California Department of Technology

Middle-Mile Broadband Initiative Annual Legislative Report

Program Year 2023
Published March 2024

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State of California

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California Government Operations Agency

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Letter from the State CIO

When California Governor Gavin Newsom signed Senate Bill (SB) 156 in July 2021, the California Department of Technology (CDT) took responsibility for a key element of the state's Broadband for All Action Plan: Overseeing the multi-year development and operation of thousands of miles of a statewide open-access Middle-Mile Broadband Network.

As we progress toward the network's planned December 2026 completion, we are pleased to report on a year of remarkable accomplishments – including signing contracts to construct, joint build, lease, and purchase approximately 83% of the planned network mileage.

In 2023, using funding allocated by SB 156 [2021] and SB 189 [2022], the Middle-Mile Broadband Initiative continued to execute its highly effective project plan – and ended the year ahead of schedule:

- By embracing joint builds and leases/purchases where feasible, the State can share construction costs and therefore expects to deploy approximately 6,500 miles of the Middle-Mile Broadband Network at approximately half the cost of standalone construction. Through these joint builds and leases/purchases, CDT is also leveraging existing projects in construction, reducing time-to-market by 14 months.
- CDT's commitment to working with local jurisdictions led to the development of strong partnerships across the state – which will enable more efficient and timely deployment in many communities.
- Early, well-planned procurement efforts enabled CDT to secure 3,000 miles of fiber, conduit, and related materials at competitive pricing – reducing the project's financial risk and supply chain uncertainty. Additionally, early Job Order Contracts allowed the program to determine market prices and lock in resources earlier than traditional design-bid-build contracting.

The Middle-Mile Broadband Initiative demonstrates the state's commitment to delivering broadband service to communities that have been overlooked and unserved. We are well on our way toward achieving that important goal.

Sincerely,
Liana Bailey-Crimmins, State of California Chief Information Officer
Director of the California Department of Technology

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Executive Summary

The California Department of Technology (CDT) submits this annual report on the Middle-Mile Broadband Initiative (MMBI) pursuant to Senate Bill 156 (SB 156) [2021] and Senate Bill 189 (SB 189) [2022]. This report documents a program that has reduced costs and is making timely progress.

In 2023, CDT secured contracts to construct, joint build, lease, and purchase approximately 83% of the Middle-Mile Broadband Network – reaching that milestone 14 months ahead of schedule.

Through innovative efforts that embrace joint builds and lease/purchase agreements to deploy approximately 6,500 miles of the network, CDT will share construction costs and therefore expects to reduce its expenses by approximately half for those routes as compared to what the cost would be for standalone construction. This is achievable because leasing space in existing conduit – or leasing existing fiber strands – eliminates most of the cost of constructing a new conduit and fiber route. Similarly, building a new route together with a partner – a joint build – can reduce each partner's cost by roughly half.

Middle-Mile Broadband Initiative: A key enabler of the state's Broadband for All vision

As specified in SB 156 [2021], CDT is overseeing the acquisition and management of contracts for the development, construction, maintenance, and operation of the open-access Middle-Mile Broadband Network. CDT continues to collaborate on these efforts with GoldenStateNet, the Middle-Mile Broadband Initiatives Third-Party Administrator.

The Middle-Mile Broadband Initiative is a key component of California's Broadband For All Action Plan (introduced through Executive Order N-73-20), which set a long-term goal of ensuring that all Californians have high-performance broadband available at home, schools, libraries, and businesses.

The Middle-Mile Broadband Initiative will provide affordable, open-access middle-mile broadband infrastructure that will enable last-mile networks to reach under-connected and unconnected communities throughout the state. Open-access means that users will connect on equal economic and service terms. This will enable users – internet service providers and public entities – to get more capacity at lower costs to benefit the communities they serve.

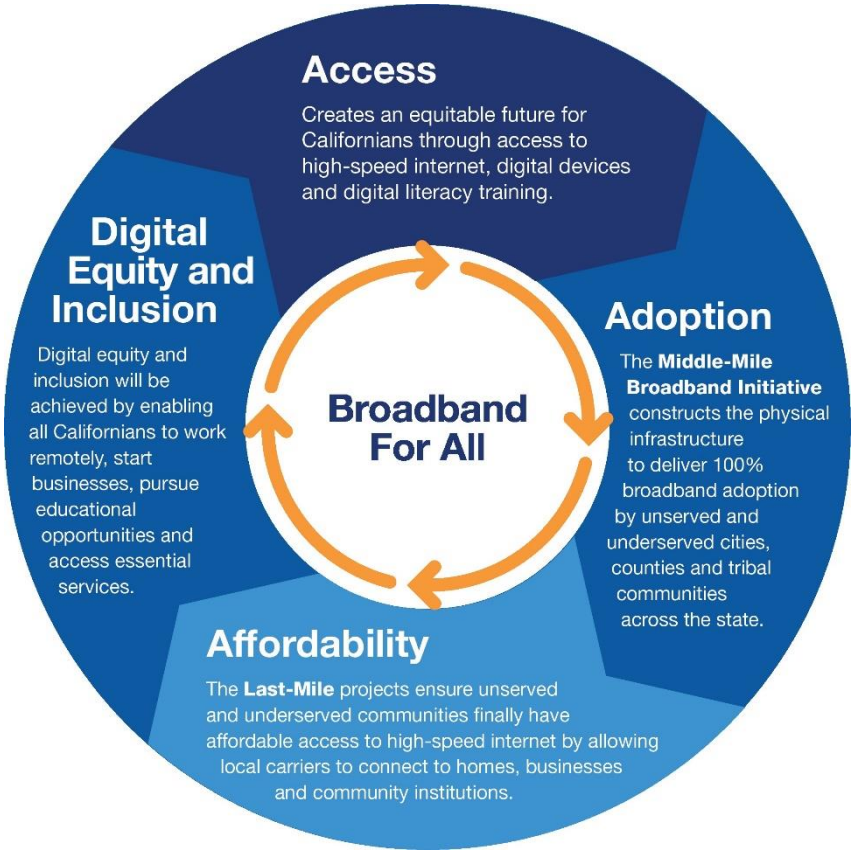


Figure 1: Broadband for All

To achieve the Middle-Mile Broadband Initiative's goals, CDT is leveraging the state's full range of tools, including policy, programs, funding, partnerships, and collaborations with federal, state, local, and tribal governments.

2023 Middle-Mile Broadband Initiative milestones

In 2023, the Middle-Mile Broadband Initiative program and its partners made significant progress toward the implementation of the Middle-Mile Broadband Network – including by accelerating state and federal permitting and securing cost-effective contracts for deploying 83% of the network. CDT continues to pioneer fast and efficient methods to deploy the statewide network, including large-scale construction, joint builds, purchases, and leases.

The Middle-Mile Broadband Initiative achieved the following milestones:

- **Maximized the impact of available funding** by awarding multiple contracts for development partnerships through a Request for Innovative Ideas (RFI^2) procurement – enabling the Middle-Mile Broadband Initiative to leverage joint builds, leases or purchases to

share construction costs and utilize projects already underway to accelerate the pace of development rather than planning new state construction. Notably, the Middle-Mile Broadband Initiative completed and delivered approximately 9.5 route miles in Arcata Bay East.

- **Minimized potential supply chain delays and inflationary pressures** by purchasing 3,000 miles of fiber, conduit, and related construction materials to ensure the availability of materials as construction crews need them. Early construction contracts also protect the project from likely labor shortages as tens of billions of dollars in federal funding begin to reshape the broadband deployment market nationwide.

Figure 2: Construction trench with conduit

- **Broke ground on the first network segments** – in Los Angeles and San Francisco – demonstrating the successful execution of the project plan, from conception to design to environmental review to permitting to procurement.
- **Streamlined permitting processes** by leveraging Caltrans to design and execute programmatic approaches with state and federal agencies with direct support from the White House Council on Environmental Quality and the Federal Permitting Improvement Steering Council.
- **Developed strong partnerships** by engaging with stakeholders in consultation with the California Public Utilities Commission (CPUC) at 20 in-person Broadband for All, Digital Equity, and Broadband Equity, Access, and Deployment (BEAD) Program regional workshops and tribal consultations in every economic region in the state.

- **Released a timely request for proposals (RFP) for network electronics** as a key strategic element of the Middle-Mile Broadband Initiative's preconstruction (planning, designing, and permitting) phase. By planning this critical procurement step even before the completion of the network design, CDT mitigated risks associated with production lead times.
- **Secured $73 million in additional federal grant funding** through the National Telecommunications and Information Administration's highly competitive Enabling Middle Mile Broadband Infrastructure Program to offset network construction costs.
- **Received recognition for a deployment partner's "Innovation in State Broadband Deployment Award"** win at the annual U.S. Broadband Summit.

Middle-Mile Broadband Initiative project timeline: On track for 2026 completion

The Middle-Mile Broadband Initiative successfully executed its preconstruction (planning, designing, and permitting) phase throughout 2023 – leading to signed contracts to construct, joint build, lease, and purchase approximately 83% of network miles. With the release of a second RFI² procurement and an RFP for network electronics late in the year, the project is on schedule to finalize its deployment contracts by December 2024, begin network activation in early 2026, and complete deployment by December 2026.

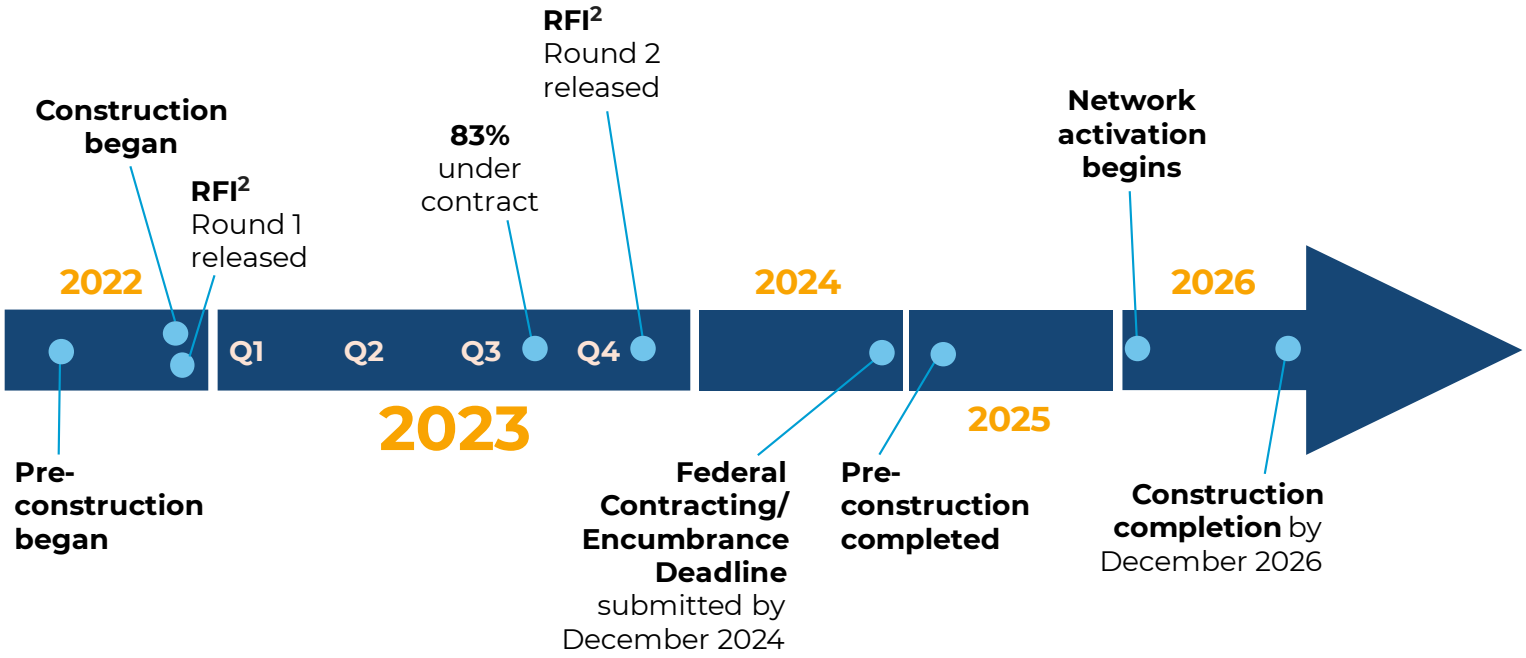


Figure 3: Middle-Mile Broadband Initiative project timeline.

2023 Middle-Mile Broadband Initiative Achievements

In 2023, CDT completed the planning phase and moved into the active procurement and deployment of the Middle-Mile Broadband Network. The year saw important achievements in all aspects of the Middle-Mile Broadband Initiative.

CDT reduced costs and accelerated network deployment by issuing a successful Request for Innovative Ideas (RFI²) procurement – resulting in the opportunity to replace approximately 6,500 miles of new construction with joint builds and leases/purchases

Figure 4: Map of statewide network by delivery method

The Middle-Mile Broadband Initiative originally estimated an average cost of $455,000 per route mile to build the Middle-Mile Broadband Network. However, inflationary pressures, an increase in infrastructure projects, and supply chain challenges have driven up construction costs; as a result, when the Middle-Mile Broadband Initiative executed five regional Job Order Contracts (JOC) in early 2023, it found that construction costs had increased by more than 40% to an average of $641,000 per route mile.

Recognizing the economic pressures that could impact the network if it were deployed primarily through new construction, CDT issued a Request for Innovative Ideas (RFI²) procurement in early 2023.

The RFI² process encouraged industry respondents to meet the Middle-Mile Broadband Initiative's fiber route needs with offers of direct purchases of existing infrastructure, joint builds, and indefeasible rights of use (IRU)/leases.

CDT received 22 responses to the RFI² and reached agreements with 10 respondents for approximately 6,500 miles of deployment.

Because costs are shared with industry partners, CDT's joint builds and leases/ purchases will cost less than half the cost of standalone construction.

Because costs are shared with industry partners, the state's joint builds and leases/purchases will cost less than half the cost of standalone construction. These agreements will also maintain consistent standards for capacity and accessibility geared toward the unique needs of last-mile providers in under-connected and unconnected areas, which will help mitigate inflationary cost pressures.

CDT issued a second RFI² on November 9, 2023, seeking to identify additional cost-effective and accelerated network deployment alternatives. (That procurement closed in January 2024; results are pending as of the issuance of this report.)

The Middle-Mile Broadband Initiative secured 3,000 miles of materials to limit supply chain risk and cost inflation

With prudent planning and negotiations, CDT completed a significant portion of the Middle-Mile Broadband Initiative's materials procurement early in the planning phase – and ahead of the nationwide demand expected to be generated by the federal BEAD Program funding. The Middle-Mile Broadband Initiative established contracts for procurement of at least 3,000 miles of fiber, conduit, and construction materials in 2023. These procurements were important to protect against potential supply chain shortages, production delays, and cost increases.

Figure 5: Spools of conduit at a state materials depot

Further capitalizing on the benefit of this early procurement, CDT secured three geographically distributed locations in the state to receive and distribute the materials. The locations will enable expeditious delivery to the construction sites.

The Middle-Mile Broadband Initiative secured contracts with construction contractors to mitigate the risk of labor shortages and inflationary pressures

Early JOCs established by the Middle-Mile Broadband Initiative will mitigate the effects of potential labor shortages as billions of dollars in federal funding and private investments in broadband create immense competition for construction labor resources – a major risk for broadband projects across the nation, particularly for one with the unprecedented scale of the Middle-Mile Broadband Initiative.

Agreements were signed with four prime JOC contractors, each committing to provide the resources necessary for the scope of construction in one or more of five regions of the state. Moreover, the agreements established unit-based pricing to inform strategic decisions. Another 11 Construction Manager/General Contractor (CMGC) contracts were signed.

The Middle-Mile Broadband Initiative began network construction and deployment – capitalizing on CDT's strategic early planning and procurement approach

A hallmark of the Middle-Mile Broadband Initiative's ongoing success has been its strategic planning. The initial construction progress described here is the culmination of early planning and procurement that led to agreements for large scopes of work and committed resources (e.g., materials) well in

advance of the timing that might be appropriate for a smaller construction effort.

Figure 6: Microtrenching to install conduit

In 2023, CDT issued 10 work authorizations for construction across the state; these capitalized on the momentum created in 2022 when the first three work authorizations were issued utilizing the California Department of Transportation's (Caltrans) Dig Smart Opportunities. These segments of the Middle-Mile Broadband Network incorporated broadband infrastructure into existing transportation projects to take advantage of existing construction, reduce cost, utilize existing permits, and minimize impacts to traffic.

Of the 10 work authorizations issued in 2023, Caltrans executed the first construction work order in Mendocino County in September– enabling the start of construction of a 10-mile span with an estimated completion date in spring 2024.

Figure 7: CDT and Yurok Telecommunications representatives signing an agreement to deploy network infrastructure

The significance of this first work order far exceeds its relatively short length. As with any project of the magnitude of the Middle-Mile Broadband Initiative, shovels in the ground

represent the culmination of all aspects of project planning – from concept to design, permitting, procurement, and construction.

In 2023, CDT also marked a first-of-its-kind agreement with Yurok Telecommunications to deploy 52 miles of network access through tribal sovereign land.

CDT streamlined permitting to accelerate network deployment while ensuring full protection of the public's environmental and cultural interests

Because permitting is critical to enabling the construction of the Middle-Mile Broadband Network, CDT recognized it could improve the middle-mile network development by partnering with Caltrans on efforts to enhance permitting processes – in alignment with the California Broadband Council's "Broadband Action Plan 2020."

These efforts have positioned the state to efficiently gain statewide programmatic permitting options for large portions of the middle-mile network.

CDT and Caltrans worked with federal and state partners to utilize programmatic permitting and approval opportunities. By using these programmatic approaches – existing and new – the Middle-Mile Broadband Initiative benefits from a shorter timeline and the predictability of the negotiated permit requirements.

Federal: CDT facilitated the implementation of a multi-agency programmatic approach for Middle-Mile Broadband Initiative projects crossing federal lands to streamline land use permitting. This approach leverages the environmental programmatic permits and approvals – potentially reducing the expected timeline per network segment from two-plus years to as short as six months in many cases.

CDT and Caltrans directly engaged the Biden Administration, the White House Council on Environmental Quality, and the Federal Permitting Improvement Steering Council, leading to the convening of federal land management agencies from Department of Agriculture, Department of Defense, and Department of the Interior, as well as the U.S. Army Corps of Engineers.

The State of California took the unprecedented approach of developing a Letter of Intent (LOI) unique to the Middle-Mile Broadband Initiative with the federal land management agencies involved in the permitting process. The state's goal was to strengthen coordination around securing the land use agreements needed for the network, including environmental and right-of-way permits and approvals. The LOI outlines a process for agencies to work together to establish roles and responsibilities; establishes a National Environmental Policy Act (NEPA) lead agency on and off federal lands; and outlines the use of programmatic approaches for permitting, regulatory requirements, and right-of-way permits.

Figure 8: California Department of Fish & Wildlife logo

The LOI builds on Caltrans' NEPA assignment from the Federal Highway Administration and the programmatic agreement for cultural/historical preservation approvals through the Office of Historical Preservation, also referred to as the Section 106 programmatic agreement. Further, CDT coordinated with Caltrans to develop new programmatic agreements with the U.S. Army Corps of engineers and the U.S. Fish and Wildlife Service – the first of its kind covering an unprecedented 200 species and critical habitats.

State: SB 156 [2021] provided a statutory exemption from the California Environmental Quality Act (CEQA) for Middle-Mile Broadband Initiative projects that meet the conditions of the exemption. Use of the exemption is expected to reduce the overall environmental process from an estimated 30 months to 17 months. The provisions of this exemption require the lead agency to file a notice of exemption with the State Clearinghouse that demonstrates how a segment of the Middle-Mile Broadband Network meets the conditions of the exemption.

Figure 9: California Coastal Commission logo

During 2023, CDT, in collaboration with Caltrans, implemented programmatic permitting approaches with the California Coastal Commission, the California

Department of Fish and Wildlife, and the California State Water Resources Control Board to further reduce typical Middle-Mile Broadband Network permitting timelines, from 17 months to an estimated 11 months.

CDT established strong stakeholder relationships through outreach, engagement, and collaboration

The Middle-Mile Broadband Initiative team, both by itself and with partners in CDT's Office of Broadband and Digital Literacy and at the CPUC, undertook extensive engagement and outreach in 2023 to ensure opportunity for input by entities that have expertise and interest in broadband and digital equity.

In just the fourth quarter of 2023, CDT participated in more than 40 engagements to gather input and raise awareness about Broadband for All, Digital Equity, and BEAD planning. Specifically, CDT continued to develop strong partnerships by engaging with stakeholders, community groups, deployment partners, tribal entities, and labor representatives. Throughout 2023, CDT:

- Conducted infrastructure planning sessions with the CPUC at in-person Broadband for All, Digital Equity, and BEAD regional workshops and tribal consultations in every economic region in the state.
- Conducted specific outreach to representatives of Small Businesses (SB) and Disabled Veteran Business Enterprises (DVBE) regarding contracting opportunities stemming from the Middle-Mile Broadband Initiative.
- Engaged with tribal nations and local and regional collaborators at events such as the Tribal Engagement Series – leading to CDT's initiation of a first-in-California joint build with the Hoopa Valley Tribe; the agreement will enable construction of 23 miles of fiber through sovereign land.

Figure 10: Hoopa Valley Tribe seal

Figure 11: Hoopa Valley Tribe joint build agreement

The Middle-Mile Broadband Initiative released an RFP for network electronics

By planning this critical procurement step even before the completion of the network design, CDT mitigated risk associated with production lead times and potential delivery delays.

This procurement covers the purchase of all the electronic components required to deliver services on the 10,000+ mile statewide network; to support access to those components by operations staff; and to secure and monitor remote facilities. The procurement also provides for staging, initial configuration, and delivery of these components to their operations locations in remote facilities across the state.

CDT secured $73 million in additional federal funds for the Middle-Mile Broadband Initiative

CDT secured $73 million in federal grant funding with a successful application to the National Telecommunications and Information Administration's (NTIA) highly competitive Enabling Middle Mile Broadband Infrastructure Program. Administered by NTIA's Office of Internet Connectivity and Growth, the grant recognizes the Middle-Mile Broadband Initiative for its effective and efficient plan to meet the program's statutory objectives:

INTERNET FOR ALL
INTERNETFORALL.GOV

Figure 12: Internet for All

- "Encourage the expansion and extension of middle-mile infrastructure to reduce the cost of reaching unserved and underserved areas to the backbone of the internet; and
- Promote broadband connection resiliency through the creation of alternative network connection paths that can be designed to prevent single points of failure on a broadband network."[1]

The Middle-Mile Broadband Initiative received national recognition for an innovative partnership

Figure 13: U.S. Broadband Summit

One of CDT's deployment partners received the "Innovation in State Broadband Deployment" award at the U.S. Broadband Summit in November 2023. The award – given by a panel of 20 judges representing broadband policymakers, market analysts, and the industry – recognized Arcadian Infracom for its partnership with CDT on the Middle-Mile Broadband Initiative. Arcadian hosted a groundbreaking event in December 2023 to kick off its construction efforts on a 306-mile route that will serve the residents of eastern Los Angeles County and extend to communities in Barstow and Needles.

[1] Infrastructure Investment and Jobs Act § 60401(b)(1). https://www.congress.gov/117/plaws/publ58/PLAW-117publ58.pdf.

Middle-Mile Broadband Initiative Annual Reporting (SB 156 [2021])

Pursuant to the Middle-Mile Broadband Initiative's enacting legislation (SB 156 [2021]), this section of the annual report documents the total network length; the length of the portion constructed in the preceding year, by quarter; the number of internet service providers using the network; the number of households projected to connect to the network; and the total expenditures for each project, by quarter. These metrics are summarized in the following table and described in more detail below. A final element of the required reporting (a list of the projected goals for each metric over the next 18 months) is included in a later section.

Table 1: Summary of Middle-Mile Broadband Initiative annual reporting (2023)

Metric	2023 annual reporting
Total planned network length	10,566 miles Extensive analysis undertaken in 2023, including through competitive procurement processes, determined that the cost of deploying the Middle-Mile Broadband Network will be considerably higher than had been anticipated when the Legislature funded the Middle-Mile Broadband Initiative. (Public input and analysis conducted after the Legislature's initial funding had also identified a need for a longer network to reach the state's unserved and underserved communities.) The Middle-Mile Broadband Initiative faces higher deployment costs associated with a period of market expansion, supply chain challenges, and considerable industry inflation. As a result, even with the extensive savings realized through the joint builds and leases/purchases described in this report, the Middle-Mile Broadband Initiative projects a shortfall of

Metric	2023 annual reporting
	funds relative to the goal of deploying a planned statewide network. CDT has identified that an additional $1.5 billion in funding will be necessary to meet the goal.
Length of the portion constructed in 2023, by quarter	SB 156 [2021] requires annual reporting on each network segment "constructed" in the preceding year. As the Middle-Mile Broadband Initiative's project plan indicates, 2023 represented part of the project's preconstruction phase, including planning, designing, and permitting; accordingly, no construction was completed. As noted above, ground was broken on the first segments, with completion of a 10-mile span anticipated in Spring 2024. Significantly, 83% of the network's planned length was contracted in 2023 through signed agreements for construction, joint builds, and leases/purchases – 14 months ahead of schedule. (Federal funding rules require contracts for construction and IRU/leases be in place by December 2024.) See Appendix A for additional details.
Number of internet service providers using the network	Because deployment of the Middle-Mile Broadband Network is in progress with a planned December 2026 completion date, no complete segments are yet available to internet service providers, businesses, or public agencies.
Number of households projected to connect to	Households will be served by last-mile networks deployed by internet service providers – which, in turn, will connect to the

Metric	2023 annual reporting
the network	Middle-Mile Broadband Network. At this point in the Middle-Mile Broadband Initiative's preconstruction (planning, designing, and permitting) phase, no households are yet connected.
Total expenditures for each project, by quarter	Please see below for full details.

Total length of the Middle-Mile Broadband Network

The anticipated length of the robust statewide open-access Middle-Mile Broadband Network is more than 10,000 miles, closely aligned with two-thirds of the 15,000-mile California state highway network.

The Middle-Mile Broadband Network routes were developed in a collaborative effort with the Middle-Mile Broadband Initiative's appointed Third-Party Administrator and the CPUC, as informed by public comment and extensive stakeholder outreach and engagement efforts. Caltrans has since influenced the initial mapping based on the challenges it has

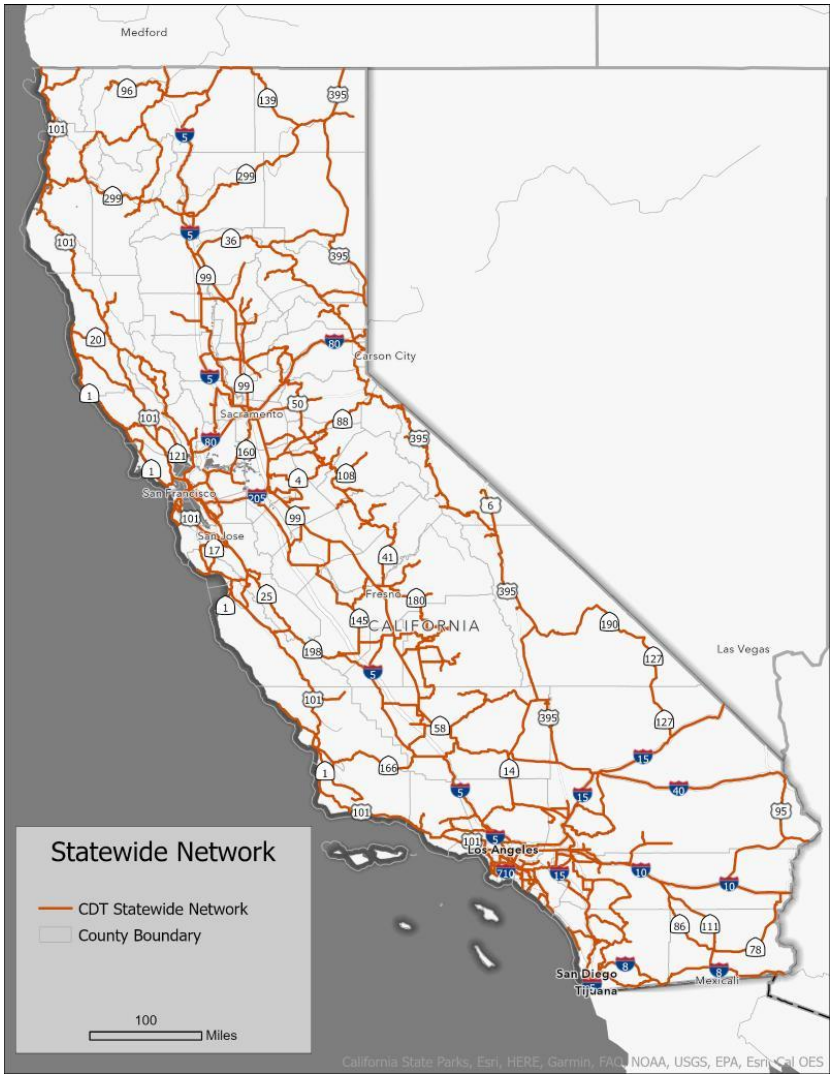


Figure 14: Planned Middle-Mile Broadband Network routes

encountered during the preconstruction (planning, designing, and permitting) phase.

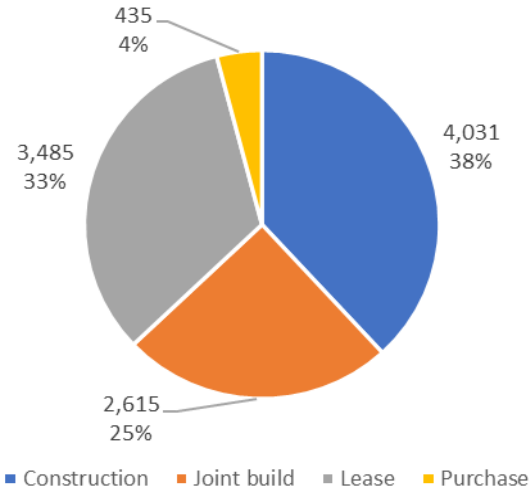
Because transparency and accountability are a hallmark of the Middle-Mile Broadband Initiative, details on all planned routes are publicly available in CDT's interactive Statewide Middle-Mile Network Map.

Length of Middle-Mile Broadband Network construction in 2023

The Middle-Mile Broadband Network is in its preconstruction phase, which is focused on planning, designing, permitting, and procurement. As of the end of 2023, approximately 6,500 miles of planned network deployment were under contract as joint builds or lease/purchase agreements. The remaining 4,000+ miles comprise the initially estimated 1,800 miles and the additional 2,200+ miles planned for Caltrans construction to complete the network. Construction plans may be adjusted if more cost-effective and accelerated network deployment alternatives are identified through the second RFI[2] process.

Table 2: Middle-Mile Broadband Initiative miles under contract (2023)[2]

Deployment type	Miles under contract
Construction	4,031
Joint build	2,615
Lease	3,485
Purchase	435
Total	10,566



In the fourth quarter of 2023, work authorizations were issued for spans in Mendocino, Shasta, and Lake counties. Trenching in Mendocino began in late

[2] "Statewide Middle-Mile Network Map: Network Miles by County," Middle-Mile Broadband Initiative, California Department of Technology, https://middle-mile-broadband-initiative.cdt.ca.gov/pages/statewide-middle-mile-network-map (accessed February 26, 2024).

2023, while construction in Lake and Shasta counties is scheduled to begin in the first quarter of 2024.

Caltrans is continuing preconstruction (planning, designing, and permitting) work on the entire remaining 4,000+ mile network as the state works toward the full build-out. Full details on the deployment method planned for each route by county are included in Appendix B.

By capitalizing on shared costs, joint builds and leases/purchases are expected to provide approximately 6,500 miles of the network at approximately half the cost of standalone construction.

Joint builds and leases/purchases are expected to provide approximately 6,500 miles of the network at approximately half the cost of standalone construction. These approaches include indefeasible rights of use (IRU), which are long-term, capitalized leases, as well as purchases and joint build agreements in which construction costs are shared with private and public sector partners.

In addition to the shared cost savings, these alternatives will capitalize on existing projects in construction – resulting in faster time-to-market and decreased environmental impact. In 2023, these joint builds and leases/purchases resulted in:

- Groundbreaking in December 2023 on construction by Arcadian Infracom in the Boyle Heights neighborhood of Los Angeles.
- Construction of a quarter-mile span in a densely populated (hard to build) area in downtown San Francisco – ahead of schedule and successfully tested in December 2023.
- Completion and delivery of approximately 9.5 miles in Arcata Bay East – from a handhole at Mitchell Heights Drive and Rancho Vista Drive in Eureka to a handhole at 12th Street and L Street in Arcata.
- Successful implementation of “first light” for the Middle-Mile Broadband Network when the Middle-Mile Broadband Initiative brought up optical connectivity between Ridgecrest and Olancha on a 55-mile Digital 395 route, generating 100G of traffic over a 100G wave for several error-free hours.

Number of internet service providers using the Middle-Mile Broadband Network

Because the Middle-Mile Broadband Network will be an open-access network, any of the more than 200 internet service providers currently operating in the state of California – as well as new internet service providers and other eligible entities, including local and tribal governments – will be able to purchase access to the infrastructure to enable delivery of last mile service to customers.

The network is not yet operational, so no internet service providers used the network in 2023. Based on the current project timeline, service could be available to internet service providers in early 2026 – and internet service providers will have access no later than Q4 of 2026.

Number of households projected to be served by the Middle-Mile Broadband Network

The Middle-Mile Broadband Network has been designed to serve communities in all 58 California counties. The middle-mile network will enable a range of programs and initiatives, including billions in last-mile funding being implemented by the CPUC to reach under-connected and unconnected households.

The middle-mile comprises high-capacity fiber optic lines that carry large amounts of data at high speeds over long distances. The initial middle-mile locations were identified to connect unserved communities – communities that do not have internet access – thus enabling internet service providers to more easily construct last-mile connections to reach individual households. Because the Middle-Mile Broadband Network will be an open-access network, internet service providers will connect on equal economic and service terms.

Each middle-mile segment will provide the potential to enable last-mile connections to other customers and entities far beyond the immediate region and will increase reliability, affordability, and competition in these areas. This will allow for greater access for more Californians at a more reasonable cost.

At the same time CDT is developing the Middle-Mile Broadband Network, the CPUC is distributing more than $2 billion in last-mile funding to internet

service providers and other entities to construct regional projects that can connect to the Middle-Mile Broadband Network.

The CPUC has indicated that providers and jurisdictions submitting applications for last-mile grants can work with the CPUC before or after submission to coordinate middle-mile needs in their grant applications.

Total Middle-Mile Broadband Initiative expenditures by quarter

The Middle-Mile Broadband Initiative's 2021 and 2022 funding ($3.25 billion allocated by SB 156 [2021]) has been encumbered and will be liquidated across the life of the project. The additional funding allocated by the Legislature through SB 189 [2022] ($300 million in the 2023–2024 California Spending Plan and $250 million in the 2024–2025 plan) brought the total budget to $3.87 billion. The graph in Figure 15 illustrates the Middle-Mile Broadband Initiative's cumulative expenditure pattern, both actual (through the end of 2023) and projected (through planned completion in 2026), based on that funding.

As noted above, the Middle-Mile Broadband Initiative projects a shortfall of funds relative to the goal of deploying a planned statewide network. The current level of funding ($3.87 billion) will enable the deployment of approximately 8,300 network miles. CDT has identified that an additional $1.5 billion in funding will be necessary to meet the full statewide deployment goal.

In 2023, the Middle-Mile Broadband Initiative had the following expenditures.

Table 3: Middle-Mile Broadband Initiative quarterly expenditures by funding source (2023)

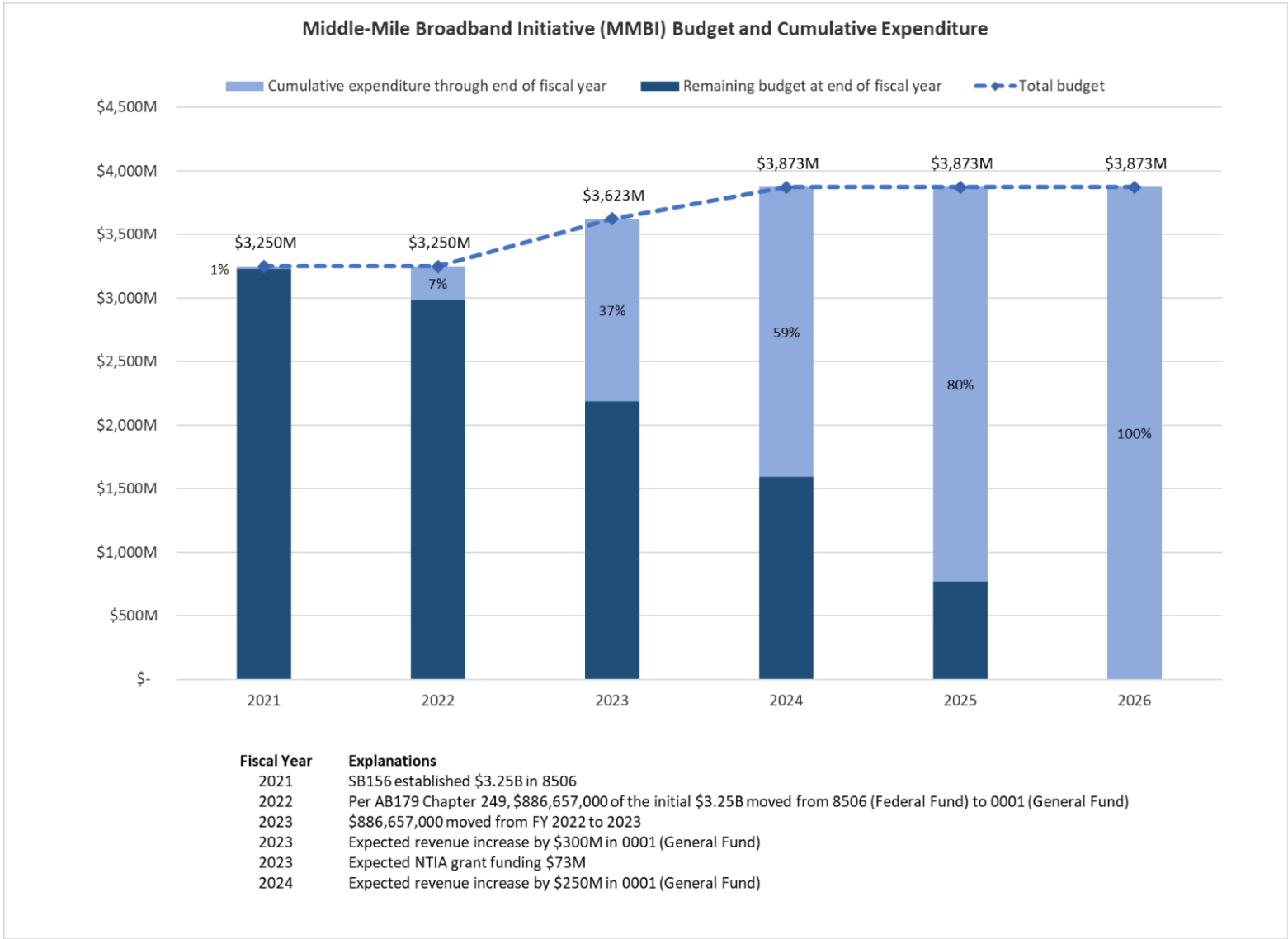
Funding source	Q1	Q2	Q3	Q4	Total
General Fund	0	0	$24,611,008	$634,362	$25,245,370
Federal Fund	$77,492,833	$62,261,019	$414,460,092	$349,867,253	$904,081,197
Total	$77,492,833	$62,261,019	$439,071,100	$350,501,615	$929,326,567

These quarterly expenditures align with the Middle-Mile Broadband Initiative's cost categories as follows. (Note: Due to rounding, the totals in this table are slightly different than in the table above.)

Table 4: Middle-Mile Broadband Initiative quarterly expenditures by category (2023)

Category	Q1	Q2	Q3	Q4	Total
Caltrans preconstruction (planning, designing, and permitting)	$30,298,890	$48,749,825	$27,564,074	$65,809,053	$172,421,841
Joint build	$41,967,900	$0	$360,102,462	$249,578,304	$651,648,666
Purchase	$0	$0	$0	$0	$0
Materials	$0	$8,715,753	$40,078,384	$23,222,674	$72,016,811
Administration	$5,226,043	$4,795,441	$11,326,180	$11,891,585	$33,239,248
Total	$77,492,833	$62,261,019	$439,071,100	$350,501,616	$929,326,566

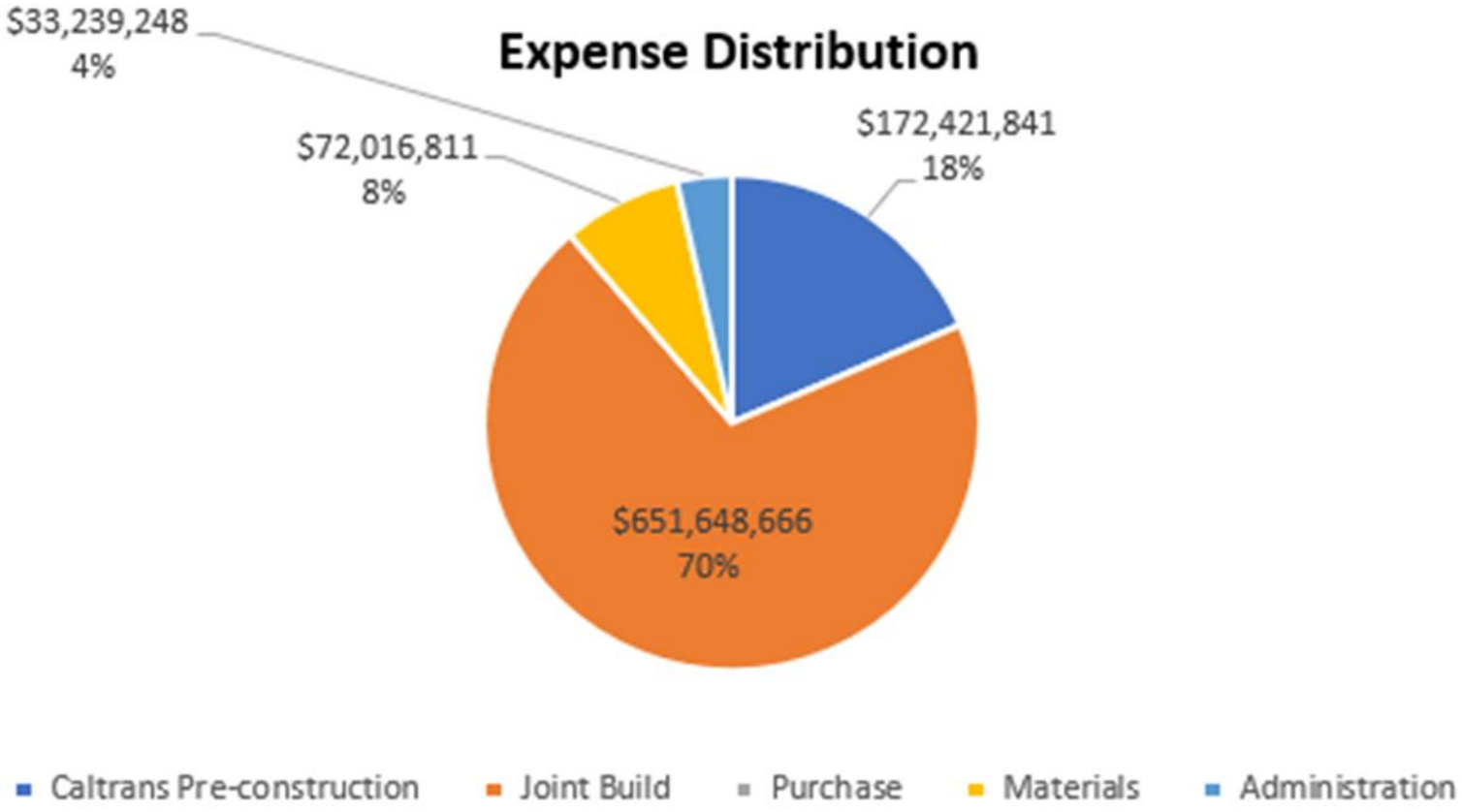
*Figure 15: Middle-Mile Broadband Initiative cumulative expenditure projection (current $3.87 billion funding)**



Fiscal Year	Explanations
2021	SB156 established $3.25B in 8506
2022	Per AB179 Chapter 249, $886,657,000 of the initial $3.25B moved from 8506 (Federal Fund) to 0001 (General Fund)
2023	$886,657,000 moved from FY 2022 to 2023
2023	Expected revenue increase by $300M in 0001 (General Fund)
2023	Expected NTIA grant funding $73M
2024	Expected revenue increase by $250M in 0001 (General Fund)

* CDT has requested an additional $1.5 billion in the Governor's Budget, based on projected funding needed to complete the network.

Figure 16: Middle-Mile Broadband Initiative expenses by category (2023)



Middle-Mile Broadband Initiative Annual Reporting (SB 189 [2022])

This section of the annual report documents the information required by SB 189 [2022] in terms of the Middle-Mile Broadband Initiative funding in the 2022 Budget agreement ($300 million in the 2023–2024 California Spending Plan).

CDT project report, in consultation with Caltrans and the CPUC

Table 5: Annual reporting for SB 189 (CDT in consultation with Caltrans and the CPUC)

Metric	2023 annual reporting
(1) The total number of miles planned for construction with these funds	315 miles Caltrans construction in the State Highway right-of-way
(2) The total number of miles planned for lease with these funds	172 miles
(3) The total number of miles planned in state highway rights-of-way	315 miles Caltrans construction in the State Highway right-of-way
(4) The total number of miles planned for which existing middle-mile broadband infrastructure is already available from another provider in the area	0 miles
(5) The total number of miles planned for which no existing middle-mile broadband infrastructure currently exists	487 miles

Metric	2023 annual reporting
(6) A list of the planned middle-mile infrastructure projects identified by Department of Transportation districts, that are to be constructed or leased, according to the following criteria	A specific list of projects is not yet available. Caltrans construction will commence in multiple Caltrans districts as preconstruction (planning, designing, and permitting) activities are completed and spans are cleared for construction. Caltrans is not identifying miles to be leased.
(A) The estimated cost of the project per mile constructed or leased	$641,000 (ranging from $387,000 to $958,000 per mile for Caltrans-led construction); $280,221 (ranging from $201,600 to $967,680 for CDT-identified leases).
(B) The estimated time needed to complete the project	The Middle-Mile Broadband Initiative expects to complete all leases by December 31, 2024, and has a planned deployment completion date (including all construction) of December 31, 2026.
(C) The number of internet service providers in that area that have expressed interest in using the statewide open-access middle-mile broadband network	Because deployment of the Middle-Mile Broadband Network is in progress with a planned December 2026 completion date, no complete segments are yet available to internet service providers, businesses, or public agencies.
(D) The estimated number of households projected to connect to the middle-mile infrastructure project, including the proportion of those	Households will be served by last-mile networks deployed by internet service providers – which, in turn, will connect to the Middle-Mile Broadband Network. At this point in the Middle-Mile Broadband

Metric	2023 annual reporting
households that are unserved by an existing internet service provider that provides service at minimum speeds of 25 megabits per second download and 3 megabits per second upload	Initiative's preconstruction (planning, designing, and permitting) phase, no households are yet connected.
(E) The estimated cost of the project per unserved or underserved household served	The estimated cost will not be known until service is provided by last-mile providers.

CDT's project reporting

SB 189 [2022] provided CDT $300 million in 2023-24 for the development, construction, and acquisition of a statewide open-access middle-mile broadband network. This section of the report meets the following reporting requirements related to those funds.

Table 6: CDT's annual reporting for SB 189

Metric	2023 annual reporting
(1) Total funds expended *The following list identifies the use and/or planned use of the SB 189 [2022] funds*	• As noted in Appendix A, approximately **$40 million** was spent toward the Trans-Pacific Network contract that covers more than 172 miles of **leased** fiber. • **$202 million** will allow Caltrans construction of 315 miles in the State Highway right-of-way. • **$58 million** is earmarked for **network materials** necessary to

Metric	2023 annual reporting
	ensure high-quality and reliable connection across the Middle-Mile Broadband Initiative.
(2) Total miles constructed	There are 315 planned construction miles with SB189 funds (along State Highway right-of-way).
(3) Total miles leased	There are 172 planned lease miles with SB189 funds. See map below for additional detail.
(4) Remaining number of miles until total network completion	CDT has identified a gap of 10,566 miles in the state's middle-mile network and will continue to work with available funding to support that build-out and leverage joint-builds and other partnerships to deliver a cost-effective project.

Figure 17: Leased miles planned with SB 189 [2022] funding

Projected Middle-Mile Broadband Initiative goals for the next 18 months (SB 156 [2021])

Over the next 18 months, the Middle-Mile Broadband Initiative expects to build on its strong foundation by cost-effectively deploying more network segments in line with the multi-year project plan. Specifically, the project's goals include the following:

- On a rolling basis, commence construction on all joint build and leased/purchased segments by January 2025;
- Begin Caltrans construction on approximately 4,000 miles of Middle-Mile Broadband Network fiber infrastructure via efficient, cost-effective JOC and CMGC delivery methods
    - JOC procurements permit the state to issue work orders against master agreements, allowing the state to scale work in real-time while ensuring contractors can mobilize labor and equipment basis as segments are ready to begin construction.

- CMGC procurements permit the state to partner with contractors during the design phase to target the most efficient and cost-effective construction approaches.
- Caltrans' Middle-Mile Broadband Network ready-to-construct projections for 2024 are as follows:

Table 7: Caltrans' projections for 2024 network preconstruction by region

	Jan-March	April-June	July-Sept	Oct-Dec	Region total
Region 1	125	130	347	576	1,178
Region 2	20	15	57	428	574
Region 3	14	39	13	680	746
Region 4	75	0	159	152	386
Region 5	106	51	595	292	1,044
Projected 2024 quarterly total	394	235	1,171	2,128	3,928*

* Differs from total construction of 4,031 due to miles "ready for construction" in 2023 and remaining miles in early 2025.

- Caltrans expects to go to construction on 450 miles by June 2024 in multiple Caltrans districts as preconstruction (planning, designing, and permitting) activities are completed and spans are cleared for construction;
- Close out construction on multiple joint build and leased/purchased spans, resulting in a total of 1,589 miles being ready for quality verification from the designated Third-Party Administrator;
- Execute a federal permitting completion strategy with federal land management agencies to continue streamlining the permitting processes while protecting the public interest. The strategy consists of enlisting resources to draft permitting guidelines, developing the Master 299 Trackers, executing programmatic options, and closely monitoring progress, issues, barriers, and schedules to ensure permitting is executed with sufficient time to complete construction by December 2026;

- Install 160 repeater nodes (electronics huts) in strategically planned locations statewide to enable internet service providers to connect last-mile networks to the Middle-Mile Broadband Network;
- Complete the market sounding study currently underway that will gather data and insights on potential client demand, and will inform the development of operating models in advance of the planned January 2027 start of operations;
- Complete a business model that integrates cost modeling, revenue modeling, and implementation of the Middle-Mile Broadband Initiative's go-to-market plan; and
- Continue consultations and collaboration with tribal nations and local communities to address access and connectivity needs.

Continuing the Middle-Mile Broadband Initiative's successful deployment

The Middle-Mile Broadband Initiative is a critical component in the state's strategy – established by Executive Order N-73-20 and presented in the Broadband for All Action Plan – to bring broadband access, affordability, equity, and inclusion to all Californians.

The program's tactical and strategic successes in 2023 reflect CDT's ongoing commitment to strong financial stewardship, results-oriented innovation, and timely delivery of a statewide network.

Looking ahead, the Middle-Mile Broadband Initiative expects to complete all contracts for construction and leases by December 2024; begin network activation by early 2026; complete construction by December 2026; and begin network operations in January 2027.

CDT and its partners are proud to play this important role in delivering on the state's goal of Broadband for All.

Appendix A: Network Deployment Partnerships

Partnerships developed by the Middle-Mile Broadband Initiative in 2023 include the following entities:

- Arcadian Infracom
- Boldyn Networks
- Caltrans
- Central Valley Independent Network (CVIN)
- Digital 299/Trans Pacific Network (TPN)
- Digital 395
- Hoopa Valley Public Utilities District (HVPUD)
- Lumen Technologies
- Siskiyou Telephone Company
- Vero Networks
- Zayo Group

Network miles by partner and type

The table below lists the Middle-Mile Broadband Initiative development partners. This includes all partners that will provide lease, purchase, joint build, and Caltrans-led construction.[3]

Table 8: Middle-Mile Broadband Initiative partners

Partner	Type	Miles
Arcadian Infracom	Joint build	1,006 miles
Boldyn Networks	Lease	81 miles
Caltrans	Construction	4,031 miles
Caltrans (SR 67 Dig Smart)	Joint build	18 miles
Central Valley Independent Network (CVIN)	Lease	2,522 miles
Digital 395	Purchase	435 miles
Hoopa	Joint build	23 miles
Lumen Technologies (joint build)	Joint build	1,186 miles
Lumen Technologies (lease)	Lease	710 miles
Siskiyou Telephone Company	Joint build	165 miles
Trans Pacific Network (TPN)/Digital 299	Lease	172 miles
Vero Networks	Joint build	24 miles
Zayo Group	Joint build	193 miles
Total		**10,566 miles**

Note: Miles stated are non-overlapping miles reflected in the contracts.

[3] "CDT Network Partners," Middle-Mile Broadband Initiative, California Department of Technology, https://middle-mile-broadband-initiative.cdt.ca.gov/pages/cdt-network-partners (accessed February 26, 2024).

Network partner route maps

Arcadian Infracom

Figure 18: Arcadian Infracom route map (joint build)

Boldyn Networks

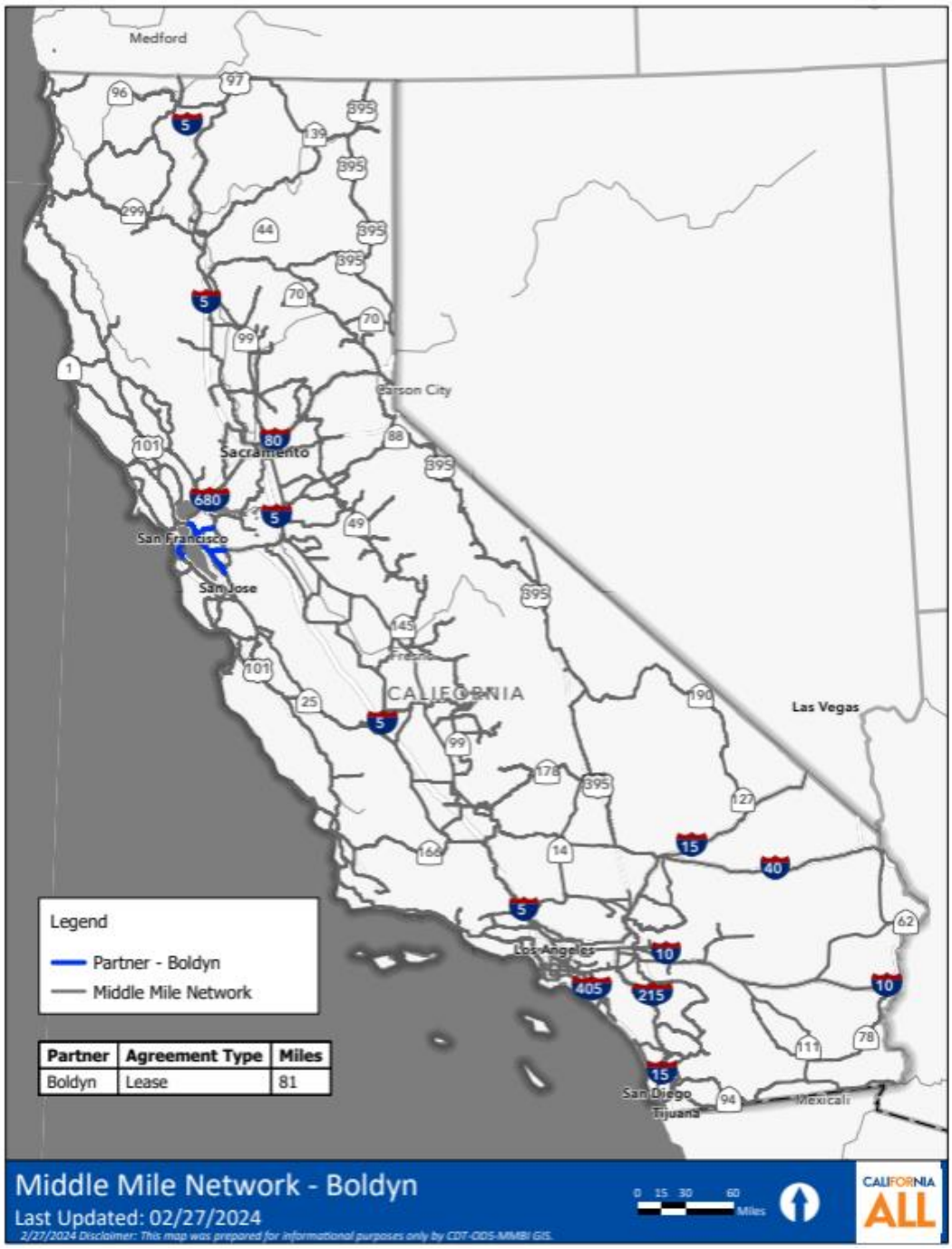


Figure 19: Boldyn Networks route map (lease)

Caltrans

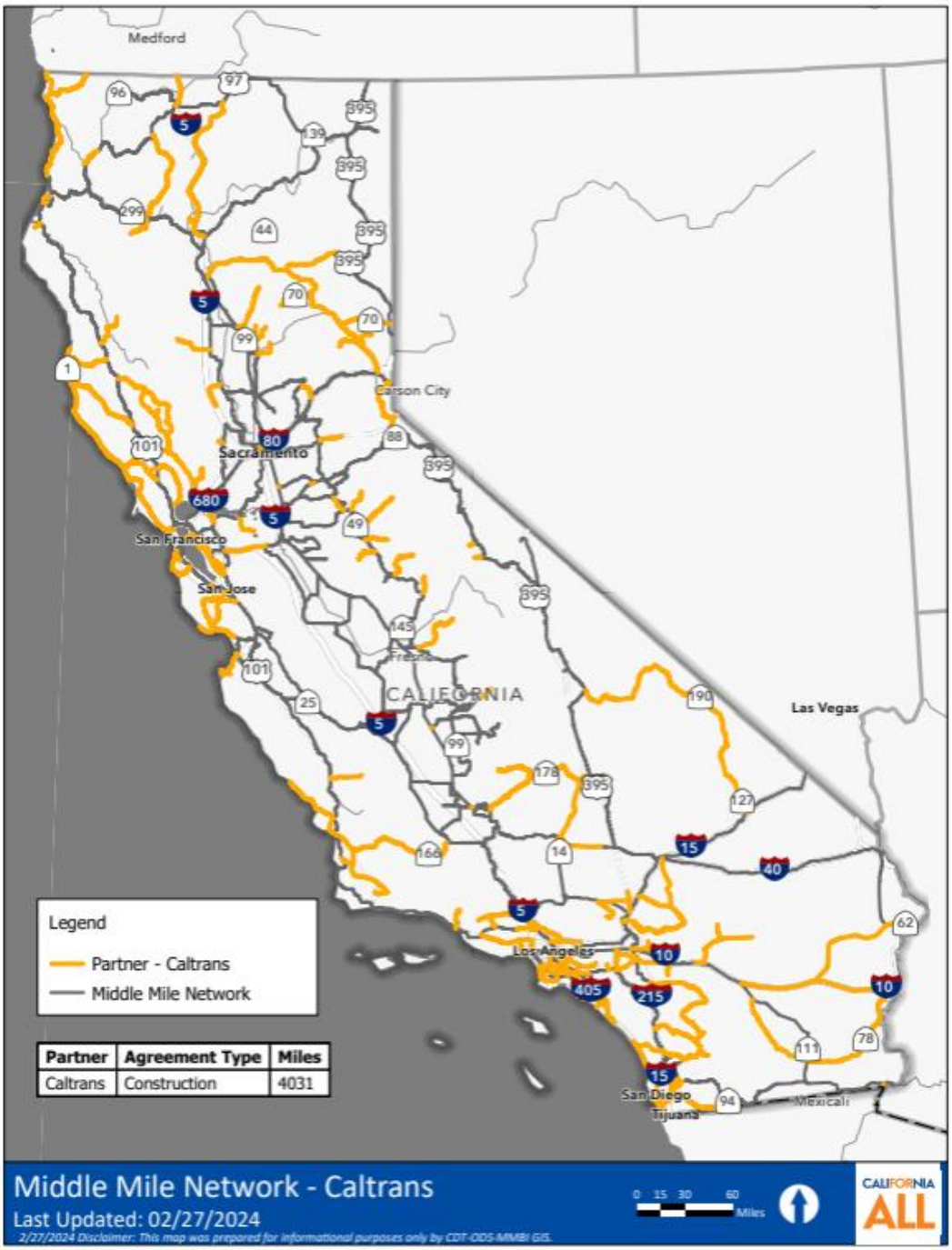


Figure 20: Caltrans route map (construction)

Caltrans (SR 67 Dig Smart)

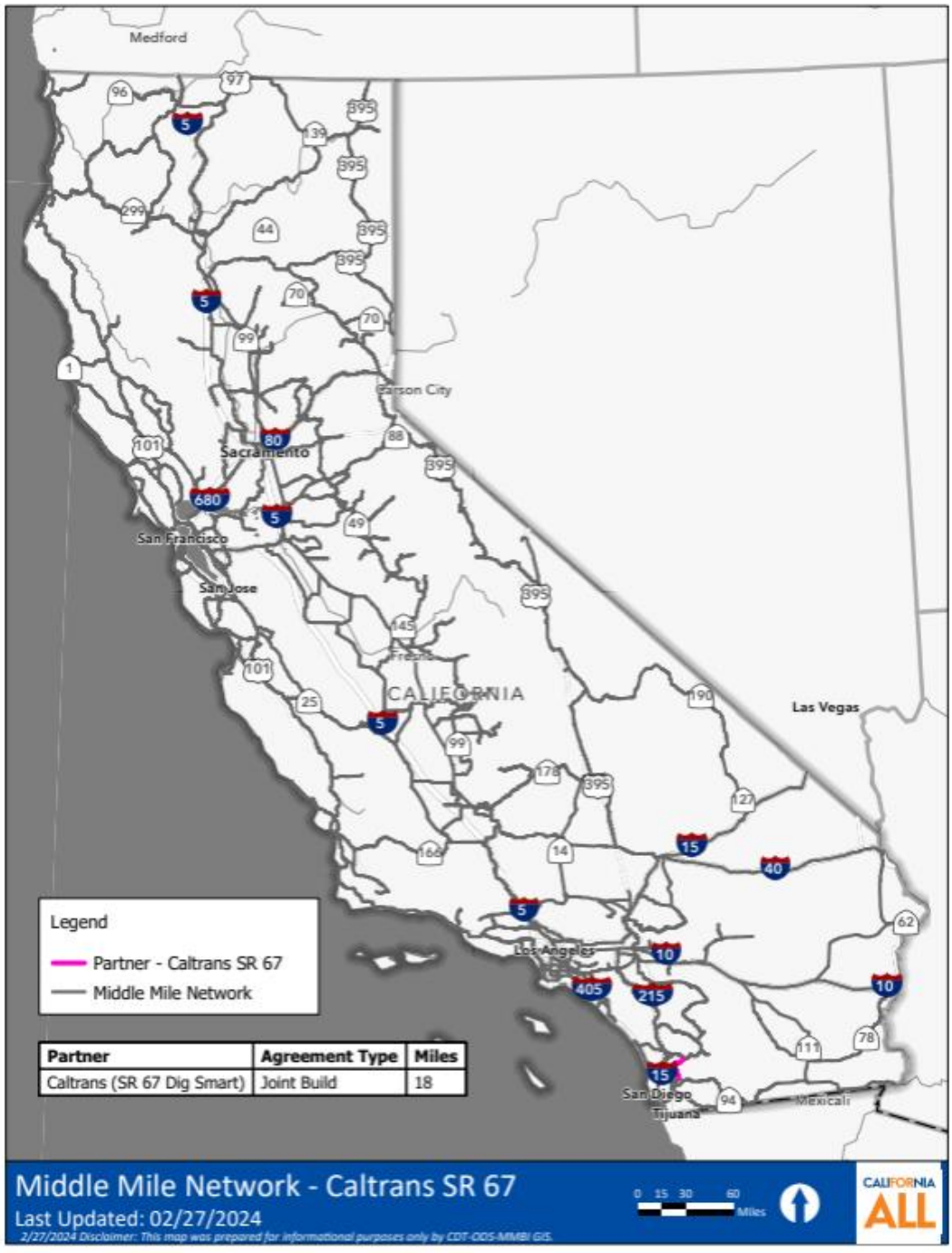


Figure 21:Caltrans route map (SR 67 Dig Smart joint build)

Central Valley Independent Network (CVIN)

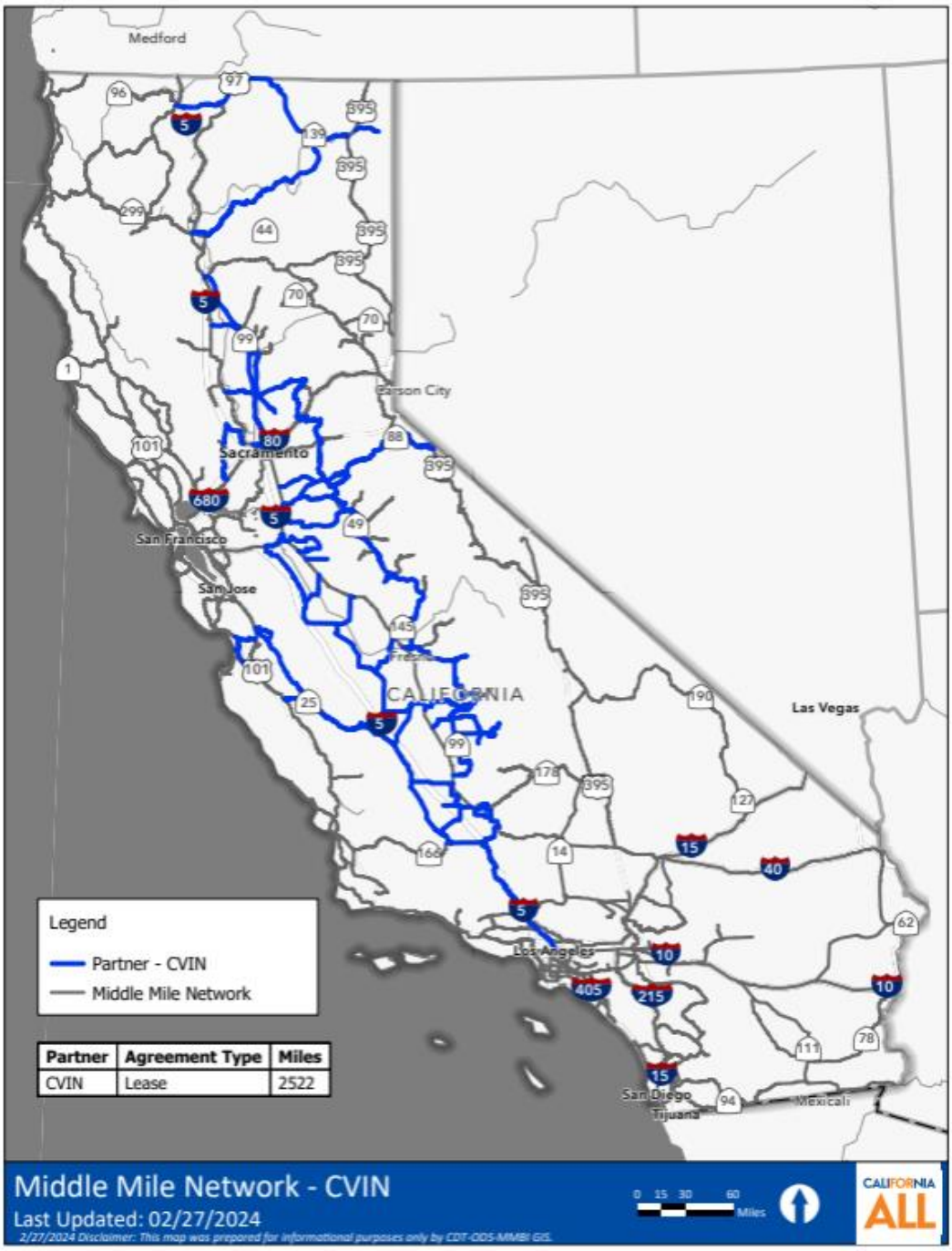


Figure 22: Central Valley Independent Network (CVIN) route map (lease)

Digital 299/Trans Pacific Network (TPN)

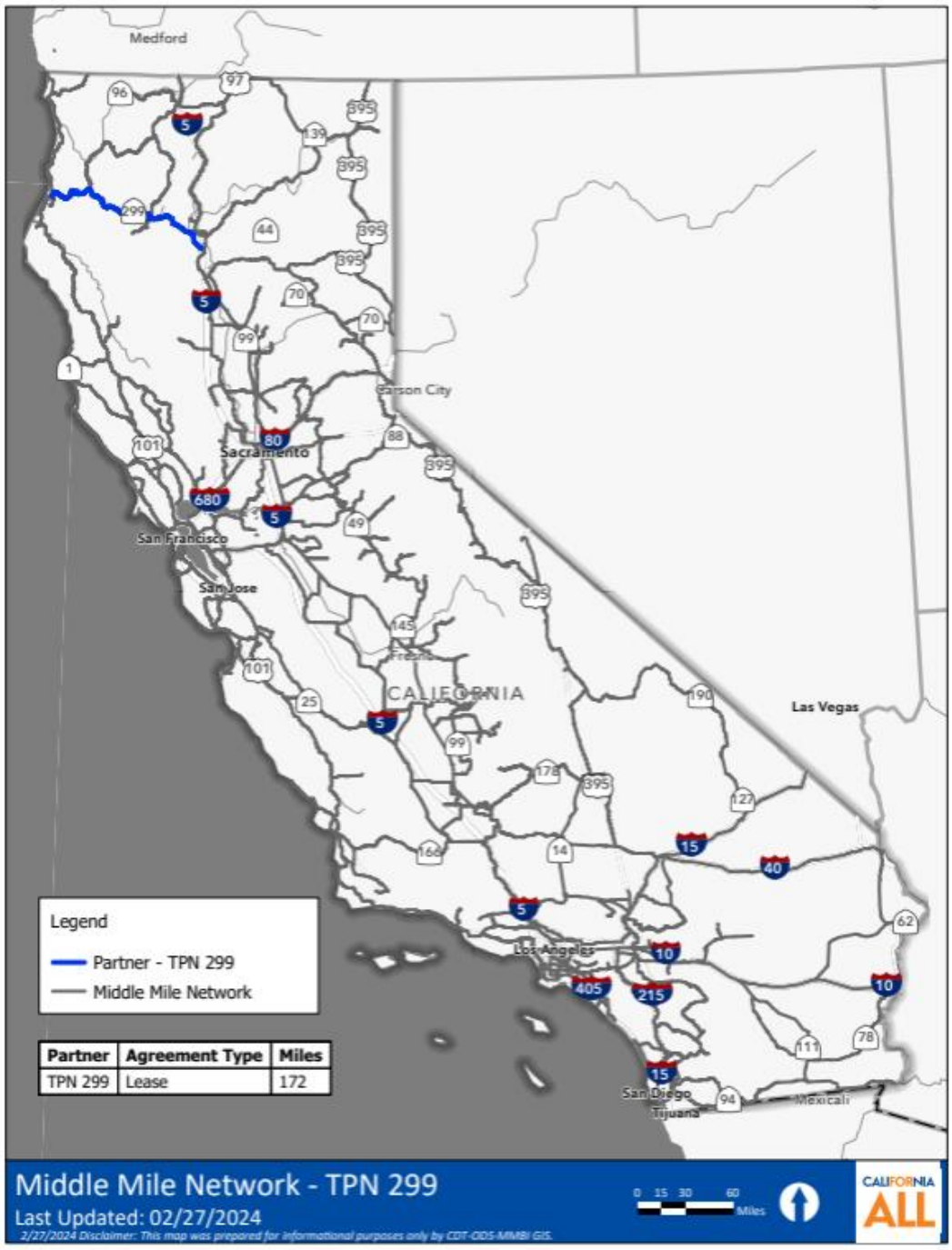


Figure 23: Digital 299/Trans Pacific Network (TPN) (lease)

Digital 395

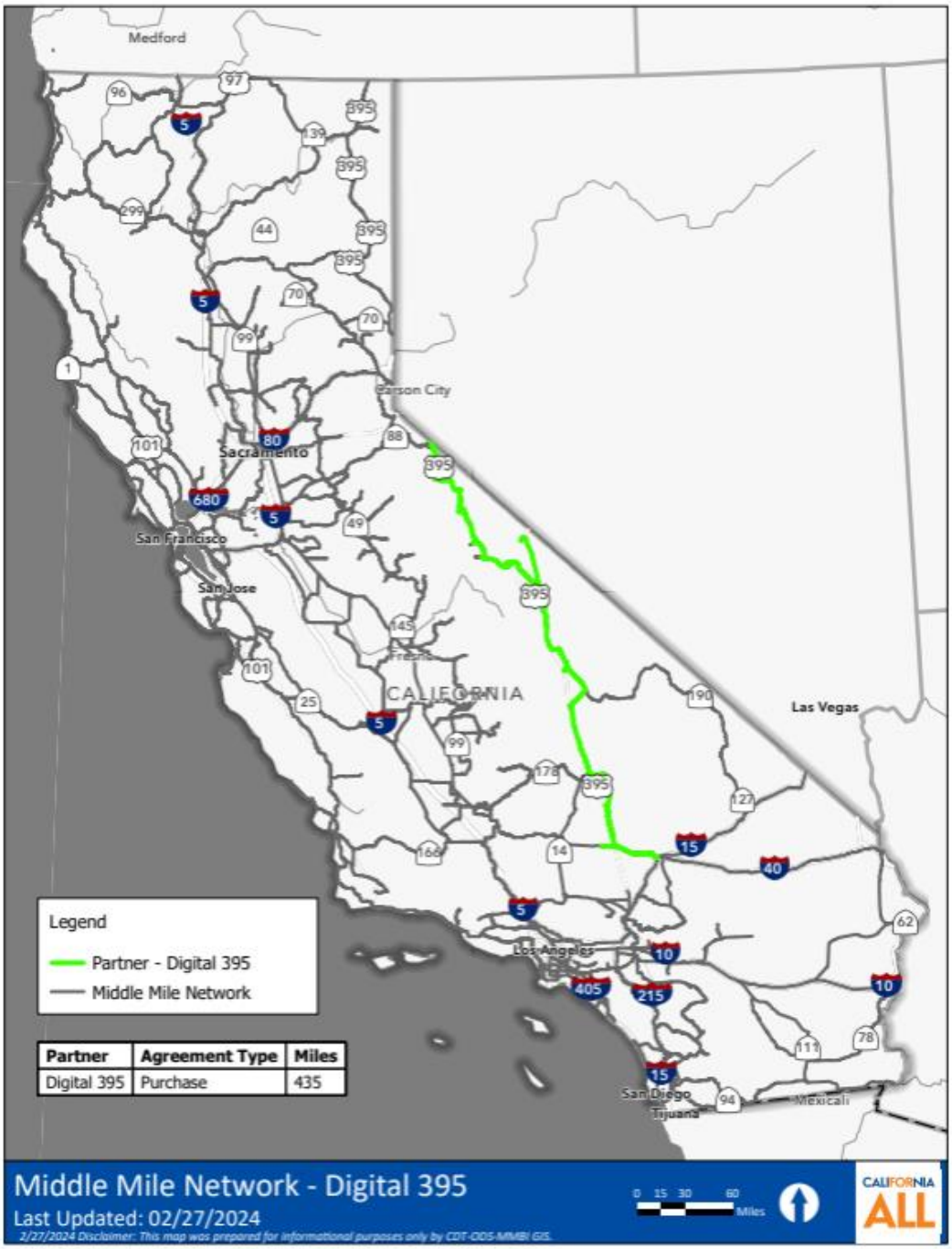


Figure 24: Digital 395 route map (purchase)

Hoopa Valley Public Utilities District (HVPUD)

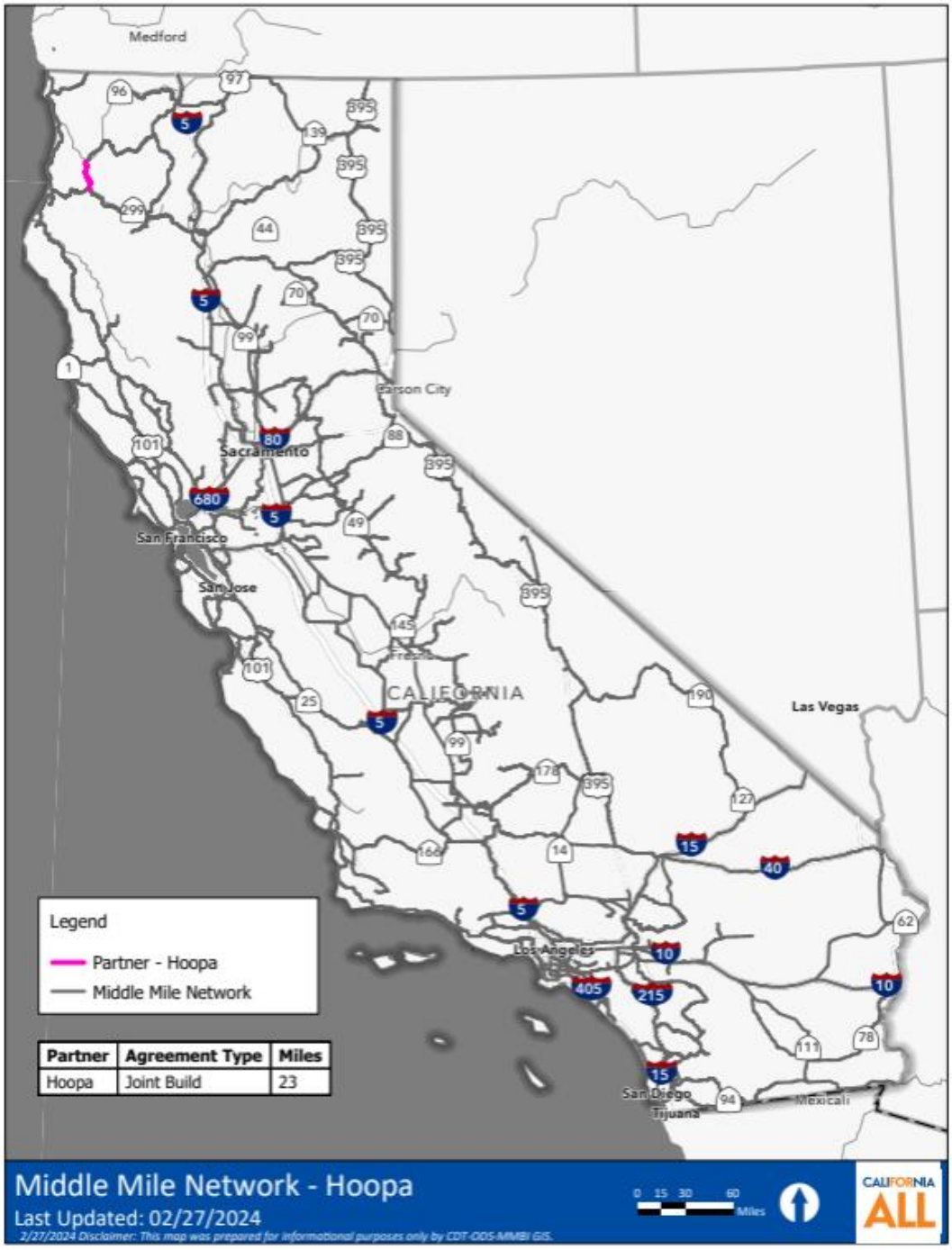


Figure 25: Hoopa Valley Public Utilities District (HVPUD) route map (joint build)

Lumen Technologies joint build

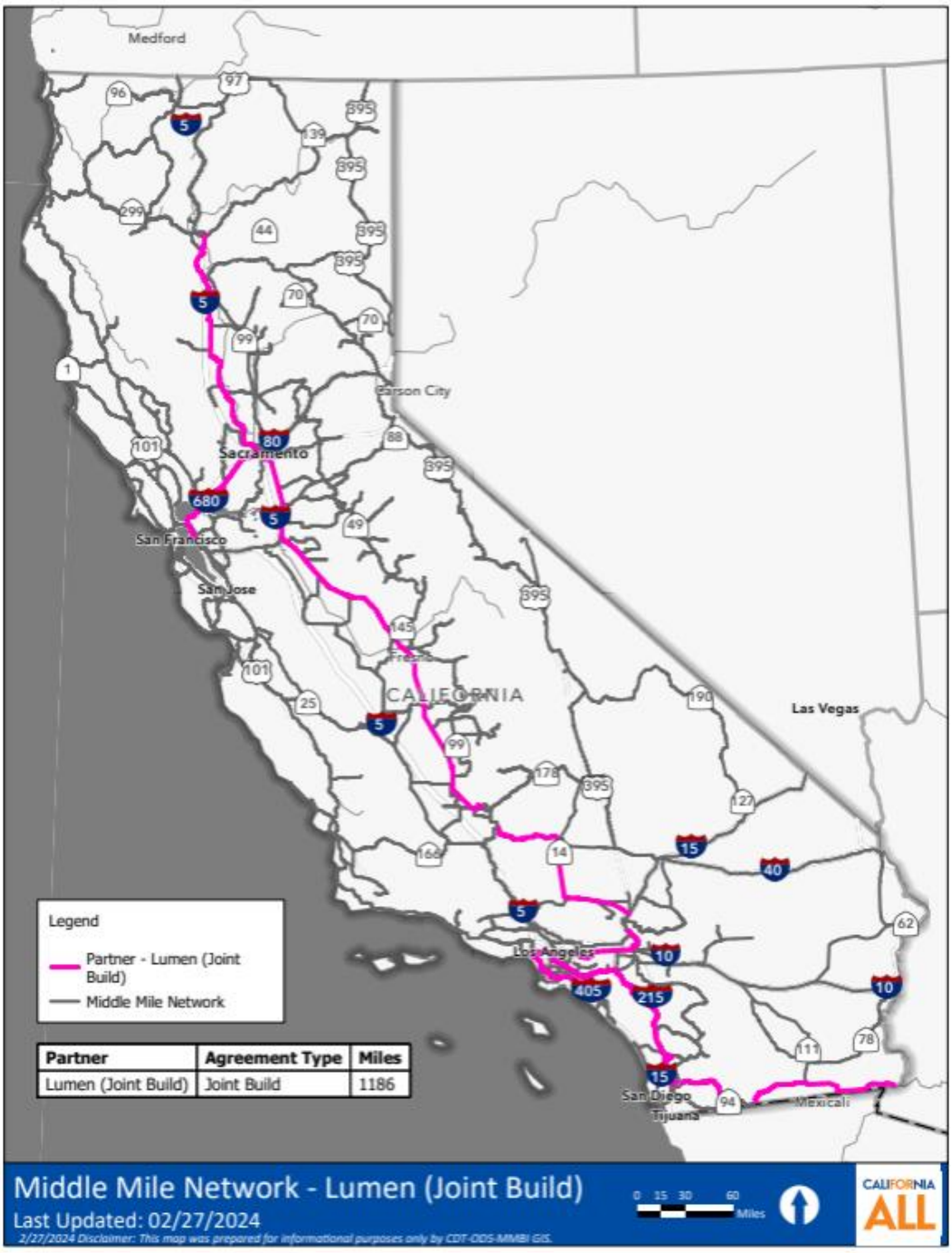


Figure 26: Lumen Technologies route map (joint build)

Lumen Technologies lease

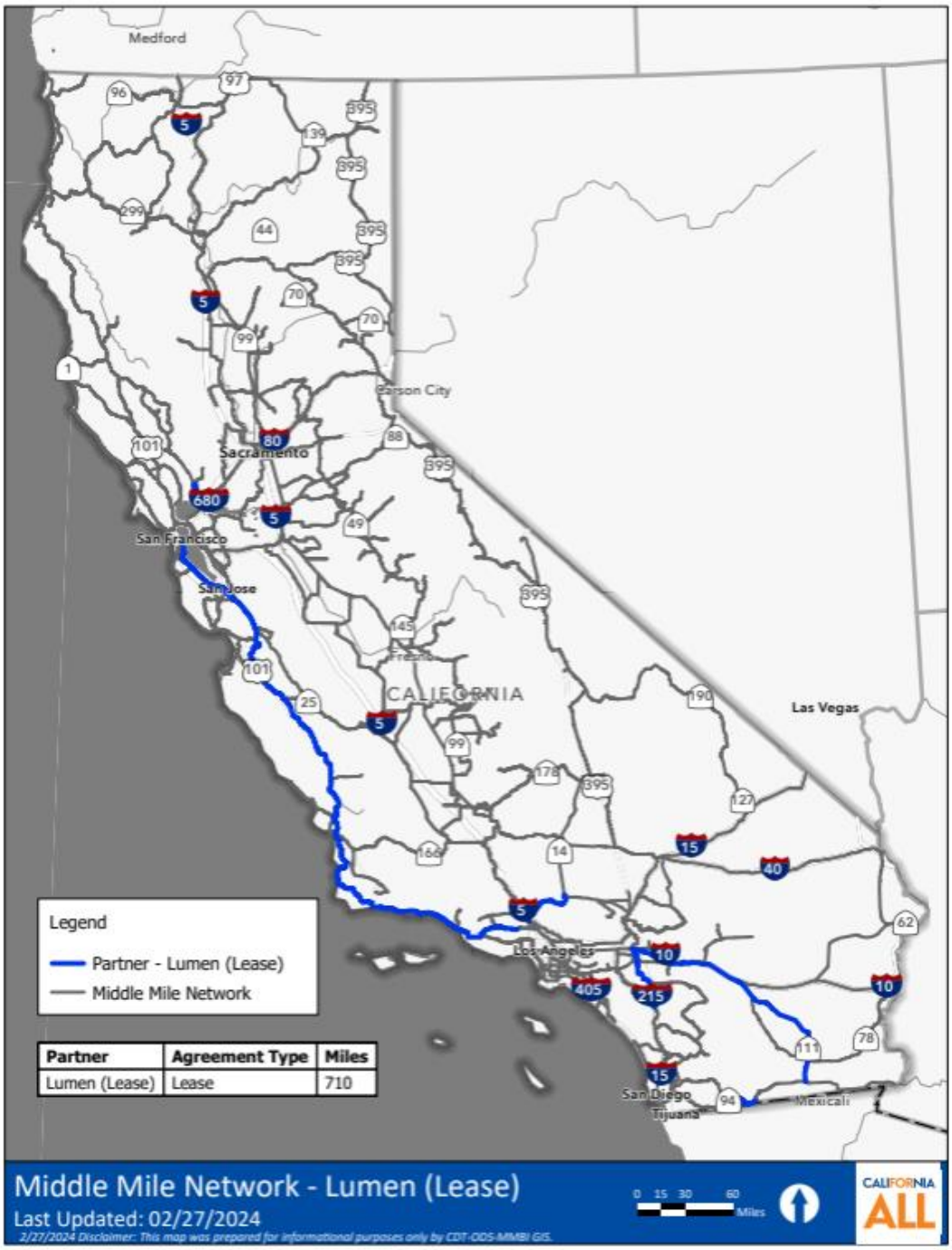


Figure 27: Lumen Technologies route map (lease)

Siskiyou Telephone Company

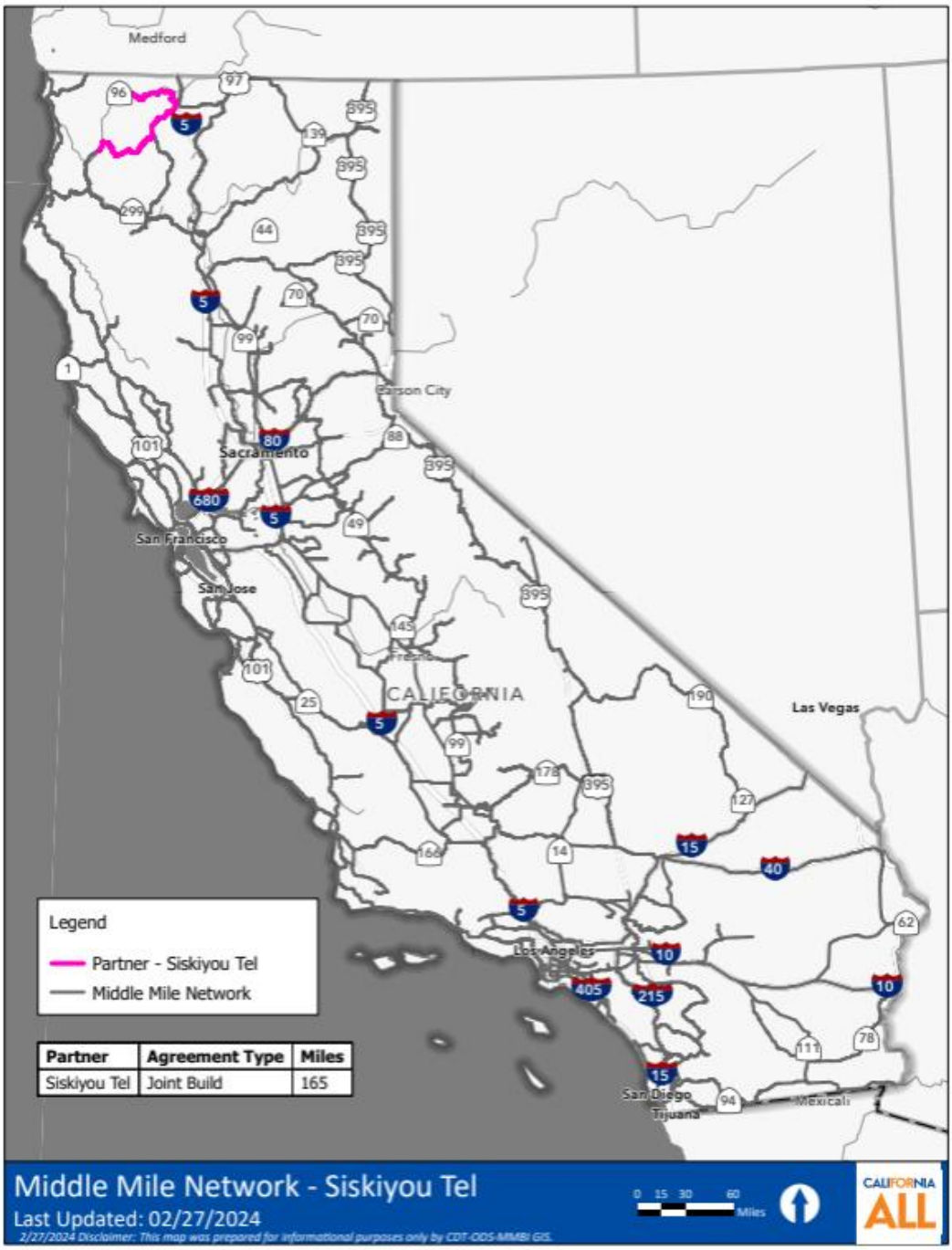


Figure 28: Siskiyou Telephone Company route map (joint build)

Vero Networks

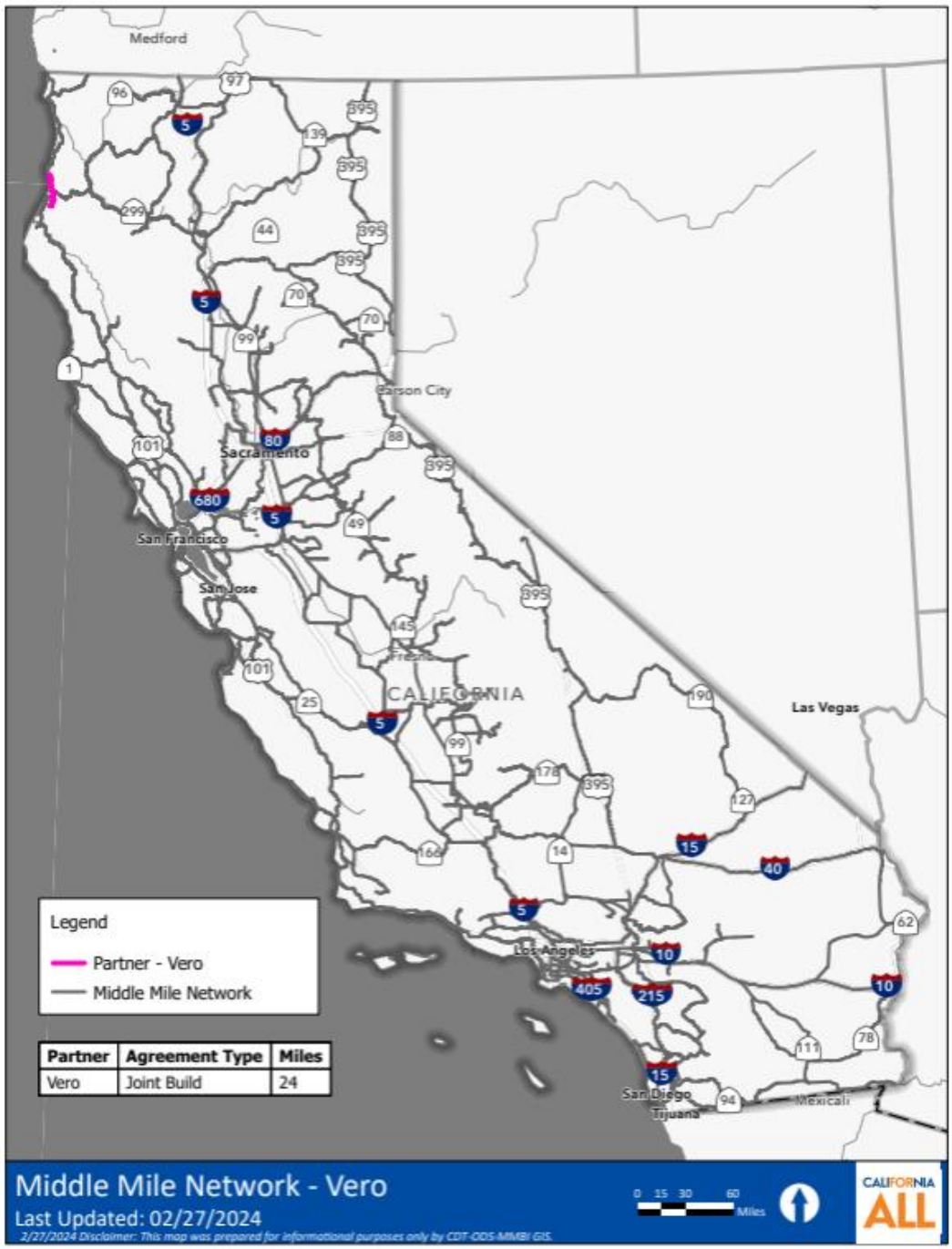


Figure 29: Vero Networks route map (joint build)

Zayo Group

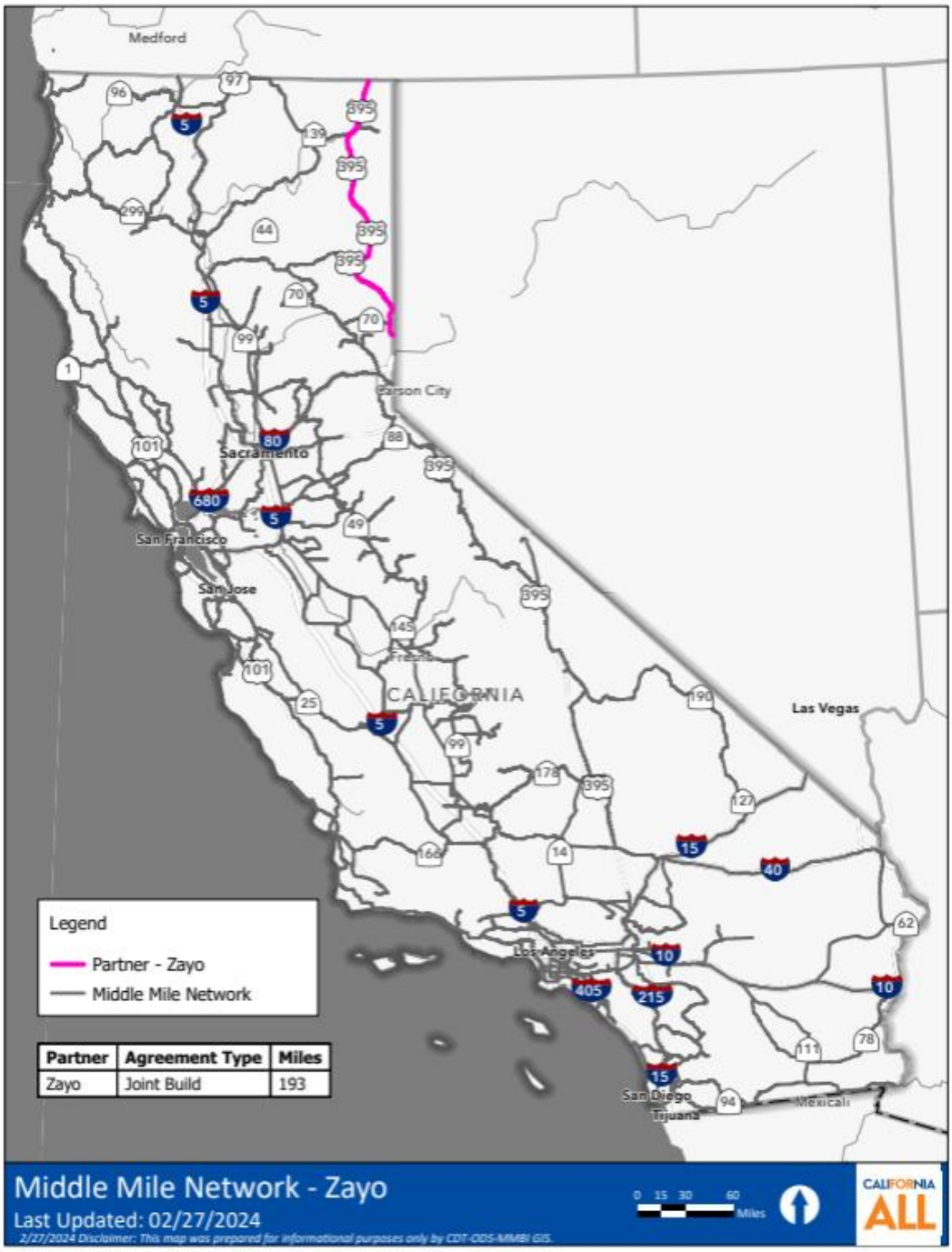


Figure 30: Zayo Group route map (joint build)

Appendix B: Network Miles by County

The following table documents the status of the Middle-Mile Broadband Network planned as of February 26, 2024.[4]

Table 9: Middle-Mile Broadband Network miles by county

County	Total	Lease	Purchase	Joint build	Construction
Alameda	162 miles	54 miles	0 mile	28 miles	80 miles
Alpine	44 miles	41 miles	0 mile	0 mile	3 miles
Amador	107 miles	106 miles	0 mile	0 mile	1 mile
Butte	155 miles	77 miles	0 mile	0 mile	78 miles
Calaveras	125 miles	100 miles	0 mile	0 mile	25 miles
Colusa	63 miles	3 miles	0 mile	41 miles	19 miles
Contra Costa	102 miles	13 miles	0 mile	66 miles	23 miles
Del Norte	82 miles	0 mile	0 mile	0 mile	82 miles
El Dorado	117 miles	51 miles	0 mile	17 miles	49 miles

[4] "Statewide Middle-Mile Network Map: Network Miles by County," Middle-Mile Broadband Initiative, California Department of Technology, https://middle-mile-broadband-initiative.cdt.ca.gov/pages/statewide-middle-mile-network-map (accessed February 26, 2024).

County	Total	Lease	Purchase	Joint build	Construction
Fresno	303 miles	230 miles	0 mile	38 miles	35 miles
Glenn	67 miles	8 miles	0 mile	35 miles	24 miles
Humboldt	247 miles	52 miles	0 mile	135 miles	60 miles
Imperial	273 miles	56 miles	0 mile	101 miles	116 miles
Inyo	322 miles	0 mile	148 miles	0 mile	174 miles
Kern	653 miles	289 miles	42 miles	115 miles	207 miles
Kings	118 miles	90 miles	0 mile	27 miles	1 mile
Lake	107 miles	0 mile	0 mile	0 mile	107 miles
Lassen	200 miles	26 miles	0 mile	129 miles	45 miles
Los Angeles	537 miles	103 miles	0 mile	187 miles	247 miles
Madera	98 miles	61 miles	0 mile	27 miles	10 miles
Marin	80 miles	0 mile	0 mile	28 miles	52 miles
Mariposa	106 miles	59 miles	0 mile	0 mile	47 miles

County	Total	Lease	Purchase	Joint build	Construction
Mendocino	295 miles	0 mile	0 mile	107 miles	188 miles
Merced	138 miles	93 miles	0 mile	45 miles	0 mile
Modoc	173 miles	112 miles	0 mile	61 miles	0 mile
Mono	210 miles	8 miles	177 miles	0 mile	25 miles
Monterey	177 miles	150 miles	0 mile	0 mile	27 miles
Napa	76 miles	12 miles	0 mile	6 miles	58 miles
Nevada	86 miles	46 miles	0 mile	22 miles	18 miles
Orange	161 miles	0 mile	0 mile	75 miles	86 miles
Placer	120 miles	23 miles	0 mile	78 miles	19 miles
Plumas	156 miles	0 mile	0 mile	0 mile	156 miles
Riverside	535 miles	141 miles	0 mile	56 miles	338 miles
Sacramento	164 miles	31 miles	0 mile	130 miles	3 miles
San Benito	92 miles	92 miles	0 mile	0 mile	0 mile

County	Total	Lease	Purchase	Joint build	Construction
San Bernardino	890 miles	18 miles	68 miles	446 miles	358 miles
San Diego	411 miles	19 miles	0 mile	128 miles	264 miles
San Francisco	19 miles	16 miles	0 mile	0 mile	3 miles
San Joaquin	160 miles	113 miles	0 mile	43 miles	4 miles
San Luis Obispo	221 miles	67 miles	0 mile	0 mile	154 miles
San Mateo	70 miles	31 miles	0 mile	0 mile	39 miles
Santa Barbara	164 miles	103 miles	0 mile	0 mile	61 miles
Santa Clara	148 miles	75 miles	0 mile	19 miles	54 miles
Santa Cruz	71 miles	5 miles	0 mile	0 mile	66 miles
Shasta	207 miles	129 miles	0 mile	16 miles	62 miles
Sierra	64 miles	0 mile	0 mile	3 miles	61 miles
Siskiyou	339 miles	82 miles	0 mile	158 miles	99 miles
Solano	61 miles	17 miles	0 mile	44 miles	0 mile

County	Total	Lease	Purchase	Joint build	Construction
Sonoma	199 miles	0 mile	0 mile	57 miles	142 miles
Stanislaus	109 miles	84 miles	0 mile	25 miles	0 mile
Sutter	65 miles	65 miles	0 mile	0 mile	0 mile
Tehama	139 miles	28 miles	0 mile	48 miles	63 miles
Trinity	151 miles	79 miles	0 mile	0 mile	72 miles
Tulare	261 miles	230 miles	0 mile	23 miles	8 miles
Tuolumne	91 miles	40 miles	0 mile	0 mile	51 miles
Ventura	127 miles	64 miles	0 mile	0 mile	63 miles
Yolo	101 miles	46 miles	0 mile	51 miles	4 miles
Yuba	47 miles	47 miles	0 mile	0 mile	0 mile
Grand total	**10,566 miles**	**3,485 miles**	**435 miles**	**2,615 miles**	**4,031 miles**

Note: Miles reported in this table will vary slightly from those reported in Appendix A. The variation is due to the point in time adjustments which follow the natural course of preconstruction (planning, designing, and permitting).

Appendix C: Outreach and Engagement Efforts

The Middle-Mile Broadband Initiative participated in outreach and engagement efforts across the state in 2023. The hundreds of individual engagements included sessions with industry stakeholders, tribal and local governments, community groups, deployment partners, and labor representatives.

Figure 31: Middle-Mile Broadband Initiative outreach by county (2023)