll Government Center, and Solano County Road Maintenance[9]. In addition to the aforementioned CAI locations, police stations, recreation and community centers, Vacaville City Hall, and more will be served upon implementation.

Vallejo North

The Vallejo North project area consists of 17.14 miles of fiber build, serving 13 CAI locations. The double door fiber cabinet is located near the served location, Vallejo Fire

[9] "Solano County Road Maintenance in Vacaville, California," CountyOffice.org, https://www.countyoffice.org/solano-county-road-maintenance-vacaville-ca-644/.

Station 25. The project area Middle Mile connection point is found to the south of the cabinet, toward the border of the polygon boundary.

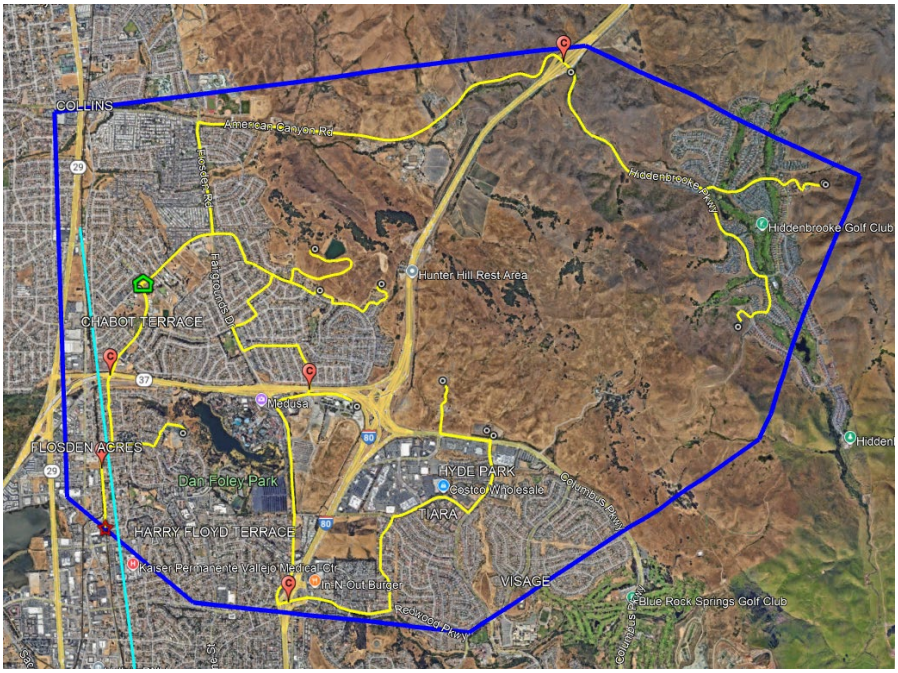


Figure 7: Vallejo North HLD

From the cabinet to the Middle Mile tie-in, there is a Caltrans crossing through Highway 37 and a railroad encroachment of 0.47 miles along the planned last-mile path. There is a second Highway 37 crossing to the east of the Middle Mile, and two I-80 crossings near the north- and southmost portions of the project area. There is a long stretch of fiber needed to reach the locations to the east, but as they are clustered together, they are not considered outliers that would drive the cost of this subproject.

Fire Station 25, along with Station 27, are currently served by Air Fiber. Another passing location, the Hiddenbrooke Public Safety Tower Site, is served by switched ethernet. Other passings in this area include pump stations, water tanks, a water treatment plant, reservoir, and an additional proposed public safety tower site at the Solano County Fairgrounds.

Vallejo South

The Vallejo South subproject, as pictured, will serve 13 locations with 13.17 miles of fiber. The fiber cabinet for this project area is located nearest to the Vallejo Municipal Marina Building passing, toward the west of the project area. The Middle Mile tie-in is found along a railroad to the east of the cabinet location, requiring a railroad crossing and 2500-foot railroad encroachment to reach the point with last-mile fiber. Just north of the cabinet is a railroad crossing, and to the north of that point within the polygon, there is a Caltrans encroachment along Highway 29 to reach the Vallejo First 5 Book Locker. The eastmost pin corresponds to Caltrans crossing through I-80 to reach three CAI locations.

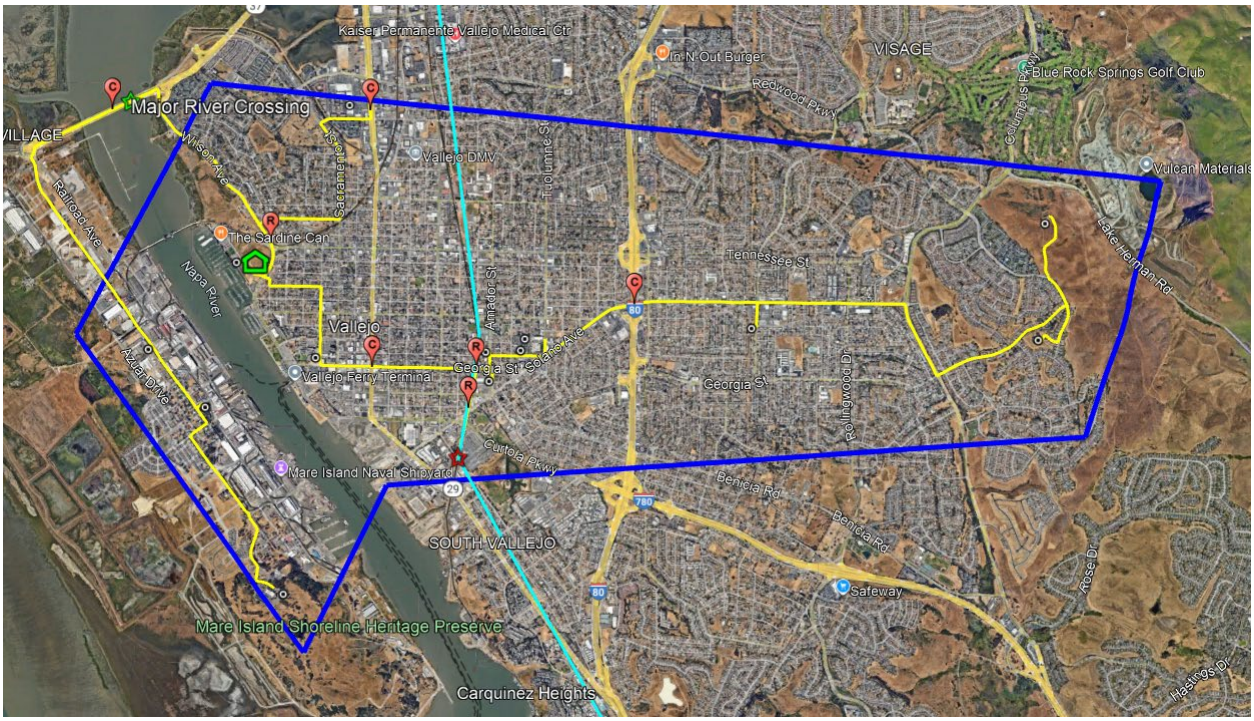


Figure 8: Vallejo South HLD

In order to reach the CAI locations, Vallejo Public Works Center[10], Alden Park Gazebo, and Mare Island Water Tank, the fiber path must go across the Napa River. The Mare Island Causeway would not support fiber infrastructure as a drawbridge[11], and thus the only feasible route is via Highway 37. However, the permit required for the major river crossing along a Caltrans encroachment would be costly and difficult (or impossible) to obtain. Therefore, an alternate design has been proposed to serve the remaining ten addresses by removing the fiber path beyond the intersection of Mare Island Way and Farragut Ave.

[10] "Public Works Department," City of Vallejo, CA, https://www.vallejo.gov/our_city/departments_divisions/public_works_department.
[11] "Mare Island Causeway Bridge," City of Vallejo, CA, https://www.vallejo.gov/our_city/departments_divisions/public_works_department/maintenance_division/mare_island_causeway_bridge.

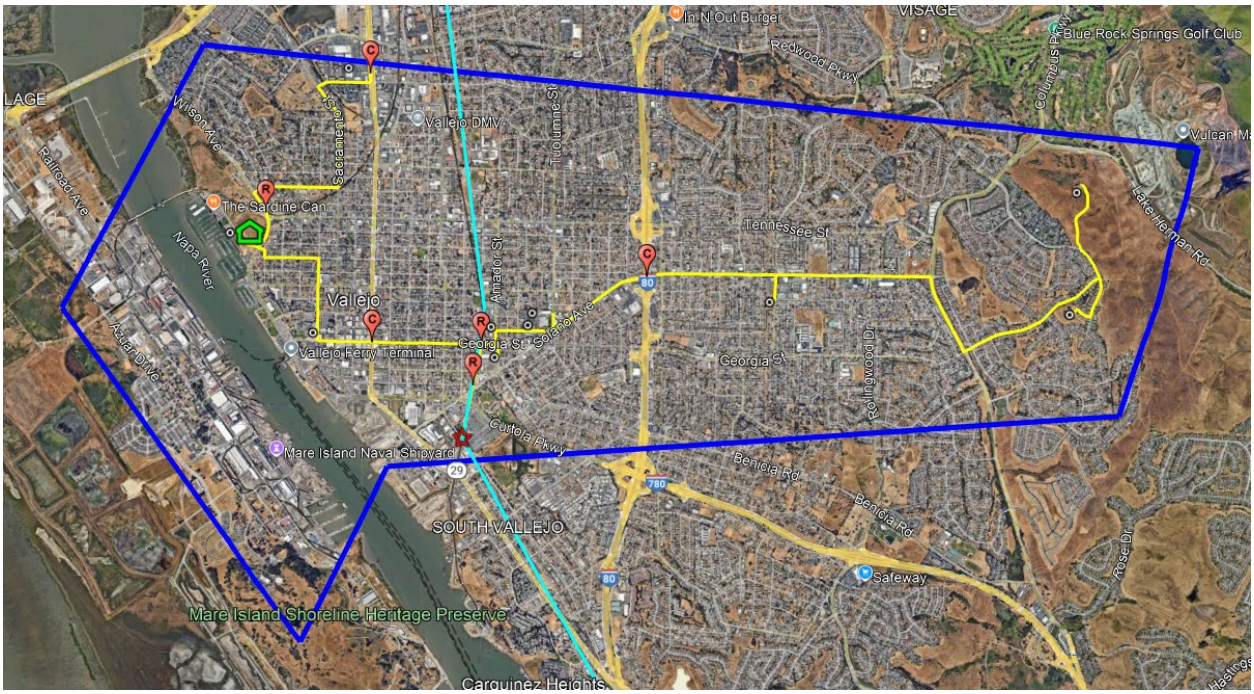


Figure 9: Vallejo South HLD excluding outliers

The ten addresses to the east of the Napa River include City of Vallejo Police Department, a public safety tower site near the Vallejo Courthouse, Florence Douglas Senior Center, two libraries, Solano County social services offices, among others. Two of these locations currently have Internet service, one from Air Fiber and one from AT&T.

Winters

Figure 10: Winters HLD

The smallest polygon within this project, this one-mile last-mile fiber build will serve one CAI address, a public safety tower adjacent to the City of Winters Fire and Police Departments. The standalone address is due to the fact that there are no other CAI locations nearby. While the City of Winters falls within Yolo County borders, this project area is included in the Solano County project because the tower will be used to provide emergency communications to Winters residents in the Solano County response jurisdiction.[12]

The double door cabinet will be located approximately 260 feet east of this address, and the Middle Mile tie-in location is found just north of the polygon. To connect the CAI address and double door cabinet to the Middle Mile connection point, the last-mile fiber route will cross Caltrans Highway 128 at two locations.

COST ESTIMATE

The high-level design's bill of materials and project statistics were used *to derive a comprehensive breakdown of materials, labor components, and appurtenances needed to construct the network.*[13] This has been provided to Solano County in the form of a build cost estimate. *Each of* the *cost projections included in this report summarize* the last-mile construction costs and installation costs (drops to the specific addresses) for each project area, including further calculations using the project area's build mileage and passing units.[14]

The "Average Cost / Mile" metric is derived from the build cost model's total Outside Plant cost, including macro categories like materials, construction labor, and engineering related

[12] "News Flash - Public Safety," *City of Winters, CA*, October 27, 2023, https://www.cityofwinters.org/CivicAlerts.aspx?AID=17.
[13] Tilson Technology, "Falmouth High-Level Design."
[14] Ibid.

to the last-mile route. In this way, encroachment acquisition, including encroachment and crossing application costs, are considered in this projection. "Average Cost / Install" is similarly computed as a combination of connections material, installation labor, and customer premises equipment (CPE), which includes items such as routers.[15] "Build Mileage" measures the total length of the last-mile route as determined by the high-level design, and "Passing Units" counts the number of CAIs given to Tilson to connect with fiber service within the polygon.

HLD Candidate Summary: All Locations

GSCA Entity: County of Solano CAI HLD
Date: 6/16/2025

Take rate: 80%

Project Area Name	Average Cost/Mile	Average Cost/Install	Build Mileage	Passing Units	Projected Subscribers	Projected Build Cost	Install	Projected Total Cost	Cost per Passing	Cost per Subscriber
Benicia	$236,842	$571	18.31	23	18	$4,336,577	$10,278	$4,346,855	$188,994	$241,492
Dixon	$285,738	$590	2.47	8	6	$705,773	$3,540	$709,313	$88,664	$118,219
Fairfield East	$234,569	$559	42.36	45	36	$9,936,343	$20,124	$9,956,467	$221,255	$276,569
Fairfield West	$236,703	$565	27.36	20	16	$6,476,194	$9,040	$6,485,234	$324,262	$405,327
Rio Vista	$241,974	$582	5.96	7	5	$1,442,165	$2,910	$1,445,075	$206,439	$289,015
Vacaville	$252,187	$559	34.00	30	24	$8,574,358	$13,416	$8,587,774	$286,259	$357,824
Vallejo North	$230,367	$578	17.14	13	10	$3,948,490	$5,780	$3,954,270	$304,175	$395,427
Vallejo South	$233,525	$578	13.17	13	10	$3,075,524	$5,780	$3,081,304	$237,023	$308,130
Winters	$323,834	$644	1.33	1	1	$430,699	$644	$431,343	$431,343	$431,343
AVERAGES:	$252,860	$581	18.01	18	14	$4,325,125	$7,946	$4,333,071	$254,268	$313,705
TOTALS:			162.1	160	126	$38,926,124	$71,512	$38,997,636		

Figure 11: Original Design Candidate Summary

"Projected Subscribers" is dependent on the take-rate assumption for the overall project, i.e., the number of Passing Units for that project area that will sign up for service. "Projected Build Cost" estimates the total cost associated with last-mile construction to the street/curb in front of all Passing Units, and "Projected Total Cost" add to this the total "Install" costs, for which only projected subscribers are considered. "Cost per Passing" and "Cost per Subscriber" provide useful insight into the significance of the Projected Total Cost for the given project area. Finally, where sensical, each column / metric is averaged and / or summed over all project areas.

These projections are *derived from the high-level design which, by nature, is not 100% accurate.* Barring *any significant changes undertaken in the final network design and*

[15] "Decoding Customer Premises Equipment (CPE): A Comprehensive Guide," *Network Encyclopedia*, January 6, 2024, https://networkencyclopedia.com/customer-premises-equipment-cpe/.

planning process, these projections represent pro-forma accuracy that can reasonably be used to determine overall investment, payback, and rate of return for the project.[16]

The Cost per Passing within the Winters project area is the highest, as there is only one address. Typically, more addresses imply a more cost-effective last-mile project. This metric is also relatively high in all project areas because the design does not connect residential, business, or many city CAI addresses to service.

Alternative Design Cost Projections

One way to reduce costs over the Solano County project is to consider the removal of outlier addresses from the fiber path. These addresses, discussed previously in the high-level design for Fairfield East, Fairfield West, Vacaville, and Vallejo South, require upwards of more than three miles of fiber to reach, with no other nearby passings.

HLD Candidate Summary: Excluding Outliers

GSCA Entity: County of Solano CAI HLD
Date: 6/16/2025

Take rate: 80%

Project Area Name	Average Cost/Mile	Average Cost/Install	Build Mileage	Passing Units	Projected Subscribers	Projected Build Cost	Install	Projected Total Cost	Cost per Passing	Cost per Subscriber
Benicia	$236,842	$571	18.31	23	18	$4,336,577	$10,278	$4,346,855	$188,994	$241,492
Dixon	$285,738	$590	2.47	8	6	$705,773	$3,540	$709,313	$88,664	$118,219
Fairfield East	$234,569	$559	33.81	44	35	$7,930,778	$19,565	$7,950,343	$180,690	$227,153
Fairfield West	$236,703	$565	19.82	18	14	$4,691,453	$7,910	$4,699,363	$261,076	$335,669
Rio Vista	$241,974	$582	5.96	7	5	$1,442,165	$2,910	$1,445,075	$206,439	$289,015
Vacaville	$252,187	$559	27.27	29	23	$6,877,139	$12,857	$6,889,996	$237,586	$299,565
Vallejo North	$230,367	$578	17.14	13	10	$3,948,490	$5,780	$3,954,270	$304,175	$395,427
Vallejo South	$233,525	$578	8.62	10	8	$2,012,986	$4,624	$2,017,610	$201,761	$252,201
Winters	$323,834	$644	1.33	1	1	$430,699	$644	$431,343	$431,343	$431,343
AVERAGES:	$252,860	$581	14.97	17	13	$3,597,340	$7,568	$3,604,908	$233,414	$287,787
TOTALS:			134.73	153	120	$32,376,061	$68,108	$32,444,169		

Figure 12: Alternative Design Candidate Summary

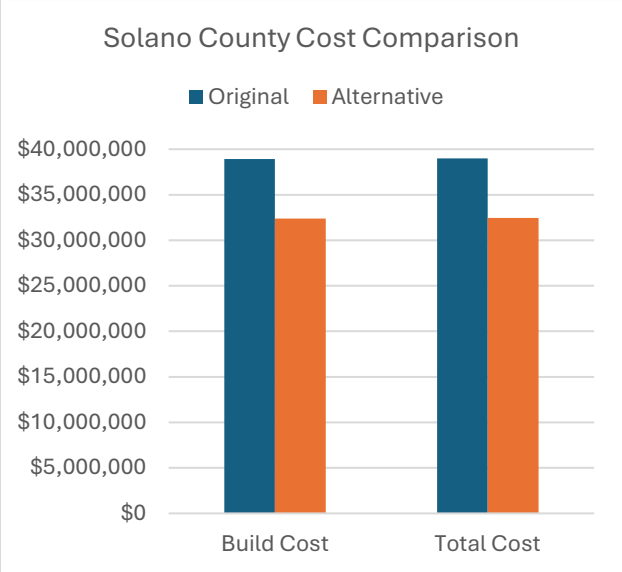
Among the four project areas with address removals, the build mileage is reduced by an average of 6.8 miles, and three project areas require one fewer encroachment permit.

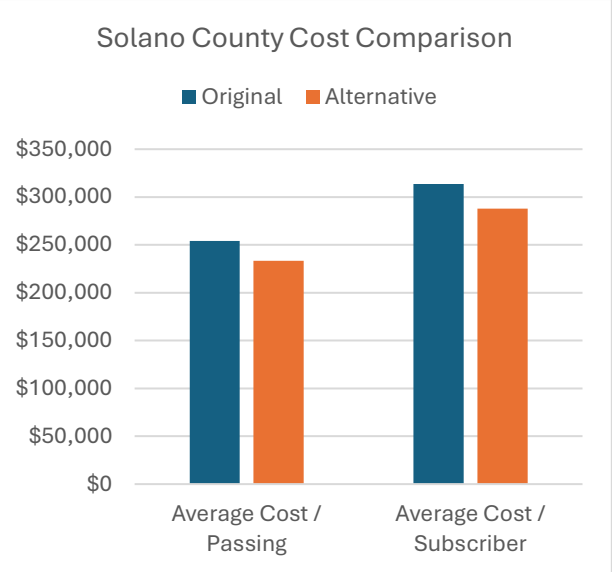
[16] Tilson Technology, "Falmouth High-Level Design."

	Build Mileage			Passing Units			
Project Area Name	Original	Alternative	Difference	Original	Alternative	Difference	Other differences (not accounted for in #s)
Fairfield East	42.36	33.81	-8.55	45	44	-1	1 less canal crossing
Fairfield West	27.36	19.82	-7.54	20	18	-2	1 less Caltrans crossing (I-80)
Vacaville	34.00	27.27	-6.73	30	29	-1	
Vallejo South	13.17	8.62	-4.55	13	10	-3	Avoid major river crossing / Caltrans encroachment
AVERAGES:	29.22	22.38	-6.84	27	25	-2	
TOTALS:	116.89	89.52	-27.37	108	101	-7	

Figure 13: Alternative Design Foundational Knowledge Comparison

Even without adjustments to the Average Cost/Mile or Cost/Install estimates, the project costs are reduced significantly. The four altered project areas were analyzed and found to have an average Project Total Cost reduction of approximately 23.3%, or $1.6 million. The Projected Build Cost and Total Cost for all Solano County project areas each fall by approximately $6.5 million, as seen below.





These cost reductions would substantially aid in the financial feasibility of the construction project for Golden State Connect Authority, allowing the organziation to more feasibly bond against a contract for the network and provide high-quality, high-speed internet service to Community Anchor Institutions across Solano County.

Alternative Design Images

Fairfield East

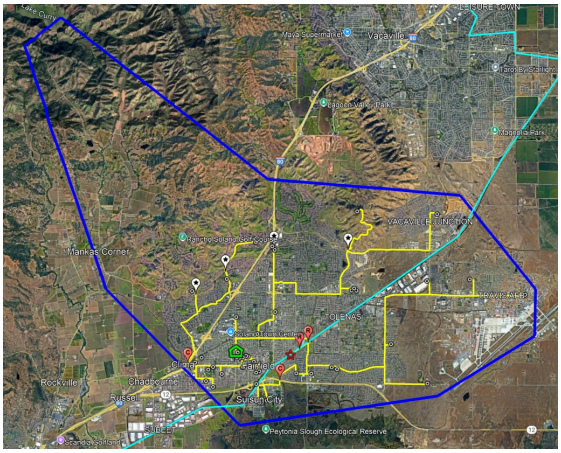


Figure 14: Fairfield East Alternative Design

Figure 17: Fairfield West Alternative Design

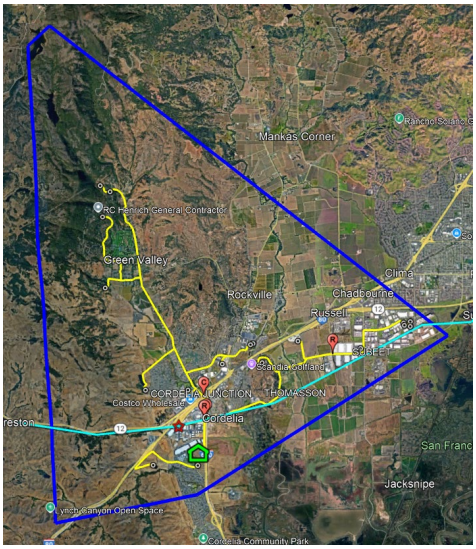


Figure 15: Fairfield West Alternative Design

Vacaville

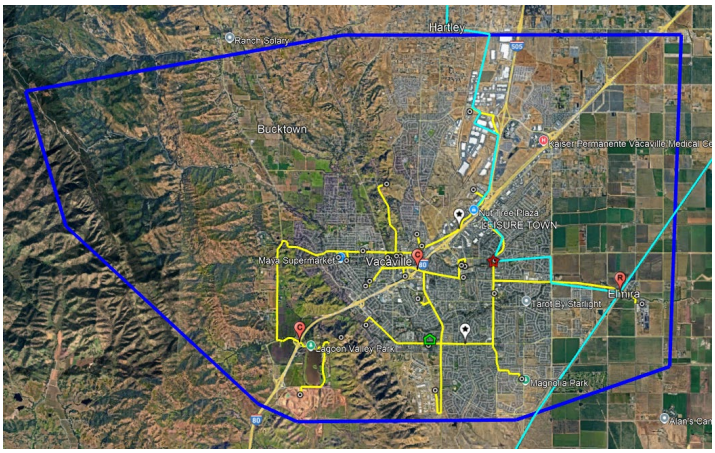


Figure 16: Vacaville Alternative Design

Vallejo South (as seen previously)

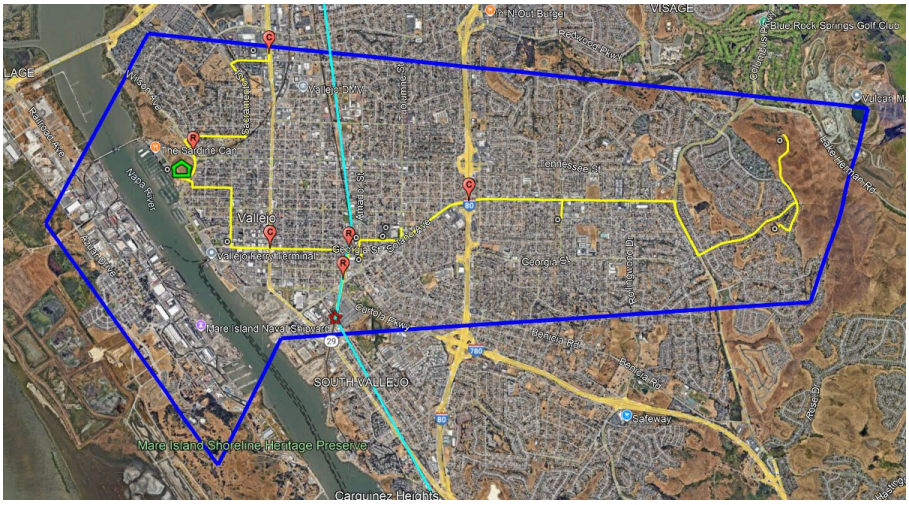
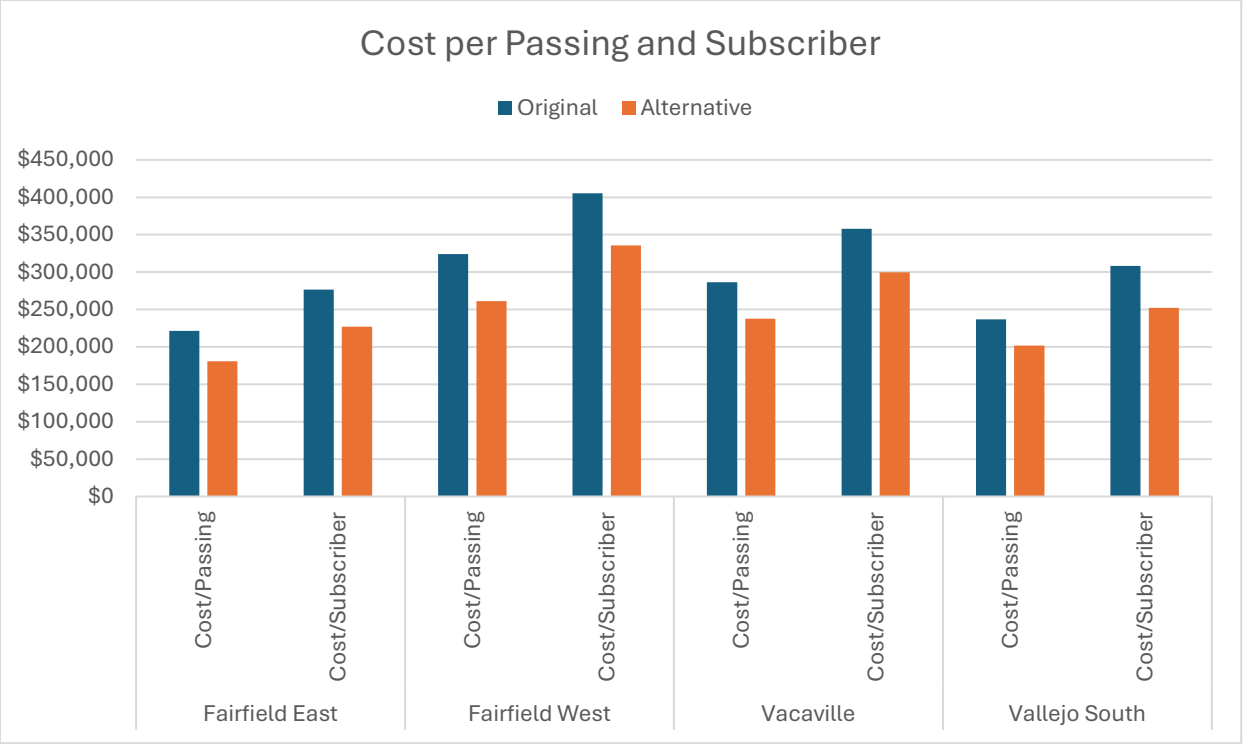
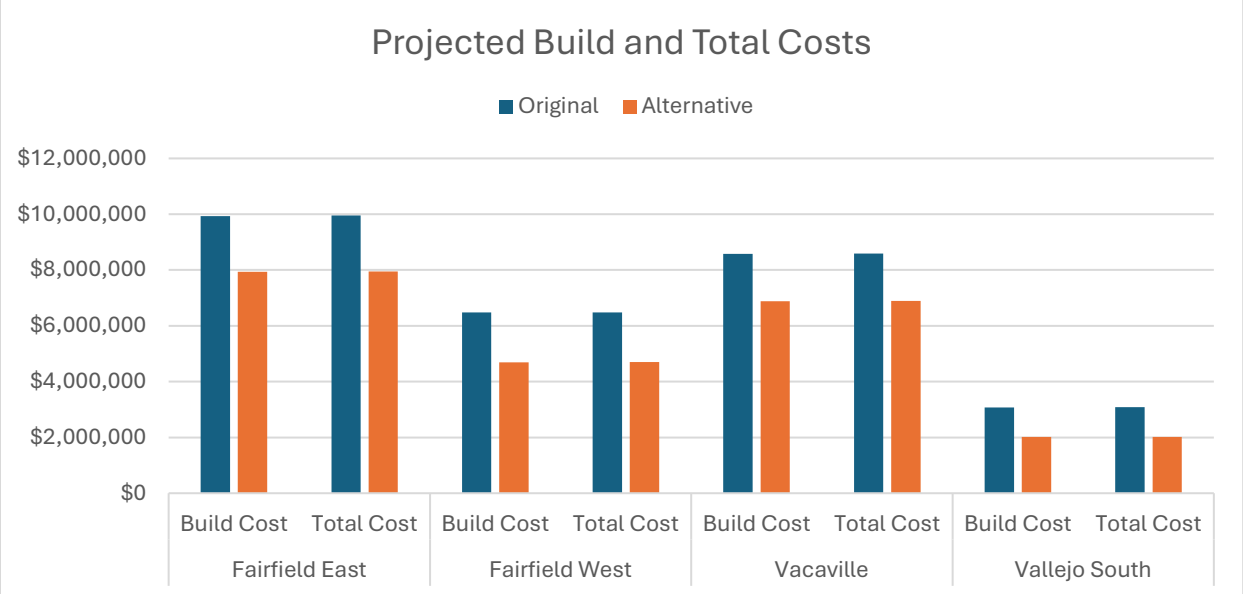


Figure 17: Vallejo South Alternative Design

Additional Alternative Design Tables and Charts

Cost Comparisons for all project areas with eliminated outlier locations





Full Financial Comparisons

	Projected Build Cost			Projected Total Cost			Cost per Passing			Cost per Subscriber		
Project Area Name	Before	After	Difference	Before	After	Difference	Before	After	Difference	Before	After	Difference
Fairfield East	$9,936,343	$7,930,778	-$2,005,565	$9,956,467	$7,950,343	-$2,006,124	$221,255	$180,690	-$40,565	$276,569	$227,153	-$49,416
Fairfield West	$6,476,194	$4,691,453	-$1,784,741	$6,485,234	$4,699,363	-$1,785,871	$324,262	$261,076	-$63,186	$405,327	$335,669	-$69,658
Vacaville	$8,574,358	$6,877,139	-$1,697,219	$8,587,774	$6,889,996	-$1,697,778	$286,259	$237,586	-$48,673	$357,824	$299,565	-$58,259
Vallejo South	$3,075,524	$2,012,986	-$1,062,539	$3,081,304	$2,017,610	-$1,063,695	$237,023	$201,761	-$35,262	$308,130	$252,201	-$55,929
AVERAGES:	$7,015,605	$5,378,089	-$1,637,516	$7,027,695	$5,389,328	-$1,638,367	$267,200	$220,278	-$46,922	$336,962	$278,647	-$58,316
TOTALS:	$28,062,419	$21,512,356	-$6,550,063	$28,110,779	$21,557,312	-$6,553,467						

CONCLUSION

The Solano County Fiber Optic Network High-Level Design (HLD) marks a significant advancement in the region's digital infrastructure strategy. By prioritizing Community Anchor Institutions (CAIs) and leveraging the State of California's Middle Mile network, this initiative establishes a robust foundation for equitable access to high-speed broadband in both urban and rural areas of the county. The strategic importance of this network is profound; it will enhance public safety, education, healthcare, and economic development by ensuring that essential institutions have reliable connectivity.

The high-level network design provides a comprehensive and technically sound blueprint that balances engineering precision with practical deployment considerations. The inclusion of detailed geographic mapping, permitting challenges, and infrastructure requirements equips stakeholders with the insights necessary to proceed to the next stage of feasibility analysis with confidence. By segmenting the network into ten project areas, the design facilitates phased implementation and localized planning, thereby improving the project's overall feasibility.

The financial modeling and cost estimate options presented in the report serve as valuable tools for informed decision-making. By comparing original and alternative designs, stakeholders can evaluate the trade-offs between coverage and cost, optimizing the network's reach while upholding fiscal responsibility. The projected savings of approximately $6.5 million from the removal of outlier addresses underscore the importance of strategic planning in large-scale infrastructure projects.

In the long term, this fiber network will act as a catalyst for digital equity and economic resilience in Solano County. It positions the county to meet future demands for bandwidth and connectivity, supports the deployment of smart technologies, and ensures that public institutions remain at the forefront of digital service delivery.

With the information provided in Solano County's LATA High Level Designs to connect Community Anchor Institutions, Golden State Connect Authority can more accurately evaluate the feasibility of working with Solano County to design a fiber network that connects all, or some, of the CAIs included in the design project areas.

On behalf of Golden State Connect Authority, the consulting engineering team from Tilson Technology, and GSCA's Operational Partner, UTOPIA Fiber, we look forward to taking the next step in evaluating project feasibility, if this is of interest.