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REMOTE PARTICIPATION ONLY

EMERGING TECHNOLOGIES COMMITTEE

Thursday, October 27, 2022
10:00 a.m. - 12:00 p.m.

To Participate on Your Computer:

<https://scag.zoom.us/j/941139378>

To Participate by Phone:

Call-in Number: 1-669-900-6833

Meeting ID: 941 139 378

***Please see next page for detailed
instructions on how to participate in the meeting.***

PUBLIC ADVISORY

Given the declared state of emergency (pursuant to State of Emergency Proclamation dated March 4, 2020) and local public health directives imposing and recommending social distancing measures due to the threat of COVID-19, and pursuant to Government Code Section 54953(e)(1)(A), the meeting will be held telephonically and electronically.

If members of the public wish to review the attachments or have any questions on any of the agenda items, please contact Maggie Aguilar at (213) 630-1420 or via email at aguilarm@scag.ca.gov. Agendas & Minutes are also available at: www.scag.ca.gov/committees.

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Instructions for Public Comments

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1. **In Writing:** Submit written comments via email to: ePublicComment@scag.ca.gov by 5pm on Wednesday, October 26, 2022. You are **not** required to submit public comments in writing or in advance of the meeting; this option is offered as a convenience should you desire not to provide comments in real time as described below.

All written comments received after 5pm on Wednesday, October 26, 2022 will be announced and included as part of the official record of the meeting.

2. **In Real Time:** If participating in real time via Zoom or phone, during the Public Comment Period (Matters Not on the Agenda) or at the time the item on the agenda for which you wish to speak is called, use the “raise hand” function on your computer or *9 by phone and wait for SCAG staff to announce your name/phone number. SCAG staff will unmute your line when it is your turn to speak. Limit oral comments to 3 minutes, or as otherwise directed by the presiding officer. For purpose of providing public comment for items listed on the Consent Calendar, please indicate that you wish to speak when the Consent Calendar is called; items listed on the Consent Calendar will be acted on with one motion and there will be no separate discussion of these items unless a member of the legislative body so requests, in which event, the item will be considered separately.

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In accordance with SCAG’s Regional Council Policy, Article VI, Section H and California Government Code Section 54957.9, if a SCAG meeting is “willfully interrupted” and the “orderly conduct of the meeting” becomes unfeasible, the presiding officer or the Chair of the legislative body may order the removal of the individuals who are disrupting the meeting.

OUR MISSION

To foster innovative regional solutions that improve the lives of Southern Californians through inclusive collaboration, visionary planning, regional advocacy, information sharing, and promoting best practices.

OUR VISION

Southern California’s Catalyst for a Brighter Future

OUR CORE VALUES

Be Open | Lead by Example | Make an Impact | Be Courageous



Instructions for Participating in the Meeting

SCAG is providing multiple options to view or participate in the meeting:

To Participate and Provide Verbal Comments on Your Computer

1. Click the following link: <https://scag.zoom.us/j/941139378>
2. If Zoom is not already installed on your computer, click “Download & Run Zoom” on the launch page and press “Run” when prompted by your browser. If Zoom has previously been installed on your computer, please allow a few moments for the application to launch automatically.
3. Select “Join Audio via Computer.”
4. The virtual conference room will open. If you receive a message reading, “Please wait for the host to start this meeting,” simply remain in the room until the meeting begins.
5. During the Public Comment Period, use the “raise hand” function located in the participants’ window and wait for SCAG staff to announce your name. SCAG staff will unmute your line when it is your turn to speak. Limit oral comments to 3 minutes, or as otherwise directed by the presiding officer.

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2. Enter the **Meeting ID: 941 139 378**, followed by #.
3. Indicate that you are a participant by pressing # to continue.
4. You will hear audio of the meeting in progress. Remain on the line if the meeting has not yet started.
5. During the Public Comment Period, press *9 to add yourself to the queue and wait for SCAG staff to announce your name/phone number. SCAG staff will unmute your line when it is your turn to speak. Limit oral comments to 3 minutes, or as otherwise directed by the presiding officer.

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EMERGING TECHNOLOGIES COMMITTEE AGENDA

ETC - Emerging Technologies Committee *Members – October 2022*

1. **Sup. Curt Hagman**
Chair, San Bernardino County
2. **Hon. Drew Boyles**
El Segundo, RC District 40
3. **Ms. Leslie Lindahl**
Government Relations, Ex-Officio Non-Voting Member
4. **Hon. Margaret Clark**
Rosemead, RC District 32
5. **Hon. Keith Eich**
La Cañada Flintridge, RC District 36
6. **Hon. Margaret Finlay**
Duarte, RC District 35
7. **Hon. Jan C. Harnik**
RCTC Representative
8. **Hon. Dan Kalmick**
Huntington Beach, OCCOG
9. **Hon. Steve Manos**
Lake Elsinore, RC District 63
10. **Mr. Paul Marquez**
Caltrans District 7, Ex-Officio Non-Voting Member
11. **Hon. Carol Moore**
Laguna Woods, OCCOG
12. **Hon. Frank Navarro**
Colton, RC District 6
13. **Ms. Pam O'Connor**
CA Road Charge TAC, Ex-Officio Non-Voting Member
14. **Sup. Luis Plancarte**
Imperial County
15. **Hon. Deborah Robertson**
Rialto, RC District 8

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EMERGING TECHNOLOGIES COMMITTEE AGENDA

16. Hon. Cheryl Viegas-Walker

El Centro, RC District 1

17. Hon. Alan Wapner

SBCTA Representative

18. Hon. Acquanetta Warren

Fontana, SBCTA

19. Hon. Edward Wilson

Signal Hill, GCCOG

20. Hon. Frank Zerunyan

Rolling Hills Estates, SBCCOG

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EMERGING TECHNOLOGIES COMMITTEE AGENDA

Southern California Association of Governments

Remote Participation Only

Thursday, October 27, 2022

10:00 AM

The Emerging Technologies Committee may consider and act upon any of the items listed on the agenda regardless of whether they are listed as information or action items.

CALL TO ORDER AND PLEDGE OF ALLEGIANCE

(The Honorable Curt Hagman, Chair)

PUBLIC COMMENT PERIOD (Matters Not on the Agenda)

This is the time for persons to comment on any matter pertinent to SCAG's jurisdiction that is **not** listed on the agenda. Although the committee may briefly respond to statements or questions, under state law, matters presented under this item cannot be discussed or acted upon at this time. Public comment for items listed on the agenda will be taken separately as further described below.

General information for all public comments: Members of the public are encouraged, but not required, to submit written comments by sending an email to: ePublicComment@scag.ca.gov by 5pm on Wednesday, October 26, 2022. Such comments will be transmitted to members of the legislative body and posted on SCAG's website prior to the meeting. Any writings or documents provided to a majority of the Emerging Technologies Committee regarding any item on this agenda (other than writings legally exempt from public disclosure) are available at the Office of the Clerk, located at 900 Wilshire Blvd., Suite 1700, Los Angeles, CA 90017 during normal business hours and/or by contacting the office by phone, (213) 630-1420, or email to aguilarm@scag.ca.gov. Written comments received after 5pm on Wednesday, October 26, 2022, will be announced and included as part of the official record of the meeting. Members of the public wishing to verbally address the Emerging Technologies Committee in real time during the meeting will be allowed up to a total of 3 minutes to speak on items on the agenda, with the presiding officer retaining discretion to adjust time limits as necessary to ensure efficient and orderly conduct of the meeting. The presiding officer has the discretion to equally reduce the time limit of all speakers based upon the number of comments received. If you desire to speak on an item listed on the agenda, please wait for the chair to call the item and then indicate your interest in offering public comment by either using the "raise hand" function on your computer or pressing *9 on your telephone. For purpose of providing public comment for items listed on the Consent Calendar (if there is a Consent Calendar), please indicate that you wish to speak when the Consent Calendar is called; items listed on the Consent Calendar will be acted upon with one motion and there will be no separate discussion of these items unless a member of the legislative body so requests, in which event, the item will be considered separately.

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EMERGING TECHNOLOGIES COMMITTEE AGENDA

REVIEW AND PRIORITIZE AGENDA ITEMS

CONSENT CALENDAR

Approval Items

1. Minutes of the Meeting – August 25, 2022 PPG. 7

INFORMATION/DISCUSSION ITEMS

2. Emerging Technologies Committee Agenda Outlook 5 Mins. PPG. 11
(Tom Bellino, Senior Regional Planner, SCAG)
3. SCAG's Draft Digital Action Plan 10 Mins. PPG. 15
(Roland Ok, Program Manager II, SCAG)
4. Clean Technology Program Update and Panel Context 15 Mins. PPG. 127
(Tom Bellino, Senior Regional Planner, SCAG)
5. Lithium Extraction in the Salton Sea 90 Mins. PPG. 132
(Michael McKibben, Geologist, UC Riverside; Supervisor Ryan Kelley, Imperial County; Jonathan Weisgall, Vice President for Legislative and Regulatory Affairs, Berkshire Hathaway Energy)

FUTURE AGENDA ITEMS

ANNOUNCEMENTS

ADJOURNMENT



Southern California Association of Governments
Remote Participation Only
October 27, 2022

**EMERGING TECHNOLOGIES COMMITTEE (ETC)
MINUTES OF THE MEETING
THURSDAY, AUGUST 25, 2022**

THE FOLLOWING MINUTES ARE A SUMMARY OF ACTIONS TAKEN BY THE EMERGING TECHNOLOGIES COMMITTEE. A DIGITAL RECORDING OF THE ACTUAL MEETING IS AVAILABLE FOR LISTENING IN SCAG’S OFFICE.

The Emerging Technologies Committee (ETC) of the Southern California Association of Governments (SCAG) held its regular meeting telephonically and electronically given public health directives limiting public gatherings due to the threat of COVID-19 and in compliance with the Governor’s recent Executive Order N-29-20. A quorum was present. The meeting was called to order by Chair Hon. Curt Hagman, San Bernardino County. A quorum was present.

Members Present:

- | | |
|---------------------------------------|------------------------------|
| Hon. Drew Boyles | District 40 |
| Hon. Margaret Clark | SGVCOG |
| Hon. Keith Eich | District 36 |
| Hon. Curt Hagman (Chair) | San Bernardino County |
| Hon. Jan Harnik | RCTC |
| Hon. Dan Kalmick | Hunington Beach, OCCOG |
| Hon. Steve Manos | District 63 |
| Mr. Paul Marquez, Caltrans District 7 | Ex-Officio Non-Voting Member |
| Hon. Carol Moore | OCCOG |
| Hon. Frank Navarro | District 6 |
| Hon. Pam O’Connor, CA Road Charge TAC | Ex-Officio Non-Voting Member |
| Hon. Cheryl Viegas-Walker | District 1 |
| Hon. Alan Wapner | SBCTA |
| Hon. Acquanetta Warren | City of Fontana |

Members Not Present:

- | | |
|-------------------------|------------------------------|
| Hon. Margaret E. Finlay | District 35 |
| Hon. Leslie Lindahl | Ex-Officio Non-Voting Member |
| Hon. Luis Plancarte | Imperial County |
| Hon. Deborah Robertson | District 8 |
| Hon. Edward H.J. Wilson | GCCOG |
| Hon. Frank Zerunyan | SBCCOG |

CALL TO ORDER & PLEDGE OF ALLEGIANCE

Hon. Curt Hagman, San Bernardino County, called the meeting to order at 10:00 a.m. Acquanetta Warren, City of Fontana, SBCTA, led the Pledge of Allegiance.

PUBLIC COMMENT

No members of the public requested to comment.

CONSENT CALENDAR

Approval Items

1. Minutes of ETC Meeting – February 24, 2022

A MOTION was made (Moore) to approve the Consent Calendar. The motion was SECONDED (Harnik) and passed by the following votes:

AYES: BOYLES, CLARK, EICH, HAGMAN, HARNIK, KALMICK, MANOS, MOORE, VIEGAS-WALKER, WAPNER, WARREN (11)

NOES: None (0)

ABSTAIN: None (0)

INFORMATION/DISCUSSION ITEMS

No members of the public requested to comment on Item No. 2.

2. State Broadband Update

Mark Monroe, Middle Mile Broadband Initiative, updated the committee on the middle-mile effort which seeks to expand accessibility in the state. He noted a map of the build out network has been produced and procurement for fiber and other construction materials is being developed. Bids will be forthcoming in 2022. He reviewed the timeline and noted construction needs to begin in 2024 and completed in 2026. He reviewed the construction and permit activities. Scott Adams,

Broadband and Digital Literacy, continued the presentation. He reviewed the goals of the Broadband Action Plan. He noted community needs will continue to be explored and future updates will be provided.

No members of the public requested to comment on Item No. 3.

3. Smart Cities – Making the Investment

Patti Zullo, Spectrum Smart City Solution, reported on their smart cities investments. It was noted Smart Cities provide a real time view of operational patterns, allowing for better citizen engagement; deeper understanding of vital operations, such as transportation and to enhance their ability provide faster, more accurate situation awareness. It also enhances a city's ability to upgrade and leverage city infrastructure such as lighting, water, and waste collection. She noted that early citizen engagement is essential. Ms. Zullo stated Smart City fundamentals include sensors that collect real time data, a network level where data is transmitted, data processing and technical applications where data is evaluated to determine if action needs to be taken. Smart City infrastructure is the result of combining physical infrastructure with digital infrastructure. It provides improved information to enable better decision making which provides faster responses and a platform to accelerate city initiatives. Often light poles are used for data collection and can provide essential data in curb space management and parking reservations.

No members of the public requested to comment on Item No. 4.

4. Broadband VMT Study Technical Methodology

Wally Siembab, South Bay Council of Governments, provided public comment reporting that broadband is an essential component of remote work development but there are many other elements critical to its ultimate growth.

Jim Damkowitz, DKS Associates, reported on Broadband VMT Study technical methodology. He reviewed the technical methodology used to determine the findings. He noted that project objectives include determining how broadband availability impacts VMT and GHG emission. For example, how to estimate how VMT and GHG emissions may be reduced when broadband is used as a substitute for travel. Further, to determine how integrated broadband and transportation planning can increase broadband availability. Mr. Damkowitz reviewed scenarios projecting future broadband buildout and potential VMT and GHG reductions. He examined roadway volumes in areas with lesser broadband penetration estimating how broadband expansion could affect roadway volumes.



FUTURE AGENDA ITEMS

Thomas Bellino, SCAG staff, reported that an agenda outlook is being developed internally and is available once approved. It will be brought before the committee at the next meeting.

ADJOURNMENT

Hon. Curt Hagman, San Bernardino County, adjourned the meeting of the Emerging Technologies Committee at 11:48 a.m.

[MINUTES ARE UNOFFICIAL UNTIL APPROVED BY THE EMERGING TECHNOLOGY COMMITTEE]

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AGENDA ITEM 2
REPORT

Southern California Association of Governments
Remote Participation Only
October 27, 2022

To: Emerging Technologies Committee (ETC)

EXECUTIVE DIRECTOR'S
APPROVAL

From: Thomas Bellino, Senior Planner
(213) 236-1830, bellino@scag.ca.gov

Subject: Emerging Technologies Committee Agenda Outlook

RECOMMENDED ACTION:

Information Only – No Action Required

STRATEGIC PLAN:

This item supports the following Strategic Plan Goal 1: Produce innovative solutions that improve the quality of life for Southern Californians.

EXECUTIVE SUMMARY:

Staff will present the agenda outlook for the remainder of fiscal year 2022-2023 and seek input from committee members on future agenda item presentations and speakers.

BACKGROUND:

The Emerging Technologies Committee (ETC) is convened to research and identify new and emerging technologies that play an important role in the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and is intended to serve as a resource for the Regional Council and other Committees. The Emerging Technologies Committee objectives include:

- Identify technological and societal trends (e.g. Mobility as a Service (MaaS); Zero Emission Vehicles (ZEV), Connected and Autonomous Vehicles (CAV); Smart Cities and Intelligent Transportation Systems (ITS)) that may fundamentally alter and improve the use of the region's transportation system.
- Frame potential policy considerations to enable the region to harness the benefits of emerging technologies that reduce sprawl, vehicle miles traveled (VMT), and greenhouse gas (GHG) emissions.
- Highlight opportunities for under-represented, disadvantaged communities to utilize emerging technologies.
- Explore technologies which, while in a nascent or testing stage, remain relevant to the future of the region's transportation system.

On October 6, 2022, the Executive/Administration Committee (EAC) adopted its 2022-2023 Strategic Work Plan, which includes an outlook for the ETC. As noted in the EAC staff report, the ETC has been leading policy conversations on several of the policy priorities discussed during the EAC retreat including broadband, energy and alternative fuels. To ensure the policy leadership provided by the ETC is reflected in the Connect SoCal 2024 update, the ETC outlook includes a work program and schedule for the committee to consider a Clean Transportation Technology Policy and an Emerging Technology Guiding Principles for Connect SoCal to be recommended to the Regional Council for inclusion in the long-range plan.

Staff will review the following proposed agenda outlook covering the remainder of the fiscal year 2022-2023. Each meeting is proposed to be structured around a specific theme or objective of the 2020 RTP/SCS. The order of topics may be subject to change based on Committee direction and may be dependent upon availability of subject matter experts that may be invited to speak.

A narrative version of the outlook is below, and a diagram version is shown on Attachment 1.

- **February 2023: Connected and Autonomous Vehicles and Data Privacy**
 - Connected and autonomous vehicles (CAVs), sometimes referred to as “self-driving cars,” have been on the horizon for several years, but large-scale implementation will ramp up soon. To make sure government has a good handle on what regulations are needed to both keep residents safe and facilitate helpful innovations, local elected officials can learn from multiple players in this sector. In particular, the ETC could engage in policy discussions regarding the linkages between smart cities, transportation infrastructure, and preparation for widespread adoption of CAVs. Additionally, staff would seek experts to provide insight into the industry outlook and state regulation.

Additionally, as more and more of our lives are tied to apps, payment systems and even vehicles are monitored by private-sector companies and government agencies, many are concerned about what those companies and agencies know about them personally, and what they’re doing with that information. It’s important for governments to proactively legislate in this area to ensure safety, accessibility, and equity in our transportation system. In particular, decision-makers must balance the public policy interest in collecting and using data to safely and effectively manage the transportation system with legislative safeguards to protect access and privacy. Additionally, staff would seek experts to provide insight into best practices for data sharing among public and private sector agencies. This panel will help inform the Smart Cities Key Connection of Connect SoCal.

- Clean Transportation Technology Policy (Action) – following on the discussion at the October 27 ETC meeting, staff will seek direction and a recommendation from the ETC to the Regional Council on a SCAG agency policy on clean transportation technology.
- Begin discussion on Emerging Technology Guiding Principles and an anticipated June ETC action.
- **April 2023: Technology and Equity**
 - The SCAG region is perhaps the most diverse pocket of the world, in every sense of the word. This presents unlimited opportunities but also concerns about how technological advances that are mostly utilized by high-resource communities may negatively impact low-resource communities. With the Guiding Principles as a baseline, how can government ensure that low-resource communities don't bear a disproportionate burden as more "disruptive" services change the way people move and work in the region? At the same time, how can we ensure that access to new technologies and their benefits do not only occur for those with most resources? Staff would also seek experts to provide insight on the role of technology in addressing disparity. This panel will inform equity-driven work on Connect SoCal.
 - Finalize input on Emerging Technology Guiding Principles for June action
- **June 2023: Emerging Technology Guiding Principles, for inclusion in Connect SoCal 2024 (Action)**
 - Local Government and Transportation Agencies Emerging Technology Policy Matrix (recap of 2020 Connect SoCal)
 - Framework for assessment and policy decisions

FISCAL IMPACT:

None.

ATTACHMENT(S):

1. PowerPoint Presentation - ETC FY23 Outlook_v2_081022

Emerging Tech Committee Agenda Outlook for FY 2023

Date	Connect SoCal	Local Assist. Program	Regional Update
July-Sept	<ul style="list-style-type: none"> Broadband and Smart Cities <ul style="list-style-type: none"> Permit Streamlining Smart Cities Broadband and VMT Reduction 		
Oct-Dec	<ul style="list-style-type: none"> Clean Technology <ul style="list-style-type: none"> SCAG Studies - Supporting Infrastructure for Med/Heavy Duty Vehicles, Passenger Electric Vehicle (PEV) Charging Stations Future demand for critical materials for zero emissions transportation Lithium and the Salton Sea <ul style="list-style-type: none"> EV battery supply chain and lithium supply Potential for Salton Sea to provide a third of the world's lithium Regional economic resiliency and equitable recovery goals 		

Emerging Tech Committee Agenda Outlook for FY 2023

Date	Connect SoCal	Local Assist. Program	Regional Update
Jan-March	<ul style="list-style-type: none"> Connected/Automated Vehicles (CAVs) <ul style="list-style-type: none"> Smart Cities, transportation infrastructure and CAVs Industry outlook Caltrans and state regulation Data and Privacy <ul style="list-style-type: none"> Public policy interest in collecting and using data Data sharing among public and private sector agencies Legislative safeguards to protect access and privacy Clean Transportation Technology Policy (Action) 		
April-June	<ul style="list-style-type: none"> Technology and Equity <ul style="list-style-type: none"> Access to new technologies Role of technology in addressing disparity Emerging Technology Guiding Principles for Connect SoCal (Action) <ul style="list-style-type: none"> Framework for assessment and policy decisions Local Govt and Transportation Agencies Emerging Technology Policy Matrix (recap of 2020 Connect SoCal) 		



AGENDA ITEM 3
REPORT

Southern California Association of Governments
Remote Participation Only
October 27, 2022

To: Emerging Technologies Committee (ETC)

EXECUTIVE DIRECTOR'S
APPROVAL

From: Roland Ok, Program Manager II
(213) 236-1819, ok@scag.ca.gov

Subject: SCAG's Draft Digital Action Plan

RECOMMENDED ACTION:

Information Only – No Action Required

STRATEGIC PLAN:

This item supports the following Strategic Plan Goal 1: Produce innovative solutions that improve the quality of life for Southern Californians. 2: Advance Southern California’s policy interests and planning priorities through regional, statewide, and national engagement and advocacy. 3: Be the foremost data information hub for the region. 4: Provide innovative information and value-added services to enhance member agencies’ planning and operations and promote regional collaboration. 7: Secure funding to support agency priorities to effectively and efficiently deliver work products.

EXECUTIVE SUMMARY:

In February 2021, SCAG’s Regional Council adopted Resolution No. 21-629-2, which pledged SCAG to assist in bridging the digital divide in underserved and unserved communities. The resolution directed staff to (1) develop a Digital Action Plan, (2) Collect and invest in broadband data for mapping and analysis, (3) conduct studies which propose solutions and/or strategies to assist in the deployment of broadband infrastructure, (4) incorporate broadband planning into SCAG’s programs, including the development of future Regional Transportation Plan/Sustainable Communities Strategies (RTP/SCS or Connect SoCal). SCAG’s Digital Action Plan will lay out actions the agency will take to provide accessibility and in turn foster an equitable, prosperous, and resilient region for all residents. Staff is requesting members of the Emerging Technology Committee review and provide feedback on the vision, goals, strategies and guiding principles of the Draft Digital Action Plan to inform the development of specific actions and deliverables to be included in the final plan.

BACKGROUND:

In February 2021, SCAG's Regional Council adopted Resolution No. 21-629-2¹, which pledged SCAG to assist in bridging the digital divide in underserved and unserved communities. The resolution directed staff to:

- (1) Develop a Digital Action Plan
- (2) Collect and invest in broadband data for mapping and analysis
- (3) Conduct studies which propose solutions and/or strategies to assist in the deployment of broadband infrastructure
- (4) Incorporate broadband planning into SCAG's programs, including the development of future Regional Transportation Plan/Sustainable Communities Strategies (RTP/SCS or Connect SoCal).

OVERVIEW OF THE DIGITAL DIVIDE:

The digital divide is defined as the growing gap between the members of society who have reliable access to broadband services and/or adequate devices for connecting to the internet, and those who do not. However, the digital divide is a complex issue, which is caused by three key factors:

- **Availability** – A lack of infrastructure or proper service
- **Affordability** – A lack of affordable subscription rates or devices
- **Literacy** – A lack of understanding or knowledge or how to participate in digital activities

Nearly half of California's population or approximately 19 million residents live within the six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) of the SCAG region. It is currently projected that the population will increase from 19 million to over 24 million.² While the region is growing and is diverse in its population, economy and environment, the region faces digital access challenges. Within the SCAG Region approximately 9-10% of residents do not have access to broadband and 3% do not have access to a computer. Upon closer inspection:

- 20% of Seniors aged 65 and over do not have access to broadband and 12% do not own a computer
- 13% of the Black population do not have access to broadband and 5% do not own a computer
- 11% of the Native American/Indigenous population do not have access to broadband and 4% do not own a computer
- 12% of the Latino/Hispanic population do not have access to broadband and 4% do not own a computer
- 70% of those without internet are concentrated within low-income households

¹ Resolution No. 21-629-2. Available at: https://scag.ca.gov/sites/main/files/file-attachments/resolution_no._21-629-2_-_support_to_increase_broadband_access.pdf?1646942018

² For more information, please visit <https://scag.ca.gov>

For a detailed set of regional and county level data, please refer to Attachment 2. SCAG's Draft Digital Action Plan.

VISION, GOALS, STRATEGIES AND GUIDING PRINCIPLES:

The Draft Digital Action Plan is guided by a vision, goals and a set of guiding principles based on feedback from member jurisdictions, elected officials who participated in some of the digital divide working groups, and stakeholders (public and private).

Vision Statement: The vision statement is consistent with Resolution 21-629-2 and SCAG's Strategic Plan and is as follows:

"We envision an equitable region that fosters accessibility and adoption of affordable high-speed broadband and digital devices for all its residents"

Goals: The Digital Action Plan is divided into four major goals, each with its own strategies, guiding principles and supporting actions:

1. **Accessibility and Affordability** – Every household in the region should have access to affordable high-speed broadband services and high-quality devices
2. **Adoption** – All residents should have the confidence and skills to participate in digital activities
3. **Consensus** – Build partnerships and reach consensus that high-quality and affordable broadband is an essential service to everyone and provides economic, environmental and safety benefits to the region
4. **Planning** – Develop broadband technical tools and studies which provide value to the region

SCAG Strategies: To reach the Plan's goals, four core strategies were developed (also known as **SCAG** strategies):

1. **Seek and Secure** - Seek and secure broadband funding for our local jurisdictions and stakeholders to deploy broadband infrastructure, digital devices, and advance digital equity initiatives.
2. **Coordinate and Collaborate** - Coordinate, collaborate and build partnerships with public agencies, local jurisdictions, partners, and the public and align work efforts to collectively bridge the digital divide.
3. **Advocate and Assist** – Advocate for better data, Southern California's fair share in funding, and open access to broadband networks, and assist low-income and rural households in underserved and unserved communities.
4. **Gather and Gain** - Gather data and gain knowledge through broadband technical and strategic studies, disseminate findings and inform decision makers and the public.

Guiding Principles: The principles which drive the strategies and actions to fulfil the goals and overall vision are as follows:

- **Break.** Break down barriers which inhibit the deployment of broadband infrastructure
- **Resilience.** Plan or advocate for networks that are efficient and assist in resiliency for communities and infrastructure
- **Invest.** Invest in communities affected by the digital divide
- **Data Driven.** Collect and share data to determine opportunity zones and solutions
- **Grassroots.** Use a bottom-up approach and listen to and prioritize a community's needs
- **Expedite.** Develop solutions which can be quickly implemented and efficiently

- **Determine.** Determine funding opportunities and potential partnerships
- **Innovate.** Promote an atmosphere which allows for healthy competition and innovative solutions which are speed driven, while remaining technologically agnostic
- **Visionary.** Plan or advocate for networks that are scalable, sustainable and accommodate future needs and innovative technology
- **Integrate.** Integrate findings into traditional disciplines of transportation and land use planning
- **Dependable.** Promote transparency and gain the trust of the public, other agencies, and stakeholder
- **Educate.** Educate the public, policy makers and stakeholders and build consensus for collective action

PREVIOUS AND CURRENT WORK EFFORTS:

Staff across the agency have worked on several projects to address the digital divide or work related to broadband (directly and indirectly) conducted by the Broadband Planning team and other departments. Some of the key work efforts include but are not limited to the following:

Request for Qualifications for Prospective Partnerships - SCAG and SANDAG conducted a joint request for qualifications to seek partnerships (RFQPP) to deploy broadband infrastructure and provide high-quality and affordable broadband service to residents, businesses, public agencies, educational institutions, and tribes in the Southern California region. The goal of the RFQPP is to secure funding from state and/or federal sources for ISPs, constructors, engineer firms and non-profits to partner with local jurisdictions for planning efforts, construction and operation of last mile services, and advocacy efforts for digital literacy.

VMT Report - In early 2022, SCAG together with the California Emerging Technology Fund (CETF) and the regional broadband consortia released a report titled Transportation Broadband Strategies

to Reduce VMT and GHGs (vehicle miles traveled and greenhouse gases, respectively). The study used the first year of the COVID-19 pandemic’s “shelter in place” orders to study some impacts on the transportation system. With travel restrictions in place, many people were forced to participate in a trial run of “tele-everything” which includes teleworking, tele-medicine, remote learning, e-commerce, etc. As such, the project team used the observed traffic patterns in conjunction with online surveying to analyze potential impacts of broadband on VMT and GHGs.

ACP/Go-Human - To provide access to affordable internet to unserved and underserved areas across the region, SCAG is partnering with the CETF for a Digital Equity Call for Action to leverage and bolster their existing campaign for the Affordable Connectivity Program (ACP).

Permit Streamlining - SCAG is developing a permit streamlining report, model permit and ordinance template that can be readily adopted by local jurisdictions within the SCAG region. The report will identify streamlined broadband permitting practices that may lead to lower cost of entry and operation of broadband systems, reduce the risk of delays during the planning, permitting and construction phases, provide opportunities for increasing revenue, and create new avenues for competitive entries.

PROPOSED ACTIONS AND DELIVERABLES:

SCAG staff is currently developing a set of proposed actions and deliverables. Actions and deliverables will be aligned with the goals, strategies, and guiding principles of the Digital Action Plan and SCAG’s Strategic Plan. Work efforts proposed will assist and go beyond bridging the digital divide. While bringing accessibility to underserved and unserved communities are of the highest priority, the future of transportation will rely on digital infrastructure, as communications infrastructure facilitates the flow of images and data required for state-of-the-art transportation management and safety improvements, including connected and autonomous vehicles, reliance on big data, and expanded use of technology which would support emergency services.³ Staff will seek feedback on the actions and deliverables from stakeholders, and the Regional Council and Policy Committee members for inclusion in the final Digital Action Plan.

NEXT STEPS:

Staff is requesting members of the Emerging Technology Committee to review the currently available contents of the Digital Action Plan and provide feedback by December 1, 2022. Further, Staff will present the Digital Action Plan to other committees, working groups and stakeholders for comments and feedback (See Table 1, Next Steps). Staff will incorporate feedback and requests to the Digital Action Plan, as feasible, complete, and incorporate the set of actions and deliverables into the Plan and present a revised draft to the Transportation Committee on January 5, 2023. Staff will then present a final copy of the Plan to the Regional Council in Spring of 2023, for approval and

³ Please note that proposed actions and deliverables are dependent on available funding and staffing resources and the annual Overall Work Program development.

adoption. Comments can be provided to Roland Ok, Program Manager II, via email at ok@scag.ca.gov.

Table 1, Next Steps

Milestones	Date
Subregional Council of Directors	10/26/22
Emerging Technology Committee	10/27/22
Transformation SoCal Working Group	November - December 2022
Equity Working Group	12/8/22
GLUE Council	12/12/22
1st Complete Draft to the Transportation Committee (Request the RC for recommendation for Regional Council to approve and adopt)	1/5/23
Final Digital Action Plan to Regional Council (Approval and Adoption)	Spring 2023

Upon approval and adoption, SCAG staff will take steps to formally implementing the Digital Action Plan and integrate work efforts into SCAG’s Overall Work Program (as feasible). Further, the Digital Action Plan is anticipated to be a “living document”, with opportunities to identify new actions overtime, and SCAG staff will provide the Policy Committees (as requested) and the Regional Council with periodic updates to ensure progress and accountability.

FISCAL IMPACT:

Work on this project is funded in SCAG’s Fiscal Year 2022-2023 Overall Work Program (OWP) under 100.4901.01 (Broadband Planning).

ATTACHMENT(S):

1. Attachment 2. SCAG's Draft Digital Action Plan
2. PowerPoint Presentation - Attachment 1. SCAG's Digital Action Plan for the ETC

SCAG'S DIGITAL ACTION PLAN

DRAFT | NOVEMBER 2022





ABOUT SCAG

SCAG is the nation's largest metropolitan planning organization (MPO), representing six counties, 191 cities and more than 19 million residents. SCAG undertakes a variety of planning and policy initiatives to encourage a more sustainable Southern California now and in the future.

VISION

Southern California's Catalyst for a Brighter Future

MISSION

To foster innovative regional solutions that improve the lives of Southern Californians through inclusive collaboration, visionary planning, regional advocacy, information sharing, and promoting best practices.



SCAG’S DIGITAL ACTION PLAN

DRAFT | NOVEMBER 2022

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INTRODUCTION

Participating in digital activities is vital for someone to fully participate in society. Yet, a sizable portion of our population do not have access to broadband, devices, or digital literacy. Those who do not have access tend to reside in low-income or rural areas, be persons of color, be of senior age, have limited English proficiency, and/or suffer from disabilities. And while this is not a new phenomenon, the growing gap between those with and those without has widened with the onset of the COVID-19 pandemic. This is what is known as the digital divide.

Both low-income urban and rural communities are either underserved or unserved with respect to broadband infrastructure and approximately 10% of residents within the region do not have access to the internet. More specifically:

13% OF THE BLACK POPULATION DO NOT HAVE ACCESS TO BROADBAND AND 5% DO NOT OWN A COMPUTER

20% OF SENIORS AGED 65 AND OVER DO NOT HAVE ACCESS TO BROADBAND AND 12% DO NOT OWN A COMPUTER

11% OF THE NATIVE AMERICAN/INDIGENOUS POPULATION DO NOT HAVE ACCESS TO BROADBAND AND 4% DO NOT OWN A COMPUTER

70% OF THOSE WITHOUT INTERNET ARE CONCENTRATED WITHIN LOW-INCOME HOUSEHOLDS

12% OF THE LATINO/HISPANIC POPULATION DO NOT HAVE ACCESS TO BROADBAND AND 4% DO NOT OWN A COMPUTER

The digital divide has and will continue to result in negative social impacts. Those without access cannot:

- Participate in remote or e-learning
- Apply for current jobs online or telework
- Apply for essential social services
- Visit the doctor virtually or order life-saving medication
- Protect themselves from identity theft or cyber crimes
- Participate in future jobs which require digital skills

Without the lack of investment in infrastructure, devices, and literacy programs, the gap will likely widen and worsen conditions for those who currently suffer economic, health, and social inequities. To halt, mitigate and close the divide, action must be taken.

HOW WE GOT HERE

Disruptive technological changes over the past three decades have been pivotal to the growth of the SCAG region. The internet, computers and smartphones have provided unprecedented access to information. Digital activities have enhanced and are responsible for the growth of financial services, businesses, work, education, healthcare, and commerce.

While most residents who reside in the region have benefited from technology, there remains a sizable population who remain unconnected. This was made apparent with the COVID-19 pandemic, as the world underwent lockdown periods, forcing many to rely upon digital activities to participate in society and continue their way of life. Those who were unconnected experienced severe disadvantages as they could not access healthcare services, food services, telework and e-learning. The post-COVID-19 society will further rely on faster broadband speeds and better devices, and disparities between those who have access and those who do not will widen.

In response, SCAG's Regional Council adopted Resolution No. 21-629-2 on February 2, 2021, which pledged SCAG to assist in bridging the digital divide in underserved and unserved communities.¹ The resolution calls for staff to engage in the following key tasks:

- Develop an Action Plan
- Collect and invest in broadband data and develop detailed broadband maps and determine broadband opportunity zones
- Conduct studies which propose solutions and/or strategies to assist in the rapid deployment of broadband infrastructure, evaluate the efficacy of broadband as a “green strategy”
- Incorporate broadband planning into SCAG's programs, including the development of future Regional Transportation Plan/Sustainable Communities Strategies (RTP/SCS or Connect SoCal)

SCAG's Digital Action Plan lays out actions the agency will take to provide digital accessibility and in turn foster an equitable, prosperous, and resilient region for all residents.

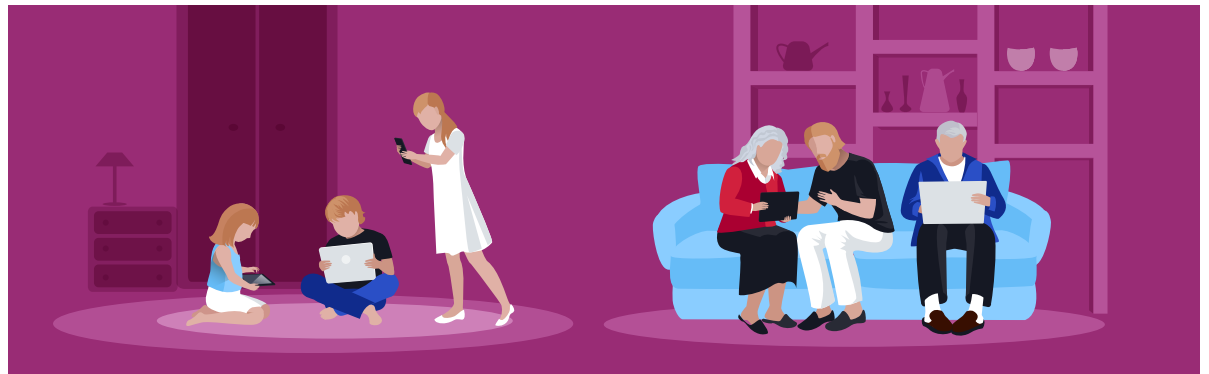
¹ Resolution No. 21-629-2. Available at: https://scag.ca.gov/sites/main/files/file-attachments/resolution_no_21-629-2_-_support_to_increase_broadband_access.pdf?1646942018

VISION, GOALS AND GUIDING PRINCIPLES

SCAG's Digital Action Plan is guided by a bold vision, goals and a set of guiding principles based on feedback from member jurisdictions, elected officials who serve on our regional council and committees, and stakeholders (public and private), and is consistent with Resolution 21-629-2 and SCAG's Strategic Plan. The Digital Action Plan is driven by staff who are committed to equity, innovation, and resilience.

VISION STATEMENT

"WE ENVISION AN EQUITABLE REGION THAT FOSTERS ACCESSIBILITY AND ADOPTION OF AFFORDABLE HIGH-SPEED BROADBAND AND DIGITAL DEVICES FOR ALL ITS RESIDENTS"



GOALS

The Digital Action Plan is divided into four major goals, each with its own strategies, guiding principles and supporting action.

1. **Accessibility and Affordability** – Every household in the region should have access to affordable high-speed broadband services and high-quality devices.
2. **Adoption** – All residents should have the confidence and skills to participate in digital activities.
3. **Consensus** – Build partnerships and reach consensus that high-quality and affordable broadband is an essential service to everyone and provides economic, environmental and safety benefits to the region.
4. **Planning** – Develop broadband technical tools and studies which provide value to the region.

SCAG STRATEGIES

To reach our goals, we have developed four core strategies (also known as SCAG Strategies):

S

SEEK AND SECURE

Seek and secure broadband funding for our local jurisdictions and stakeholders to deploy broadband infrastructure, digital devices, and advance digital equity initiatives.

C

COORDINATE AND COLLABORATE

Coordinate, collaborate and build partnerships with public agencies, local jurisdictions, partners, and the public and align work efforts to collectively bridge the digital divide.

A

ADVOCATE AND ASSIST

Advocate for better data, Southern California's fair share in funding, and open access to broadband networks and assist low-income and rural households in underserved and unserved communities.

G

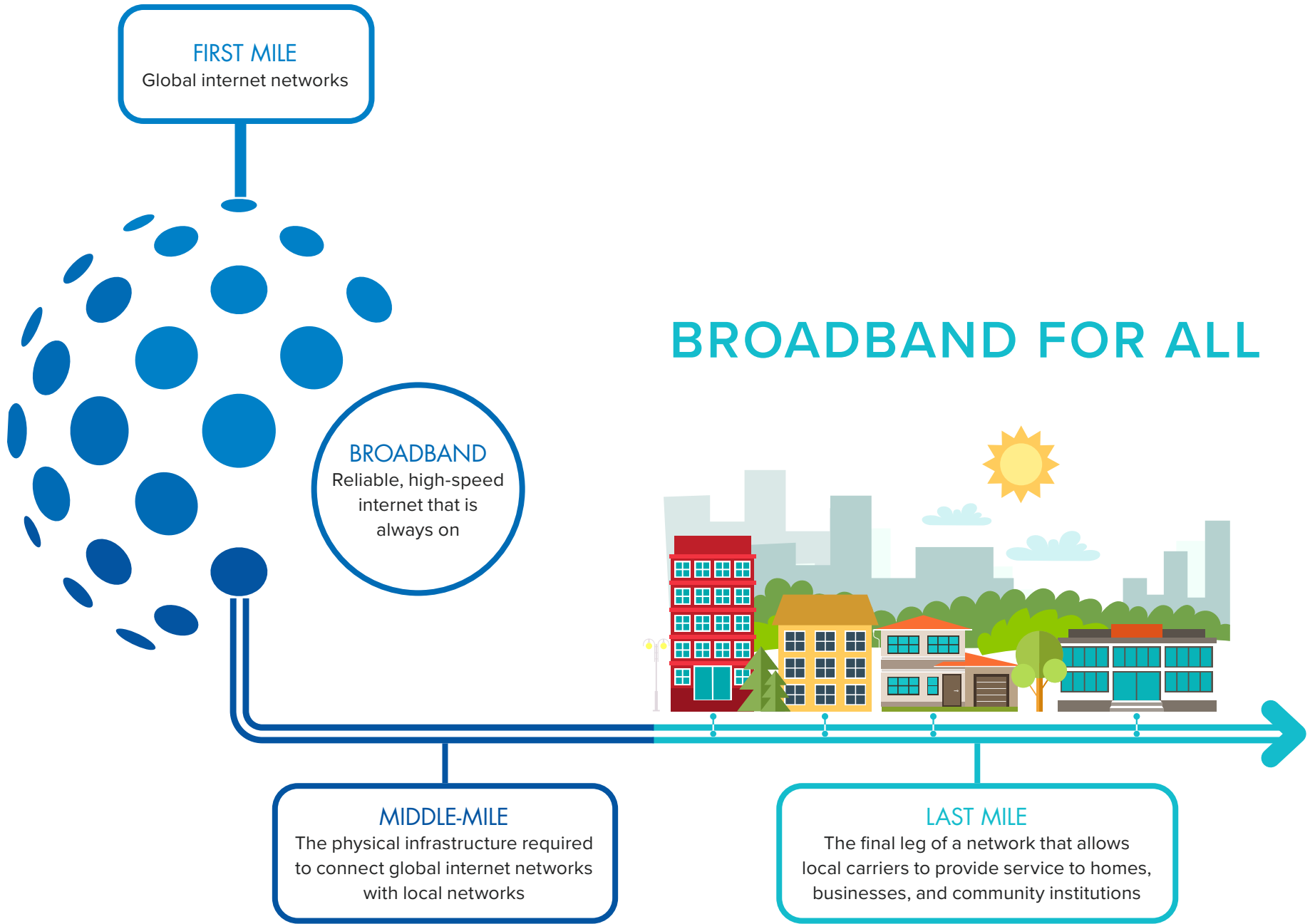
GATHER AND GAIN

Gather data and gain knowledge through broadband technical and strategic studies, disseminate findings and inform decision makers and the public.

GUIDING PRINCIPLES

These are the principles which drive our strategies and actions to fulfil our goals and overall vision:

B BREAK. Break down barriers which inhibit the deployment of broadband infrastructure	R RESILIENCE. Plan or advocate for networks that are efficient and assists in resiliency for communities and infrastructure	I INVEST. Invest in communities affected by the digital divide	D DATA DRIVEN. Collect and share data to determine opportunity zones and solutions	G GRASSROOTS. Use a bottom-up approach and listen to and prioritize a community's needs	E EXPEDITE. Develop solutions which can be quickly implemented and efficiently
D DETERMINE. Determine funding opportunities and potential partnerships	I INNOVATE. Promote an atmosphere which allows for healthy competition, innovative solutions which are speed driven, while remaining technologically agnostic	V VISIONARY. Plan or advocate for networks that are scalable, sustainable and accommodate future needs and innovative technology	I INTEGRATE. Integrate findings into traditional disciplines of transportation and land use planning	D DEPENDABLE. Promote transparency and gain the trust of the public, other agencies, and stakeholders	E EDUCATE. Educate the public, policy makers and stakeholders and build consensus for collective action



BROADBAND 101

DEFINITION OF BROADBAND

In the context of internet access, broadband is used to mean any high-speed internet access that is always on and faster than dial-up access. According to the Federal Communications Commission (FCC), currently the minimum speeds which qualify as broadband are a minimum of 25 megabits per second (Mbps) for downloading data and 5 megabits per second for uploading data, commonly referred to as “25/3 Mbps”.

BROADBAND INFRASTRUCTURE

One of the greatest things about the internet is that nobody owns it. It is a global connection of networks, both big and small. Since its birth in 1969, the internet has grown from four host computer systems to tens of millions.²

Broadband service relies on a network of communications infrastructure, and while there are various components within broadband infrastructure, the three big pieces of broadband infrastructure are what is known as the “backbone” infrastructure which consists of the global network, middle and last mile.

- **First Mile/Global Internet Network** is a collective of networks which span across international and continental boundaries usually through undersea or terrestrial fiber optic cables. This allows large amounts of data to span over long distances at a global or national scale.
- **Middle mile** is physical infrastructure required to enable internet connectivity and is made up of high-capacity fiber lines that carry large amounts of data at high speeds over long distances between local networks and the global internet network.
- **Last Mile** allows for an Internet Service Provider (ISPs) to provide a connection to a home, business, or community anchor institution via wired or wireless connection. For last mile connections to work, it must link to the middle-mile network.

² ARPANET. Available at: <https://www.darpa.mil/about-us/timeline/arpamet>

HOW BROADBAND IS BUILT

Building broadband infrastructure requires several key players:

- Public Sector (Federal, State, Local)
- Private Property Owners
- Internet Service Providers (public or private)

To build broadband networks, ISPs must adhere to standards regulated and administered by the Federal Communications Commission (FCC) then design and install on public and/or private land. To do so, they must first obtain permits and easements.

- Permits allow ISPs to access to public right of ways, such as highways, streets, sidewalks and in some cases trails. Permitting entities include local government, state agencies such as the California Department of Transportation (Caltrans), or federal agencies such as the Bureau of Land Management (BLM)
- Easements are provided by private property owners and allow ISPs to access the property and build necessary equipment

Once permits have been granted, construction begins and the type of infrastructure is dictated by what the permit allows, local ordinances allow, and the service an ISP wishes to offer. Such infrastructure may include:

- **Aerial fiber** – Aerial fiber are one of the quickest ways of providing wireline last mile services. ISPs work with electric utilities and/or telephone companies and use their poles to install fiber which run parallel to existing electric or telephone conduit.
- **Underground Infrastructure** – Underground installations require trenching along streets, sidewalks, or highways to install cable, fiber, or other forms of conduit. Installing underground infrastructure is the most used method of providing middle and last mile services.
- **Wireless Facilities** – Wireless facilities are last mile services which provide cellular or hotspot services using 5G signals. Wireless towers and antennas require “line-of-sight” between towers to allow signals to move from one to another.

- **Satellite** – Satellites are a last mile service which deployed into orbit via spacecraft, in which signals are beamed down to Earth. This is an emerging technology and is regulated by the Federal Aviation Administration (FAA) Office of Commercial Space Transportation.

WHO ARE THE INTERNET SERVICE PROVIDERS?

While no one person, company, organization, or government owns the internet, the gatekeepers who provide access to the internet are the ISPs. Most ISPs are within the private sector and provides access to consumers through paid subscriptions.

In rare instances a local government may decide to provide municipal fiber services. Such services are either designed, built, and operated by the local government or leased to smaller private companies to maintain and operate, while the local government provides general oversight.

SERVICE AND SPEED

ISPs provide high speed internet access via multiple types of service technologies such as the following:

- **Digital Subscriber Line (DSL)** provides broadband connection over telephone lines.
- **Cable** provides broadband connection over the same connections that deliver cable television service.
- **Fiber** provides the fastest broadband connection which transmits data through light pulses via fiber optic cables.
- **Wireless broadband** uses over the air radio waves between a cellular tower and the home.
- **Satellite broadband** connections use satellites orbiting the earth to send signals to a fixed device typically mounted on the roof or side of a home.

Broadband speeds vary depending on the technology. For example, a cable line may provide speeds from 25/3 Mbps to 500/50 Mbps, whereas fiber may deliver speeds from 250/250 Mbps to 1000/1000 Mbps (See

Table 1. Fixed Broadband Upload and Download Speed Ranges by Broadband Technology). The type of service someone may access is dependent on location of service, price, and availability of service provider and/or associated technology.

Depending on the type of activity a user participates in, minimum speeds are needed for adequate performance for each application. For example, general browsing and email may take up to 1 Mbps and a standard definition video may require 3-4 Mbps, whereas ultra-high definition may take up to 25 Mbps.

Depending on the type of service a household has, individuals within the household may be able to participate in one or several activities simultaneously. However, if the service speed is substandard, multiple activities occurring at the same time can result in a loss of quality or cause a network slowdown. For example, a household with a 25/3 Mbps connection may not be able to stream two 4k resolution videos at the same time, as they would require a minimum download speed of 50 Mbps (See Table 2. Broadband Speed Guide). As a result, the user may experience blurry or pixelated video quality.

TABLE 1 Fixed Broadband Upload and Download Speed Ranges by Broadband Technology

BROADBAND TECHNOLOGY	DOWNLOAD SPEED RANGE	UPLOAD SPEED RANGE
Cable	10-500 Mbps	5-50 Mbps
DSL	5-34 Mbps	1-10 Mbps
Fiber	250-1000 Mbps	250-1000 Mbps
Wireless	10-25 Mbps	1 Mbps
Satellite	25-100 Mbps	1-20 Mbps

Source: Tyler Cooper, *DSL vs Cable vs Fiber. Comparing Internet Options, Broadband Now*. Available at: <https://broadbandnow.com/guides/dsl-vs-cable-vs-fiber>.

TABLE 2 Broadband Speed Guide

ACTIVITY	MINIMUM DOWNLOAD SPEED
GENERAL USAGE	
Browsing and Email	1 Mbps
Streamlining Online Radio	Less than 0.5 Mbps
Voip Calls	Less than 0.5 Mbps
Student	5-25 Mbps
Telecommuting	5-25 Mbps
File Downloading	10 Mbps
Social Media	1 Mbps
WATCHING VIDEO	
Standard Definition Video	3-4 Mbps
High Definition (HD) Video	5-8 Mbps
Ultra HD (4k) Video	25 Mbps
VIDEO CONFERENCING	
Standard Personal Video	1 Mbps
HD Personal Video Call	1.5 Mbps
HD Video Teleconferencing	6 Mbps
GAMING	
Console connecting to the internet	3 Mbps
Online multiplayer	4 Mbps

Source: *Broadband Speed Guide*. FCC. Available at: <https://www.fcc.gov/consumers/guides/broadband-speed-guide>



THE BENEFITS OF BROADBAND

The technology supporting connectivity continues to advance as do the benefits of getting connected. Here are some examples as to how broadband can benefit society.

ACCESSIBILITY:

BROADBAND HELPS PEOPLE WITH DISABILITIES TO PARTICIPATE IN SOCIETY

- People who face physical mobility challenges can participate in the workforce via telework
- The hearing impaired can communicate through chat programs or text messages or use webcams to communicate with one another through sign language
- People experiencing visual impairment can use text-to-voice programs or learn and connect through audio streaming services

CIVIC ENGAGEMENT:

BROADBAND EMPOWERS CIVIC ENGAGEMENT AND EFFECTIVE GOVERNANCE

- Access to the internet allows residents to attend virtual council meetings and allows them to participate in civic life and gives them a means to communicate directly with public officials
- The internet gives them access to petitions, participating in comment periods and other forms of engagement which can foster and bolster democratic values
- It would also assist residents to be informed of and receive government benefits

ECONOMIC DEVELOPMENT:

BROADBAND FOSTERS ECONOMIC GROWTH

- Broadband makes it easier for job seekers to search for jobs and apply to them
- Broadband can support business growth through advertisement, e-commerce startups and access to small business loans
- Broadband also allows people to gain access to financial services such as traditional banking or investing in the stock market



EDUCATION:

BROADBAND CAN ENHANCE EDUCATION

- Broadband can help facilitate flexibility to accommodate different learning styles via remote learning
- Class websites or apps give students the ability to download assignments and materials.
- Students can work with their peers to complete group assignments
- Email and direct messaging allow students or parents to communicate with their teachers

PUBLIC HEALTH:

BROADBAND CAN IMPROVE ACCESS TO HEALTHCARE

- Broadband can help people to connect with medical professionals virtually
- Broadband allows people to order prescription medication online and have them delivered to their home

PUBLIC SAFETY:

BROADBAND CAN HELP CREATE A SAFER SOCIETY

- Broadband allows emergency dispatchers (911 operators) to communicate quickly with the police or fire department
- Improvements to wireless broadband can enable advances to disaster response and early warning systems
- Enhanced broadband infrastructure can assist in developing a safer and more efficient transportation system (intelligent transportation systems, traffic signal synchronization, connected and automated vehicles (CAV))

SMART CITIES:

BROADBAND CAN MAKE CITIES "SMARTER"

- Broadband is essential for smart parking and transportation systems
- Broadband allows for smart resource monitoring systems for water monitoring, trash disposal and EV charging systems.

SUSTAINABILITY:

BROADBAND IS A "GREEN STRATEGY"

- Telework, E-learning, and other remote access options have the potential to reduce car travel and the associated greenhouse gas emissions.
- Broadband is necessary to collect, analyze and track climate change data.



THE DIGITAL DIVIDE

WHAT IS THE DIGITAL DIVIDE?

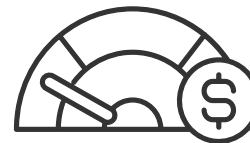
Broadband provides endless benefits to society and its residents. However, there are those amongst us that lack this critical service. During the COVID-19 pandemic, disparities amongst low-income urban and rural households, young students, and senior citizens became more apparent as they did not have access to essential services that are dependent on having broadband and devices. When compared to those who were connected, those who were unconnected or under connected were at a disadvantage with respect to educational, economic, medical, and social opportunities.

This is the digital divide.

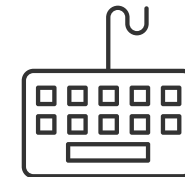
Simply put, the digital divide refers to the growing gap between the members of society who have reliable access to broadband service and/or an adequate device for connecting to the internet, and those who do not. However, the digital divide is a complex issue, and a multitude of factors have caused the issue to persist. In other words, **there is not just one divide but multiple divides.**



AVAILABILITY
A lack of infrastructure or proper service



AFFORDABILITY
A lack of affordable subscription rates or devices



LITERACY
A lack of understanding or knowledge of how to participate in digital activities

WHO IS AFFECTED BY THE DIGITAL DIVIDE?

Studies on the digital divide have been conducted since the mid to late 1990s. According to a 1998 study by Stanford University, the highest levels of disparities occurred amongst Black and Latino populations, low-income households, and those who are non-college educated.³ This remains true to this day, but more recent studies have highlighted the disparities between seniors, K-12 students, employed versus unemployed, and urban versus rural households.

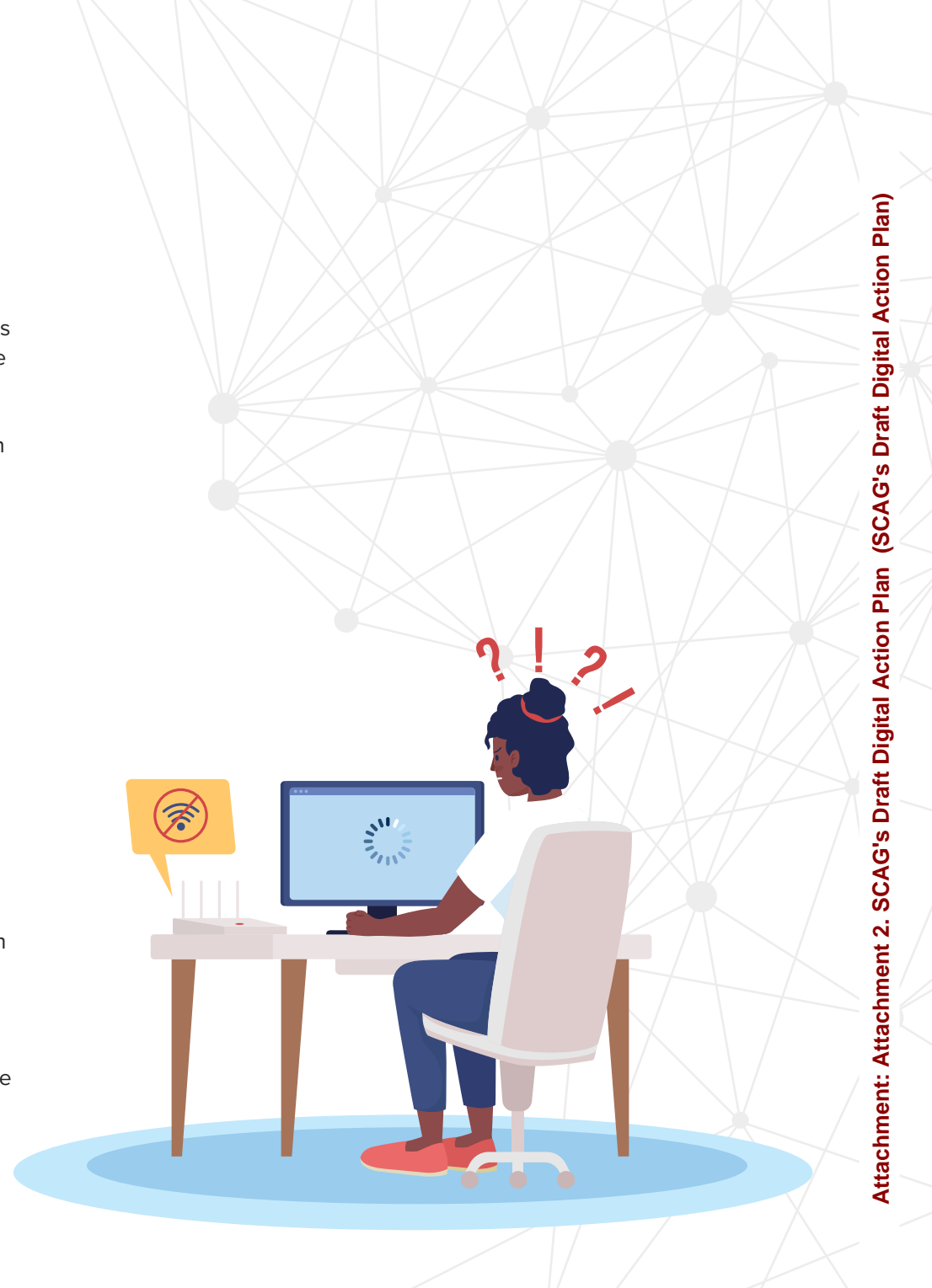
However, barriers to access are varied and complex and while data is not easily available, additional factors and populations should be considered for future analysis. This includes but is not limited to:

- Immigrants, undocumented residents, and refugee households
- Veterans
- People who are incarcerated
- People with disabilities
- People with chronic or complex medical issues
- People who are homeless or experiencing housing insecurity
- People who are experiencing food insecurity
- People who live in areas with terrain challenges
- Small business owners

At a geographic level, those who experience the digital divide often live in **unserved** and **underserved** communities.

- **Unserved communities** are those that do not have access to broadband infrastructure or access to devices.
- **Underserved communities** are those that do not have sufficient service (i.e., minimum speeds of 25/3 Mbps).

³ Digital Divide. Stanford University. Available at: <https://cs.stanford.edu/people/eroberts/cs181/projects/digital-divide/start.html>



THE DIGITAL DIVIDE IN CALIFORNIA

Overall, broadband adoption is on the rise in the state of California. In 2008, approximately 55% of California's population had adopted broadband, and this has risen to approximately 90% in 2021.⁴ However, there remains at least 9 to 10% of the population who are not connected to broadband or don't have computers to access the internet, and this remains uneven across income, age groups, education, and race/ethnicity lines.⁵

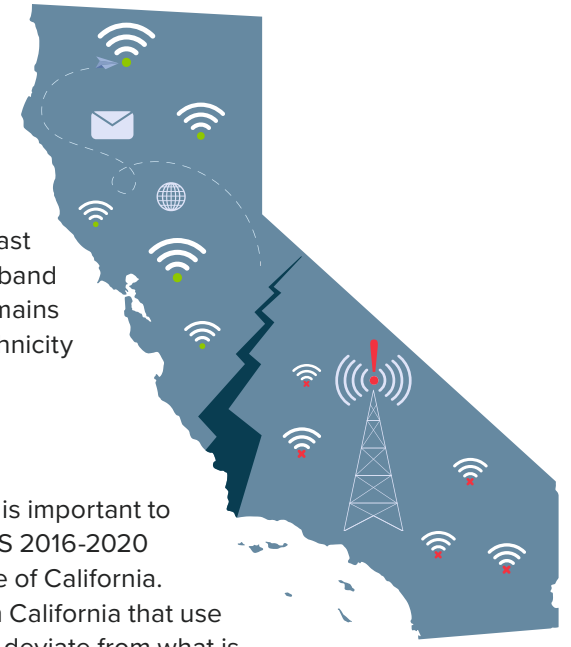
DATA

Before we present data on the digital divide in California, it is important to note that for consistency purposes, SCAG chose to use ACS 2016-2020 Census Data to provide a baseline assessment for the State of California. There are several documents regarding the digital divide in California that use different data sources and analysis from those reports may deviate from what is presented in this plan.

RACIAL GAP

While progress has been made, when compared to the White and Asian populations, Black, Native American/Indigenous and Latino/Hispanic populations are less likely to be connected or own a computer (See Table 3, Population by Race and Age in California without Broadband and Computer).

- 12% of the Black population do not have access to broadband and 5% do not own a computer
- 13% of the Native American/Indigenous population do not have access to broadband and 11% do not own a computer
- 11% of the Latino/Hispanic population do not have access to broadband and 4% do not own to a computer



⁴ 2021 CETF-USC Statewide Broadband Adoption Survey. Available at: <https://www.cetfund.org/wp-content/uploads/2021/03/Statewide-Survey-on-Broadband-Adoption-CETF-Report.pdf>
⁵ 2021 CETF-USC Statewide Broadband Adoption Survey. Available at: <https://www.cetfund.org/wp-content/uploads/2021/03/Statewide-Survey-on-Broadband-Adoption-CETF-Report.pdf>

TABLE 3 Populations in California without Broadband and Computers

	POPULATION	WITH BROADBAND	WITH BROADBAND (PERCENT)	WITHOUT BROADBAND	WITHOUT BROADBAND (PERCENT)	NO COMPUTER	NO COMPUTER (PERCENT)
CALIFORNIA (TOTAL)	38,521,288	35,169,205	91%	3,352,083	9%	1,314,283	3%
CALIFORNIA							
White alone	21,605,116	19,708,956	91%	1,896,160	9%	796,947	4%
Black or African American alone	2,129,228	1,868,171	88%	261,057	12%	107,189	5%
Native American and Indigenous	300,670	262,564	87%	38,106	13%	15,269	5%
Asian alone	5,740,307	5,439,896	95%	300,411	5%	115,970	2%
Latino/Hispanic	15,132,999	13,409,156	89%	1,723,843	11%	608,017	4%
AGE							
Under 18 years	8,935,169	8,326,146	93%	609,023	7%	153,899	2%
18 to 64 years	24,081,685	22,358,042	93%	1,723,643	7%	537,093	2%
65 years and over	5,504,434	4,485,017	82%	1,019,417	18%	623,291	11%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

AGE GAPS

When compared amongst their age group, the largest disparities are amongst the senior populace (See Table 3, Populations in California without Broadband and Computer).

- 18% of Seniors aged 65 and over do not have access to broadband and 11% do not own a computer

INCOME GAPS

Internet subscriptions are unaffordable to low-income households (See Table 4. Low Income Households in California Without Internet)

- Low-income households account for 70% of the digital divide
- 1 in 4 or 25% of low-income households do not have access to the internet

GAPS BASED ON EDUCATIONAL ATTAINMENT

Those who are under-educated are less likely to have a broadband subscription or a computer when compared to populations with a college degree and above.

- 30% of people who are undereducated (less than high school graduate) do not have access to broadband and 18% do not own a computer

EDUCATION GAPS

Efforts across the state have been made by school districts to connect children, there is a sizable number of young students who are not connected. Further, there are many college students who are not connected.

- 6% percent of students from pre-K to 12th grade have no internet subscription or no computer.
- 5% of students who are in college or graduate school do not have an internet subscription or computer.

TABLE 4 Low Income Households in California Without Internet

HOUSEHOLD INCOME AND SUBSCRIPTION	HOUSEHOLDS
LESS THAN \$10,000 TO \$50,000	4,277,540
With dial-up Internet subscription alone	14,340
With a broadband Internet subscription	3,281,288
Without an Internet subscription	981,912
\$50,000 TO \$74,999	2,007,523
With dial-up Internet subscription alone	5,111
With a broadband Internet subscription	1,816,691
Without an Internet subscription	185,721
\$75,000 OR MORE:	6,818,051
With dial-up Internet subscription alone	7,344
With a broadband Internet subscription	6,552,860
Without an Internet subscription	257,847
Total Low Income Households	4,277,540
Total Households (No Internet)	1,425,480
Total Low income Households (No Internet)	981,912
Concentration Rate of all Digital Divide (Low-Income Households)	70%
Low Income Households Experiencing Digital Divide	25%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates
 Note: The average household size is three. Low-income households are those with annual income below \$50,000; this is roughly 225% of the federal poverty line for a household with three persons (\$51, 818)

TABLE 5 Adoption by Educational Attainment (California)

	TOTAL	BROADBAND INTERNET SUBSCRIPTION	BROADBAND (PERCENT)	NO BROADBAND (PERCENT)	NO COMPUTER IN HOUSEHOLD	PERCENT NO COMPUTER IN HOUSEHOLD
TOTAL POPULATION	38,521,288	35,169,205	91%	9%	1,314,283	3%
EDUCATIONAL ATTAINMENT						
Household population 25 years and over	26,159,970	23,640,443	90%	10%	1,110,161	4%
Less than high school graduate or equivalency	4,135,249	3,286,510	80%	20%	418,783	10%
High school graduate	12,827,397	11,519,254	90%	10%	564,765	4%
Bachelor's degree or higher	9,197,324	8,834,679	96%	4%	126,613	1%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

TABLE 6 Students in California without Internet or a Computer

	TOTAL	PERCENT
PRE K-12 (TOTAL STUDENTS)	7,098,947	
Has a computer and Internet Subscription	6,639,034	94%
No subscription or no computer	459,913	6%
UNDERGRADUATE OR HIGHER (TOTAL STUDENTS)	2,958,260	
Has a computer and Internet Subscription	2,818,536	95%
No subscription or no computer	139,724	5%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

THE DIGITAL DIVIDE IN THE SCAG REGION

PRESENTATION OF DATA

Before we present data on the state of the Region, it is important to note that SCAG's Digital Action Plan relies on best and current available data provided by the Federal Communications Commission (FCC), California Public Utilities Commission (CPUC), and United States Census Bureau. Further, both the FCC and CPUC have recognized that their data sets require updates as they do not present details at the granular level.

This assessment focuses primarily on the accessibility of fixed broadband services (wired or wireless infrastructure) and availability of computers. Data on speed, availability and cost of service providers are presented in limited fashion as data are taken from open sources of information (M-Lab and Broadband Now) and should be considered experimental. Further, this assessment does not provide data on cellular and satellite data. Satellite is an emerging technology and requires further assessment, and while cellular services are important, they are often inadequate to qualify as broadband by the current federal definition of 25/3 Mbps, as the average cellular data plan provides on average 10/1 Mbps.⁶

Regardless of limitations, SCAG believes that the data provides valuable insight on the state of the region and will continue to work towards securing accurate data and will periodically update the Regional Council as better data comes along.

Further, for County level data and figures, please refer to Appendix A: County Level Data and Appendix B for County Level Figures.

GENERAL

Nearly half of California's population or approximately 19 million residents live within the six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) of the SCAG region. It is currently projected that the population will increase from 19 million to over 24 million.⁷ While the region is growing and is diverse in its population, economy and environment, the region faces digital access challenges. Like the State of California, the SCAG Region follows the same trends as the state as 9% residents within SCAG region do not have access to broadband and 3% do not have access to a computer (See Table 7. Population in the SCAG Region Without Broadband and Computers).

⁶ Defining Broadband: Minimum Threshold Speeds and Broadband Policy. EveryCRSReport. Available at: <https://www.everycrsreport.com/reports/R45039.html>

⁷ For more information, please visit <https://scag.ca.gov>

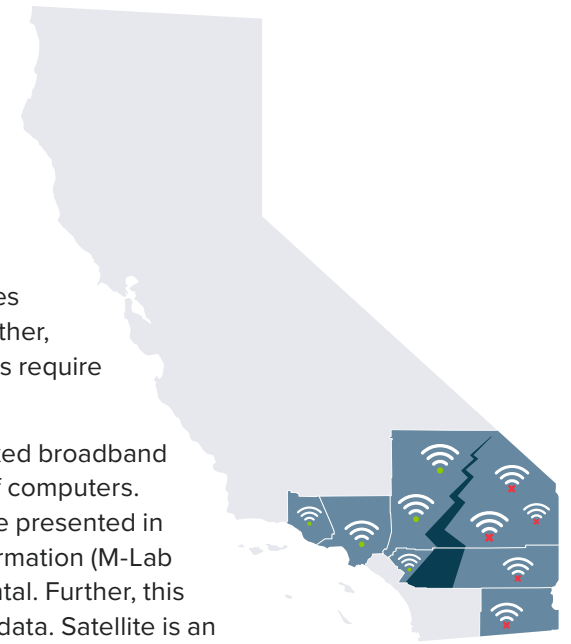


TABLE 7 Population in the SCAG Region Without Broadband and Computers

COUNTY	TOTAL POPULATION	WITH BROADBAND	WITHOUT BROADBAND	WITHOUT BROADBAND (PERCENT)	WITHOUT DEVICE	WITHOUT DEVICE (PERCENT)
Imperial	170,517	149,865	20,652	12%	11,412	7%
Los Angeles	9,858,119	8,824,138	1,033,981	10%	388,863	4%
Orange	3,126,693	2,931,456	195,237	6%	71,198	2%
Riverside	2,399,905	2,204,195	195,710	8%	72,686	3%
San Bernardino	2,110,605	1,901,118	209,487	10%	63,346	3%
Ventura	832,500	761,388	71,112	9%	34,249	5%
SCAG	18,498,339	16,772,160	1,726,179	9%	641,754	3%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

AGE, RACE AND EDUCATIONAL ATTAINMENT GAPS

Like California, there are disparities amongst certain age groups, races, and educational attainment populations (See Table 8. Populations (Age, Race and Educational Attainment) in the SCAG Region without Broadband or a Computer).

When compared amongst their age group, the largest disparities are amongst the senior populace

- 20% of Seniors aged 65 and over do not have access to broadband and 12% do not own a computer

The Black, Native American/Indigenous and Latino/Hispanic population are less likely to be connected or own a computer compared to the White and Asian Population.

- 13% of the Black population do not have access to broadband and 5% do not own a computer
- 11% of the Native American/Indigenous population do not have access to broadband and 4% do not own a computer

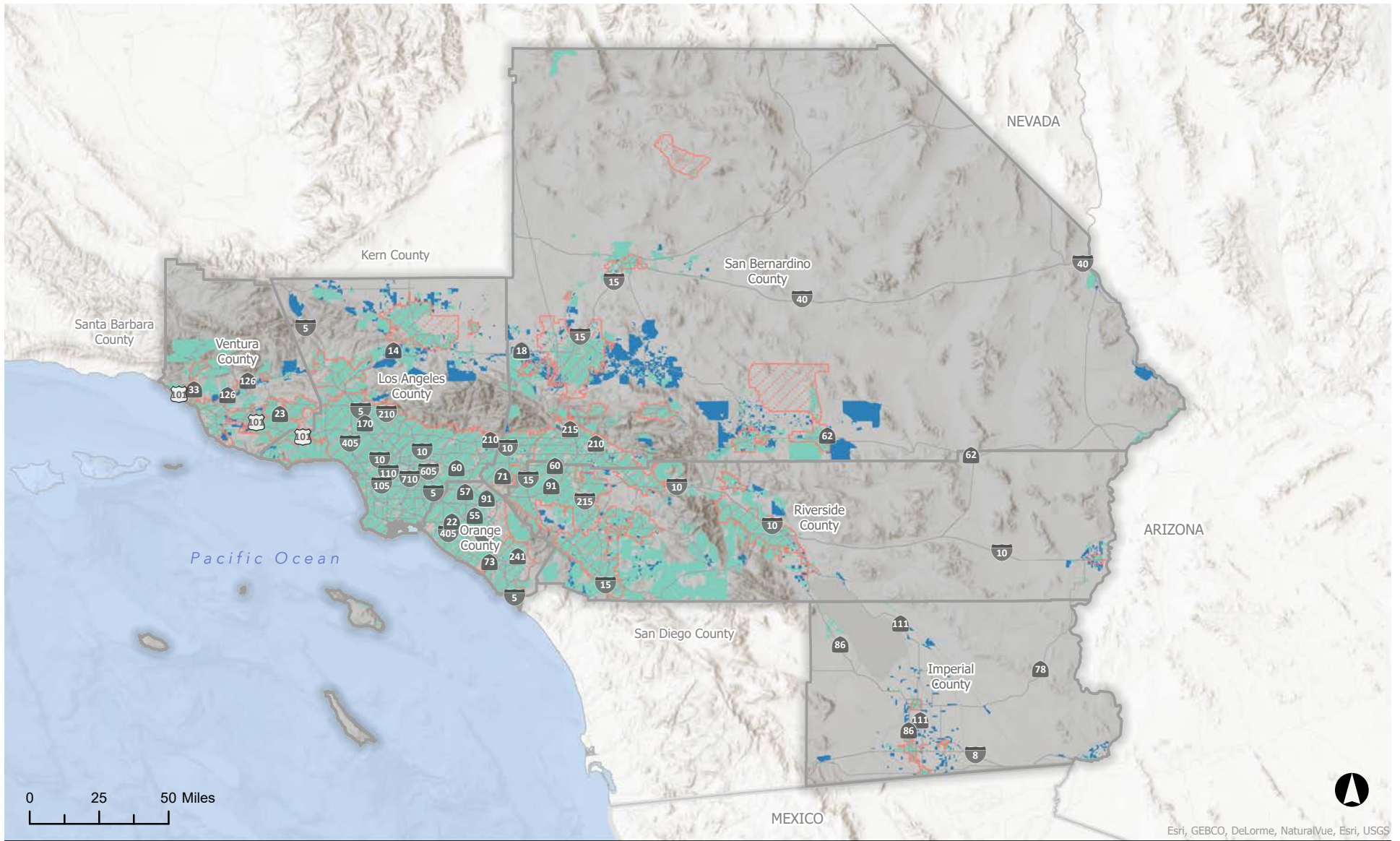
- 12% of the Latino/Hispanic population do not have access to broadband and 4% do not own to a computer
- While the SCAG region is performing better than the state, even still:
- 20% of people who are undereducated (less than high school graduate) do not have access to broadband and 9% do not own a computer

FIXED BROADBAND SERVICE




There is a difference in accessibility when comparing urban and rural communities. 68% of urban areas in the SCAG Region are served by fixed broadband (25/3 Mbps minimum), whereas only 5% of rural areas are served by the fixed broadband. (See Figure 1. Fixed Broadband by Census Block, Federal Threshold: 25 Mbps / 3 Mbps). However, this does not mean that only 5% of households in rural areas have internet, rather this map depicts the vastness of the region and gives us a sense of where the infrastructure is being prioritized.

Further analysis shows that 15% of households in urbanized areas and 13% in rural areas experience speeds under the 25/3 Mbps (See Table 9, Urbanized and Rural Areas Experiencing Speeds Under the 25/3 Mbps Threshold).

FIGURE 1 Fixed Broadband by Census Block, Federal Threshold 25 Mbps/3 Mbps



0 25 50 Miles

-  Urbanized Boundary
- SCAG Fixed Consumer Deployment
-  Below Federal Threshold
-  Meets Federal Threshold

Esri, GEBCO, DeLorme, NaturalVue, Esri, USGS



Source: SCAG 2022, FCC Open Data 2022

TABLE 8 Populations (Age, Race and Educational Attainment) in the SCAG Region without Broadband or a Computer

	POPULATION	WITH BROADBAND	WITHOUT BROADBAND	WITHOUT BROADBAND (PERCENT)	NO COMPUTER	NO COMPUTER (PERCENT)
TOTAL POPULATION IN HOUSEHOLDS	18,498,339	16,772,160	1,726,179	9%	641,754	3%
AGE						
Under 18 years	4,297,268	3,973,280	323,988	8%	76,325	2%
18 to 64 years	11,668,879	10,762,294	906,585	8%	265,274	2%
65 years and over	2,532,192	2,036,586	495,606	20%	300,155	12%
RACE						
White	9,754,588	8,863,158	891,430	9%	367,438	4%
Black or African American	1,167,554	1,015,104	152,450	13%	61,178	5%
Native American/Indigenous	136,164	121,086	15,078	11%	6,037	4%
Asian	2,502,952	2,361,855	141,097	6%	54,751	2%
Hispanic/Latino	8,697,391	7,687,091	1,010,300	12%	334,814	4%
EDUCATIONAL ATTAINMENT						
Household population 25 years and over	12,520,746	11,235,724	1,285,022	10%	540,919	4%
Less than high school graduate or equivalency	2,286,848	1,821,768	465,080	20%	217,236	9%
High school graduate	6,166,434	5,522,441	643,993	10%	263,273	4%
Bachelor's degree or higher	4,067,464	3,891,515	175,949	4%	60,410	1%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

TABLE 9 Urbanized and Rural Areas Experiencing Speeds Under the 25/3 Mbps Threshold

COUNTY	URBANIZED AREA	RURAL AREA
Imperial County	22%	24%
Los Angeles County	16%	9%
Orange County	9%	5%
Riverside County	14%	13%
San Bernardino County	16%	15%
Ventura County	12%	14%
SCAG Region	15%	13%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates, Caltrans Adjusted Area 2010.

SERVICE PROVIDERS, COST AND SPEED

An average of 11 ISPs provides broadband at the zip code level across the SCAG Region. Speed and cost differ across the region when looking at the data at the County Level. For example, there is a stark difference between the speed of service and cost in urban areas and rural areas. Los Angeles County has higher speeds and lower cost of subscription when compared to Imperial County.

16% of the SCAG region experiences outages or slow traffic, resulting in speeds which fall under the 25/3 Mbps, with Imperial County facing the greatest disparities at 67%.

INCOME GAPS

Low-income households without internet connection are spread throughout the SCAG Region

- Concentration of low-income households without internet are the highest in Imperial and Riverside County (See Figure 2. Low Income Households without Broadband: Percent of Households by Census Block)
- 70% of those without internet are concentrated within low-income households
- A total of 22% of low-income households within the SCAG Region do not have access to the internet

EDUCATION GAPS

- Like the state, there is a sizable number of young students and college students who are not connected (See Table 13. Students in the SCAG Region without Internet or Computer).
- 7% percent of students from pre-K to 12th grade has no internet subscription or no computer.
- 5% of students who are in college or graduate school do not have an internet subscription or computer

TABLE 10 Internet Service Provider Cost Summary

COUNTY	AVERAGE NUMBER OF PROVIDERS PER ZIP CODE	AVERAGE MBPS	AVERAGE LOWEST PRICE TERRESTRIAL BROADBAND PLAN PER ZIP CODE
Imperial	10	79	\$68.36
Los Angeles	12	237	\$35.24
Orange	13	101	\$34.94
Riverside	12	78	\$35.69
San Bernardino	10	71	\$42.49
Ventura	11	98	\$36.19
SCAG	11	111	\$42.15

Source: BroadbandNow 2020

TABLE 11 Average Broadband Speed Test

	25+ / 3+ MBPS	1-25 / 3+ MBPS	1-25 / UP 0-3 MBPS	BELOW 25/3 TOTAL	NO DATA
Imperial	33%	25%	42%	67%	0%
Los Angeles	80%	9%	1%	11%	10%
Orange	81%	11%	0%	11%	8%
Riverside	72%	19%	7%	25%	3%
San Bernardino	62%	11%	14%	25%	13%
Ventura	76%	8%	3%	11%	14%
SCAG Region	75%	11%	5%	16%	9%

Data Source: M-Lab's data (Dec 2019 - Oct 2020)

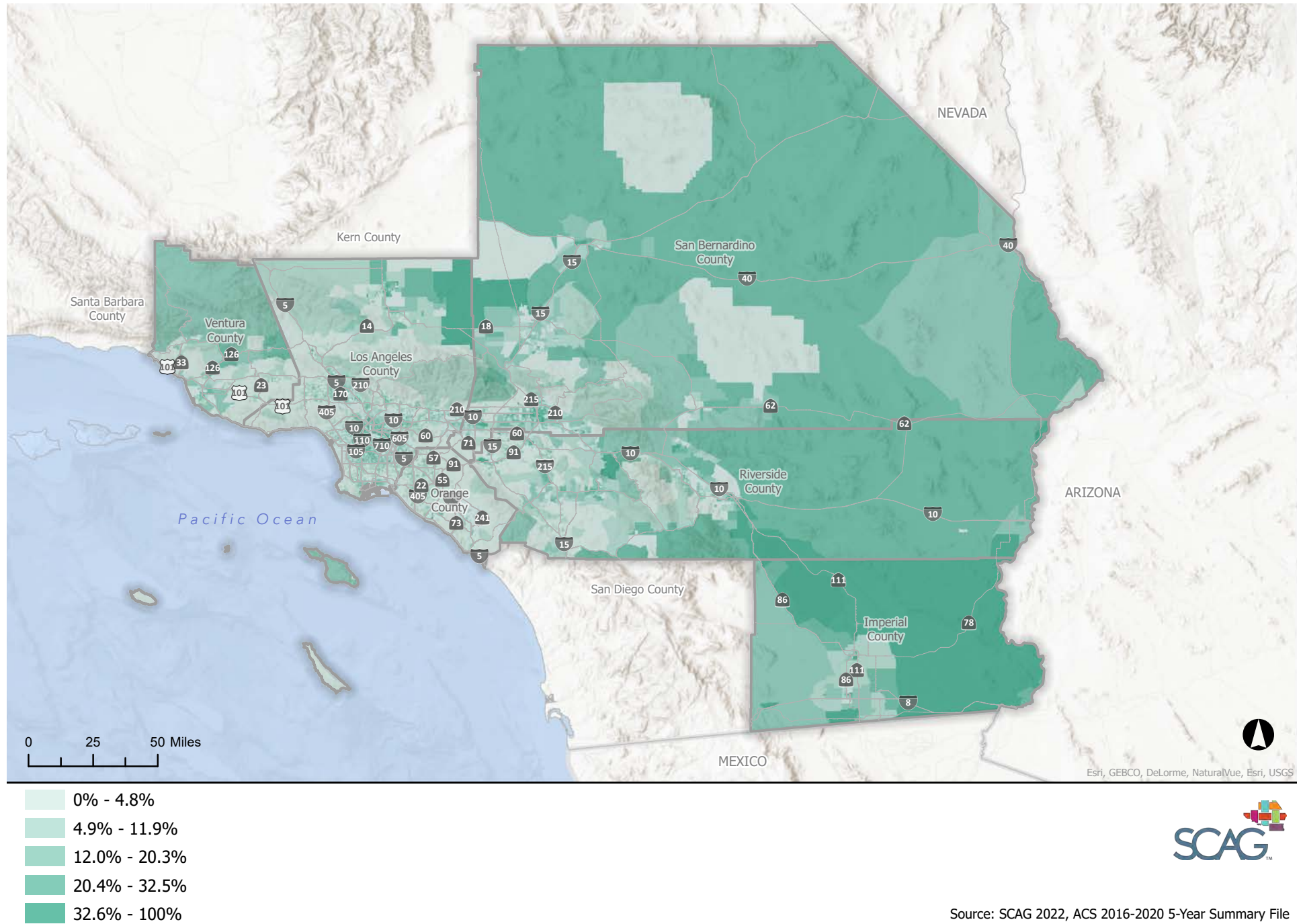
TABLE 12 Low Income Households in the SCAG Region Without Internet

HOUSEHOLD INCOME AND SUBSCRIPTION	HOUSEHOLDS
LESS THAN \$10,000 TO \$50,000	2,078,828
With dial-up Internet subscription alone	5,724
With a broadband Internet subscription	1,585,676
Without an Internet subscription	487,428
\$50,000 TO \$74,999	962,993
With dial-up Internet subscription alone	2,121
With a broadband Internet subscription	870,282
Without an Internet subscription	90,590
\$75,000 OR MORE:	3,024,594
With dial-up Internet subscription alone	3,450
With a broadband Internet subscription	2,897,226
Without an Internet subscription	123,918
Total Low Income Households	2,078,828
Total Households (No Internet)	701,936
Total Low income Households (No Internet)	487,428
Concentration Rate of Digital Divide (Low-Income Households)	70%
Low Income Households Experiencing Digital Divide	22%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

Note: The average household size is three. Low-income households are those with annual income below \$50,000; this is roughly 225% of the federal poverty line for a household with three persons (\$51, 818)

FIGURE 2 Low Income Households Without Broadband: Percent of Households by Census Block



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File

TABLE 13 Students in the SCAG Region without Internet or a Computer

	TOTAL	PERCENT
PRE K-12 (TOTAL STUDENTS)	3,419,260	
Has a computer and Internet Subscription	3,173,412	93%
No subscription or no computer	245,853	7%
UNDERGRADUATE OR HIGHER (TOTAL STUDENTS)	1,454,875	
Has a computer and Internet Subscription	1,380,784	95%
No subscription or no computer	74,096	5%

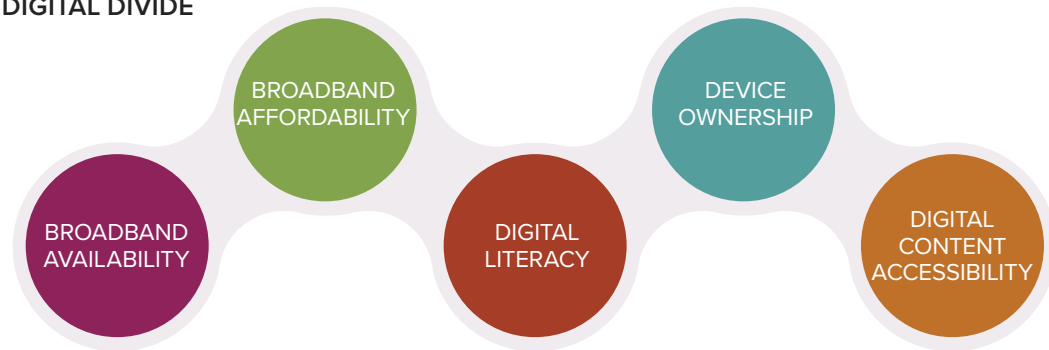
Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

WHAT'S CAUSING THE DIGITAL DIVIDE

BARRIERS AND CAUSES FOR THE DIVIDE

As previously mentioned, there are many barriers which prevent digital access and adoption. Earlier we categorized the digital divide resulting from Availability, Affordability and Literacy. But even that is too basic of an explanation, and a deeper dive is necessary.

THE DIGITAL DIVIDE



HIGH COST AND LITTLE RETURN TO PROVIDE INFRASTRUCTURE

While broadband infrastructure may seem ubiquitous, there are pockets of rural and urban areas in American and within the SCAG region with no infrastructure or poor/old infrastructure. These are known as “digital deserts” where high-speed internet access is unavailable at any price or service is unreliable, unaffordable, or too slow.⁸ In a nationwide study by the FCC, Purdue University and Oklahoma State University, approximately 21.3 million people had speeds less than the standard of 25/3 or approximately 5 million people and/or 2.2 million households had access to no provider, and more than two-thirds of these deserts were in rural areas.⁹

In rural areas, the economic incentive for ISPs to upgrade infrastructure or provide services are not there due to the lack of a customer base. To bring high-speed wireline services to rural areas, an ISP would have to make a substantial investment to cover conduit costs and the cost of digging miles of trenches only to reach a few customers per mile.¹⁰ Urban areas may have some form of internet access but are considered substandard as they rely on older technology. An example of old technology is DSL, which relies on existing telephone lines and provide speeds that are considerably

⁸ Why digital deserts are counting on an infrastructure deal. NBCNews. Available at: <https://www.nbcnews.com/news/nbcblk/large-swaths-digital-deserts-are-counting-infrastructure-deal-rcna2429>
⁹ A parched country study shows that digital deserts exist. Connected Nation. Available at: <https://connectednation.org/blog/2019/09/18/a-parched-country-study-shows-digital-deserts-exist/>
¹⁰ Why is it so hard to get fast & reliable rural internet? Get Unwired. Available at: <https://www.getunwired.com/why-is-it-so-hard-to-get-fast-reliable-rural-internet>

slower than cable or fiber-optics broadband. Underserved urban areas are disproportionately located in communities of color and a high concentration of low-income households and experience “underinvestment” in which ISPs are unwilling to upgrade the network due to the lack of financial incentives. In some cases, underserved communities (both urban and rural) may experience higher subscription rates but slower speeds.¹¹ An example of this was previously shown on Table 10. Internet Service Provider Cost Summary, in which Imperial County residents paid more for lower speeds when compared to residents in Los Angeles County.¹²

Municipal broadband is an option many local jurisdictions have considered and, in some cases, implemented. Some local jurisdictions opt to build maintain and operate their own fiber network, while others build the infrastructure and lease the fiber to small providers to provide service to its residents. Some notable examples in the SCAG Region include OntarioNet (City of Ontario)¹³ and Culver Connect (Culver City)¹⁴, both of which provide high-speed fiber to its residents. However, this is not an option for many local jurisdictions and other attempts have failed. For local jurisdictions with fewer resources, the capital cost of investment is too high and cannot be supported by a city or county’s budget. Broadband infrastructure projects require municipalities to take on enormous upfront costs, and unsuccessful projects can lead to expensive litigation and unreliable service.¹⁵ During the COVID-19 pandemic, municipal budgets have plummeted, and many cities have cut their budget due to the decreased tax revenue.¹⁶ Further, the rising cost of construction materials and technology equipment due to inflation and supply chain issues have exacerbated the infeasibility of a municipal service.

11 The nuances of digital redlining explained. Governing Daily. Available at: <https://www.governing.com/community/the-nuances-of-digital-redlining-explained/>
12 Imperial County is considered rural by the Rural County Representatives of California (RCRC). Available at: <https://www.rcrcnet.org/imperial>
13 OntarioNet. Available at <https://www.ontarioca.gov/fiber>
14 CulverConnect. <https://www.culvercity.org/City-Projects/Culver-Connect-Municipal-Fiber-Network>
15 Can municipal broadband networks close the digital divide? The regulatory review. Available at: <https://www.theregreview.org/2021/08/11/schaengold-municipal-broadband-networks-close-digital-divide/>
16 How COVID-19 is harming State and City Budgets: <https://www.cfr.org/backgrounder/how-covid-19-harming-state-and-city-budgets>

UNCOMPETITIVE MARKET

Lack of competition can cause stagnation of technology and speed. Millions of Americans do not have a real choice when it comes to internet service. As referenced earlier, the SCAG region is served by an average of 11 ISPs at the zip code level, however in urban areas in different regions of the nation, the majority can choose up to one to two ISPs (one usually being the cable company and the other a telephone company).¹⁷ In rural areas, residents are fortunate to get any service at all. For fixed wireline services, cable and DSL are the most common choices. While fiber services are considered the gold standard as they provide the greatest level of reliability and speed, ISPs which hold a monopoly on service areas have little incentive to modernize their equipment as there are no competitors who are willing to provide better service for cheaper rates. The lack of competition results in high subscription rates with stagnant speeds.

INCONSISTENT THRESHOLDS FOR BROADBAND SPEEDS

As stated before, the FCC’s minimum threshold for what qualifies as broadband is 25/3 Mbps. This has been the federal threshold since 2015, and these speeds are proving to be inadequate in today’s and tomorrow’s environment as multiple people in a single household are participating in activities simultaneously (See Table 2. Broadband Speed Guide).

Further, the FCC’s threshold for broadband does not apply to rural areas. The United States Department of Agriculture (USDA) defines minimum broadband speeds as 10/1 Mbps.¹⁸ This inconsistency in minimum thresholds allow for greater disparities in service quality. As shown on Table 1, Fixed Broadband Upload and Download Speed Ranges by Broadband Technology, broadband speed is dependent on the type of technology a user subscribes to. While fiber can provide up to 1000/1000 Mbps, older technologies such as DSL can fall below 25/3 Mbps, thereby causing additional confusion as to whether services like DSL should qualify as broadband.

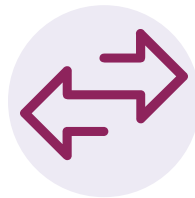
17 Profiles of Monopoly and Telecom. ISLR. Available at: https://cdn.ilsr.org/wp-content/uploads/2020/08/2020_08_Profiles-of-Monopoly.pdf?_ga=2.245667776.595357048.1662312884-1507830798.1662312884&_gl=1*nujw3*_ga*MTUwNzgZMDc5OC4xNjYyMzEyODg0*_ga_M3134750WM*MTY2MjMzMDU0OC4yLjEuMTY2MjMzMDU0OC4wLjAuMA
18 Reconnect Program. USDA. <https://www.usda.gov/sites/default/files/documents/reconnect-all-faqs.pdf>

PERMITTING, ORDINANCES AND COST ISSUES

Other issues can also inhibit the development or upgrading of broadband infrastructure. In a survey conducted by the San Diego Association of Governments (SANDAG), ISPs have stated that permitting challenges are one of the key barriers to infrastructure deployment. The survey found that permitting processes are not transparent, cost and time consuming, and inconsistent with respect to fees.¹⁹ Long permitting timeframes leads to increased cost and project delays, and as a result much of that cost is rolled over to the consumer. Local codes and preferred practices can also inhibit development. Many cities prefer that an ISP provide terrestrial or underground wireline services and prohibit the use of aerial fiber. Aerial fiber allows for an ISP to leverage existing light, energy and/or telephone poles to layout conduit, thereby allowing an ISP to save time on permitting and avoid trenching and road repair costs. The interviews also indicated that road repair costs are contentious issue between a local jurisdiction and the ISP in which there are disagreements upon the cost burden an ISP or local jurisdiction should take upon when backfill activities occur.



LACK OF ORGANIZED AND ACCESSIBLE INFORMATION ON PERMITTING



INCONSISTENCY ACROSS JURISDICTIONS, SOMETIMES EVEN WITHIN AN AGENCY



RESTRICTIVE POLICIES AND PROHIBITIVE CONDITIONS THAT DON'T COMPLY WITH FCC GUIDELINES



UNCERTAIN TIMELINES AND COST



LACK OF STANDARDS FOR MICROTRENCHING

¹⁹ Summary of provider interviews: Challenges and Opportunities for Broadband Infrastructure Deployment. SANDAG. Available at: https://www.sandag.org/uploads/meetingid/meetingid_5841_28872.pdf

MATERIALS AND TERRAIN

In certain cases, ISPs are providing adequate service, but speeds are affected by the user's home itself. Older and historic homes tend to have poor internet connections due to the materials that were used to build the walls. Modern homes are designed with wiring and internet/cable service in mind. However, older homes prioritized building strength over modern technology. Common materials found in older homes such as metal plaster lath, metal stucco lath, foil insulation, and steel reinforced concrete can block Wi-Fi signals.²⁰ Homes in communities such as South Los Angeles may experience poor Wi-Fi signals as approximately 50% (125,000 out of 250,000) were built between 1939 and 1950, during an era where the most commonly used material for insulation was foil.²¹ Affordable housing complexes such as those administered by the Housing Authority of Los Angeles (HACLA), also face signal issues as most of the public housing complexes were built during the World War II era.²²

Terrain can also present a problem. In mountainous areas wireless signals from towers tend to be weak due to line of sight issues.²³ Foliage, rain and wind can also affect latency speeds. This poses a challenge in urban areas for cellular services and in rural areas can affect last-mile wireless solutions and cellular services.²⁴ An increasing amount of satellite service providers have entered the broadband market over the past years. However, this technology is new and emerging and is affected by atmospheric and terrain conditions. Long distance travel from space to Earth, even at light speed, already causes minor delays, and atmospheric conditions like storm and rain result in a degradation of service.²⁵

²⁰ What's in your home's walls and why it's disrupting your WiFi signal. MyMove. Available at: <https://www.mymove.com/internet/wifi-vs-walls-why-historic-homes-have-terrible-connections-and-how-to-fix-it/>
²¹ South L.A. Demographics. Available at: <https://www.point2homes.com/US/Neighborhood/CA/Los-Angeles/South-LA-Demographics.html>
²² HACLA-Public Housing. HACLA. Available at: <https://www.hacla.org/en/about-public-housing>
²³ Technology in the mountains: Why it's not up to speed, Aspen Times. Available at: <https://www.aspentimes.com/news/technology-in-the-mountains-why-its-not-up-to-speed/>
²⁴ 11 building materials that can kill your cell phone signals. Wilson Amplifiers. Available at: <https://www.wilsonamplifiers.com/blog/11-major-building-materials-that-kill-your-cell-phone-reception/>
²⁵ Pros and Cons of Satellite Internet Service. Available at: <https://www.satelliteinternet.com/resources/satellite-internet-pros-and-cons/>

LACK OF DEVICES

Broadband adoption is meaningless without a device. Such devices could include a computer, a smart phone, or a tablet. This is referred to as the “device divide” or the “technology gap.” Approximately 650,000 residents faced difficulties acquiring a device during the height of the COVID-19 pandemic, when computers and webcams were in high-demand but people faced short supplies and high prices, and those who did experienced financial strain (further discussed under **Affordability**).²⁶

Throughout the nation, smartphone ownership has been on the rise. Out of all the digital devices available in the market, low-income families saw the biggest gains in smartphone ownership, with 76% of low-income households owning a smartphone.²⁷ While phones and tablets allow for some level of connectivity, a person without a proper computer can face significant challenges should they wish to pursue telework opportunities or e-learning opportunities.

These challenges are particularly true for students of low-income households, and this form of digital divide is commonly referred to as the “homework gap”. In 2009, the FCC Broadband Task force reported that approximately 70% of teachers assigned homework requiring access to broadband and devices. In addition, while 65% of students accessed the internet at home to complete their work, the remaining students, mostly concentrated in low-income households, relied on public libraries or public spaces that provided Wi-Fi.²⁸ Prior to the pandemic, students in low-income households could rely on services in libraries or schools, but the COVID-19 pandemic forced most of the schools to go virtual and previously relied upon facilities were no longer available. As a result, the lack of accessibility resulted in difficulties with attending online classes, connecting with their peers and teachers, and doing homework.

26 Device Shortage Impacts Digital Device. Community Tech Network. Available at: <https://www.communitytechnetwork.org/blog/device-shortage-impacts-digital-divide/>
27 Digital divide persists even as Americans with lower incomes make gains in tech adoption. Pew Research Center. Available at: <https://www.pewresearch.org/fact-tank/2021/06/22/digital-divide-persists-even-as-americans-with-lower-incomes-make-gains-in-tech-adoption/>
28 The homework gap: The cruelest part of the Digital Divide. NEA. <https://www.nea.org/advocating-for-change/new-from-nea/homework-gap-cruelest-part-digital-divide>

AFFORDABILITY

In a survey done by the California Emerging Technology Fund (CETF) and the University of Southern California, 68% of respondents stated that affordability was the main reason that kept them from adopting broadband.²⁹

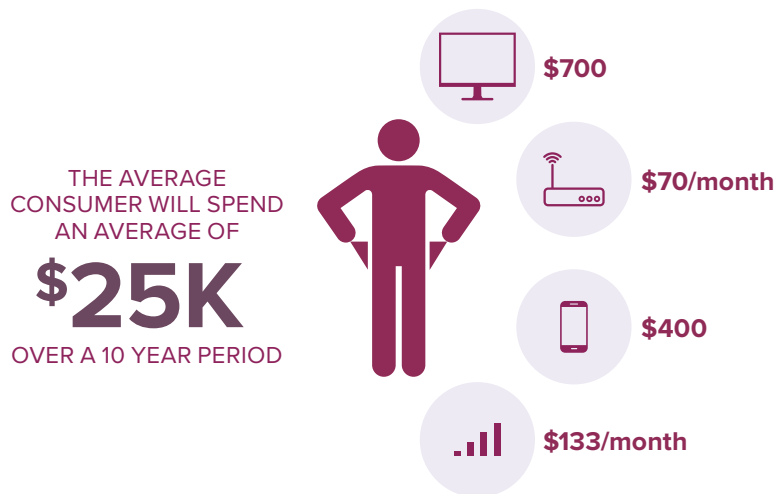
68%
OF RESPONDENTS STATED THAT AFFORDABILITY WAS THE MAIN REASON THAT KEPT THEM FROM ADOPTING BROADBAND

According to BroadbandNow, roughly 95% of California residents have the “opportunity” to access broadband subscriptions, and the most popular package provides 100/20 Mbps at \$69.99 per month.^{30,31} However, the opportunity of access does not always lead to adoption in low-income communities. As shown on Table 14. Sample of Cities Comparing Poverty Rates and Broadband Adoption, the following cities within the SCAG region experience a poverty rate between 13% to 24%, but only 75% to 86% of households have broadband due to affordability issues.

There have been several attempts to provide affordable internet to low-income households. For example, ISPs such as Charter Spectrum provide affordable rates as low as \$17.99 a month under their Internet Assist program.³² Government subsidies such as the FCC administered Affordable Connectivity Program (ACP) provide qualifying households \$30 a month to pay for broadband.³³ However, over 65% of unconnected or smartphone only households are not aware of discount internet plans, and fewer than 25% of those who are aware report ever having applied.³⁴ This indicates that there may be several factors at play: a lack of outreach, language barriers, or a cumbersome application process.

29 2021 Statewide Survey on Broadband Adoption, CETF and USC. Available at: https://www.cetfund.org/wp-content/uploads/2021/03/Annual_Survey_2021_CETF_USC_Final_Summary_Report_CETF_A.pdf
30 Price after initial 12-month promotion of 49.99 per month.
31 BroadbandNow Data. Broadband Now. Available at: <https://broadbandnow.com/research/data>
32 Spectrum Internet Assist. Charter Spectrum. Available at: <https://www.spectrum.com/internet/spectrum-internet-assist>
33 Affordable Connectivity Program. Federal Communications Commission. Available at: <https://www.fcc.gov/acp>
34 2021 Statewide Survey on Broadband Adoption, CETF and USC. Available at: https://www.cetfund.org/wp-content/uploads/2021/03/Annual_Survey_2021_CETF_USC_Final_Summary_Report_CETF_A.pdf

Low-income households are also less likely to own a tablet or laptop than those with higher incomes or higher education levels.³⁵ The average price of a desktop computer and laptop ranges from \$600 to \$700 with a life span of 5-6 years.³⁶ On average a smartphone costs approximately \$400 (with a lifespan of 2.5 years) and a cellular plan cost \$113 per month.^{37,38} Assuming a person decides to purchase a computer (at \$700), broadband subscription (at \$70 a month), smartphone (at \$400) and cellular data plan (at \$133 a month), the average consumer will spend an average of \$25,000 over a 10 year period.³⁹ As difficult as it is for low-income households, their situation worsened during the pandemic due to dwindling supply of affordable and/or refurbished devices, as manufacturing delays caused a global chip shortage, and inflation caused a sharp increase in prices.⁴⁰



35 The demographics of device ownership. Pew Research Center. Available at: <https://www.pewresearch.org/internet/2015/10/29/the-demographics-of-device-ownership/>
 36 ASP Global Forecast. Statista. Available at: <https://www.statista.com/statistics/722992/worldwide-personal-computers-average-selling-price/>
 37 Is having a smartphone a requirement in 2022? Investopedia. <https://www.investopedia.com/is-having-a-smartphone-a-requirement-in-2021-5190186#citation-13>
 38 Average Smartphone Lifespan 2014 to 2025. Statista. Available at: <https://www.statista.com/statistics/619788/average-smartphone-life/>
 39 This assumes no inflation, no accidents, no repairs, and no insurance.
 40 Intel CEO warns chip shortage won't end until at least 2023 - as laptop sales get hit by supply issues. Available at: <https://www.theverge.com/2021/10/21/22739192/intel-chip-shortage-q3-2021-earning-laptop-revenue>

DIGITAL LITERACY

Digital literacy or rather digital “illiteracy” is another form of the digital divide. As essential services are now reliant on the internet, society requires one to be able to use technology to boost productivity (school and work) to one’s work or one’s life (i.e., banking, e-commerce, scheduling appointments).

To be considered digitally literate, one needs to:

1. Be able to use digital technology (computer), navigate through various tools (programs) to create content:
 - *A student knows how to use a computer and a word processing program to draft a history report*
2. The ability to understand and access and share information through various formats:
 - *Now the student knows how to use a web browser to source information for the history report, draft and submit the report to his/her professor using email.*
3. The ability to build upon digital skills and apply them in other settings:
 - *The student is now a young professional and can apply his/her digital skills to send emails, create spreadsheets, research and draft memos and reports for his/her supervisor.*

Digital literacy is no longer exclusive to higher education or white-collar professions. Digital literacy goes beyond word processing, researching, or analyzing charts, and is now a requirement in blue collar professions. Essential service jobs such as retail, food services, construction, and others require computers or other tools to increase productivity. For example, plumbers must adapt and offer Venmo or Square to their customers to accept payments. This also affects immigrant owned businesses as owners must be digitally literate as they may be required to develop a website, provide online shopping options, and post advertisements on social media.

TABLE 14 Sample of Cities Comparing Poverty Rates and Broadband Adoption

	SANTA ANA	COMPTON	SAN BERNARDINO	EL CENTRO	SANTA PAULA	DESERT HOT SPRINGS
Population Estimates	309,441	93,597	222,203	44,158	30,759	32,716
Households with a Computer	94%	91%	92%	89%	82%	88%
Households with a Broadband Subscription	86%	75%	77%	85%	78%	82%
Median Households Income	\$72,406	\$58,703	\$49,287	\$47,366	\$62,241	\$37,818
Persons in Poverty	13%	20%	24%	24%	16%	24%

Source: Census QuickFacts: Santa Ana, Compton, San Bernardino, El Centro, Santa Paula, Desert Hot Springs

TABLE 15 Reasons for Non-Adopters

REASONS	PERCENT
Not interested	21%
Don't have a computer	13%
Too difficult	10%
Don't have the skills	8%
Too old to learn	8%
Don't have access	7%
Too expensive	6%
Don't need or want it	6%
Waste of time	4%
Physically unable (poor eyesight or disabled)	4%
Too busy/No time	3%
Worried about security	3%
Other	7%
SUMMARY OF REASONS	
Relevance (not interested/waste of time/too busy/don't need or want)	34%
Usability (difficult/too old/don't know how/physically unable/worried about security)	32%
Price (too expensive/don't have a computer)	19%
Lack of Availability/Access	7%

Source: Inland Empire Regional Broadband Consortium - Broadband Access Plan

Unfortunately, many non-adopters do not understand or recognize the value of the internet. Approximately 16% of Americans are not digitally literate and people who face challenges tend to be one or a combination of the following demographics: senior, less educated (did not finish high school), low-income, of Black or Latino descent and/or foreign-born citizens who face language barriers.⁴¹ And while there are those who consider internet too expensive; many consider it a waste of time or are not interested in using the internet (See Table 15. Reasons From Non-Adopters).⁴²

Those who are not digitally literate are likely to be members of populations with a high concentration of health and financial risks. With access, senior citizens can apply for public medical assistance, visit their doctors online and purchase medication directly from the hospital websites. Low-income households and minority communities can access information or apply for public assistance programs online. Digital literacy can also protect one from crime. Senior citizens and minority communities are also the most common targets for online scams such as phishing and identity theft.⁴³ These groups stand to benefit the most from digital literacy, yet they often have the lowest levels of knowledge in these areas, and educational programs are rarely suited to their needs.

41 A description of U.S. Adults who are not digitally literate. United States Department of Education. Available at: <https://nces.ed.gov/pubs2018/2018161.pdf>

42 Inland Empire Broadband Consortium Infrastructure and Access Plan. IERBC. Available at: <http://iebroadband.com/Portals/0/Inland%20Empire%20Broadband%20Infrastructure%20and%20Access%20Plan%2011-6-2014.pdf>

43 Researchers aim to boost digital literacy skills of populations vulnerable to scams. Available at: <https://news.ku.edu/2019/01/16/researchers-develop-test-program-boost-digital-literacy-skills-populations-most-risk>

The “homework gap” experienced by children of low-income households can prevent social mobility. A study found that six- to seven-year-olds scored a higher average digital quotient (DQ) score than adults who are aged 45-49.⁴⁴ While there are concerns over social media and its impact on children, there are benefits to early exposure. Children can quickly learn to access and exchange information, develop basic software and coding skills, learn different languages, and develop other special skills such as music and art, through free online resources. Children who are digitally divided may fall behind peers of more affluent backgrounds, decreasing the likelihood of being a competitive applicant for universities, trade schools and the workforce.⁴⁵

The effect of the digital divide is starting to show amongst young adults. Black and Latino/Hispanic communities are 10 years behind White communities with respect to digital skills.⁴⁶ Approximately 60% of the Latino/Hispanic population and 70% of the Black population cite being unprepared for jobs which require digital skills.⁴⁷ Combined with the rapid digitization of the U.S. economy, this suggests that large numbers of the Black and Latino/Hispanic American workers could be disqualified or underprepared for 86% of jobs in the U.S. by 2045.⁴⁸

44 Ofcom: six-year-olds understand digital technology better than adults. The Guardian. Available at: <https://www.theguardian.com/technology/2014/aug/07/ofcom-children-digital-technology-better-than-adults>

45 The demographics of device ownership. Pew Research Center. Available at: <https://www.pewresearch.org/internet/2015/10/29/the-demographics-of-device-ownership/>

46 America's Racial Gap & Big Tech's closing window. Deutsche Bank. Available at: https://www.dbresearch.com/PROD/RPS_EN-PROD/America%27s_Racial_Gap_%26_Big_Tech%27s_Closing_Window/RPS_EN_DOC_VIEW.caliias?rwnode=PROD0000000000464258&ProdCollection=PROD0000000000511664

47 The U.S. has a “racial tech gap” problem. Marketplace. <https://www.marketplace.org/2020/09/18/racial-tech-gap-broadband-hardware-access-deutsche-bank-employment-wealth-digitization-us-economy/>

48 The U.S. has a “racial tech gap” problem. Marketplace. <https://www.marketplace.org/2020/09/18/racial-tech-gap-broadband-hardware-access-deutsche-bank-employment-wealth-digitization-us-economy/>

POOR DATA

Detailed data on broadband infrastructure, service availability and reliability, and adoption are not available to the public. Data that is available to the public (i.e., FCC⁴⁹ and CPUC⁵⁰ maps) are either inaccurate or not useful due to the lack granularity. Inaccurate data makes it difficult for state and local governments to justify their funding needs as current maps may show a region’s baseline state to appear better than actual reality. For example, a state or federal map may say that a resident in a particular neighborhood should have services that can provide speeds up to 25/3 or 100/20 Mbps, but the resident may experience maximum speeds of 10/1 Mbps. There have been attempts to use speed test data from data collector firms such as Ookla⁵¹ and M-lab⁵², but this too can be inaccurate as users tend to report speeds when broadband is activated for the first time and when they are experiencing bottlenecks or outages, thus capturing speeds at extreme ends. This level of inaccuracy hinders progress as it is difficult to gauge the full extent of the digital divide.

MPOs such as SCAG and SANDAG, with the assistance from Caltrans and CPUC have made attempts to determine baseline conditions by analyzing data at the census block level, but it still does not provide the level of accuracy needed to determine last-mile infrastructure. This is not the fault of the state and/or federal government as granular or address level data is held by the ISPs and are proprietary and cannot be released to the public.

49 Fixed Broadband Deployment. FCC. Available at: <https://broadbandmap.fcc.gov/#/>

50 California Interactive Broadband Map. CPUC. Available at: <https://www.broadbandmap.ca.gov/>

51 SpeedTest. Ookla. Available at: <https://www.speedtest.net/>

52 Measurement Lab. M-Lab. Available at: <https://www.measurementlab.net/>

EFFORTS TO BRIDGE THE DIVIDE

FEDERAL GOVERNMENT

Like the State of California, the United States Government has made attempts to bridge the digital divide with the passage of legislative bills to fund broadband infrastructure, subsidies, and programs. This section provides a high-level overview of some of the federal government's initiatives.

CORONAVIRUS AID, RELIEF, AND ECONOMIC SECURITY (CARES) ACT

In response to the COVID-19 pandemic, the CARES act, a \$2.2 trillion economic stimulus bill was passed by the U.S. Congress and signed into law by President Donald Trump on March 27, 2020. The CARES act set aside funding to assist with telehealth programs, affordable broadband for households, and digital access for the education sector.⁵³ Key programs funded by the CARES act are as follows:

- **COVID-19 Telehealth Program** – A \$500 million federal initiative administered by the FCC which supports the efforts of health care providers to continue serving their patients by providing telecommunications services, information services, and connected devices necessary to enable telehealth during the COVID-19 pandemic.⁵⁴
- **Emergency Broadband Benefit (Now Defunct)** – \$3.2 billion Emergency Broadband Benefit administered by the FCC to help households struggling to pay for internet service during the pandemic. The program provided a discount of up to \$50 per month towards broadband service for eligible households and up to \$75 per month for households on Tribal lands. Eligible households also received a one-time discount of up to \$100 to purchase a laptop, desktop computer, or tablet from participating providers if they contribute more than \$10 or less than \$50 toward the purchase price.⁵⁵
- **Emergency Connectivity Fund** – A \$7.1 billion Emergency Connectivity Fund administered by the FCC that enabled eligible schools and libraries to purchase equipment and advanced telecommunications and information services for use by students, school staff, and library patrons at locations other than a school or library.⁵⁶

⁵³ CARES act. Available at: <https://www.congress.gov/bill/116th-congress/senate-bill/3548/text>

⁵⁴ COVID-19 Telehealth Program. Available at: <https://www.fcc.gov/covid-19-telehealth-program-invoices-reimbursements>

⁵⁵ Emergency Broadband Benefit Program. Available at: <https://www.fcc.gov/broadbandbenefit>

⁵⁶ Emergency Connectivity Fund. Available at: <https://www.fcc.gov/emergency-connectivity-fund>

INFRASTRUCTURE INVESTMENT AND JOBS ACT

The Infrastructure Investment and Jobs Act (IIJA), a \$1.2 trillion plan, was passed by the U.S. Congress and signed into law by President Joseph Biden on November 15, 2021. Approximately \$65 billion was set aside for broadband and digital divide initiatives. Key programs funded by the IIJA are as follows:

- **Broadband Equity, Access, Deployment (BEAD) Program** – A \$42.5 billion program administered by the National Telecommunications and Information Administration (NTIA) to expand high-speed internet access by funding planning, infrastructure deployment and adoption programs in all 50 states.⁵⁷
- **Enabling Middle-Mile Broadband Infrastructure Program** – A \$1 billion program administered by the NTIA which funds the extension of middle mile infrastructure to reach unserved and underserved areas.⁵⁸
- **Digital Equity Program** – A \$2.75 billion program administered by the NTIA to fund programs which support the closure of the digital divide, promote equity and digital inclusion so that individuals and communities have the information technology capacity that is needed for full participation in the society and economy of the United States.⁵⁹
- **ReConnect Program** – A \$2 billion program administered by the USDA which furnishes loans and grants to provide funds for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide broadband services in eligible rural areas.⁶⁰

⁵⁷ Broadband Equity, Access, and Deployment (BEAD) Program. Available at: <https://broadbandusa.ntia.doc.gov/resources/grant-programs/broadband-equity-access-and-deployment-bead-program#:~:text=The%20Broadband%20Equity%2C%20Access%2C%20and,and%20the%20Commonwealth%20of%20the>

⁵⁸ Enabling Middle Mile Broadband Infrastructure Program. Available at: <https://broadbandusa.ntia.doc.gov/resources/grant-programs/enabling-middle-mile-broadband-infrastructure-program>

⁵⁹ Digital Equity Program. Available at: <https://broadbandusa.ntia.doc.gov/resources/grant-programs/digital-equity-programs>

⁶⁰ ReConnect Loan and Grant Program. Available at: <https://www.usda.gov/reconnect>

- **Affordable Connectivity Program (ACP)** – A \$14.2 billion program administered by the FCC to replaces the now defunct EBB (Emergency Broadband Benefit) program. The benefit provides a discount up to \$30 per month towards internet service for eligible households and up to \$75 month for households on qualifying Tribal lands. Eligible households can also receive a one-time discount of up to \$100 to purchase a device from participating providers if they contribute more than \$10 and less than \$50 toward the purchase price.⁶¹
- **Tribal Broadband Connectivity Program** – A \$980 million program directed to tribal governments to be used for broadband deployment on tribal lands, as well as for telehealth, distance learning, broadband affordability, and digital inclusion.⁶²

⁶¹ Affordable Connectivity Program. Available at: <https://www.fcc.gov/acp>

⁶² Tribal Broadband Connectivity Program. Available at: <https://broadbandusa.ntia.doc.gov/resources/grant-programs/tribal-broadband-connectivity-program>

REDEFINING BROADBAND

On July 15, 2022, FCC chairwoman Jessica Rosenworcel circulated a Notice of Inquiry that would kick off the agency’s annual evaluation of the state of broadband across the country and proposed increasing the national standard for minimum broadband speeds and proposed setting a long-term goal for broadband speed.⁶³ The Notice of Inquiry states that the 25/3 Mbps metric is not just behind the times, it is a harmful one because it masks the extent to which low-income neighborhoods and rural communities are being left behind and left offline. The Notice of Inquiry proposes to increase the national broadband standard to 100 megabits per second for download and 20 megabits per second for upload, and discusses a range of evidence supporting this standard, including the requirements for new networks funded by the IIJA. Further, the Notice of Inquiry proposes to set a separate national goal of 1 Gbps/500 Mbps for the future. While this new definition has yet to be adopted, it is apparent that the FCC is aware of the issues ahead and are working towards a solution.

⁶³ Chairwoman Rosenworcel proposes increase in minimum broadband speeds. FCC. Available at: <https://www.fcc.gov/document/chairwoman-rosenworcel-proposes-increase-minimum-broadband-speeds>

STATE OF CALIFORNIA

Since the onset of the COVID-19 Pandemic, the State of California has accelerated its efforts to bridge the digital divide. This section will provide a high-level overview of some of the State’s initiatives.

EXECUTIVE ORDER N-73-20

On August 2020, Governor Gavin Newsom signed Executive Order N-73-20 to advance the state’s commitment to bridging the digital divide by increasing equitable, affordable access to high-speed internet service across California.⁶⁴ The executive order addresses the following:

- **Speed:** Directives to redefine California’s minimum broadband speed threshold to 100/20 Mbps
- **Broadband for All Plan:** Authorized the development of the California Broadband for All Plan (Published in December 2020)⁶⁵
- **Mapping and Data:** Directs agencies to gather data and develop a mapping tool which provides granular data, to the fullest extent as possible
- **Public/Private Partnerships:** Directs agencies to work with the private sector to project current and future demand for broadband
- **Funding:** Directs agencies to identify funding sources to support infrastructure, devices, and digital literacy programs
- **Infrastructure Deployment:** Directs state agencies to deploy new or bolster infrastructure to accommodate broadband to support low-income and rural communities, emergency services, agriculture and food systems, and recommendations for low-cost broadband for public and low-income housing
- **Outreach:** Develop tools for qualified applicants to apply for affordable broadband plans
- **Digital Literacy:** Directs agencies to analyze the needs of seniors and provide literacy training

⁶⁴ Executive Order N-73-20. Available at: <https://www.gov.ca.gov/wp-content/uploads/2020/08/8.14.20-EO-N-73-20.pdf>

⁶⁵ California’s Broadband for All Plan. Available at: <https://broadbandcouncil.ca.gov/wp-content/uploads/sites/68/2020/12/BB4All-Action-Plan-Final.pdf>

AB/SB 156 – BROADBAND BUDGET BILL

On July 20, 2021, Governor Gavin Newsom signed Assembly Bill/Senate Bill 156, also known as the Broadband Budget Bill.⁶⁶ At \$6 billion, the Broadband Budget Bill is the largest public infrastructure investment in the nation. The bill prioritizes the construction of broadband infrastructure in unserved and underserved communities, providing grant opportunities to support local jurisdictions, tribal governments, the education sector, digital devices, digital literacy programs and technical studies. AB/SB 156 provides:

- \$2 Billion for last-mile broadband infrastructure, which will increase connectivity to unserved and underserved low-income urban and rural communities
- 3.25 billion for a statewide, open-access, middle mile network
- \$750 million to a loan loss reserve account
- Reforms the California Advance Service Funds (CASF) which provides additional funding to bond accounts, digital literacy programs, Regional Broadband Consortia (RBC), and technical reports⁶⁷

CPUC BROADBAND IN SCHOOLS INITIATIVE

The CPUC and the California Department of Education (CDE) formed a partnership to distribute a total of \$30 million to support connectivity. The funds were supported were made available from the California Teleconnect Fund (CTF) and California Advanced Services Fund (CASF).⁶⁸ The funds provided 50 percent discounts on the cost of hotspot services and were targeted towards low-income communities, communities with high percentages of residents with limited English proficiency, and communities' high percentages of residents with limited education attainment.

⁶⁶ AB/SB 156 – Broadband Budget Bill. Available at: https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=20210220SB156

⁶⁷ AB/SB 156 – Broadband Budget Bill. Available at: https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=20210220SB156

⁶⁸ Governor Newsom Announces Cross-Sector Partnerships to Support Distance Learning and Bridge the Digital Divide. Available at: <https://www.gov.ca.gov/2020/04/20/governor-newsom-announces-cross-sector-partnerships-to-support-distance-learning-and-bridge-the-digital-divide/>

CALIFORNIA BROADBAND MIDDLE MILE INITIATIVE

After the passage of the Broadband Budget Bill, CDT retained GoldenStateNet, a subsidiary of CENIC networks to administer open access broadband connections through middle-mile infrastructure across California.⁶⁹

While California has been developing middle mile development over the past several decades, on November 18, 2021, 18 accelerated middle-mile projects were unveiled, 5 of which are in the SCAG Region (See Table 16. Middle Mile Projects in the SCAG Region and Figure 3. Broadband Middle Mile: Unserved Groups and Fiber Builds) (For County-Level Maps, please refer to Appendix C County Level Middle-Mile Projects).⁷⁰

Upon completion of the middle-mile network, local jurisdictions and ISPs will have the opportunity to connect their last-mile solutions to the network and provide affordable high-speed broadband services to their communities.

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Caltrans has recognized the importance of broadband and have been tasked to provide oversight over the construction of the middle-mile network be installed along their right of way (ROW).⁷¹

Further, Caltrans has been promoting the use of “Dig Once” policies for transportation network improvements. According to the Federal Highway Administration (FHWA), “Dig Once” refers to requirements designed to reduce the number and scale of repeated excavations for the installation and maintenance of broadband facilities in ROW.⁷² Simply put, whenever major roadway improvements occur, an entity should take the opportunity to install conduit simultaneously, to minimize time, cost, and environmental impacts.

⁶⁹ GoldenstateNet/CENIC. Available at: <https://cenic.org/initiatives/goldenstatenet>

⁷⁰ Middle Mile Broadband Initiative. CDT. Available at: <https://middle-mile-broadband-initiative.cdt.ca.gov/pages/resources>

⁷¹ Middle Mile Broadband Initiative. CDT. Available at: <https://middle-mile-broadband-initiative.cdt.ca.gov/pages/resources>

⁷² Dig Once Policy. FHWA. Available at: https://www.fhwa.dot.gov/policy/otps/policy_brief_dig_once.pdf

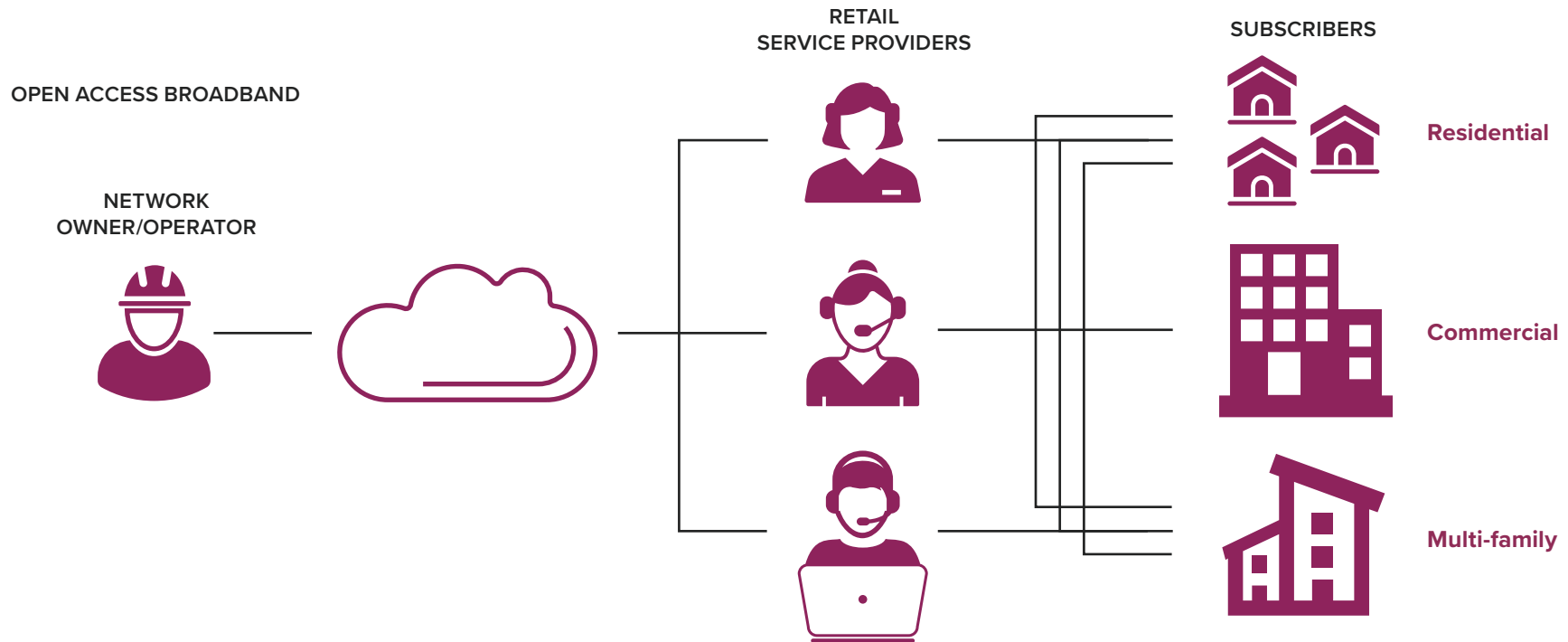
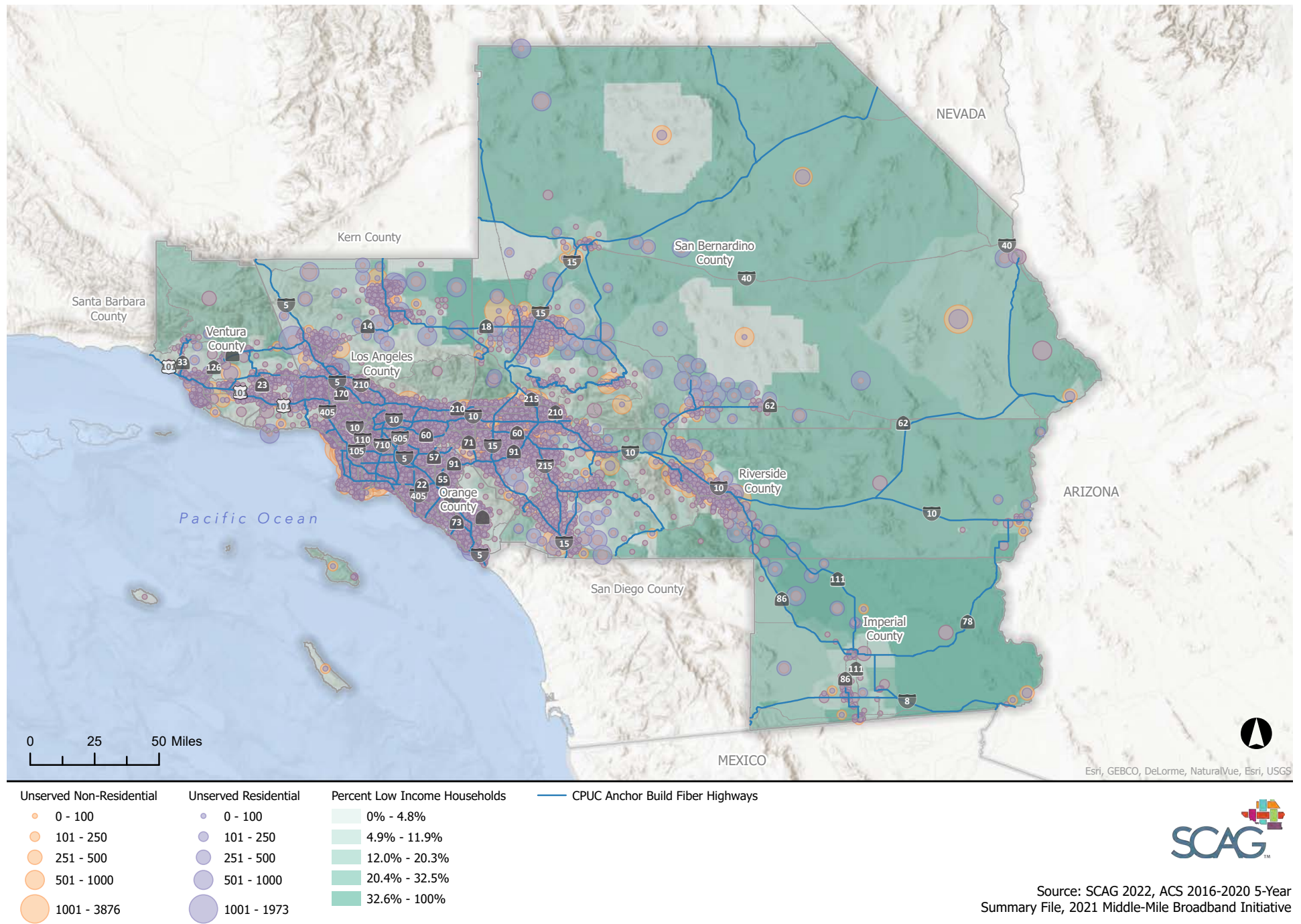


TABLE 16 Middle Mile Projects in the SCAG Region

PROJECT NAME	DESCRIPTION	MILES (FIBER)
San Bernardino	Hwy 247, High Desert, Barstow to Thorn	47.6
Los Angeles/South Los Angeles	South Los Angeles communities including South Gate, Lynwood, Paramount, Bell Flower, Compton and Lakewood	120
Orange County	Inland Orange County communities including Buena Park, Orange Fullerton, Garden Grove and Westminster	80
Riverside County (Coachella Valley)	Palm Springs to Indio and Coachella	20.5
Riverside/San Diego County	San Diego and Riverside counties including the Cahuilla Reservation, Julian and Santee	227.8

Source: GoldenStateNet. Middle Mile Broadband Initiative. Available at: <https://middle-mile-broadband-initiative.cdt.ca.gov/pages/cdt-approval-tpa-recommendations>

FIGURE 3 Broadband Middle Mile: Unserved Groups and Fiber Builds



Esri, GEBCO, DeLorme, NaturalVue, Esri, USGS



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative

CALIFORNIA BROADBAND COUNCIL

The California Broadband Council (CBC) was established in 2010 by SB 1462 (Chapter 338, Statutes of 2010) to promote broadband deployment in unserved and underserved areas of the state as defined by the Public Utilities Commission, and broadband adoption throughout the state.⁷³

The CBC identifies state resources, encourages public and private partnerships, and recommends strategic policy to establish effective structures for providing world-class high-speed Internet access throughout California. The 12-member CBC is run by CDT's Office of Broadband and Digital Literacy which provides support by managing the statewide ecosystem of individuals and organizations dedicated to closing the digital divide.

OTHER ENDEAVORS

Digital Devices – In April 2020, the state mobilized companies, business leaders and philanthropists through public-private partnerships to facilitate distance learning at school districts in need across the state. As many families of low-income households reported that they needed broadband or devices, a public-private partnership initiative was formed to connect students with mobile hotspots, laptops, Chromebooks, tablets, and other devices.⁷⁴

Digital Literacy – On August 31, 2022, The California Department of Education announced its partnership with technology company Footsteps2Brilliance on a new bilingual digital reading and writing initiative.⁷⁵ The program is targeted towards solving both the language literacy and digital illiteracy issues students of minority populations face. The program is an app-based system that gamifies learning through 500 bilingual activities, from interactive books to games to songs.⁷⁶

⁷³ California Broadband Council. CBC. Available at: <https://broadbandcouncil.ca.gov/about-us/>

⁷⁴ Governor Newsom Announces Cross-Sector Partnerships to Support Distance Learning and Bridge the Digital Divide. Available at: <https://www.gov.ca.gov/2020/04/20/governor-newsom-announces-cross-sector-partnerships-to-support-distance-learning-and-bridge-the-digital-divide/>

⁷⁵ California rolls out free bilingual digital literacy program for young students. Available at: <https://spectrumnews1.com/ca/la-west/education/2022/08/31/california-rolls-out-free-bilingual-digital-literacy-program-for-young-students>

⁷⁶ Footsteps2Brilliance. Available at: <https://www.footsteps2brilliance.com/>

LOCAL JURISDICTIONS

Local jurisdictions play a critical, if not the most critical role for last mile access. While ISPs are design, deploy and operate, local jurisdictions guide the development of broadband through their planning efforts, permitting process and are the most knowledgeable of areas that need service. Local jurisdictions have made attempts to the bridge the divide by developing visionary plans and programs or providing service themselves. Below are two examples of local jurisdictions doing their part.



LOS ANGELES COUNTY (INTERNAL SERVICES DEPARTMENT)

Los Angeles County has several digital equity initiatives. However, one which deserves highlighting is the Free Broadband Initiative Pilot Program proposed by the Los Angeles County Internal Services Department (ISD).⁷⁷ The goal is to develop a pilot program which can eventually scale to provide free wireless services to approximately 365,000 households that are either unconnected or under connected. The Plan proposes a pilot program which would:

- **Develop Community Wireless Networks** that utilize radio service and 5 GHz wireless antennas mounted on County managed real estate assets and privately-owned sites whose owners will make their buildings available for the network.
- **Install Radios and Routers** at the homes of eligible LA County residents, initially focused on four areas of the county with some of the lowest levels of broadband adoption – the neighborhoods around the I-110 Corridor, East Los Angeles, the Alameda corridor around Tweedy Boulevard, and the rural Antelope Valley – and deployed in partnership with community-based organizations, generating well-paying jobs for residents in these communities whenever possible.

⁷⁷ Free Broadband for the Residents of the County of Los Angeles. LA County ISD. Available at: https://file.lacounty.gov/SDSInter/bos/bc/1113566_UtilizingExistingInfrastructureandResourcestoAccelerateDigitalEquity9-30-21.pdf

- **Procure a Managed Service Provider (MSP – different from an ISP)** to provide network development and management services under County oversight, working in collaboration with community-based organizations for local hiring.
- **Create an inter-agency Pilot Program Management Team** supported by a professional program management team experienced with wireless network deployments, with the mandate to ensure that County real estate assets and relevant permits are secured efficiently and to monitor pilot program progress to inform its refinement and the development of further County actions.



RIVERSIDE COUNTY (RIVCO CONNECT)

In September 2016, the Riverside County Board of Supervisors approved the Riverside Broadband Master Plan, proposed by their Digital Equity Department (RIVCO Connect) to establish a road map that can be used by County departments to work together to develop fiber to the premises (FTTP) infrastructure. Infrastructure would consist of “dark fiber” or fiber that has yet to be activated and can be used for either the development of a municipal or privately operated network. The Broadband Master Plan lays out a vision which provides general design guidelines, is technology agnostic and is aligned with their general plan and is forward thinking (i.e., planning for smart cities initiatives).⁷⁸

Over the past few years, RIVCO Connect also implemented a digital equity program (DEP) which seeks to bridge the digital divide by acting on the following strategies⁷⁹:

- **Digital Equity Program** – RIVCO Connect advances digital equity by through the refurbishment, repurposing and donation of surplus computers and related technology equipment in partnership and collaboration with Community Action Partnership (CAP), the County’s Department of Public Social Services (DPSS) and the Economic Development Agency (EDA), the county is working with community non-profit organizations to donate and train residents on the use of computers. Since the goal of the county is to enable resident’s self-sufficiency, the DEP program also hires and trains those receiving social service benefits through DPSS to do e-waste sorting and materials handling, refurbish computers, and general warehouse operations. This training program helps those in need to gain skills and experiences that help them to qualify participants for future employment opportunities.
- **Broadband** – RIVCO Connect advocates for high-speed broadband services throughout all 87 incorporated, unincorporated, and tribal communities within Riverside County. This advocacy includes a low cost or free option for qualifying residents. High speed broadband services are the foundation of 5G cellular services, smart and intelligent communities, and connected families around our nation.
- **Digital Literacy Training** – The DEP program has partnered with school districts throughout the county, other local government agencies, non-profit organizations to provide computer literacy training.

⁷⁸ Riverside County Broadband Master Plan. Riverside County. Available at: <https://rivcoconnect.org/Portals/0/RivcoDocs/Broadband%20Master%20Plan%20for%20Riverside%20County.pdf>

⁷⁹ RIVCO Connect. Riverside County. Available at: <https://rivcoconnect.org/About-Us/Documents>

INTERNET SERVICE PROVIDERS

ISPs can and have been playing a pivotal role in bridging the digital divide. Below are some examples of private sector initiatives.



AT&T

In April 2021, AT&T announced a \$2 billion investment to bridge the digital divide.⁸⁰ The investment will go towards discounted access for low-income families and schools:

Access Program – AT&T is providing up to 100 Mbps for \$30 per month or less. Contracts or installation fees are waived, and a Wi-Fi modem is provided at no charge. Anyone who is qualified under the ACP program is qualified for this service.⁸¹

Connected Learning – AT&T's connected learning program provides connectivity for students and teachers. The goal of this program is to assist in closing the homework gap by providing students and teachers discounted wireless data plans and free Wi-Fi hotspots. In addition, AT&T has been investing in teacher-focused organizations across the nation and digital literacy programs to help students with special needs.⁸²

⁸⁰ AT&T Makes \$2 Billion, 3-Year Commitment to Help Bridge the Digital Divide AT&T Available at: https://about.att.com/story/2021/digital_divide.html

⁸¹ Access. AT&T. Available at: <https://www.att.com/internet/access/>

⁸² ConnectedLearning. AT&T. Available at: <https://about.att.com/csr/home/society/education.html>



COX COMMUNICATIONS

Cox communications is doing its part by offering two low-income internet options for qualifying participants through its Connect2Compete and Connect Assist Programs.

Connect2Compete – The Connect2Compete program provides affordable internet plans for households with students and offers up to 100 Mbps for \$9.95/mo. and includes a free Wi-Fi modem and no deposits or annual contracts. To qualify for this plan, participants must have at least one K-12 student in their household and have at least one member of the household enrolled in the National School Lunch Program (NSLP), Public Housing, Supplemental Nutrition Assistance Program (SNAP) or Temporary Assistance for Needy Families (TANF).⁸³

Connect Assist – For households who do not qualify for the Connect2Compete program. The Connect Assist provides low-cost internet plans to households who are qualified under the ACP program.⁸⁴

⁸³ Connect2Compete. COX Communications. Available at: <https://www.cox.com/residential/internet/connect2compete.html>

⁸⁴ Connect Assist. COX Communications. Available at: <https://www.cox.com/residential/internet/low-cost-internet-plans.html>



SPECTRUM

Since the onset of the COVID-19 Pandemic, Spectrum has worked towards bridging the digital divide by developing programs which expand digital education and digital literacy and are providing affordable internet plans to households.

Spectrum Digital Education Program – This program supports non-profit organizations to educate communicate community members on the benefits of broadband and provide, digital devices, digital literacy training, through a grant program. Since 2020, 48 grants have been distributed across the nation and has helped in teaching seniors’ digital skills, purchasing of laptops for underserved communities, online classes to assist in homework or job support, and setting up technology labs.⁸⁵

Spectrum Internet Assist – Spectrum is providing up to 30 Mbps for \$30 per month or less. Data caps are waived, and a modem is provided at no charge. Anyone who is qualified under the ACP program is qualified for this service.⁸⁶

⁸⁵ Spectrum Digital Education Program. Spectrum. Available at: <https://corporate.charter.com/digital-education>
⁸⁶ Spectrum Internet Assist. Spectrum. Available at: <https://www.spectrum.com/internet/spectrum-internet-assist>



VERIZON

Verizon is doing its part by improving educational opportunities for disadvantaged students, providing low-cost internet plans to households, and expanding connectivity into rural communities.

Innovative Learning Program – In 2012, Verizon launched its Innovative Learning Program which provides free internet access and devices, and works with educational institutions, non-profits, and technology experts to develop online STEM (Science, Technology, Engineering, and Math) programs and lessons to students. Verizon’s initiative goal is to assist 10 million students by 2030.⁸⁷

Fios Forward and Affordable Mobile Plans – For households qualified under the ACP program, Verizon offers free or discounted fiber plans and affordable cellular plans.⁸⁸

Rural Connectivity – Verizon is also in the process of expanding its 5G Home Internet to more areas of the U.S., including rural communities. Verizon is currently available in 31 markets, and it announced in the first quarter of 2021 that it plans to offer up to 1 Gig speeds to 250 million Americans on its 5G network by 2024. This project will cost \$10 billion.⁸⁹

⁸⁷ Innovative Learning Program. Verizon. Available at <https://www.verizon.com/about/responsibility/digital-inclusion/verizon-innovative-learning>
⁸⁸ Fios Forward and Discounted Mobile Plans. Verizon. Available at: https://www.verizon.com/home/promo/affordable-connectivity-program/?CMP=OLA_CON_NA_22222_NA_20211230_NA_NM20210172_00001
⁸⁹ Which internet providers are addressing the digital divide? AllConnect. Available at: <https://www.allconnect.com/blog/which-internet-providers-are-addressing-the-digital-divide>

NON-PROFITS

Non-profits play an important role in bridging the digital divide. Public and privately funded non-profits consist of researchers and leaders who are invested in helping the public through philanthropy, research on niche topics, and grassroots efforts to advocate for the specific needs of their communities. Their expertise, deep ties to the communities, and passion to bridge the digital divide provide reach far beyond the government and private sector. Below are some non-profit initiatives:



CALIFORNIA EMERGING TECHNOLOGY FUND⁹⁰

The California Emerging Technology Fund (CETF) is a non-profit which focuses on forging partnerships and fostering public policy to close the Digital Divide. CETF has provided seed capital to grants for non-profit organizations in three priority communities: rural and remote areas; urban disadvantaged neighborhoods; and people with disabilities. As a result, more than 100 grantees have delivered digital literacy training to more than 800,000 residents and got more than 250,000 low-income households online.

Additionally, CETF has advanced policies and initiatives such as securing the Governor's Executive Order on Digital Literacy; designing and managing School2Home, founding and funding the California Telehealth Network; leading projects to connect residents in publicly subsidized complexes; developing model policies for smart communities, and conducting annual studies with the University of Southern California assessing the adoption progress rate of California.

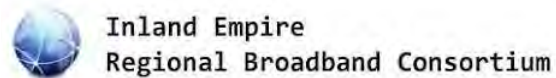
⁹⁰ California Emerging Technology Fund. Available at: <https://www.cetfund.org/>

NATIONAL CORE⁹¹

National CORE is a non-profit organization centered around developing and operating housing. While housing is their primary objective, National CORE also works on supporting efforts with local communities, businesses, nonprofits, and community-based organizations to advance equity across the region.



They recognize that low-income urban neighborhoods and underserved rural communities, including Tribal Lands, often lack the infrastructure to access the internet – this “digital divide” creates a huge barrier to educational and economic growth for many communities. National CORE has provided support in convening a broad coalition of leaders representing health, education, business, government, philanthropy, and other disciplines to address broadband connectivity issues throughout the Southern California region.



INLAND EMPIRE REGIONAL BROADBAND CONSORTIUM⁹²

The Inland Empire Regional Broadband Consortium (IERBC) is a non-profit dedicated towards addressing broadband technology access, planning, service reliability, affordability, infrastructure requirements and deployment, and needs within both San Bernardino and Riverside Counties. IERBC represents a variety of urban, suburban, rural, mountain and desert interests in the region with strong concern and commitment to becoming a ‘smart region’, closing the Digital Divide, and improving broadband speed, reliability, availability, cost, and access in the Inland Empire.

⁹¹ National Core. Available at: <https://nationalcore.org/about-us/commitment-to-community/>

⁹² Inland Empire Regional Broadband Consortium. Available at: <http://www.iebroadband.com/>

IERBC is funded through the California Public Utilities Commission (CPUC) to provide collaborative broadband planning within the San Bernardino and Riverside County region. And to-date, IERBC has successfully facilitated \$55 million in CPUC California Advanced Services Fund (CASF) Broadband Infrastructure and Adoption Grants in Riverside and San Bernardino Counties.



LOS ANGELES DIGITAL EQUITY ACTION LEAGUE⁹³

The Los Angeles Digital Equity Action League (LA DEAL) is a non-profit Regional Broadband Consortia funded and recognized by the CPUC to advance broadband initiatives in Los Angeles County. The LA DEAL Consortium convenes with community leaders and stakeholders to develop and implement an actionable roadmap to end the digital divide, including overcoming specific barriers to universal broadband access and adoption across L.A. County. LA DEAL provides tutorials and information regarding broadband grant opportunities, leads mapping initiatives, hosts workshops and task forces and works with stakeholders to develop policies directed towards bridging the digital divide.



LOS ANGELES/ORANGE COUNTY BROADBAND COLLABORATIVE⁹⁴

The Los Angeles/Orange County Broadband Collaborative (LA/OCRBC) is a non-profit and is comprised of six sub-regional consortiums representing communities in both Los Angeles and Orange Counties.

⁹³ Los Angeles Digital Action League. Available at: <https://ladeal.org/>

⁹⁴ Los Angeles/Orange County Broadband Collaborative. Available at: <https://laocrbc.org/index.php/en/about>

The LA/OCRBC is responding to the pandemic by helping engage key stakeholders to address the Digital Divide, including local government officials, major employers, community leaders, and Internet Service Providers (ISPs). LA/OCRBC over the past few years have been hosting forums which discuss and advocate the need for broadband, its associated technology, and its benefits to society.

PARTNERSHIPS

As shown, there are several players working towards bridging the digital divide, all in their own unique way. Some choose to fund, some build, some provide service, some provide information, and some advocate. But there is one missing critical piece that has yet to be discussed:

Partnerships.

Addressing all the barriers and serving the needs of millions of households spread across a vast region is an impossible task for one entity or sector to handle. The formation of partnerships across all sectors allows for a unified approach to solutions, without the expense of each party, including the household in need.

For example, a local jurisdiction and an ISP may have asymmetric goals when it comes to broadband. A local jurisdiction may want to exercise a level of control to ensure that broadband will remain responsive to community needs, and they will place higher value on advancing initiatives such as economic development, education, workforce development over profit. Whereas an ISPs primary objective is to meet revenue and return on investments. An effective partnership can enable each entity to achieve its goals.

PARTNERSHIP MODELS

There are several models for partnerships and no model is better than the other. A partnership should be designed to execute the project in a timely and cost-effective manner, provide an affordable high-speed service to households, and if possible, technology agnostic. The NTIA recommends that partnerships follow one of three models:⁹⁵

- **Private Sector Led** – A commercial operator (private or non-profit) builds, owns and operates the network. Community Anchor Institutions (libraries, schools, medical facilities) and economic development authorities support the business case by contributing planning, monetary and regulatory support, and by aggregating demand and securing customer commitments in advance.
- **Government-Led and Privately Supported** – A public entity (e.g., state, county or city government, municipal electric utility, or rural coop) owns the network and private partners construct, operate and/ or maintain the network in exchange for financial and in-kind support, as well as the types of contributions described in the private-sector led model. The public entity may either use an existing organization, such as a municipal electric system, or create an entirely new one.
- **Joint-Ownership Model** – A commercial operator (private or non-profit) and the public enterprise jointly invest in the network and share capacity. Both partners also contribute a mix of financial, in-kind, and other support to the project.

These models do not apply to infrastructure projects only, they also apply to digital device, digital literacy, and equity programs as well.

⁹⁵ The power of broadband partnerships. NTIA. Available at: https://broadbandusa.ntia.doc.gov/sites/default/files/publication-pdfs/bbusa_power_broadband_partnerships.pdf

EQUAL PARTNERSHIP

Regardless of which model is chosen, all parties involved should be treated as equals as each partner provides critical resources:⁹⁶

- **Government** – Federal, state, and local governments provide leadership, large scale public investments via taxes, identify community needs, develop policies and initiatives, access to public lands, right of way (ROW) access, and can host community and townhall meetings.
- **Private Sector** – The private sector can provide materials, equipment, innovative design and engineering, private capital, customer and network support and expertise.
- **Community Forces** – Non-profit groups can conduct research, outreach, host campaign efforts, fundraising, educate, spread awareness and work with community leaders to drive or locate demand at a grassroots level.

Leveraging all these skillsets can bring a project to fruition and those who are underserved and unserved benefit the most.

THE PARTNER OF ALL PARTNERS

But how do these partners connect with one another to form relationships, share resources, and reach a common goal? Who can bring everyone together?

That is where SCAG comes in!

⁹⁶ The power of broadband partnerships. NTIA. Available at: https://broadbandusa.ntia.doc.gov/sites/default/files/publication-pdfs/bbusa_power_broadband_partnerships.pdf



SCAG'S DIGITAL ACTION PLAN

The Digital Action Plan lays out a comprehensive set of goals, strategies, and actions that the agency will take towards bridging the digital divide. SCAG has already initiated work efforts which align with the agency's goals and the Digital Action Plan (described under *The Work We've Done So Far*). The Action Plan proposes additional work efforts, potential deliverables, associated partnerships, and a high-level timeline for each proposed deliverable. SCAG will monitor implementation, evaluate agency priorities, and update the Digital Action Plan on an annual basis to show our progress. Bridging the digital divide will require SCAG to collaborate with various stakeholders, including the federal, state, local governments, other public agencies, non-profits, the education and health sector, and industry leaders.

ABOUT SCAG

Founded in 1965, the Southern California Association of Governments (SCAG) is a Joint Powers Authority under California state law, established as an association of local governments and agencies that voluntarily convene as a forum to address regional issues. Under federal law, SCAG is designated as a Metropolitan Planning Organization (MPO) and under state law as a Regional Transportation Planning Agency and a Council of Governments.⁹⁷

The SCAG region encompasses six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) and 191 cities in an area covering more than 38,000 square miles. The agency develops long-range regional transportation plans including sustainable communities' strategy and growth forecast components, regional transportation improvement programs, regional housing needs allocations and a portion of the South Coast Air Quality management plans. SCAG's governing body consists of an 86-member Regional Council to help accommodate new responsibilities mandated by the federal and state governments, as well as to provide more broad-based representation of Southern California's cities and counties.

⁹⁷ About SCAG. SCAG. Available at: <https://scag.ca.gov/about-us>

SCAG also has close ties with state agencies such as Caltrans and the California Department of Housing and Community Development (HCD) and federal agencies such as the United States Department of Transportation Federal Highway Administration (FHWA). Further, SCAG works with stakeholders from the business, environmental, and non-profit community. By leveraging our regional council, policy committees, and technical working groups, SCAG has extensive experience in bringing representatives from all sectors to develop solutions and strategies with respect to transportation, housing, climate change, and now broadband.

Just as middle-mile and last-mile infrastructure brings connectivity to public/private sectors and households to interact with one another. SCAG can serve as the “conduit” to connect various stakeholders and agencies together to educate and collaborate with one another, conduct consensus building exercises and develop actionable strategies to bridge the digital divide. **However, unlike infrastructure:**

SCAG does not need to be built, we already exist and are already activated.

VISION STATEMENT

“WE ENVISION AN EQUITABLE REGION THAT FOSTERS ACCESSIBILITY AND ADOPTION OF AFFORDABLE HIGH-SPEED BROADBAND SERVICES AND DIGITAL DEVICES FOR ALL ITS RESIDENTS.”

GOALS

The Digital Action Plan is divided into four major goals, each with its own strategies, guiding principles, and supporting action.

1. **Accessibility and Affordability** – Every household in the region should have access to affordable high-speed broadband services and high-quality devices
2. **Adoption** – All residents should have the confidence and skills to participate in digital activities
3. **Consensus** – Build partnerships and reach consensus that high-quality and affordable broadband is an essential service to everyone and provides economic, environmental and safety benefits to the region
4. **Planning** – Develop broadband technical tools and studies which provide value to the region

SCAG STRATEGIES

To reach our goals, we have developed four core strategies (also known as SCAG Strategies):

- **Seek and Secure** – Seek and secure broadband funding for our local jurisdictions and stakeholders to deploy broadband infrastructure, digital devices, and advance digital equity initiatives.
- **Coordinate and Collaborate** – Coordinate, collaborate and build partnerships with public agencies, local jurisdictions, partners, and the public and align work efforts to collectively bridge the digital divide.
- **Advocate and Assist** – Advocate for better data, Southern California’s fair share in funding, open access to broadband networks and assist low-income and rural households in underserved and unserved communities.
- **Gather and Gain** – Gather data and gain knowledge through broadband technical and strategic studies, disseminate findings and inform decision makers and the public.

GUIDING PRINCIPLES

These are the principles which drive our strategies and actions to fulfil our goals and overall vision:

- **Break.** Breakdown barriers which inhibit the deployment of broadband infrastructure
- **Resilience.** Plan or advocate for networks that are efficient and assists in resiliency for communities and infrastructure
- **Invest.** Invest in communities affected by the digital divide
- **Data Driven.** Collect and share data to determine opportunity zones and solutions
- **Grassroots.** Use a bottom-up approach and listen to and prioritize a community's needs
- **Expedite.** Develop solutions which can be quickly implemented and efficiently

- **Determine.** Determine funding opportunities and potential partnerships
- **Innovate.** Promote an atmosphere which allows for healthy competition, innovative solutions which are speed driven, while remaining technologically agnostic
- **Visionary.** Plan or advocate for networks that are scalable, sustainable and accommodates future needs and innovative technology
- **Integrate.** Integrate findings into traditional disciplines of transportation and land use planning
- **Dependable.** Promote transparency and gain the trust of the public, other agencies, and stakeholders
- **Educate.** Educate the public, policy makers and stakeholders and build consensus for collective action

BEYOND THE DIVIDE

The need for better broadband infrastructure goes beyond bridging the digital divide. The future of transportation will rely on digital infrastructure, as communications infrastructure facilitates the flow of images and data required for state-of-the-art transportation management and safety improvements, including connected and autonomous vehicles, reliance on big data, and expanded use of technology which would support emergency services. These improvements are aligned with State of California's Climate Action plan as for Transportation Infrastructure (CAPTI)⁹⁸ and initiatives such as Vizion Zero which aim to support safe and efficient mobility for all transportation system users, including freight and transit operators. At the local scale, smart cities initiatives such as signal synchronization and smart utilities (water, gas, and electricity) require systems to be able to communicate with one another and will be reliant on high-speed fiber and wireless towers. Further, as telework increases in adoption, the way we look at land-use development will also change. While data is not readily available, there is a likelihood that our housing needs, peak traffic (due to shifts in travel patterns), commerce and other factors will change over the decades.

SCAG'S CORE VALUES

Broadband is a new and exciting program for SCAG, and there is a lot of work ahead of us. Bridging the digital divide appears to be a daunting task but our core values provide a solid foundation for the program's success.

SCAG's Strategic Plan – In early 2018, SCAG adopted a new strategic plan which guides the agency to work toward a brighter future for Southern California.⁹⁹ The strategic plan's mission and vision statements, core agency values and set of goals and objectives, allows SCAG to pursue a strategic path that prioritizes innovation, collaboration, and solutions to improve the quality of life for all Southern Californians.

⁹⁸ CAPTI: Climate Action for Transportation Infrastructure. Available at: <https://calsta.ca.gov/-/media/calsta-media/documents/capti-july-2021-a11y.pdf>
⁹⁹ SCAG's Strategic Plan. SCAG. Available at: <https://scag.ca.gov/post/strategic-plan>

As such, our work in broadband and the Digital Action Plan is consistent with the following goals:

- **Goal 1** – Produce innovative solutions that improve the quality of life for Southern Californians
- **Goal 2** – Advance Southern California’s policy interests and planning priorities through regional, statewide, and national engagement and advocacy
- **Goal 3** – Be the foremost data information hub for the region
- **Goal 5** – Provide innovative information and value-added services to enhance member agencies’ planning and operations and promote regional collaboration
- **Goal 7** – Secure funding to support agency priorities to effectively and efficiently deliver work products

Resolution No. 20-623-2, SCAG’s Commitment to Equity – In July 2020, SCAG’s Regional Council adopted Resolution 20-623-2, affirming its commitment to advancing justice, equity, diversity, and inclusion throughout Southern California. The resolution called for the formation of an ad hoc Special Committee on Equity and Social Justice to further develop SCAG’s response to advancing equity.¹⁰⁰ The Committee met on a quarterly basis starting on September 20, 2020, and concluding in March 2021, culminating in the development of a Racial Equity Early Action Plan.

“ AS CENTRAL TO SCAG’S WORK, RACIAL EQUITY DESCRIBES THE ACTIONS, POLICIES, AND PRACTICES THAT ELIMINATE BIAS AND BARRIERS THAT HAVE HISTORICALLY AND SYSTEMICALLY MARGINALIZED COMMUNITIES OF COLOR, TO ENSURE ALL PEOPLE CAN BE HEALTHY, PROSPEROUS, AND PARTICIPATE FULLY IN CIVIC LIFE.

¹⁰⁰ Resolution No. 20-623-2. SCAG. Available at: <https://scag.ca.gov/sites/main/files/file-attachments/rcresolution206232.pdf?1604640361>

Racial Equity Early Action Plan – On May 6, 2021, SCAG’s Regional Council adopted the Racial Equity Early Action Plan, which seeks to guide and sustain SCAG’s regional leadership in service of equity and social justice over the years to come. The Early Action Plan provides a definition of equity and establishes goals, strategies, and a set of “early actions” to advance racial equity through SCAG’s policies, practices, and activities.

The framework of the Early Action Plan includes four goals:

- **Shift Organizational Culture** – Focus SCAG’s internal work and practices on inclusion, diversity, equity, and awareness
- **Center Racial Equity in Regional Policy & Planning** – Bring equity into SCAG’s regional planning functions
- **Encourage Racial Equity in Local Planning Practices** – Promote racial equity in efforts involving local elected officials and planning professionals
- **Activate and Amplify** – Communicate broadly SCAG’s commitment to racial equity and join with others in different fields and sectors to amplify impact

Resolution No. 21-629-2, SCAG’s commitment to Bridging the Digital Divide – SCAG’s regional council adopted Resolution No. 21-629-2 on February 2, 2021, which pledges SCAG to assist in bridging the digital divide in underserved and unserved communities.¹⁰¹ The resolution calls for staff to engage in the following key tasks:

- Develop an Action Plan
- Collect and invest in broadband data and develop detailed broadband maps and determine broadband opportunity zones
- Conduct studies which propose solutions and/or strategies to assist in the rapid deployment of broadband infrastructure, evaluate the efficacy of broadband as a “green strategy”
- Incorporate broadband planning into SCAG’s programs, including the development of future Regional Transportation Plan/Sustainable Communities Strategies (RTP/SCS or Connect SoCal)

¹⁰¹ Resolution No. 21-629-2. Available at: https://scag.ca.gov/sites/main/files/file-attachments/resolution_no_21-629-2_-_support_to_increase_broadband_access.pdf?1646942018

THE WORK WE'VE DONE SO FAR

Staff across the agency have worked on several projects to address the digital divide or work related to broadband (directly and indirectly) conducted by the Broadband Planning team and other Departments. Some of our work efforts are but not limited to the following:

Advocacy, Coordination and Partnerships – Since the beginning of the COVID-19, SCAG has conducted advocacy exercises, coordinated with stakeholders and agencies, and formed partnerships. Examples include but are not limited to:

- **Southern California (SoCal) Transformation** – SoCal Transformation is a working group which consists of representatives from multiple sectors: government, non-profits, education, health, ISPs, and other private sectors. The group meets every two weeks to discuss the current state of Broadband, legislature related to broadband, funding sources, presentation on respective work efforts and a discussion of solutions/actions to bridge the digital divide. Since its inception, SCAG has been a key player and partner to the working group and have shared its work products, announced opportunities, and provided presentations.
- **Joining forces with San Diego Association of Governments (SANDAG)** – SCAG has joined forces with SANDAG to collaborate and align on our work efforts. Over the past several years, both SCAG and SANDAG have worked in unison on tracking and applying for funding, advocacy and comment letters to state and federal agencies, workshops, resolutions, proposals, and reports.
- **Partnership with California Emerging Technology Fund (CETF)** – SCAG has formed a partnership with CETF to conduct several work efforts such as our VMT (Vehicle Miles Traveled) report, permit streamlining efforts, and promotion of the ACP campaign.
- **Caltrans and Caltrans Equity Leadership Group** – SCAG has been in close communication with Caltrans, tracking the progress of the middle-mile construction and has been an active supporter and participant of their Equity Leadership Group.

- **Big 4 MPOs** – SCAG has collaborated with the Big 4 MPOs which include, SCAG, SANDAG, Sacramento Area Council of Governments (SACOG) and Metropolitan Transportation Commission (MTC) to advocate for transportation agencies to be involved the development and access to CDTs middle-mile network. Access to the network would assist in modernizing California's transportation network as it would allow for the implementation of emerging technologies.
- **Advocacy for our Member Jurisdictions and Stakeholders** – SCAG has conducted outreach exercises and submitted comment letters to various governmental agencies (federal and state), requesting that Southern California get its fair share of broadband funding.

Sample Resolution and Model Policy for Local Jurisdictions to support Broadband – SCAG developed a sample resolution and model policy paper for local jurisdictions to use as a template.¹⁰² Like SCAG's Resolution No 21-629-2, the sample resolution recognizes digital divide and commits its member jurisdiction to solving the crisis. Four (Imperial, Orange, San Bernardino, Ventura) out of the six Counties used this template to develop their own resolution and all have been approved and adopted. The model policy paper for local jurisdiction staff to use as a roadmap for their own digital equity or broadband plan. The policy paper lays out governance structure and a list of best management practices.

Request for Qualifications for Prospective Partnerships – SCAG and SANDAG conducted a joint request for qualifications to seek partnerships (RFQPP) to deploy broadband infrastructure and provide high-quality and affordable broadband service to residents, businesses, public agencies, public agencies, educational institutions, and tribes in the Southern California region. The goal of the RFQPP is to secure funding from state or federal sources for ISPs, constructors, engineer firms and non-profits to partner with local jurisdictions for planning efforts, construction and operation of last mile services, and advocacy efforts for digital literacy. A pool of 20 qualified candidates were selected and funding and work efforts must go towards serving unserved or underserved communities. The RFQPP is an experimental exercise and first in the nation, which has become a template for other agencies or partnerships to model after.

¹⁰² Sample Resolution and Model Policy Paper. SCAG. Available at: https://scag.ca.gov/sites/main/files/file-attachments/attach4_sampleresolutionandpolicypaper_local_jurisdictions.pdf?1646942032

VMT Report – In early 2022, SCAG released a report titled Transportation Broadband Strategies to Reduce VMT and GHGs (vehicle miles traveled and greenhouse gases, respectively). The study used the first year of the COVID-19 pandemic’s “shelter in place” orders to study some impacts on the transportation system. With travel restrictions in place, many people were forced to participate in a trial run of “tele-everything” which includes teleworking, tele-medicine, remote learning, e-commerce, etc. As such, SCAG decided to use the observed traffic patterns in conjunction with online surveying to analyze potential impacts of broadband on VMT and GHGs.

The topline results for the analysis year of 2045 showed that targeted improvements to broadband infrastructure in areas where there is low adoption (under 50% of households and higher concentration of essential workers) would potentially yield a 1-2% reduction in VMT over baseline conditions, while regionwide improvements paired with expanded telework policies could yield a 15% reduction in VMT. Increased broadband adoption could be a significant tool to reduce VMT and congestion, and many low-income households and essential workers, while usually not having jobs that allow for telework, would still reduce non-work trips if they had broadband service.

ACP/Go Human – To provide access to affordable internet to unserved and underserved areas across the region, SCAG is partnering with the California Emerging Technology Fund (CETF) for a Digital Equity Call for Action to leverage and bolster their existing campaign for the Affordable Connectivity Program (ACP). Millions of Californians are eligible for assistance by the ACP, but relatively few are aware of the program. SCAG seeks to explore opportunities to support the promotion of the ACP in alignment with SCAG’s Vehicles Miles Traveled (VMT) reduction goals and equity commitments, as established in SCAG’s commitment to racial equity in the July 2020 Resolution and the adopted Racial Equity Early Action Plan. This pilot is also in support of SCAG’s “Go Human Evolution” project.

The program will develop a Toolkit and provide direct support to communities in the SCAG region to implement strategies to increase applications to the ACP and thus adoption of broadband in underserved communities. The Toolkit will also serve as a resource to eligible areas more broadly, promoted through targeted outreach and partner engagement. The program will also develop cohorts of “Digital Navigators” in counties across the region to lead ACP enrollment in their communities and implement strategies outlined in the Toolkit. Lastly, this pilot will include a sponsorship program to bolster the campaign and local engagement efforts. In coordination with CETF, SCAG will conduct outreach to internet service providers and members of the Business Community to raise funding to increase support for the campaign initiatives and awareness of the ACP.

Permit Streamlining – SCAG is coordinating with SANDAG to develop streamlined broadband permitting practices that are regionally consistent. This includes identifying regional or local policies or legislation that may inhibit broadband deployment, developing regional permitting standards and practices, coordinating local efforts with state initiatives, and more. To develop these standards, SANDAG has convened the Regional Digital Infrastructure Taskforce (ReDIT), which consists of local agency staff and technical experts (representing the SANDAG and SCAG Region) involved in digital infrastructure permitting and services.¹⁰³

Leveraging the findings from SANDAG’s taskforce, SCAG is developing a permit streamlining report, model permit and ordinance template that can be readily adopted by local jurisdictions within the SCAG region. The report will identify streamlined broadband permitting practices that may lead to lower cost of entry and operation of broadband systems, reduce the risk of delays during the planning, permitting and construction phases, provide opportunities for increasing revenue, and create new avenues for competitive entries.

¹⁰³ ReDIT Taskforce. SANDAG. Available at: <https://www.sandag.org/index.asp?committeeid=124&fuseaction=committees.detail>

SoCal Transformation Workshop on Broadband and Housing – On October 21, 2021, SCAG and SANDAG in partnership with a coalition of stakeholders, hosted a workshop on “Connecting Publicly Subsidized Housing Complexes to High-Speed Internet”.¹⁰⁴ The purpose of the workshop was to discuss opportunities to bridge the digital divide in public housing that would ultimately: (a) connect all residents in publicly subsidized housing complexes to high-speed internet service; (b) help residents acquire affordable computing devices; and (c) provide digital literacy training to ensure that residents can utilize the internet to improve their lives. The workshop featured a roundtable discussion among affordable housing developers & administrators, internet service providers (ISPs), and state and federal agencies.

Connect SoCal – As part of the upcoming 2024 Connect SoCal Plan (Regional Transportation Plan/Sustainable Communities Strategies), SCAG is developing on-model strategies and language which incorporates broadband based or tele-everything assumptions. Strategies are aimed towards supporting travel demand management, improve travel efficiency and reducing GHG emissions for the SCAG region.

UC Davis Study – SCAG partnered with researchers at the University of California at Davis to investigate the temporary and longer-term Impacts of the COVID-19 pandemic on mobility. They found that remote work was most widespread in Fall 2020. Physical commutes had partially rebounded by Summer 2021, but workers are increasingly adopting a hybrid work model. In Summer 2021, 29% of survey respondents reported working a hybrid schedule (versus 15% pre-pandemic), and in Summer 2021, only 14% of survey respondents commuted to the office every day (versus 44% pre-pandemic). A significant portion of workers expect to continue some form of remote or hybrid work after the pandemic. However, low-income workers are less likely to work remotely, and higher incomes correlate with higher likelihood of remote/hybrid work. Additionally, Hispanic workers were more likely to continue to commute to physical job sites at the beginning of the pandemic, but the gap between Hispanic and non-Hispanic groups shrank as time went on.

SCAG has done a lot of work and has made progress, but this is not enough,

**SCAG needs to
take further action.**

¹⁰⁴ Connecting Publicly Subsidizing Housing Complexes to High-Speed Internet. SCAG. Available at: https://scag.ca.gov/sites/main/files/file-attachments/socal_transformation_affordable_housing_workshop.pdf?1646941873



ACTIONS AND DELIVERABLES IN DEVELOPMENT



APPENDIX A COUNTY-LEVEL DATA

APPENDIX A – TABLE 1 Populations (Age, Race and Educational Attainment) in Imperial County without Broadband or a Computer

	POPULATION	WITH BROADBAND	WITHOUT BROADBAND	WITHOUT BROADBAND (PERCENT)	NO COMPUTER	NO COMPUTER (PERCENT)
TOTAL POPULATION IN HOUSEHOLDS	170,517	149,865	8,923	5.2%	11,412	6.7%
AGE						
Under 18 years	51,735	48,406	1,734	3.4%	1,542	3.0%
18 to 64 years	95,757	85,998	5,009	5.2%	4,558	4.8%
65 years and over	23,025	15,461	2,180	9.5%	5,312	23.1%
RACE						
White	101,161	88,655	6,230	6.2%	6,003	5.9%
Black or African American	2,610	2,164	253	9.7%	193	7.4%
Native American/Indigenous	1,940	1,480	190	9.8%	237	12.2%
Asian	2,352	2,266	53	2.3%	33	1.4%
Hispanic/Latino	146,368	129,067	7,445	5.1%	9,569	6.5%
EDUCATIONAL ATTAINMENT						
Household population 25 years and over	101,954	85,866	6,530	6.4%	9,294	9.1%
Less than high school graduate or equivalency	29,169	20,796	2,713	9.3%	5,626	19.3%
High school graduate	55,953	49,336	3,220	5.8%	3,212	5.7%
Bachelor's degree or higher	16,832	15,734	597	3.5%	456	2.7%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

APPENDIX A – TABLE 2 Populations (Age, Race and Educational Attainment) in Los Angeles County without Broadband or a Computer

	POPULATION	WITH BROADBAND	WITHOUT BROADBAND	WITHOUT BROADBAND (PERCENT)	NO COMPUTER	NO COMPUTER (PERCENT)
TOTAL POPULATION IN HOUSEHOLDS	9,858,119	8,824,138	631,669	6.4%	388,863	3.9%
AGE						
Under 18 years	2,173,094	1,984,489	141,058	6.5%	45,855	2.1%
18 to 64 years	6,352,776	5,801,185	384,312	6.0%	160,804	2.5%
65 years and over	1,332,249	1,038,464	106,299	8.0%	182,204	13.7%
RACE						
White	4,702,718	4,212,444	279,791	5.9%	201,712	4.3%
Black or African American	778,623	665,340	65,138	8.4%	47,513	6.1%
Native American/Indigenous	76,021	67,747	4,849	6.4%	3,348	4.4%
Asian	1,462,589	1,368,993	53,392	3.7%	38,365	2.6%
Hispanic/Latino	4,801,406	4,184,898	407,322	8.5%	204,616	4.3%
EDUCATIONAL ATTAINMENT						
Household population 25 years and over	6,802,101	6,025,812	437,119	6.4%	328,401	4.8%
Less than high school graduate or equivalency	1,361,234	1,065,005	154,500	11.3%	140,026	10.3%
High school graduate	3,136,072	2,761,431	216,242	6.9%	152,321	4.9%
Bachelor's degree or higher	2,304,795	2,199,376	66,377	2.9%	36,054	1.6%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

APPENDIX A – TABLE 3 Populations (Age, Race and Educational Attainment) in Orange County without Broadband or a Computer

	POPULATION	WITH BROADBAND	WITHOUT BROADBAND	WITHOUT BROADBAND (PERCENT)	NO COMPUTER	NO COMPUTER (PERCENT)
TOTAL POPULATION IN HOUSEHOLDS	3,126,693	2,931,456	119,457	3.8%	71,198	2.3%
AGE						
Under 18 years	696,133	663,714	23,866	3.4%	7,830	1.1%
18 to 64 years	1,974,052	1,874,968	69,625	3.5%	27,438	1.4%
65 years and over	456,508	392,774	25,966	5.7%	35,930	7.9%
RACE						
White	1,797,620	1,693,892	56,909	3.2%	43,944	2.4%
Black or African American	51,921	47,840	2,340	4.5%	1,611	3.1%
Native American/Indigenous	15,308	14,259	630	4.1%	419	2.7%
Asian	660,137	627,670	20,830	3.2%	11,057	1.7%
Hispanic/Latino	1,059,447	969,140	58,052	5.5%	30,241	2.9%
EDUCATIONAL ATTAINMENT						
Household population 25 years and over	2,155,505	2,006,540	84,820	3.9%	60,587	2.8%
Less than high school graduate or equivalency	298,600	255,499	22,399	7.5%	20,167	6.8%
High school graduate	961,041	888,331	41,200	4.3%	29,705	3.1%
Bachelor's degree or higher	895,864	862,710	21,221	2.4%	10,715	1.2%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

APPENDIX A – TABLE 4 Populations (Age, Race and Educational Attainment) in Riverside County without Broadband or a Computer

	POPULATION	WITH BROADBAND	WITHOUT BROADBAND	WITHOUT BROADBAND (PERCENT)	NO COMPUTER	NO COMPUTER (PERCENT)
TOTAL POPULATION IN HOUSEHOLDS	2,399,905	2,204,195	120,596	5.0%	72,686	3.0%
AGE						
Under 18 years	612,679	575,181	28,905	4.7%	8,362	1.4%
18 to 64 years	1,439,969	1,337,728	68,923	4.8%	32,194	2.2%
65 years and over	347,257	291,286	22,768	6.6%	32,130	9.3%
RACE						
White	1,339,385	1,230,681	61,558	4.6%	45,246	3.4%
Black or African American	153,129	139,724	8,431	5.5%	4,834	3.2%
Native American/Indigenous	18,494	16,701	920	5.0%	862	4.7%
Asian	159,897	153,985	4,206	2.6%	1,652	1.0%
Hispanic/Latino	1,189,653	1,076,982	73,467	6.2%	38,400	3.2%
EDUCATIONAL ATTAINMENT						
Household population 25 years and over	1,565,094	1,420,169	81,449	5.2%	61,445	3.9%
Less than high school graduate or equivalency	266,480	218,163	24,900	9.3%	22,933	8.6%
High school graduate	931,429	849,981	47,127	5.1%	33,129	3.6%
Bachelor's degree or higher	367,185	352,025	9,422	2.6%	5,383	1.5%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

APPENDIX A – TABLE 5 Populations (Age, Race and Educational Attainment) in San Bernardino County without Broadband or a Computer

	POPULATION	WITH BROADBAND	WITHOUT BROADBAND	WITHOUT BROADBAND (PERCENT)	NO COMPUTER	NO COMPUTER (PERCENT)
TOTAL POPULATION IN HOUSEHOLDS	2,110,605	1,901,118	143,749	6.8%	63,346	3.0%
AGE						
Under 18 years	570,118	522,800	39,530	6.9%	7,441	1.3%
18 to 64 years	1,296,559	1,187,149	81,964	6.3%	26,312	2.0%
65 years and over	243,928	191,169	22,255	9.1%	29,593	12.1%
RACE						
White	1,184,441	1,066,610	74,671	6.3%	41,100	3.5%
Black or African American	166,986	146,499	13,737	8.2%	6,727	4.0%
Native American/Indigenous	17,612	15,643	1,356	7.7%	588	3.3%
Asian	157,451	150,408	4,268	2.7%	2,675	1.7%
Hispanic/Latino	1,143,676	1,016,705	95,291	8.3%	30,631	2.7%
EDUCATIONAL ATTAINMENT						
Household population 25 years and over	1,329,462	1,182,603	91,424	6.9%	53,561	4.0%
Less than high school graduate or equivalency	250,563	199,647	31,808	12.7%	18,697	7.5%
High school graduate	789,065	707,354	50,543	6.4%	29,976	3.8%
Bachelor's degree or higher	289,834	275,602	9,073	3.1%	4,888	1.7%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

APPENDIX A – TABLE 6 Populations (Age, Race and Educational Attainment) in Ventura County without Broadband or a Computer

	POPULATION	WITH BROADBAND	WITHOUT BROADBAND	WITHOUT BROADBAND (PERCENT)	NO COMPUTER	NO COMPUTER (PERCENT)
TOTAL POPULATION IN HOUSEHOLDS	832,500	761,388	35,831	4.3%	34,249	4.1%
AGE						
Under 18 years	193,509	178,690	9,439	4.9%	5,295	2.7%
18 to 64 years	509,766	475,266	20,183	4.0%	13,968	2.7%
65 years and over	129,225	107,432	6,209	4.8%	14,986	11.6%
RACE						
White	629,263	570,876	28,101	4.5%	29,433	4.7%
Black or African American	14,285	13,537	394	2.8%	300	2.1%
Native American/Indigenous	6,789	5,256	950	14.0%	583	8.6%
Asian	60,526	58,533	957	1.6%	969	1.6%
Hispanic/Latino	356,841	310,299	24,954	7.0%	21,357	6.0%
EDUCATIONAL ATTAINMENT						
Household population 25 years and over	566,630	514,734	23,362	4.1%	27,631	4.9%
Less than high school graduate or equivalency	80,802	62,658	8,284	10.3%	9,787	12.1%
High school graduate	292,874	266,008	11,402	3.9%	14,930	5.1%
Bachelor's degree or higher	192,954	186,068	3,676	1.9%	2,914	1.5%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates

APPENDIX A – TABLE 7 Low Income Households in Imperial County Without Internet

HOUSEHOLD INCOME AND SUBSCRIPTION	HOUSEHOLDS
LESS THAN \$10,000 TO \$50,000	24,448
With dial-up Internet subscription alone	55
With a broadband Internet subscription	17,439
Without an Internet subscription	6,954
\$50,000 TO \$74,999	6,788
With dial-up Internet subscription alone	0
With a broadband Internet subscription	6,143
Without an Internet subscription	645
\$75,000 OR MORE:	14,532
With dial-up Internet subscription alone	47
With a broadband Internet subscription	13,871
Without an Internet subscription	614
Total Low Income Households	24,448
Total Households (No Internet)	8,213
Total Low income Households (No Internet)	6,954
Concentration Rate of all Digital Divide (Low-Income Households)	85%
Low Income Households Experiencing Digital Divide	28%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates
 Note: The average household size is three. Low-income households are those with annual income below \$50,000; this is roughly 225% of the federal poverty line for a household with three persons (\$51, 818)

APPENDIX A – TABLE 8 Low Income Households in Los Angeles County Without Internet

HOUSEHOLD INCOME AND SUBSCRIPTION	HOUSEHOLDS
LESS THAN \$10,000 TO \$50,000	1,206,218
With dial-up Internet subscription alone	3,160
With a broadband Internet subscription	898,768
Without an Internet subscription	304,290
\$50,000 TO \$74,999	527,863
With dial-up Internet subscription alone	1,195
With a broadband Internet subscription	473,209
Without an Internet subscription	53,459
\$75,000 OR MORE:	1,598,423
With dial-up Internet subscription alone	2,101
With a broadband Internet subscription	1,526,049
Without an Internet subscription	70,273
Total Low Income Households	1,206,218
Total Households (No Internet)	428,022
Total Low income Households (No Internet)	304,290
Concentration Rate of all Digital Divide (Low-Income Households)	71%
Low Income Households Experiencing Digital Divide	25%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates
 Note: The average household size is three. Low-income households are those with annual income below \$50,000; this is roughly 225% of the federal poverty line for a household with three persons (\$51, 818)

APPENDIX A – TABLE 9 Low Income Households in Orange County Without Internet

HOUSEHOLD INCOME AND SUBSCRIPTION	HOUSEHOLDS
LESS THAN \$10,000 TO \$50,000	270,173
With dial-up Internet subscription alone	943
With a broadband Internet subscription	220,475
Without an Internet subscription	48,755
\$50,000 TO \$74,999	147,146
With dial-up Internet subscription alone	447
With a broadband Internet subscription	135,153
Without an Internet subscription	11,546
\$75,000 OR MORE:	622,682
With dial-up Internet subscription alone	585
With a broadband Internet subscription	601,155
Without an Internet subscription	20,942
Total Low Income Households	270,173
Total Households (No Internet)	81,243
Total Low income Households (No Internet)	48,755
Concentration Rate of all Digital Divide (Low-Income Households)	60%
Low Income Households Experiencing Digital Divide	18%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates
 Note: The average household size is three. Low-income households are those with annual income below \$50,000; this is roughly 225% of the federal poverty line for a household with three persons (\$51, 818)

APPENDIX A – TABLE 10 Low Income Households in Riverside County Without Internet

HOUSEHOLD INCOME AND SUBSCRIPTION	HOUSEHOLDS
LESS THAN \$10,000 TO \$50,000	263,005
With dial-up Internet subscription alone	712
With a broadband Internet subscription	208,706
Without an Internet subscription	53,587
\$50,000 TO \$74,999	124,844
With dial-up Internet subscription alone	178
With a broadband Internet subscription	114,678
Without an Internet subscription	9,988
\$75,000 OR MORE:	348,564
With dial-up Internet subscription alone	283
With a broadband Internet subscription	334,431
Without an Internet subscription	13,850
Total Low Income Households	263,005
Total Households (No Internet)	77,425
Total Low income Households (No Internet)	53,587
Concentration Rate of all Digital Divide (Low-Income Households)	69%
Low Income Households Experiencing Digital Divide	20%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates
 Note: The average household size is three. Low-income households are those with annual income below \$50,000; this is roughly 225% of the federal poverty line for a household with three persons (\$51, 818)

APPENDIX A – TABLE 11 Low Income Households in San Bernardino County Without Internet

HOUSEHOLD INCOME AND SUBSCRIPTION	HOUSEHOLDS
LESS THAN \$10,000 TO \$50,000	241,608
With dial-up Internet subscription alone	529
With a broadband Internet subscription	185,062
Without an Internet subscription	56,017
\$50,000 TO \$74,999	117,304
With dial-up Internet subscription alone	204
With a broadband Internet subscription	106,235
Without an Internet subscription	10,865
\$75,000 OR MORE:	281,178
With dial-up Internet subscription alone	315
With a broadband Internet subscription	268,480
Without an Internet subscription	12,383
Total Low Income Households	241,608
Total Households (No Internet)	79,265
Total Low income Households (No Internet)	56,017
Concentration Rate of all Digital Divide (Low-Income Households)	71%
Low Income Households Experiencing Digital Divide	23%

Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates
 Note: The average household size is three. Low-income households are those with annual income below \$50,000; this is roughly 225% of the federal poverty line for a household with three persons (\$51, 818)

APPENDIX A – TABLE 12 Low Income Households in Ventura County Without Internet

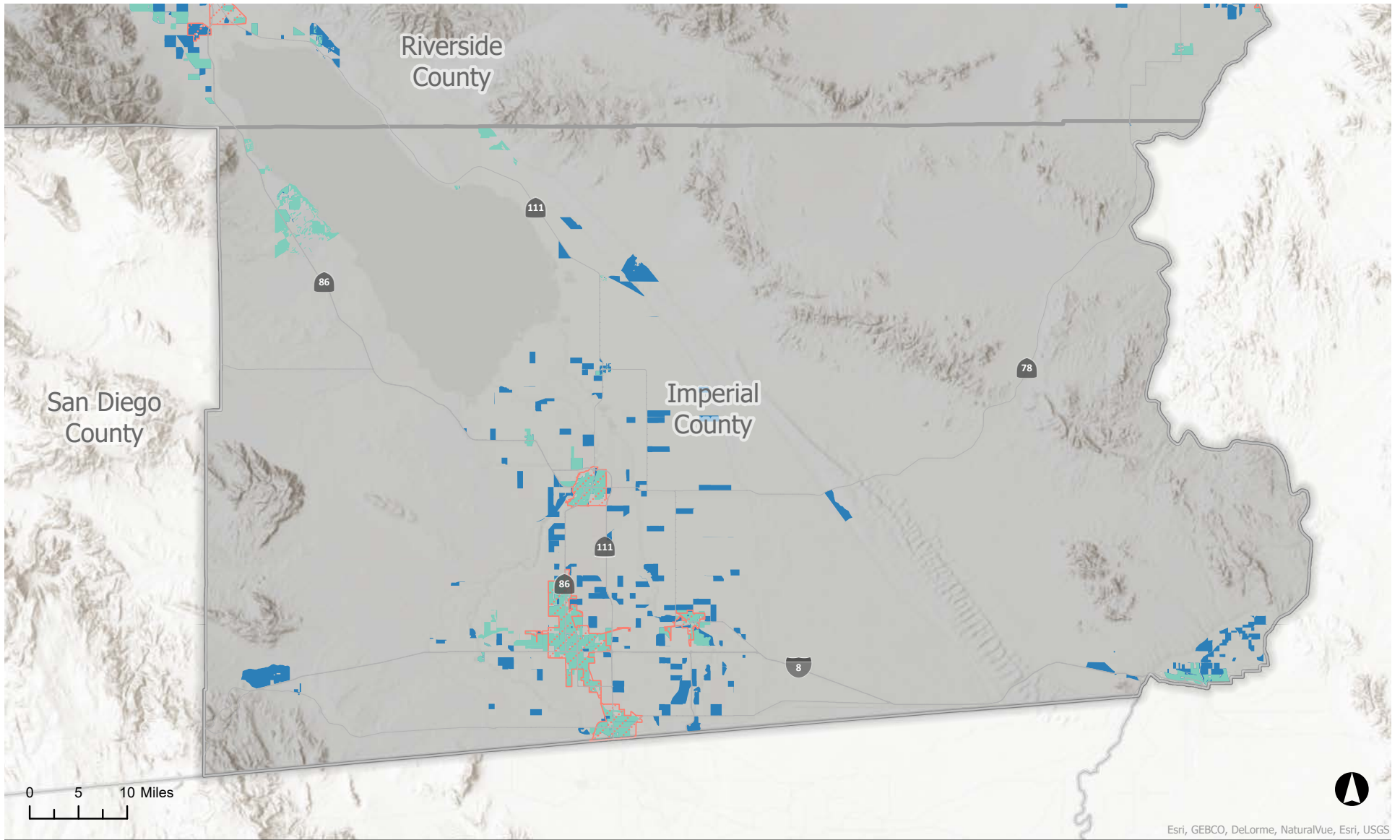
HOUSEHOLD INCOME AND SUBSCRIPTION	HOUSEHOLDS
LESS THAN \$10,000 TO \$50,000	73,376
With dial-up Internet subscription alone	325
With a broadband Internet subscription	55,226
Without an Internet subscription	17,825
\$50,000 TO \$74,999	39,048
With dial-up Internet subscription alone	97
With a broadband Internet subscription	34,864
Without an Internet subscription	4,087
\$75,000 OR MORE:	159,215
With dial-up Internet subscription alone	119
With a broadband Internet subscription	153,240
Without an Internet subscription	5,856
Total Low Income Households	73,376
Total Households (No Internet)	27,768
Total Low income Households (No Internet)	17,825
Concentration Rate of all Digital Divide (Low-Income Households)	64%
Low Income Households Experiencing Digital Divide	24%




Source: U.S. Census Bureau, 2016-2020 ACS 5-Year Estimates
 Note: The average household size is three. Low-income households are those with annual income below \$50,000; this is roughly 225% of the federal poverty line for a household with three persons (\$51, 818)

APPENDIX B

COUNTY-LEVEL FIGURES

APPENDIX B – FIGURE 1 Fixed Broadband by Census Block: Imperial County



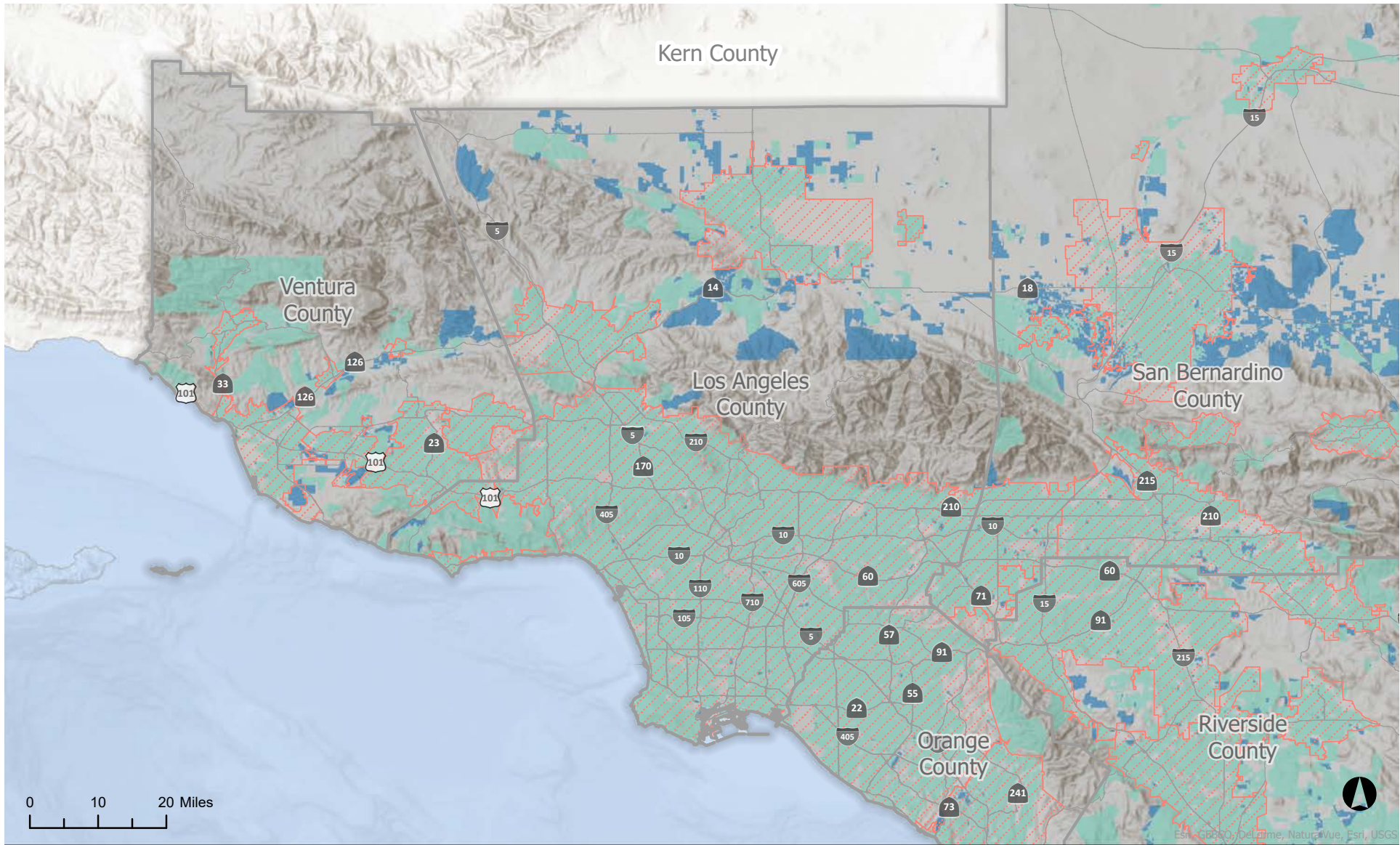
-  Urbanized Boundary
- SCAG Fixed Consumer Deployment
-  Below Federal Threshold
-  Meets Federal Threshold






Source: SCAG 2022, FCC Open Data 2022

Attachment: Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)

APPENDIX B – FIGURE 2 Fixed Broadband by Census Block: Los Angeles County



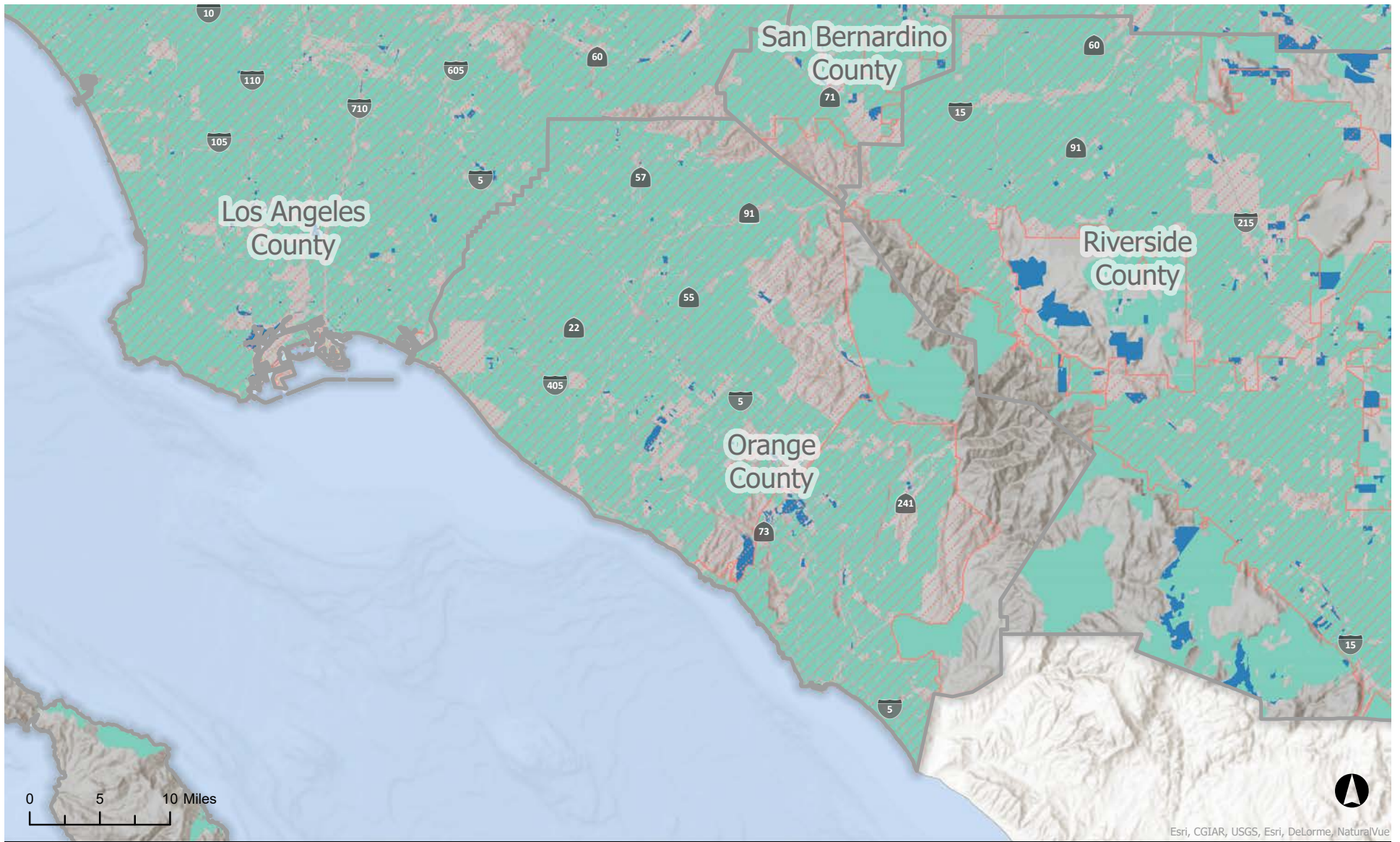
-  Urbanized Boundary
 -  Below Federal Threshold
 -  Meets Federal Threshold
- SCAG Fixed Consumer Deployment






Source: SCAG 2022, FCC Open Data 2022

Attachment: Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)

APPENDIX B – FIGURE 3 Fixed Broadband by Census Block: Orange County



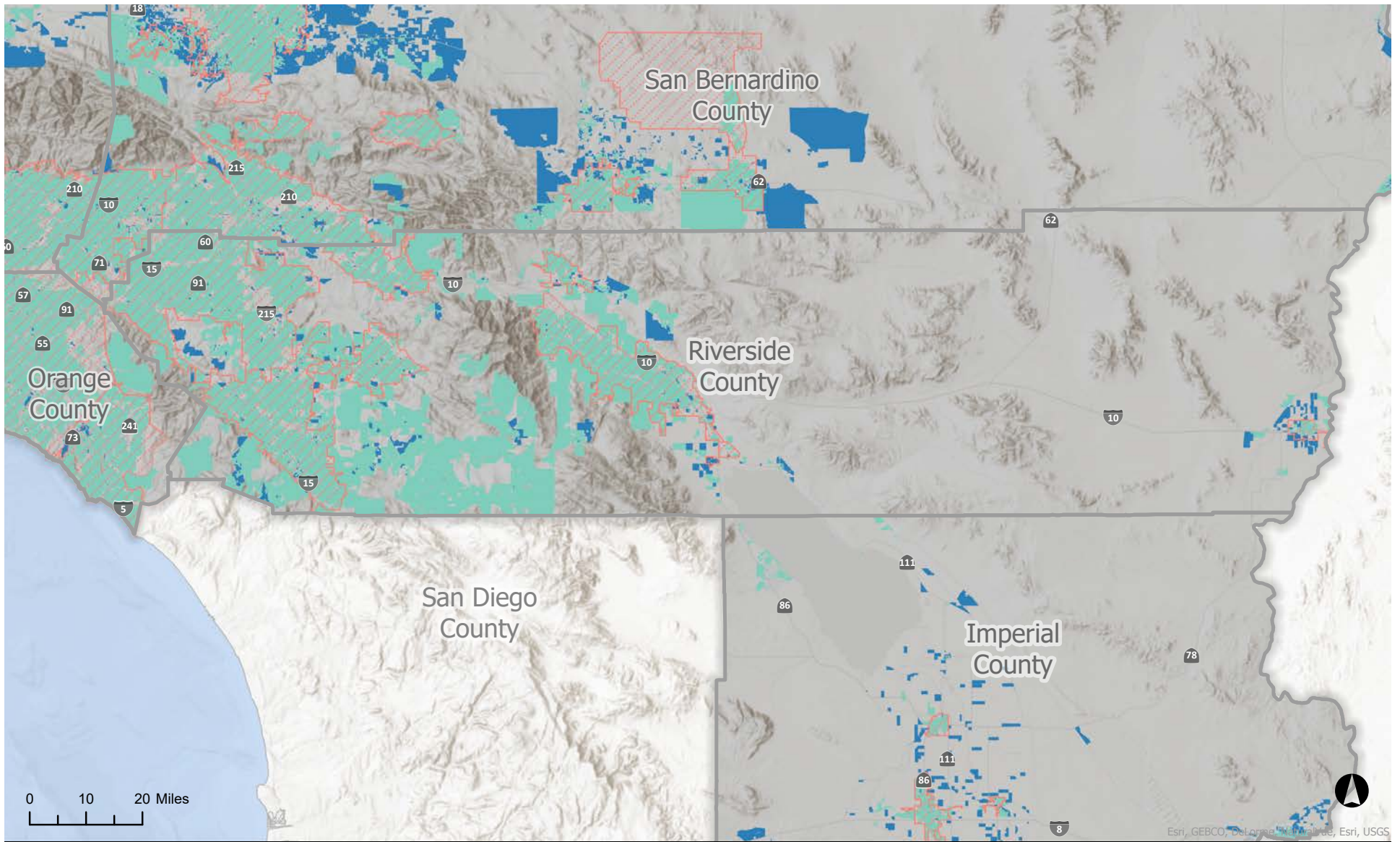
-  Urbanized Boundary
- SCAG Fixed Consumer Deployment
-  Below Federal Threshold
-  Meets Federal Threshold






Source: SCAG 2022, FCC Open Data 2022

Attachment: Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)

APPENDIX B – FIGURE 4 Fixed Broadband by Census Block: Riverside County

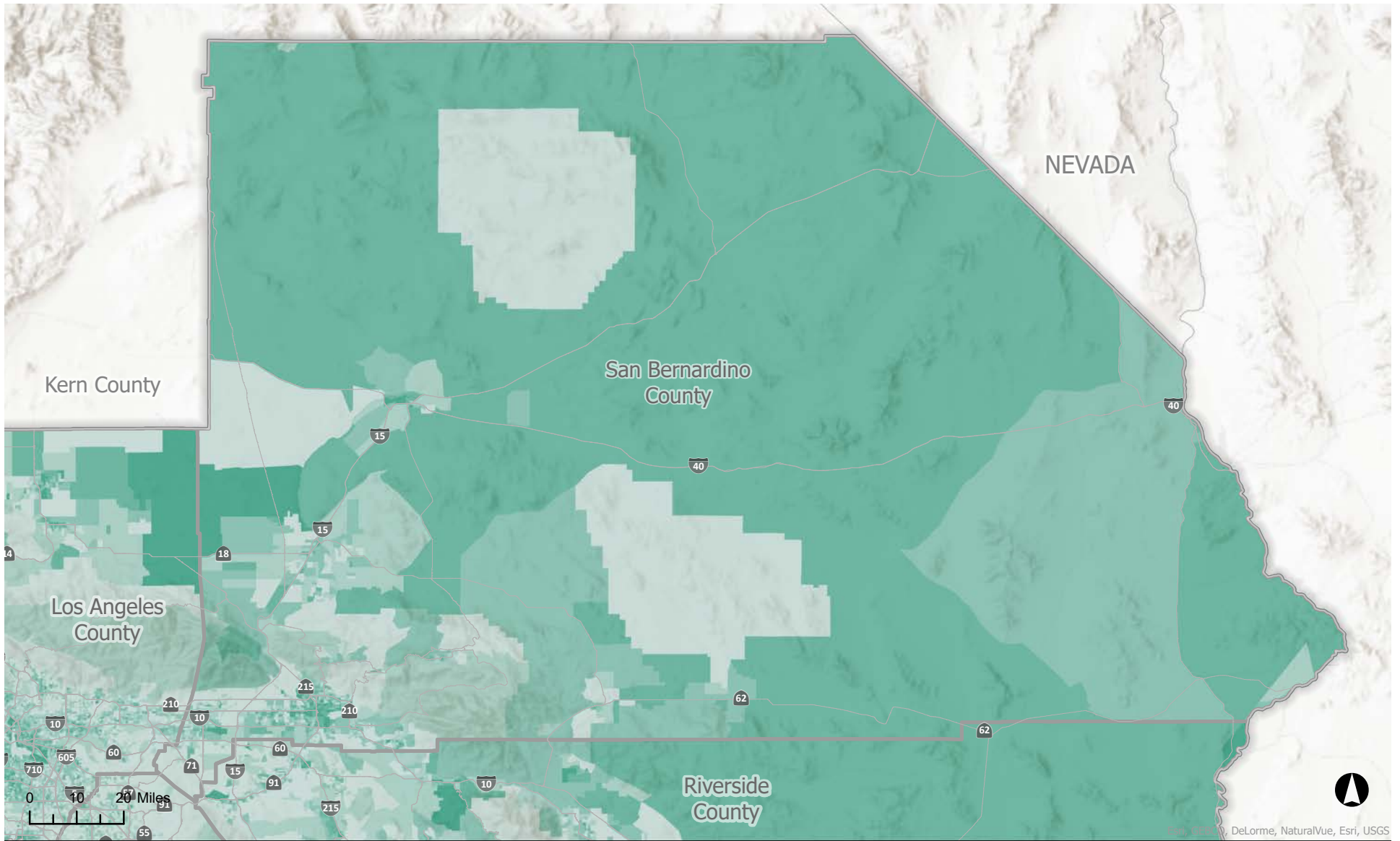


-  Urbanized Boundary
- SCAG Fixed Consumer Deployment
-  Below Federal Threshold
-  Meets Federal Threshold



Source: SCAG 2022, FCC Open Data 2022

APPENDIX B – FIGURE 5 Fixed Broadband by Census Block: San Bernardino County



Percent Low Income Households

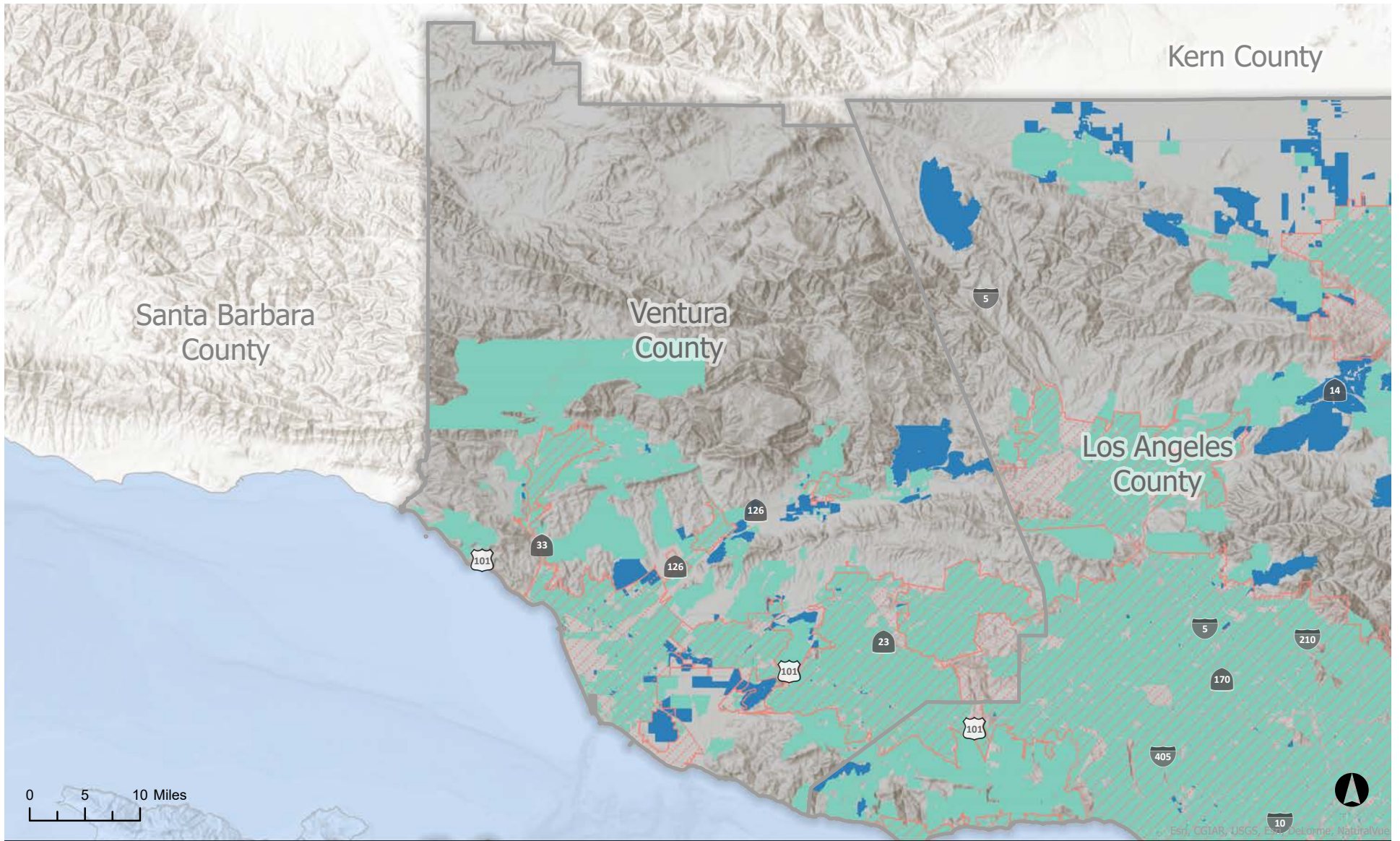
- 0% - 4.8%
- 4.9% - 11.9%
- 12.0% - 20.3%
- 20.4% - 32.5%
- 32.6% - 100%






Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative

Attachment: Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)

APPENDIX B – FIGURE 6 Fixed Broadband by Census Block: Ventura County

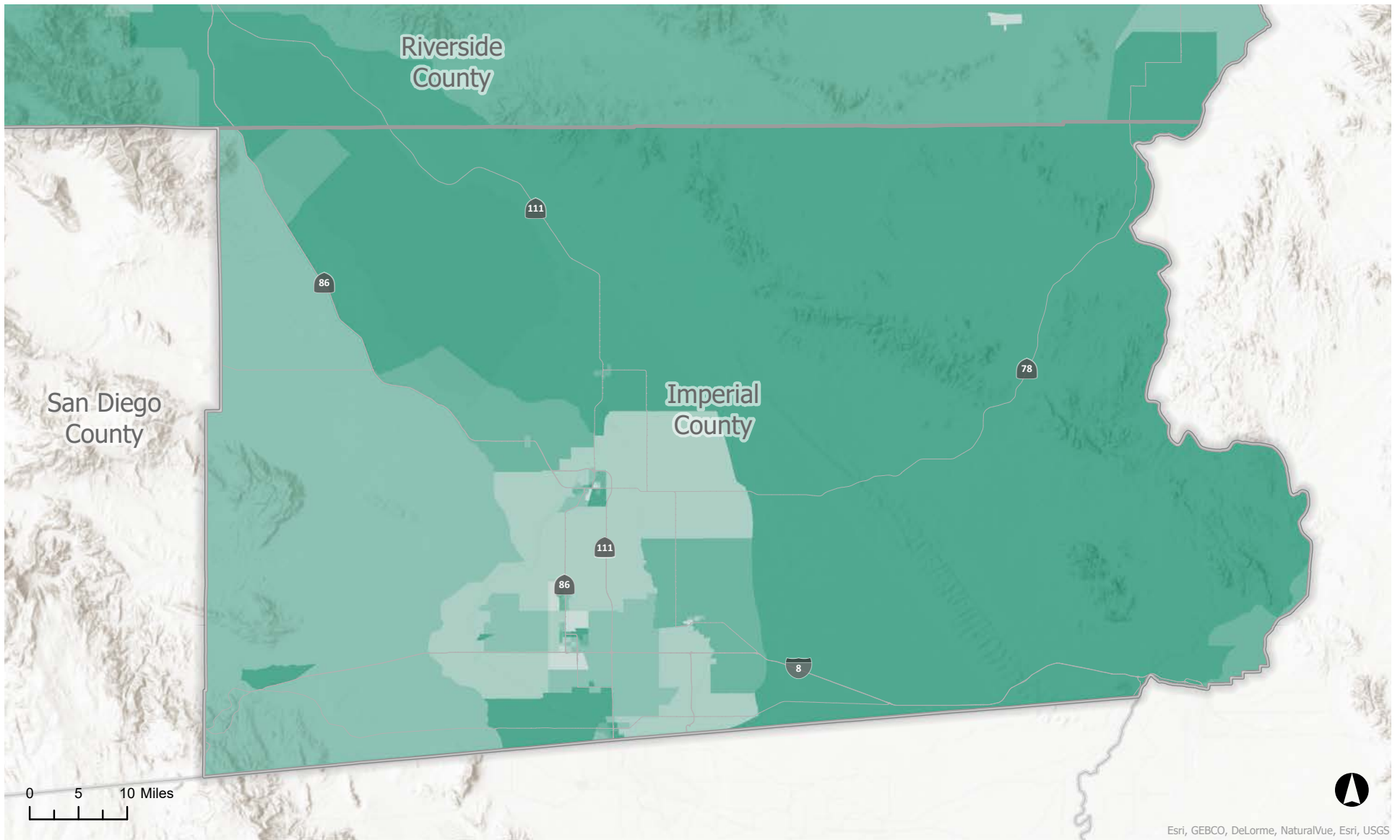


-  Urbanized Boundary
- SCAG Fixed Consumer Deployment
-  Below Federal Threshold
-  Meets Federal Threshold



Source: SCAG 2022, FCC Open Data 2022

APPENDIX B – FIGURE 7 Low Income Households Without Broadband: Imperial County



Percent Low Income Households

- 0% - 4.8%
- 4.9% - 11.9%
- 12.0% - 20.3%
- 20.4% - 32.5%
- 32.6% - 100%

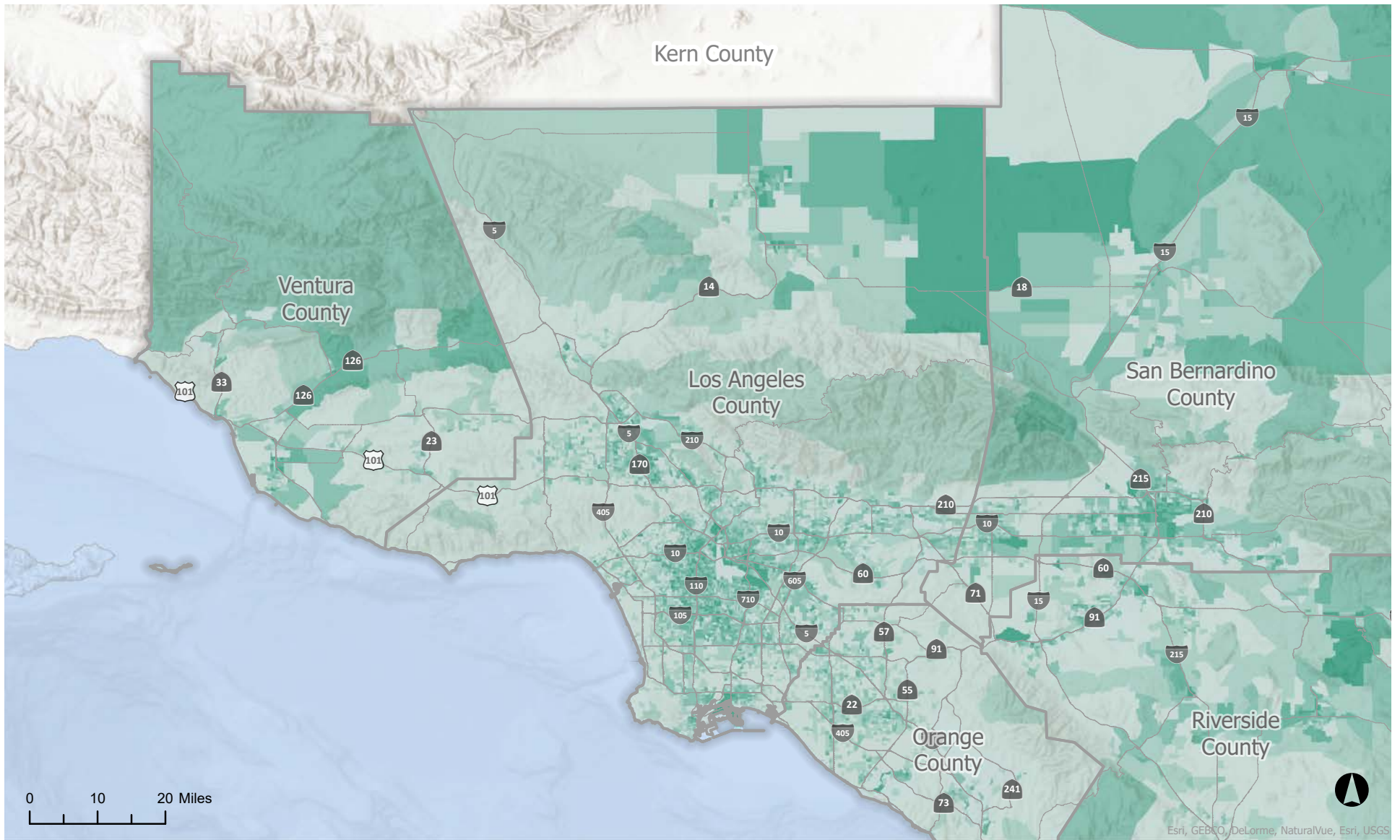
Esri, GEBCO, DeLorme, NaturalVue, Esri, USGS



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative

Attachment: Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)

APPENDIX B – FIGURE 8 Low Income Households Without Broadband: Los Angeles County



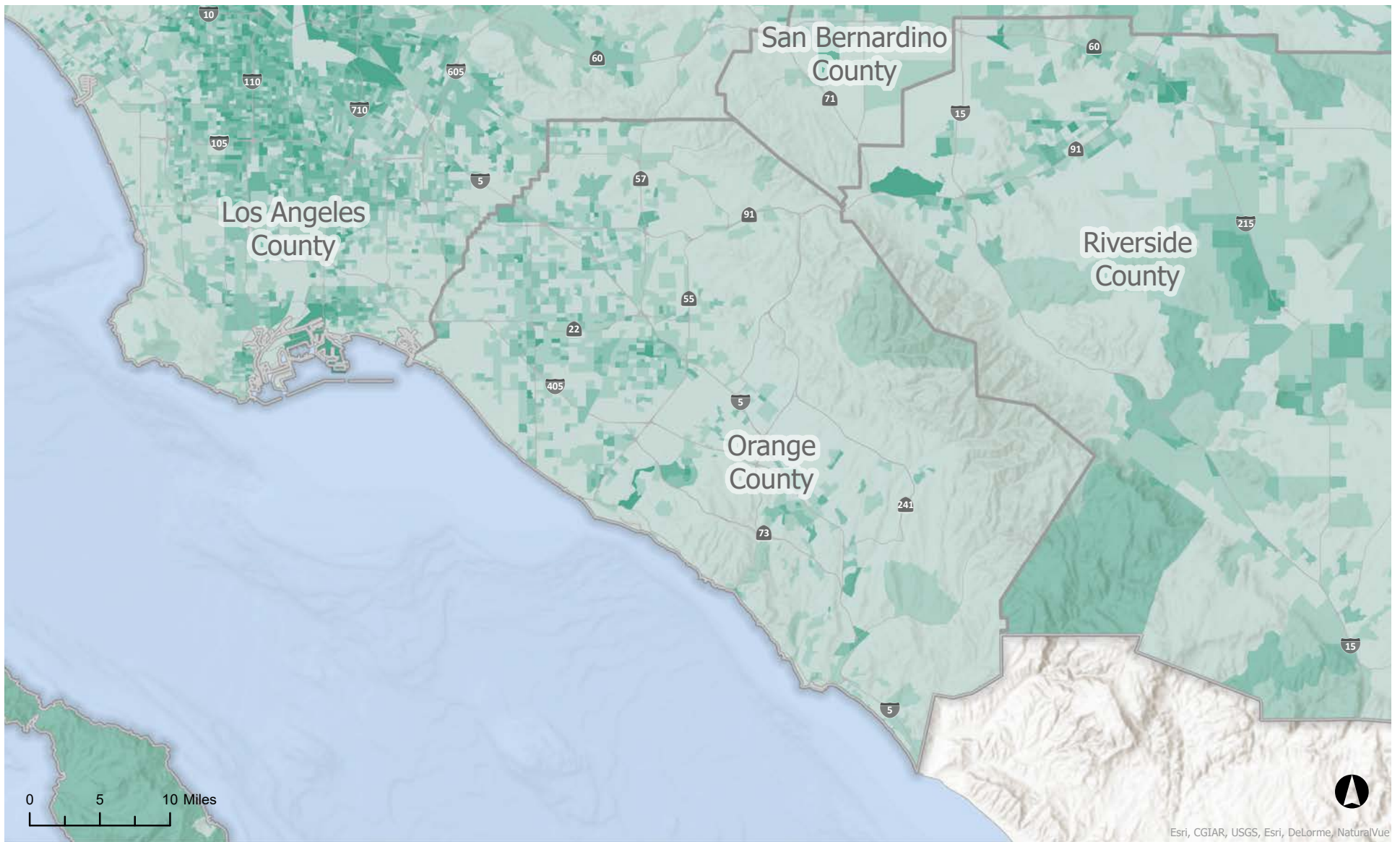
Percent Low Income Households

- 0% - 4.8%
- 4.9% - 11.9%
- 12.0% - 20.3%
- 20.4% - 32.5%
- 32.6% - 100%



Source: SCAG 2022, FCC Open Data 2022

APPENDIX B – FIGURE 9 Low Income Households Without Broadband: Orange County



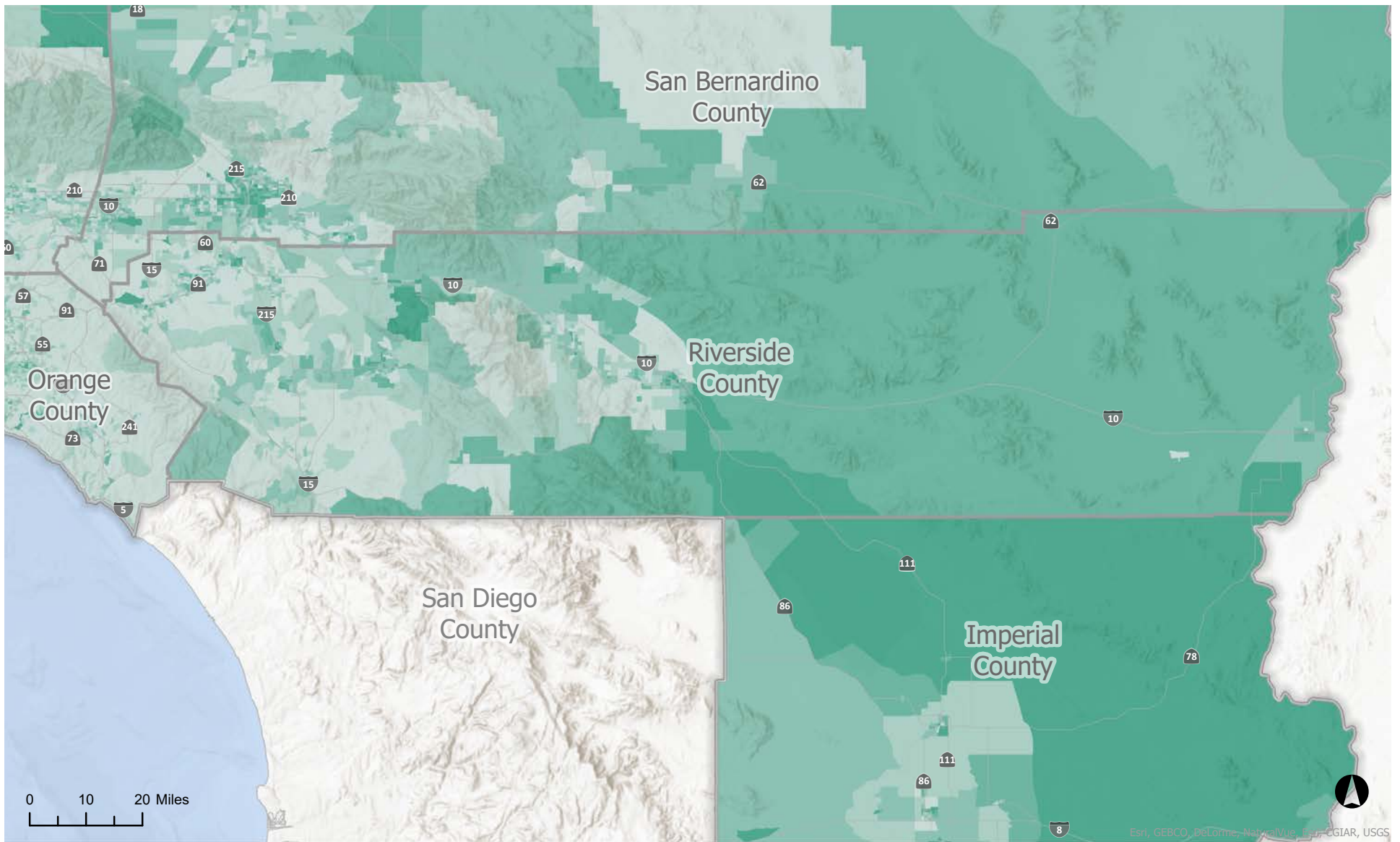
Percent Low Income Households

- 0% - 4.8%
- 4.9% - 11.9%
- 12.0% - 20.3%
- 20.4% - 32.5%
- 32.6% - 100%



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative

APPENDIX B – FIGURE 10 Low Income Households Without Broadband: Riverside County



Percent Low Income Households

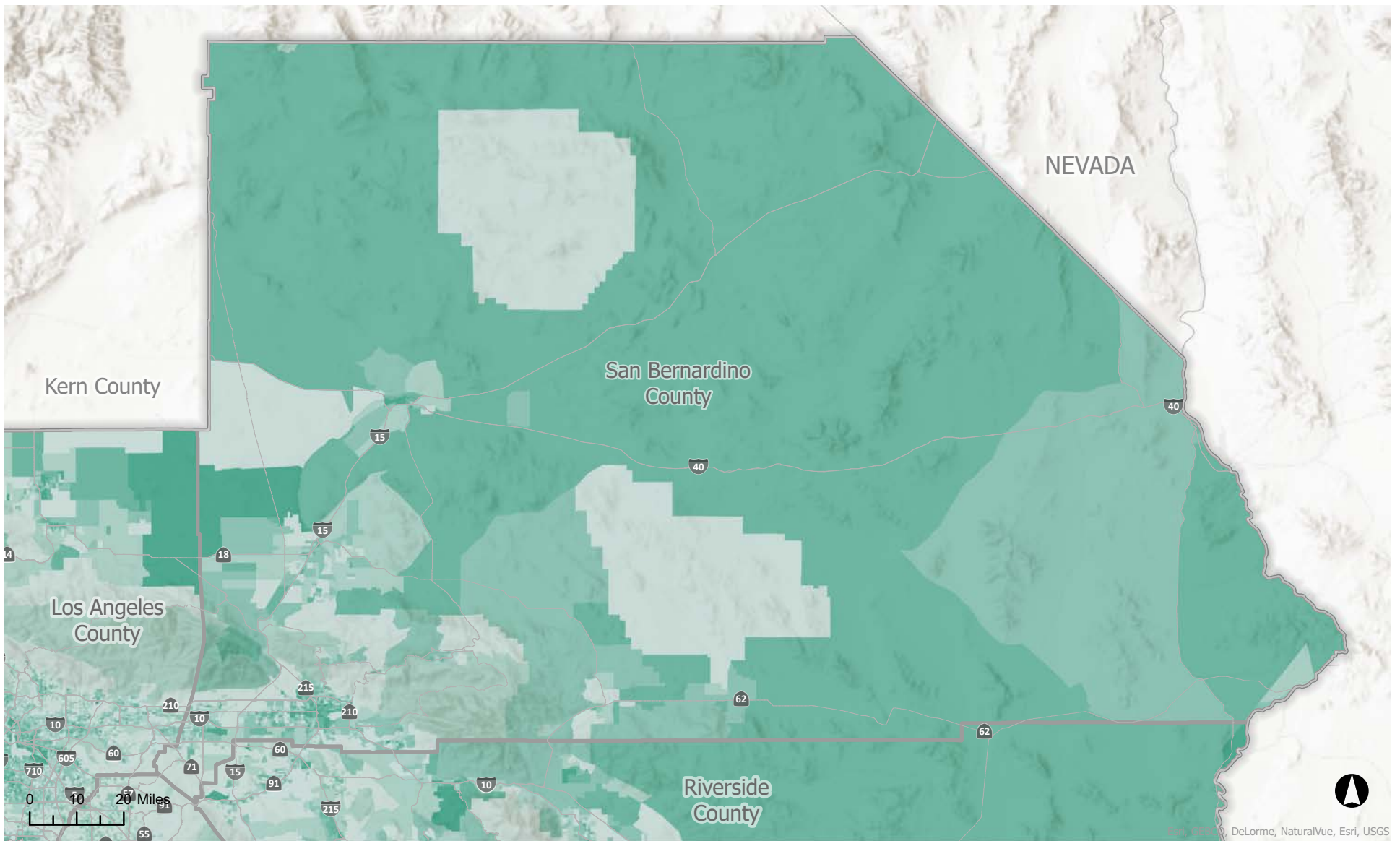
- 0% - 4.8%
- 4.9% - 11.9%
- 12.0% - 20.3%
- 20.4% - 32.5%
- 32.6% - 100%



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative

Attachment: Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)

APPENDIX B – FIGURE 11 Low Income Households Without Broadband: San Bernardino County



Percent Low Income Households

- 0% - 4.8%
- 4.9% - 11.9%
- 12.0% - 20.3%
- 20.4% - 32.5%
- 32.6% - 100%

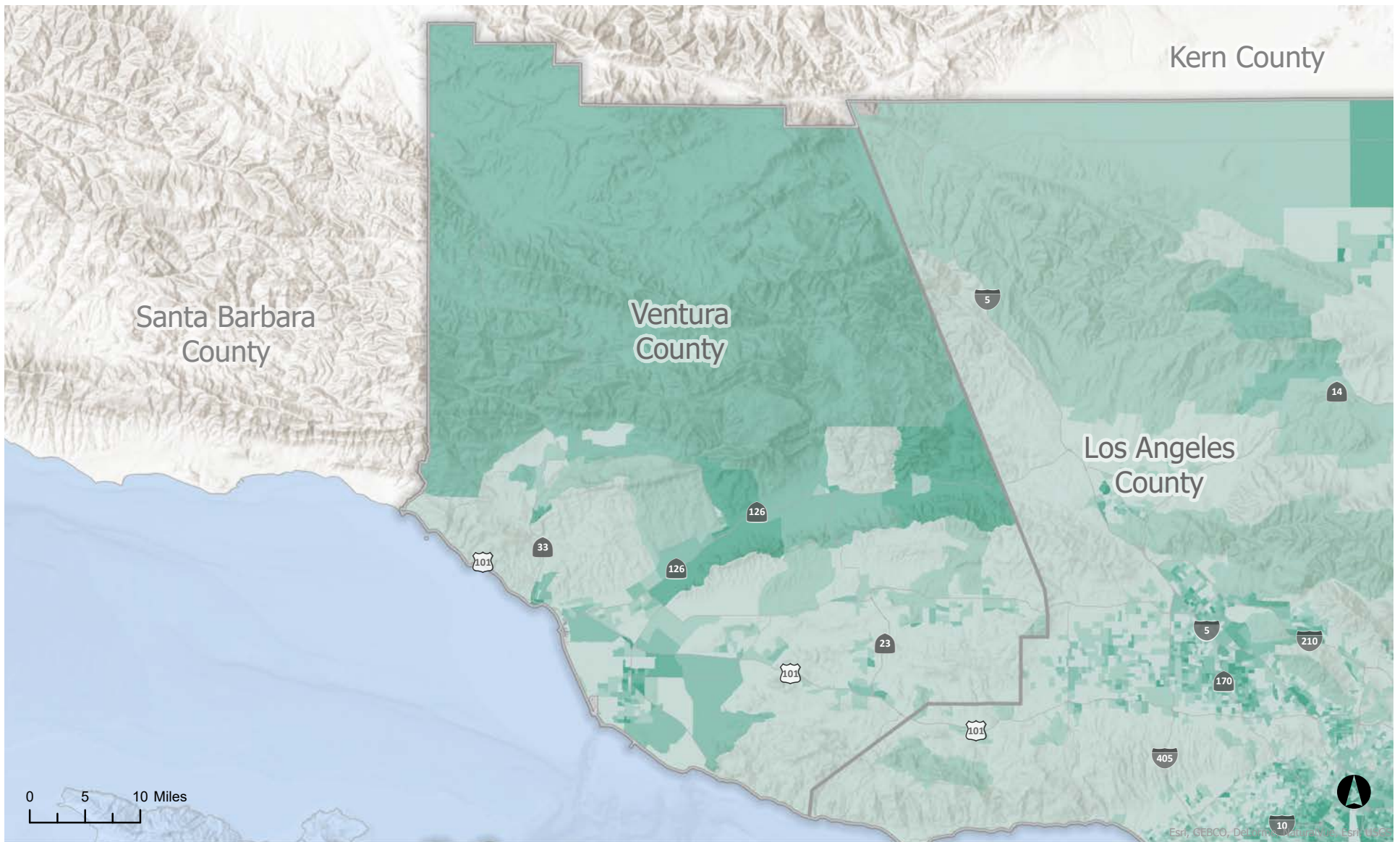
Map: CBM, DeLorme, NaturalVue, Esri, USGS



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative

Attachment: Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)

APPENDIX B – FIGURE 12 Low Income Households Without Broadband: Ventura County



Percent Low Income Households

- 0% - 4.8%
- 4.9% - 11.9%
- 12.0% - 20.3%
- 20.4% - 32.5%
- 32.6% - 100%

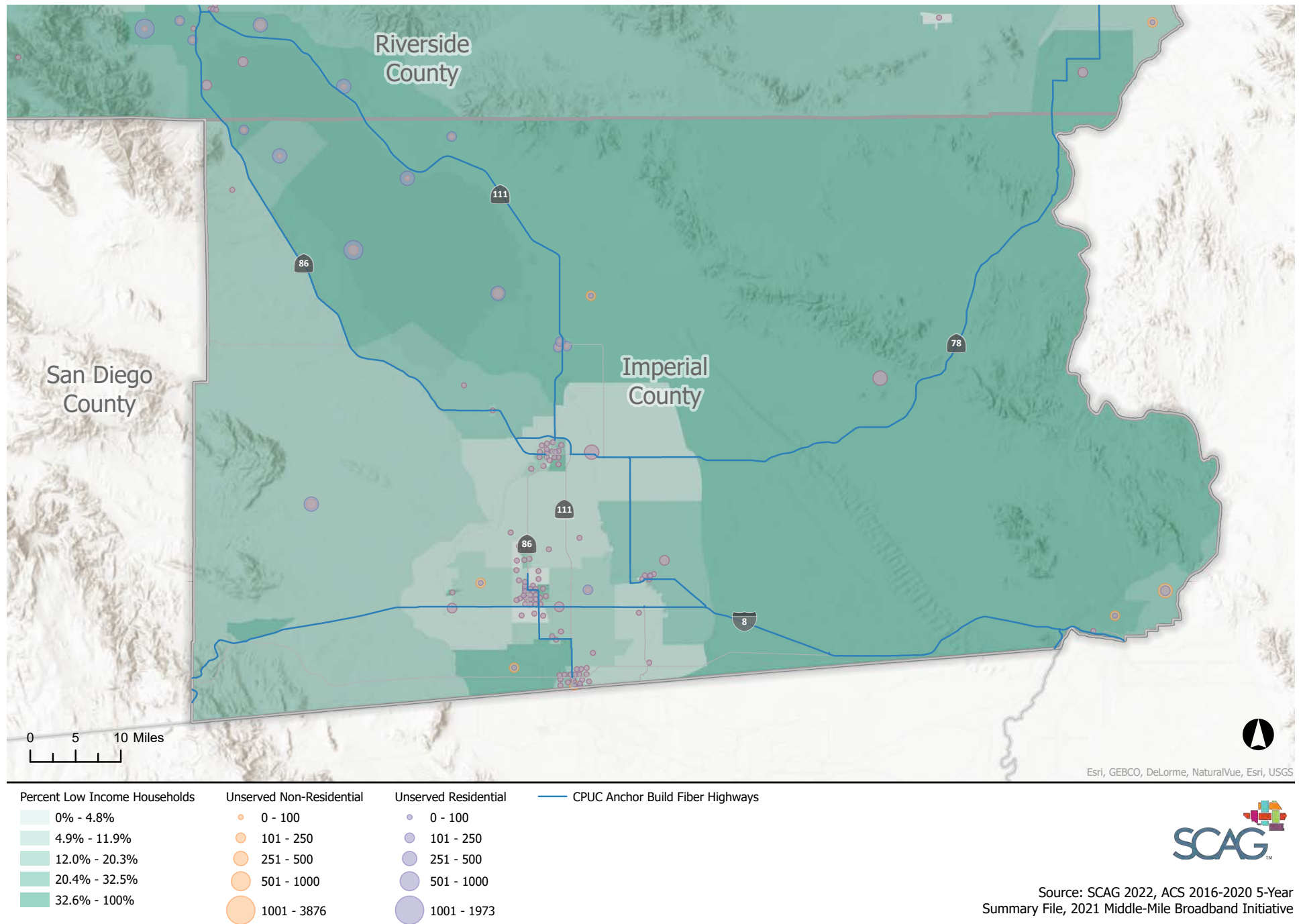


Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative



APPENDIX C COUNTY-LEVEL MIDDLE- MILE PROJECTS

APPENDIX C – FIGURE 1 Broadband Middle Mile Imperial County

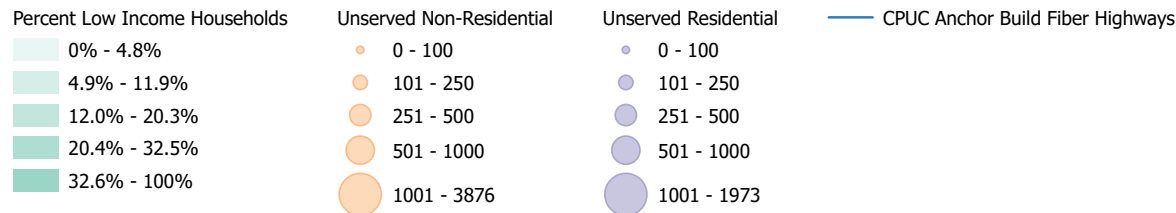
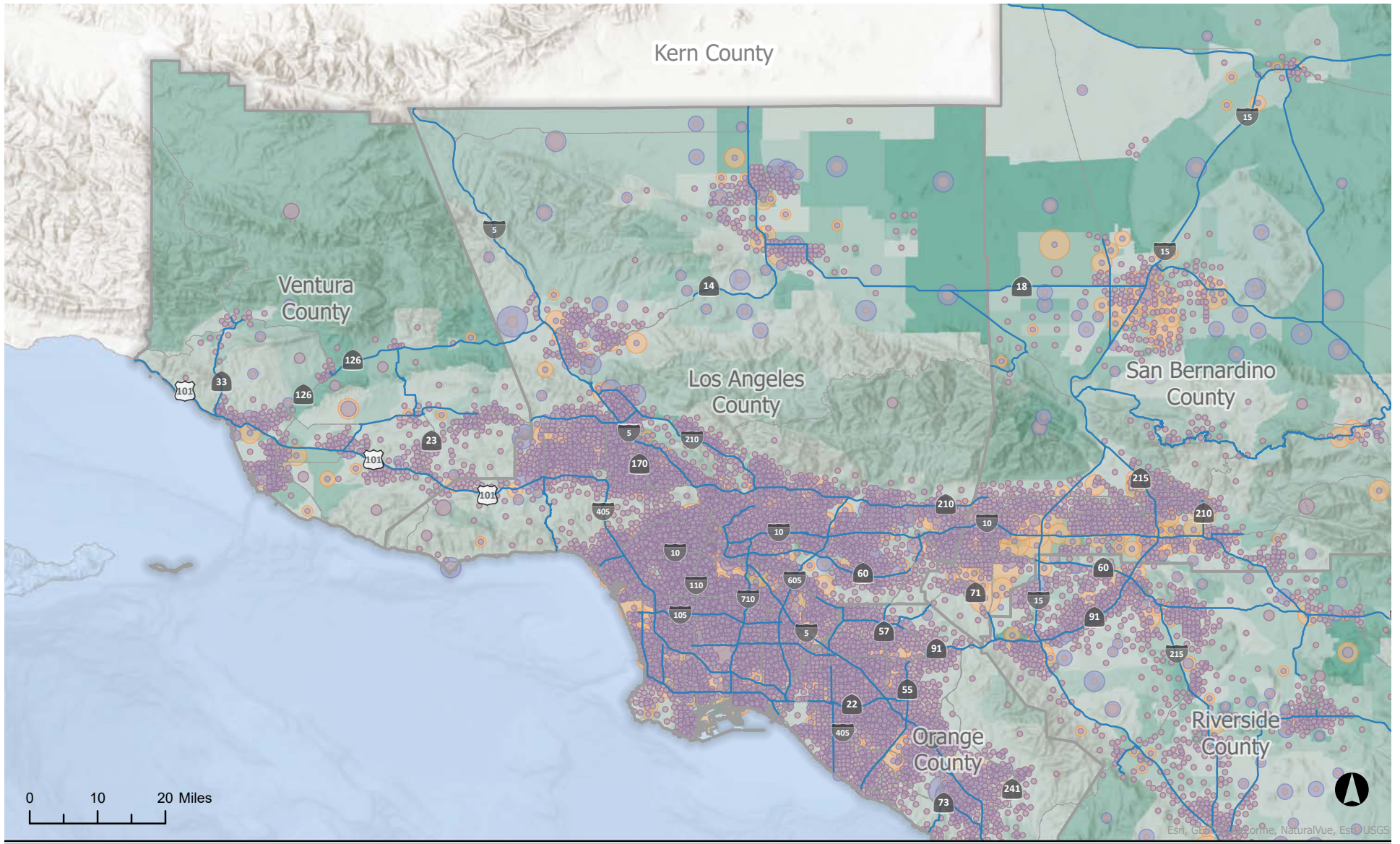


Attachment: Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)



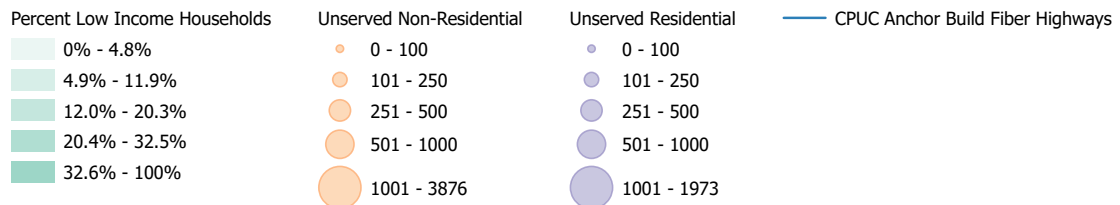
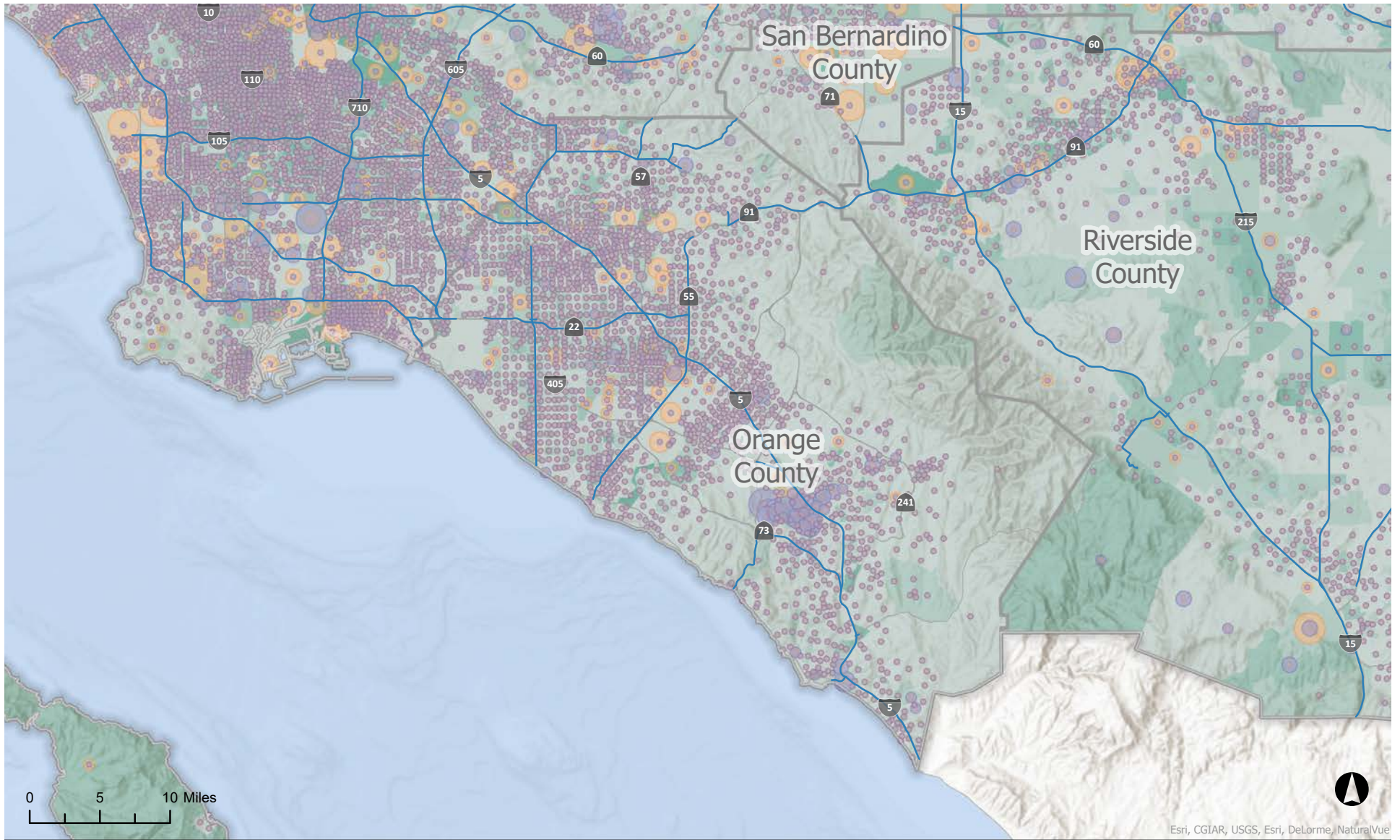
Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative

APPENDIX C – FIGURE 2 Broadband Middle Mile Los Angeles County



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative

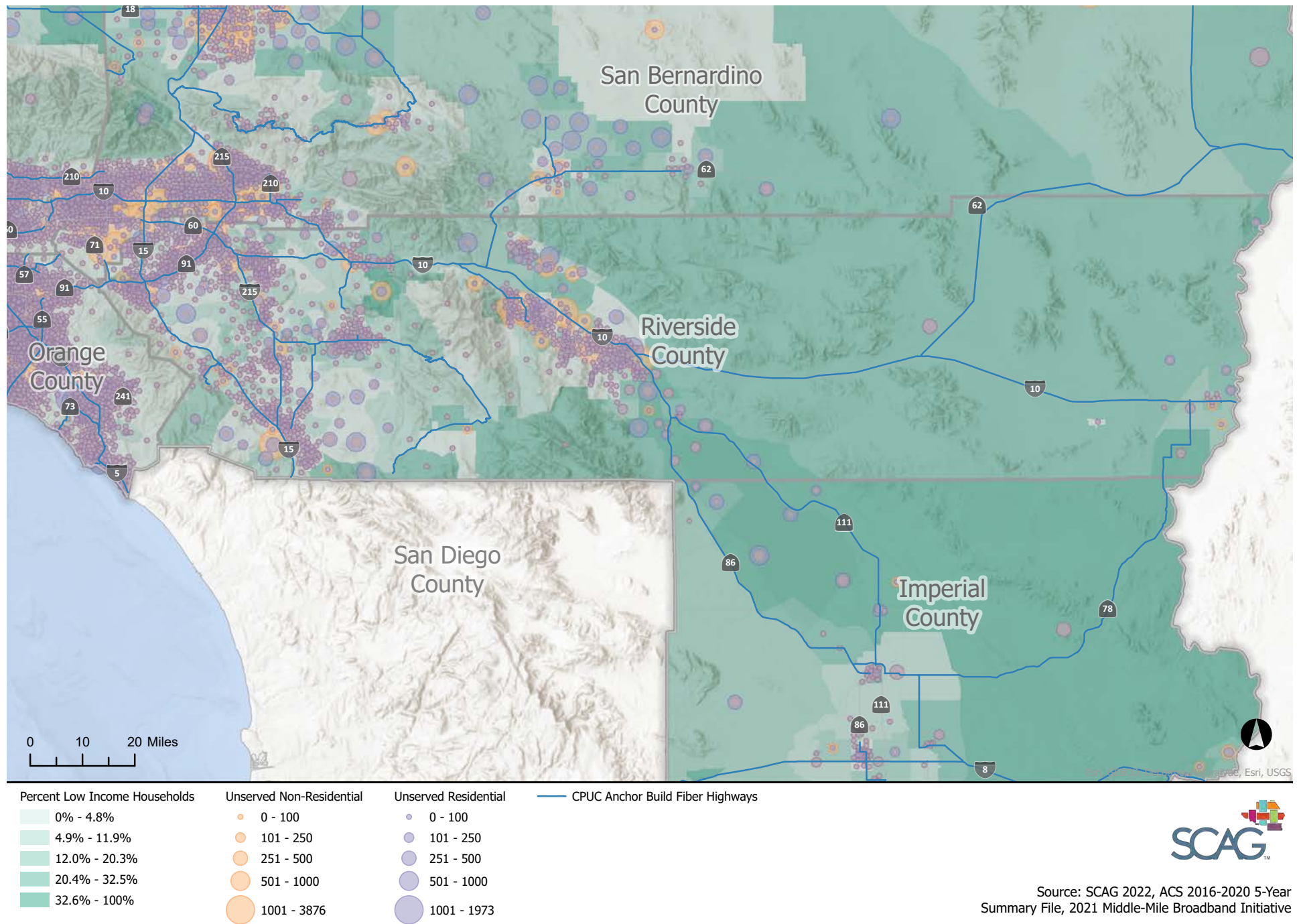
APPENDIX C – FIGURE 3 Broadband Middle Mile Orange County



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative

Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)

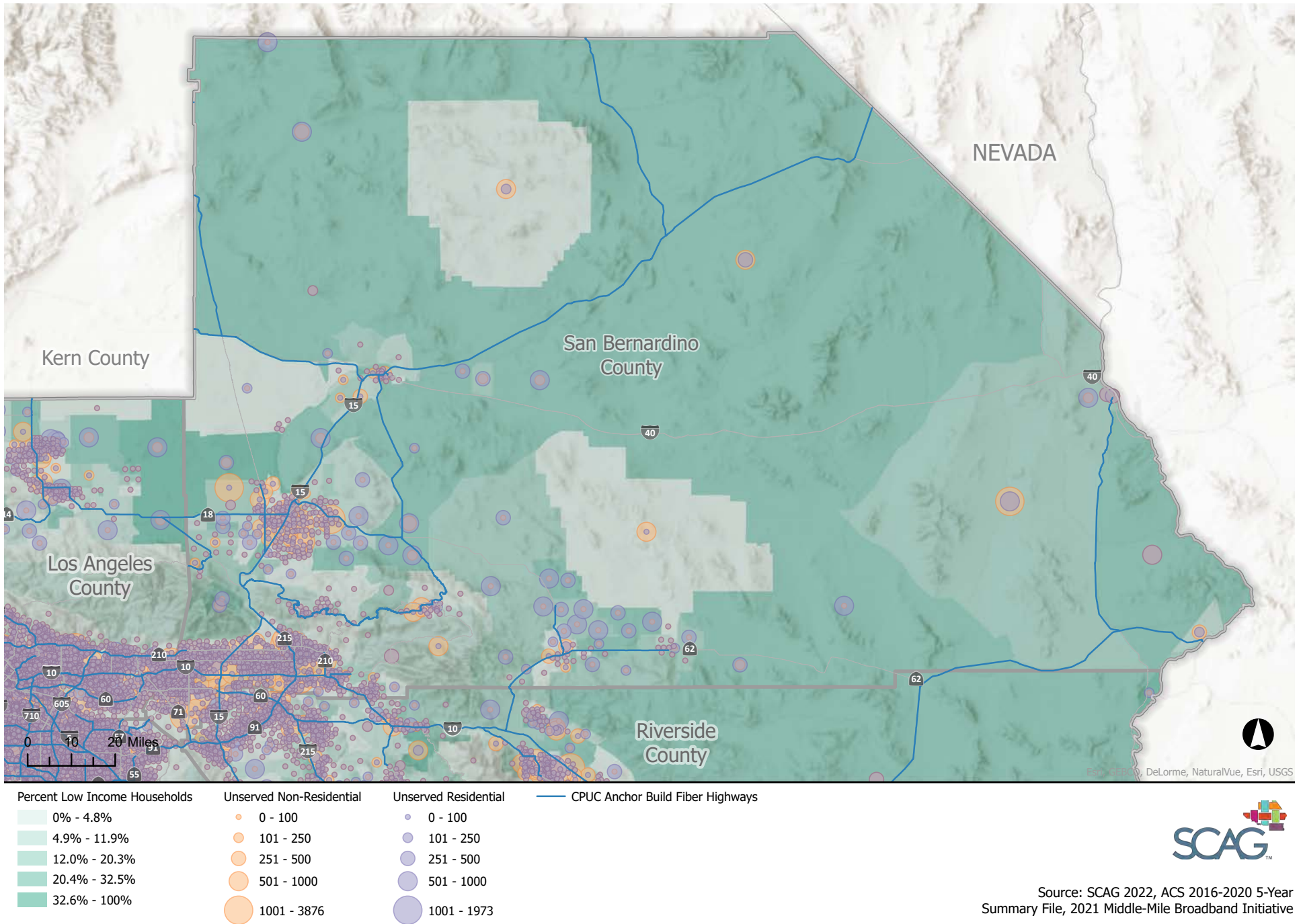
APPENDIX C – FIGURE 4 Broadband Middle Mile Riverside County



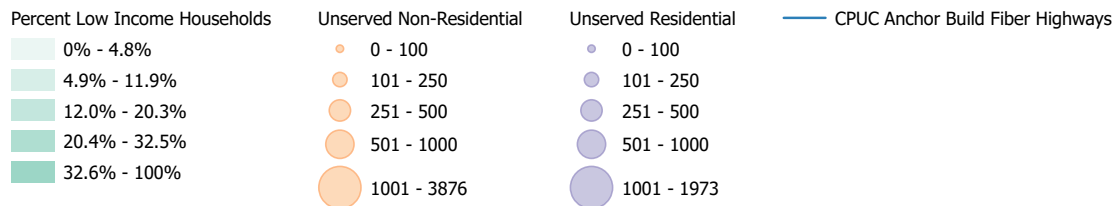
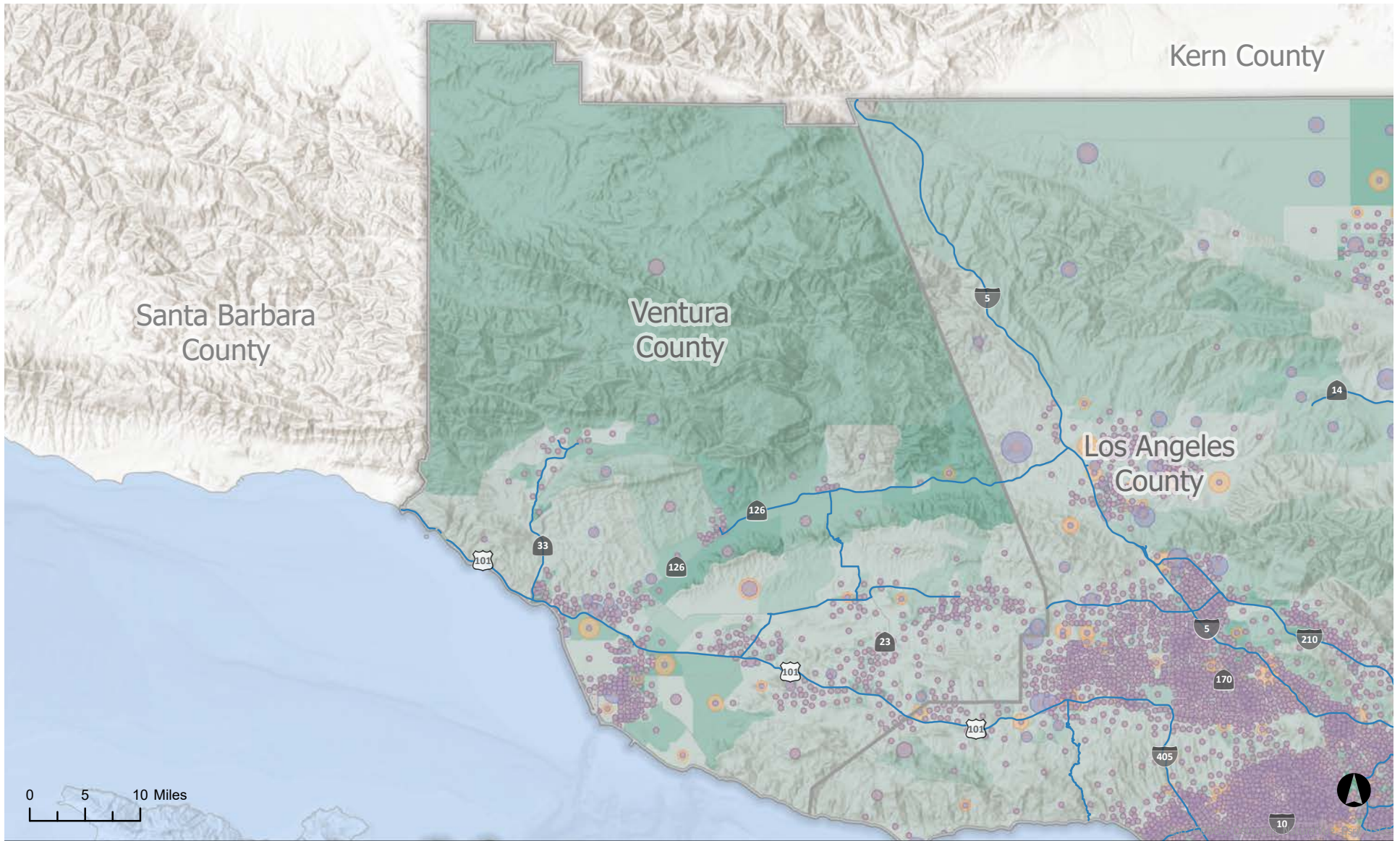
Attachment: Attachment 2. SCAG's Draft Digital Action Plan (SCAG's Draft Digital Action Plan)



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative



APPENDIX C – FIGURE 6 Broadband Middle Mile Ventura County



Source: SCAG 2022, ACS 2016-2020 5-Year Summary File, 2021 Middle-Mile Broadband Initiative



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SCAG's Digital Action Plan

Emerging Technology Committee

October 27, 2022

WWW.SCAG.CA.GOV



THE DIGITAL DIVIDE

The Benefits of Broadband


- **Accessibility:** Broadband helps people with disabilities to participate in society.
- **Civic engagement:** Broadband empowers civic engagement and effective governance
- **Economic development:** Broadband fosters economic growth
- **Education:** Broadband can enhance education
- **Public health:** Broadband can improve access to healthcare
- **Public safety:** Broadband can help create a safer society
- **Sustainability:** Broadband is a Green Strategy

What is the Digital Divide?

- Simplified Definition: *"The gap between those with internet access and those without it"*
- Reality: There is no **one** digital divide, there are **multiple** divides



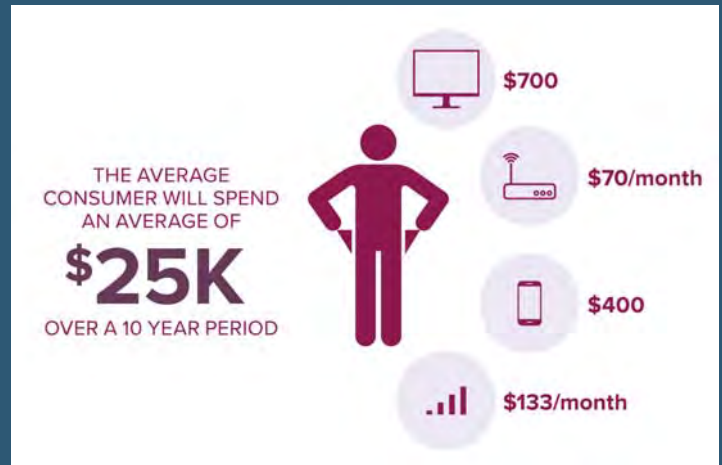
Multiple Divides



AVAILABILITY
A lack of infrastructure or proper service

AFFORDABILITY
A lack of affordable subscription rates or devices

LITERACY
A lack of understanding or knowledge of how to participate in digital activities



Snapshot of the Region

- **9 to 10%** of households do not have access to adequate internet speeds or a computer
- **13%** of the Black population do not have access to broadband and **5%** do not own a computer
- **11%** of the Native American/Indigenous population do not have access to broadband and **4%** do not own a computer
- **12%** of the Latino/Hispanic population do not have access to broadband and **4%** do not own to a computer
- **20%** of Seniors aged 65 and over do not have access to broadband and **12%** do not own a computer
- **70%** of those without internet are **concentrated** within **low-income households**

Societal Impacts

- Senior citizens and minority communities are targets for **online crime**
- The **“homework gap”** experienced by children of low-income households can prevent social mobility.
- **60%** of the Latino/Hispanic population and **70%** of the Black population **unprepared for jobs** which require digital skills
- Disqualified or underprepared for **86% of jobs** in the U.S. by 2045.



WORK EFFORTS FROM SCAG

Resolution 21-629-2 – Pledge to Bridge the Digital Divide

- **SCAG Resolution 21-629-2:** SCAG pledged to assist in bridging the digital divide
 - Develop a **Digital Action Plan**
 - Collect and invest in broadband data and conduct analysis
 - Conduct technical studies
 - Incorporate broadband into SCAG's programs



Work Efforts

- **Joint Request for Qualifications for Prospective Partnerships (RFQPP)**
- **ACP/Go-Human**
- **Broadband/VMT Report**
- **UC Davis Telework Study**
- **Permit Streamlining Project**
- **Connect SoCal**

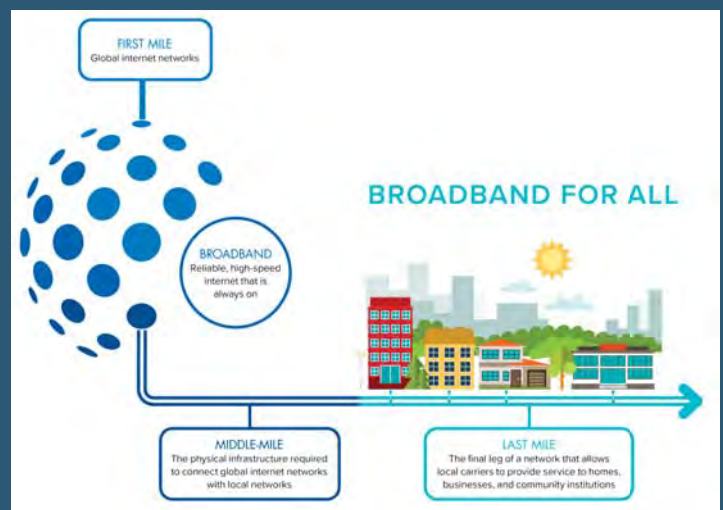




DIGITAL ACTION PLAN

Main Contents

- **Broadband 101**
- **Vision, Goals and Strategies**
- **Digital Divide 101**
- **Causes of the Digital Divide**
- **State of the Region**
- **Work Efforts**
- **Actions and Deliverables (Work in Progress)**



Vision Statement

“We envision an equitable region that fosters accessibility and adoption of affordable high-speed broadband and digital devices for all its residents”



Goals

1. **Accessibility and Affordability** – Every household in the region should have access to affordable high-speed broadband services and high-quality devices
2. **Adoption** – All residents should have the confidence and skills to participate in digital activities
3. **Consensus** – Build partnerships and reach consensus that high-quality and affordable broadband is an essential service to everyone and provides economic, environmental and safety benefits
4. **Planning** – Develop broadband technical tools and studies which provide value to the region

SCAG Strategies

S **SEEK AND SECURE**
 Seek and secure broadband funding for our local jurisdictions and stakeholders to deploy broadband infrastructure, digital devices, and advance digital equity initiatives.

C **COORDINATE AND COLLABORATE**
 Coordinate, collaborate and build partnerships with public agencies, local jurisdictions, partners, and the public and align work efforts to collectively bridge the digital divide.

A **ADVOCATE AND ASSIST**
 Advocate for better data, Southern California's fair share in funding, and open access to broadband networks and assist low-income and rural households in underserved and unserved communities.

G **GATHER AND GAIN**
 Gather data and gain knowledge through broadband technical and strategic studies, disseminate findings and inform decision makers and the public.

Guiding Principles to BRIDGE the DIVIDE

B **BREAK.** Break down barriers which inhibit the deployment of broadband infrastructure

R **RESILIENCE.** Plan or advocate for networks that are efficient and assists in resiliency for communities and infrastructure

I **INVEST.** Invest in communities affected by the digital divide

D **DATA DRIVEN.** Collect and share data to determine opportunity zones and solutions

G **GRASSROOTS.** Use a bottom-up approach and listen to and prioritize a community's needs

E **EXPEDITE.** Develop solutions which can be quickly implemented and efficiently

D **DETERMINE.** Determine funding opportunities and potential partnerships

I **INNOVATE.** Promote an atmosphere which allows for healthy competition, innovative solutions which are speed driven, while remaining technologically agnostic

V **VISIONARY.** Plan or advocate for networks that are scalable, sustainable and accommodate future needs and innovative technology

I **INTEGRATE.** Integrate findings into traditional disciplines of transportation and land use planning

D **DEPENDABLE.** Promote transparency and gain the trust of the public, other agencies, and stakeholders

E **EDUCATE.** Educate the public, policy makers and stakeholders and build consensus for collective action

Proposed Actions and Deliverables

- Proposed Actions and Deliverables are currently in development
- Will be vetted **internally, with stakeholders, Regional Council and Policy Committees**
- Will be aligned with **Goals, Strategies, Guiding Principles**
- Consistent with **SCAG's Strategic Plan**
- **Assist and go beyond "Bridging the Digital Divide"**

Note: Proposed actions and deliverables are dependent on resources available

Next Steps

Milestones	Date
Subregional Council of Directors	October 26, 2022
Emerging Technology Committee	October 27, 2022
Transformation SoCal Working Group	November – December 2022
Equity Working Group	December 8, 2022
GLUE Council	December 12, 2022
1 st Complete Draft to Transportation Committee (Request TC to recommend RC for approval and adoption)	January 5, 2023
Final Digital Action Plan to Regional Council (Request approval and adoption)	Spring 2023

Comments and Feedback

- All comments, suggestions, and feedback are **welcome**
- Please provide the 1st round of comments by **December 1st, 2022**
- Please contact **Roland Ok** via email at ok@scag.ca.gov



THANK YOU!

For more information, please visit:

Broadband Planning: scag.ca.gov/broadband



AGENDA ITEM 4
REPORT

Southern California Association of Governments
Remote Participation Only
October 27, 2022

To: Emerging Technologies Committee (ETC)

EXECUTIVE DIRECTOR'S
APPROVAL

From: Thomas Bellino, Senior Planner
(213) 236-1830, bellino@scag.ca.gov

Subject: Clean Technology Program Update and Panel Context

RECOMMENDED ACTION:

Information Only – No Action Required

STRATEGIC PLAN:

This item supports the following Strategic Plan Goal 1: Produce innovative solutions that improve the quality of life for Southern Californians. 2: Advance Southern California's policy interests and planning priorities through regional, statewide, and national engagement and advocacy.

EXECUTIVE SUMMARY:

Connect SoCal 2020 identified a series of integrated strategies to assist the Region in reaching the greenhouse gas reduction targets. This included a holistic and coordinated approach to decarbonizing passenger vehicles, transit, and goods movement vehicles. The SCAG legislative platform, approved by the Regional Council on February 3, 2022, included a principle which supports the development and deployment of zero emission and alternative fuel vehicles and their supporting infrastructure. SCAG takes a carbon-neutral position when considering new technologies and supports innovative technologies that fit a diversity of operational needs. In February 2023, staff intends to seek direction from the Emerging Technology Committee (ETC) to confirm this position as policy direction for Connect SoCal 2024.

This presentation will provide a brief update on two SCAG studies that support the development of zero emission and alternative fuel vehicles and their supporting infrastructure. The first is the Passenger Electric Vehicle Charging Station Study (EVCSS), which began in January 2021, and is roughly halfway through completion. The second is the Supporting Infrastructure for Medium and Heavy Duty Zero Emission Trucks Study which is expected to kick-off in late 2022. After this presentation, the discussion will transition to the topic of lithium and other critical materials to meet the expected demand for battery electric vehicles which will play a large role in California's transition to a zero-emission transportation system.

BACKGROUND:

In the South Coast Air Basin (SCAB) in 2016, mobile sources were estimated to be responsible for 83 percent of NO_x emissions and transportation was estimated to be 40 percent of greenhouse gas emissions (GHGs).¹ Criteria pollutants such as NO_x and PM_{2.5} threaten public health and GHGs lead to climate change which has exacerbated extreme heat days, drought, and wildfire in Southern California. Both criteria pollutant and GHG challenges threaten our economic resilience.

Connect SoCal sets a vision to reduce both the local and global emissions associated with multiple modes of transportation by deploying clean mobility solutions and the infrastructure needed to support them. This vision is being implemented across many SCAG initiatives. Two large studies are part of a comprehensive catalog of projects and programs for SCAG to advance the region's transition to a zero-emission transportation system. The first is the Passenger Electric Vehicle Charging Station Study (EVCSS), which began in January 2021, and is expected to be completed February 2023. The second is the Supporting Infrastructure for Medium and Heavy Duty Zero Emission Trucks Study which is expected to kick-off in late 2022. More information about these efforts are provided below.

As discussed in the adopted Connect SoCal 2020, SCAG takes a technology neutral position to zero emission technology deployment. In the future, SCAG staff will provide additional information about technology neutrality and the development of a compendium of clean transportation technologies to support the development of the Connect So Cal 2024 update.

While SCAG's position is to remain technology neutral, current market trends suggest that battery electric vehicles will be a part of the region's transition to a zero-emission transportation system. As deployment of these vehicles increases, SCAG is evaluating the lifecycle impacts of electric vehicles, such as disposal and extraction of raw materials.

Holistic View of Electric Vehicles and the SCAG Legislative Platform

The SCAG legislative platform, approved by the Regional Council on February 3, 2022, includes a principle that supports taking a life cycle approach to the development and deployment of zero emission and alternative fuel vehicles and their supporting infrastructure. This principle specifically states that for electric vehicles SCAG shall "support policies that ensure that proper battery reuse, recycling, and disposal are in place." SCAG recognizes that battery electric vehicles are a prominent technology in helping to achieve the region's zero emission vision. As of February 2022, ZEVs represented 12% of all vehicles sold in the state, and the Advanced Clean Cars Rule II approved by CARB on August 25, 2022, mandated that 100% of passenger vehicles sold by 2035 will be zero emission.

¹ Connect So Cal 2020, Goods Movement Technical Report

As demand for Electric vehicles is expected to rise, so is the demand for critical materials such as cobalt and lithium, key components of the battery. Currently, most critical materials are extracted overseas, and California and the Nation may potentially face supply issues, due to increasing global demand, uncertainty in trade agreements, and supply chain/logistical problems (as witnessed during the COVID-19 pandemic). To mitigate logistical uncertainties and environmental impacts from extracting raw materials, there is a potential to recycle and extract critical materials from retired lithium-Ion batteries. The University of Technology Sydney's Institute for Sustainable Futures found that recycling is the most important strategy for the renewable energy and battery industries moving forward².

Acknowledging this need the California legislature passed AB 2832 in 2018, dictating a process for selecting participants for the composition of the Lithium-Ion Car Battery Recycling Advisory Group and requiring submission of a report at the end of the process. As such, the Advisory Group submitted policy recommendations to the Legislature to ensure "...that as close to 100% as possible of lithium-ion batteries in the state are reused or recycled at end-of-life." SCAG staff, Alison Linder, Senior Regional Planner, served as a committee member and chair of the Reuse Subcommittee from November 2019 – March 2022. The committee offered several policy recommendations to encourage battery reuse and recycling and support growth of a reuse and recycling industry in California. For more about that effort, please see the staff report and presentation submitted to the Environment and Energy Committee on October 6th, 2022, entitled Lithium-Ion Battery Reuse, Recycling and Safe Disposal - Findings from the CA Lithium-Ion Battery Recycling Advisory Group.

Despite efforts to improve recycling efficiency, it will not meet all demand and at least in the short-term new mining will occur. John Graham, professor of risk analysis at Indiana University outlines that demand for lithium as a raw material will likely remain high through 2030 as recycling of lithium-ion batteries is very costly, and long vehicle lifetimes will delay the secondhand supply.³ At least in the short term, it is estimated that additional extraction of critical materials will be needed to meet demand. These materials are rare and extraction processes could lead to contamination of water and agricultural soils and health impacts on workers, the environment, and surrounding communities. Certification programs to ensure responsible sourcing of critical materials are one possible recommendation.⁴ The California Lithium Valley Commission is currently investigating the development of lithium supply within California and will evaluate the opportunities and potential impacts.

Passenger Electric Vehicle Charging Station Study (EVCSS)

² https://earthworks.org/wp-content/uploads/2022/06/Responsible-minerals-sourcing-for-renewable-energy-Executive-Summary-MCEC_UTS_Earthworks-Report.pdf

³ <https://nap.nationalacademies.org/read/26668/chapter/2#14>

⁴ https://earthworks.org/wp-content/uploads/2022/06/Responsible-minerals-sourcing-for-renewable-energy-Executive-Summary-MCEC_UTS_Earthworks-Report.pdf

For the Electric Vehicle Charging Station Study (EVCSS), SCAG is partnering with 18 cities within the SCAG region to help jurisdictions promote development and deployment of EV charging infrastructure to accelerate transportation electrification. The study includes tailored policy guidance to study partner cities; a regionwide Site Suitability Analysis to target areas for future EV charging infrastructure, with a focus on increasing EV infrastructure in traditionally underserved and hard-to-reach communities including multi-unit dwellings (MUDs) and Disadvantaged Communities (DACs); EV site evaluations; and a Passenger Electric Vehicle (PEV) Infrastructure Plan that will provide a roadmap for cities to spur development of charging stations and support EV adoption across Southern California.

As part of the EVCSS project, SCAG hosted 22 listening sessions, a virtual meeting room, 15 community events, and a survey of consumer preferences to engage with city stakeholders, industry experts, and local communities to raise project awareness, encourage EV adoption, and gather community stakeholder input. During the listening sessions with cities, SCAG provided technical assistance on meeting the requirements of AB 1236 and AB 970 to help cities streamline EV permitting. SCAG found that most cities are fulfilling the permit streamlining requirements mandated under AB 1236. SCAG used this feedback to create guides for cities and site developers. SCAG also ran a site suitability analysis across the region to evaluate potential for EV stations using 25 criteria weighted differently for 3 different scenarios. Scored parcels will be integrated into SCAG's PEV atlas providing a tool for cities to plan for station locations. For the 18 cities in the study, SCAG is currently developing high-level site evaluations for prioritized sites and creating a final PEV Infrastructure plan. This study is expected to be completed in February 2023.

Supporting Infrastructure for Medium and Heavy Duty Zero Emission Trucks Study

Connect SoCal includes a technology advancement plan for the regional goods movement system, as well as action steps to be taken by SCAG and its regional partners. This includes a focus on the long-term goal of a zero-emission goods movement system where technically feasible and economically viable, while also integrating near-zero emissions technologies that serve as bridging options to continue to reduce emissions below current levels.

SCAG will initiate a planning study to help envision a regional network of zero emission charging and fueling infrastructure. This study will create a phased blueprint and action plan towards realizing this goal, and answer key questions about how stations in the region may operate to serve different truck markets and business functions. Though convened by SCAG, this study will be guided by a Technical Advisory Committee of key stakeholders, who will be instrumental in implementing this plan. Details regarding the quantity, distribution and characteristics of charging and fueling stations will be quantified to the extent possible to help visualize and plan for infrastructure needs and investments. Up to 10 sites will be selected to provide a closer look at the needs of deploying an individual station.

To support this work, SCAG has received a California Energy Commission (CEC) Research Hub for Electric Technologies in Truck Applications (RHETTA) grant as a sub-recipient to the Electric Power Research Institute (EPRI). The larger grant effort was designed to fund applied research and development (AR&D) and technology demonstration and deployment (TD&D) activities through the creation of a Research Hub for Electric Technologies in Truck Applications. The larger study will demonstrate and evaluate corridor-based charging strategies for zero emission truck solutions. Phase 1 of the larger project has been funded for \$13,000,000. Of this, SCAG will receive \$600,048 associated with its study of supporting infrastructure for medium and heavy duty zero emission trucks. This grant was accepted by the Regional Council on Jan 6, 2022, under Resolution # 22-639-1.

The benefits and key deliverables of this study include, but are not limited to:

1. Determining the demand for stations based on truck market operational characteristics and travel behavior and assessing the potential supply of land for stations;
2. Planning the distribution of future stations throughout the region based on a variety of factors, (travel demand, need for public, private, and privately accessible stations, power and fueling supply, potential impacts to surrounding communities, and other factors to yet to be determined);
3. A micro-level site assessment for roughly 10 stations to understand the factors to get one up and running; and
4. A regional action plan supported by participating stakeholders showing the extent of the needed infrastructure and a sequence for phased development and recommendations that partners can take to facilitate the goal of a regional charging and fueling network.

FISCAL IMPACT:

Work associated with the Clean Technology Program is included in the Fiscal Year 2022-2023 Overall Work Program associated with 115.4912.01



Southern California Association of Governments
Remote Participation Only
October 27, 2022

To: Emerging Technologies Committee (ETC)

EXECUTIVE DIRECTOR'S
APPROVAL

From: Thomas Bellino, Senior Planner
(213) 236-1830, bellino@scag.ca.gov

Subject: Lithium Extraction in the Salton Sea

RECOMMENDED ACTION:

Information Only – No Action Required

STRATEGIC PLAN:

This item supports the following Strategic Plan Goal 1: Produce innovative solutions that improve the quality of life for Southern Californians. 2: Advance Southern California’s policy interests and planning priorities through regional, statewide, and national engagement and advocacy. 4: Provide innovative information and value-added services to enhance member agencies’ planning and operations and promote regional collaboration.

EXECUTIVE SUMMARY:

As energy companies prepare to begin extracting lithium from the Salton Sea next year, the SCAG Region’s leaders should be knowledgeable about the science, context and potential for benefits and challenges that will come from lithium extraction. It is imperative that stakeholders in the SCAG region work together to ensure regional cooperation in this sector that is projected to grow rapidly in the coming years.

The Emerging Technology Committee (ETC) will hear from three experts in the field, each of whom will provide a crucial perspective. From the academic research field, University of California, Riverside, geologist Michael McKibben will explain the science behind what lithium is, why it’s so valuable, and the different means of extraction and their environmental impacts. Representing the public sector, Imperial County Supervisor Ryan Kelley will discuss the role of government at the federal, state, and local levels in encouraging economic development and minimizing negative environmental impacts. Jonathan Weisgall, the Vice President for Legislative and Regulatory Affairs for Berkshire Hathaway Energy, will provide an overview of the extraction process, and the perspectives of the private sector.

BACKGROUND:

SCAG's 2020 Connect SoCal Plan outlines multiple goals for the region that rely upon an increased supply of and capacity for low- or zero-emissions vehicles on our roads. Additionally, several state laws and executive orders require California to transition rapidly to electric vehicles. An increase in capacity for electric charging, batteries, and other infrastructure will be required to accommodate future needs, and the raw material most in-demand will be lithium. Laws and executive orders have been enacted around lithium. A few examples are:

- Presidential Executive Order (2017) No.13817
 - Lists lithium as a critical mineral essential to the nation's economic and national security
- Presidential Executive Order (2020) No. 13953
 - Intent to secure a domestic supply of critical minerals
- California Governor (2020) Executive Order N-79-20
 - 100% zero emission passenger vehicles by 2045
- California Governor (2020) signed AB 1657
 - Creates the Lithium Valley Commission

Lithium is a crucial component of electric vehicle (EVs) because it is the lightest of the metals and can store more energy per weight than other metals. Further, lithium is best suited to powering digital devices (smartphones, tablets, computers and auxiliary support systems in vehicles). To obtain lithium, it must be mined or extracted from brine.

There are limited places on earth where lithium exists and global events such as pandemics, wars and trade embargoes could easily disrupt the United States' supply of the mineral. Currently nearly 100% of the US's lithium stock is imported from other parts of the world. While Australia and Chile are reliable cooperators, other major lithium-production countries like Russia, China and Belarus are unreliable, given recent events.

Luckily, the US contains a large supply of untapped lithium, and it exists in the SCAG region. According to reporting by the Desert Sun, "prices for refined lithium have risen sixfold between January 2020 and May 2022 on the Chinese market," and that "ultimately a third of global supply could come from" Imperial County.¹ As such, lithium can potentially bolster economic growth within the Imperial Valley.

However, lithium extraction can come at a cost to the environment. For example, Chile and Australia require environmentally damaging extraction practices, such as hard rock mining and massive evaporation lagoons in fragile desert ecosystems. The Salton Sea (located within the

¹ <https://www.desertsun.com/story/news/2022/05/13/lithium-valley-look-major-players-near-salton-sea-seeking-billions-funding/9665978002/>

Imperial Valley) already has large geothermal power sites that produce a brine from which lithium can be extracted in a way that is much less environmentally damaging. This is one compelling reason for leaders to encourage this region to become the largest source of lithium for the US and potentially the world.

In 2020, Assembly Bill 1657 (Garcia) was enacted to create the Blue Ribbon Commission on Lithium Extraction in California. The legislative findings and declarations for the bill are²:

- World demand for lithium is expected to grow as much as tenfold in the next decade, but virtually none is produced in the United States. Almost all the global lithium supply is mined in Argentina, Chile, China, and Australia;
- The Salton Sea geothermal resource area is well-positioned to become a competitive source of lithium that could satisfy more than one-third of today's worldwide lithium demand, but investment in this resource requires that the technology to recover lithium from geothermal brine on a commercial scale can occur without certain risks and uncertainties;
- There is a national security rationale for developing a domestic supply of lithium. Lithium was listed in the Federal Register as a critical mineral "essential to the economic and national security of the United States" pursuant to the 2017 presidential Executive Order Number 13817 titled "A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals.";
- The opportunity for lithium production in California has the potential to unleash billions of dollars of new economic infrastructure development.

The Blue-Ribbon Commission would eventually become the Lithium Valley Commission³, which began convening in February of 2021 and is charged with reviewing, investigating, and analyzing certain issues and potential incentives, as further detailed in the statute, regarding lithium extraction and use in California; and, to consult, if feasible, with the United States Environmental Protection Agency and the United States Department of Energy in performing these tasks. The Commission is required to submit to the California Legislature a report documenting its findings and recommendations. All three of today's presenters are involved in the Commission and are highly regarded experts in their respective fields.

The Draft Report of the Blue Ribbon Commission on Lithium Extraction in California is available for public comment through Friday, October 28, 2022. According to the Draft Report², lithium extraction is projected to create 4,285 jobs and \$359.3 million in annual earnings and taxes for Imperial County, thanks in part to new lithium extraction taxes that will go into effect in 2023.

² Draft Report of the Blue Ribbon Commission on Lithium Extraction in California, <https://www.energy.ca.gov/publications/2022/report-blue-ribbon-commission-lithium-extraction-california-pursuant-assembly>

³ <https://www.energy.ca.gov/data-reports/california-power-generation-and-power-sources/geothermal-energy/lithium-valley>

Currently, several companies are participating in the Commission as well as extraction that will begin in 2023, including Berkshire Hathaway Energy (who will be providing a presentation to the ETC).

While Southern California would benefit from the economic development that will come with these operations coming online, it is important to minimize negative environmental impacts, as Imperial County is already significantly impacted by industries that create serious environmental justice concerns. According to the Draft Report, in 2020, “the median household income in Imperial County was \$46,222 compared to the statewide average of \$78,672 and 18.1 percent of the population of Imperial County is living in poverty, significantly higher than the state average of 11.5 percent.” Additionally, several Native American/Indigenous Tribes reside in Imperial County. Residents of Brawley, one of the closest towns to the extraction sites, would benefit from additional jobs, but have expressed concerns over environmental impacts⁴.

Government at all levels must ensure that Imperial County residents face the absolute minimum amount of environmental degradation possible, and the Commission as well as this meeting can help to make sure that is a common goal. With lithium becoming the most important mineral resource for the 21st century, the supply of raw lithium within the Salton Sea will allow the State of California and the United States as a whole to be a major global competitor, and the local communities of Imperial County as well as the SCAG Region can reap its economic benefits.

FISCAL IMPACT:

None, information only.

ATTACHMENT(S):

1. PowerPoint Presentation - Michael McKibben UC Riverside Salton Sea
2. PowerPoint Presentation - Sup Kelley Lithium Valley SCAG Presentation 10-12-22
3. PowerPoint Presentation - Berkshire Hathaway SCAG Emerging Technology Committee meeting 10.27.22

⁴ <https://www.theguardian.com/us-news/2021/sep/27/salton-sea-california-lithium-mining>

Lithium Resources Beneath The Salton Sea: Opportunities and Challenges

Michael A. McKibben, Ph.D.

Research Professor (Economic Geology & Geochemistry)

Department of Earth and Planetary Sciences

University of California, Riverside

michael.mckibben@ucr.edu

Southern California Association of Governments Emerging Technology Committee
Oct. 27, 2022

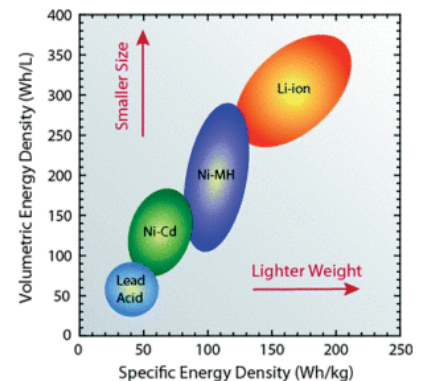
What is **Lithium** and why is it so valuable?

Atomic number 3 on the periodic table of the elements:
the lightest of the metals

Can store **more energy per weight** than other metals

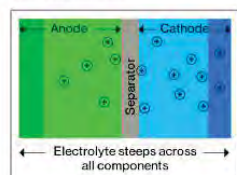
So, lithium is ideal for powering mobile electrical devices

**Smart phones, Laptops/Tablets, Earbuds/Airpods,
Weedwhackers, Power drills, Electric vehicles**



But, like, what is a battery even?

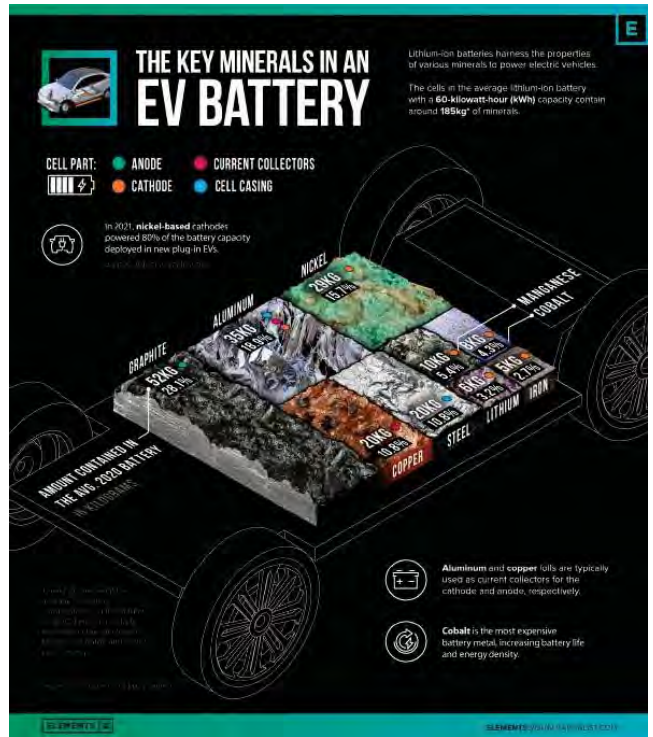
All batteries consist of four components: anode, cathode, electrolyte, and separator. As a battery is charged, ions flow from the cathode to the anode. When it's discharged, the ions reverse course.



The components can come in a tightly wound cylinder steeped in liquid electrolyte. The amount and proportion of ingredients fluctuate with metals used.

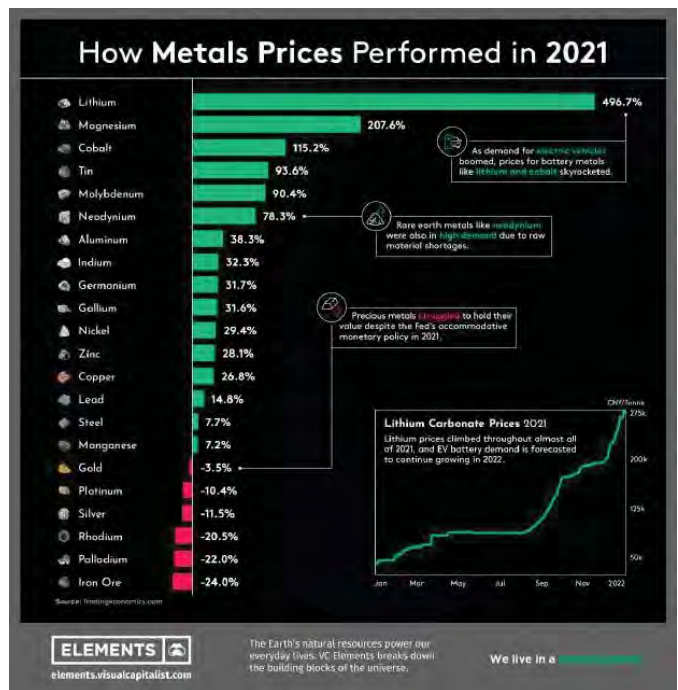
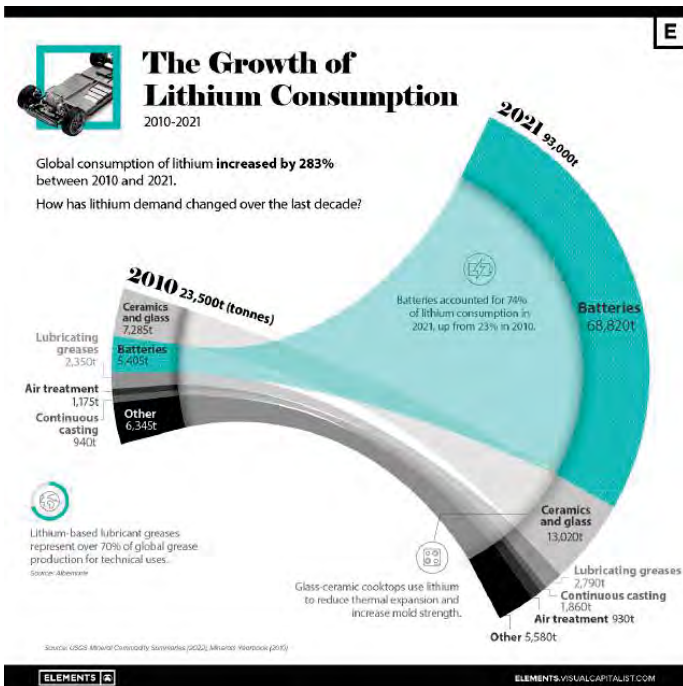


Metals in battery cells for electric vehicles come from minerals and brines



~ 6 kg of lithium (13.2 pounds)

Growth in demand = growth in price



This is the reason for all the sudden interest in the geothermal Li far beneath the Salton Sea!

Field:	Salton Sea
Well:	S2-14 ^b
Temperature (°C) ^a	330
Depth (m) ^h	2500–3220
Constituent	
Na	54,800
Ca	28,500
K	17,700
Fe	1,710
Mn	1,500
SiO ₂ ⁱ	>588
Zn	507
Sr	421
B	271
Ba	≈210
Li	209
Mg	49
Pb	102
Cu	7
Cd	2
NH ₄	330
Cl	157,500
Br	111
CO ₂ ^j	1,580
HCO ₃ ^k	NA
H ₂ S	10
SO ₄ ^l	53
TDS	26.5%

Many of the metals in the Salton Sea geothermal brines are **strategic commodities**

Commodity	Main use	Import reliance	Import sources
Li	Batteries	>90%	Argentina, Chile, China
Mn	Steel-making	100%	S. Africa, Australia, Gabon, Georgia
Zn	Galvanizing	76% (refined Zn)	China , Peru, Australia
K	Fertilizer	93%	Canada, Russia, Belarus
Sr	Magnets	100%	Mexico, Germany, China
Rb	Quantum computers	100%	Canada, China

Why should we use geothermal brines to get our lithium supplies?

The U.S. has a very fragile Lithium Supply Chain

World Mine Production and Reserves: Reserves for Argentina, Australia, and "Other countries" were revised based on new information from Government and industry sources.

	Mine production		Reserves ⁶
	2020	2021*	
United States	W	W	750,000
Argentina	5,900	6,200	2,200,000
Australia	39,700	65,000	5,700,000
Brazil	1,420	1,500	95,000
Chile	21,500	26,000	9,200,000
China	13,300	14,000	1,500,000
Portugal	348	900	60,000
Zimbabwe	417	1,200	220,000
Other countries ⁵	—	—	2,700,000
World total (rounded)	⁸ 82,500	⁹ 100,000	22,000,000

Data in metric tons of Li metal, USGS MCS 2022



Note: 50,000 miles describes the route, by land and sea, that some materials travel before reaching the car manufacturer as finished battery cells.

Bloomberg

This supply chain can be easily interrupted or broken by wars, embargoes, pandemics.

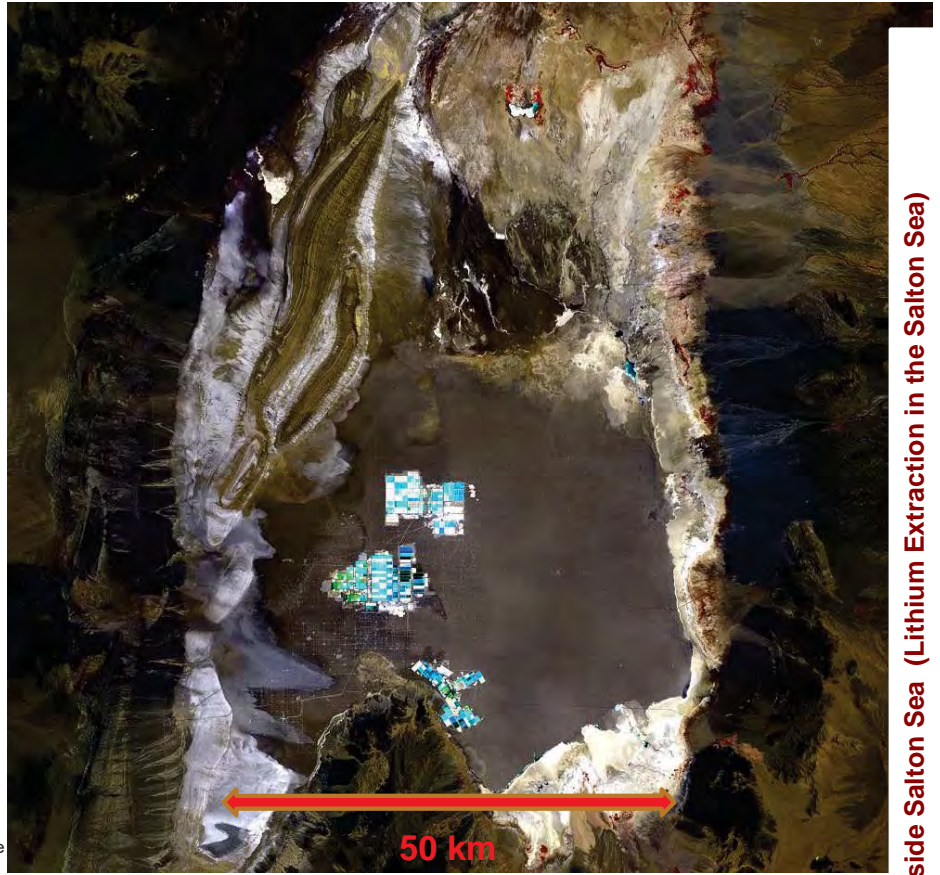
Our lithium consumption also damages the Atacama Desert's dry salt flats (salars) in Chile

Salar de Atacama, Chile – the size of Yosemite National Park (3000 km²)



Financial Post

<https://eros.usgs.gov/image-gallery/earthshot/salar-de-atacama-chile>



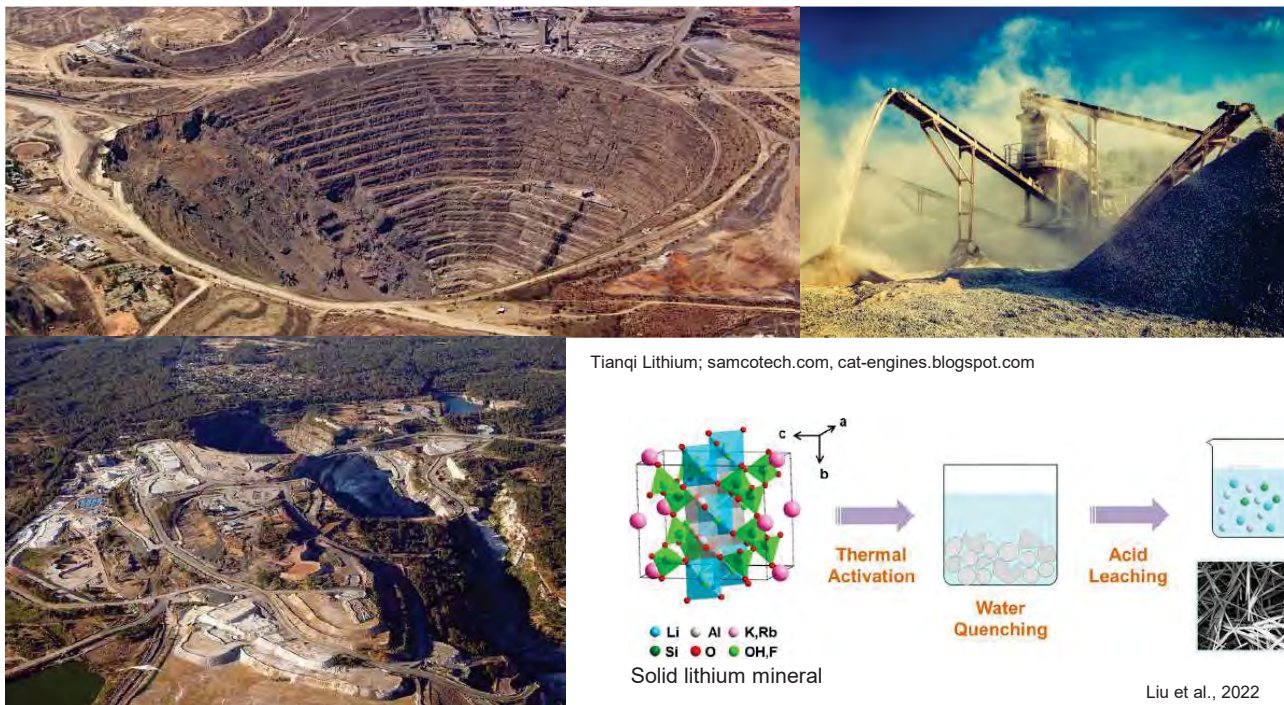
Environmental impacts of traditional salar Li mining in **Chile & Argentina**: huge footprint, high water loss, lagoon ecology



SQM; Lithium Americas; Millennial Lithium

Attachment: PowerPoint Presentation - Michael McKibben UC Riverside Salton Sea (Lithium Extraction in the Salton Sea)

Traditional open-pit hard rock Li mines in **Australia**: blasting, crushing, dust, sulfuric acid, tailings piles and ponds.



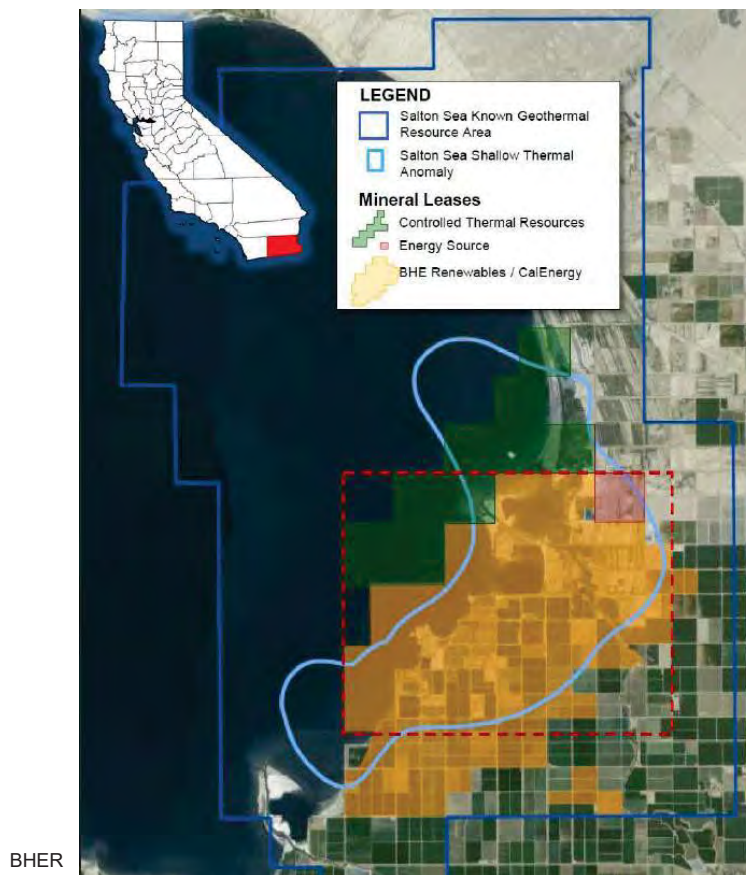
**A new, more environmentally-friendly approach:
Direct Lithium Extraction (DLE) at the Salton Sea
Geothermal Field**

Three operators generate ~400 MWe of electricity:

Berkshire Hathaway Energy Renewables (BHER)
(CalEnergy)
10 power plants

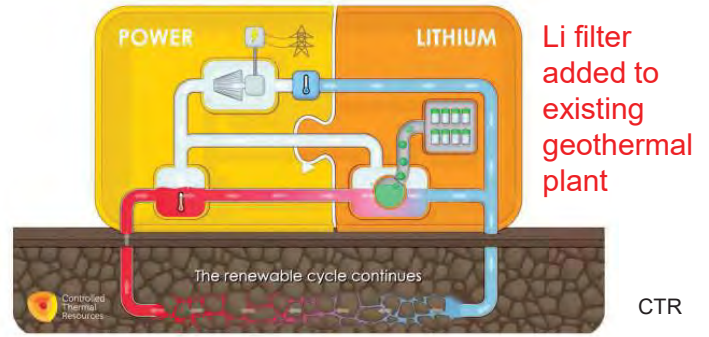
EnergySource Minerals (ESM)
(Hudson Ranch/Featherstone)
1 power plant

Controlled Thermal Resources (CTR)
(Hell’s Kitchen)
Building new facilities



Attachment: PowerPoint Presentation - Michael McKibben UC Riverside Salton Sea (Lithium Extraction in the Salton Sea)

Geothermal brine Li recovery: smallest footprint: closed-loop process, no huge evaporation ponds, no blasting, no pits.



How much Li may be in the Salton Sea geothermal brines?

Estimates: *brine Li concentration x reservoir porosity x reservoir volume* (McKibben 1991, McKibben et al., 1990, 2021). There are ranges in resource area, thickness, porosity and Li concentration.

“**Conservative**” = currently drilled portion of reservoir to 2 km depth, porosity of 10%.

“**Optimistic**” = total reservoir to 3 km depth from Kaspereit et al. (2016), porosity of 20%.

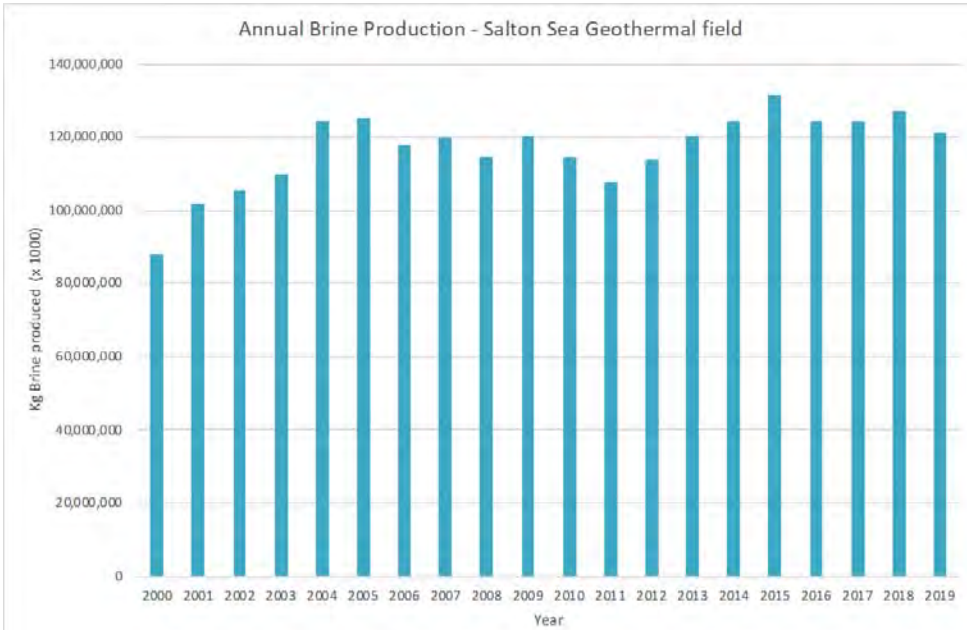
	Reservoir brine volume (km ³)		Li in reservoir brines (metric tons of Li metal)	
	1990s	2016	1990s	2016
Porosity				
10%	5.5 km ³ “conservative”	15.5 km ³	1,000,000 “conservative”	3,000,000
20%	11 km ³	33 km ³ “optimistic”	2,000,000	6,000,000 “optimistic”

For comparison, Salar de Atacama in Chile contains 6 million metric tons of Li metal (Munk et al. 2016).

1 ton Li metal = 5.32 tons LCE = 6.05 tons LHME

Attachment: PowerPoint Presentation - Michael McKibben UC Riverside Salton Sea (Lithium Extraction in the Salton Sea)

How much of the dissolved Li might be recovered each year?



~20 year production record!

For the current field's annual brine production rates:
 The total amount of Li contained in produced brine over a year = 120,000,000 kg x 0.0002 (200 ppm Li) = 24,000 tons Li metal/yr @ 400 MWe, equivalent to 128,000 tons LCE/yr @ 400 MWe.

At 90% recovery efficiency:
= 115,200 tons LCE/yr @ current 400 MWe brineflow
3.6M EVs/yr

Annual cumulative brine production rates compiled by Pat Dobson (from CA Dept. of Conservation web site, 2021).

115,200 tons LCE/yr @ 400 MWe currently
= 288 tons LCE/yr per MWe

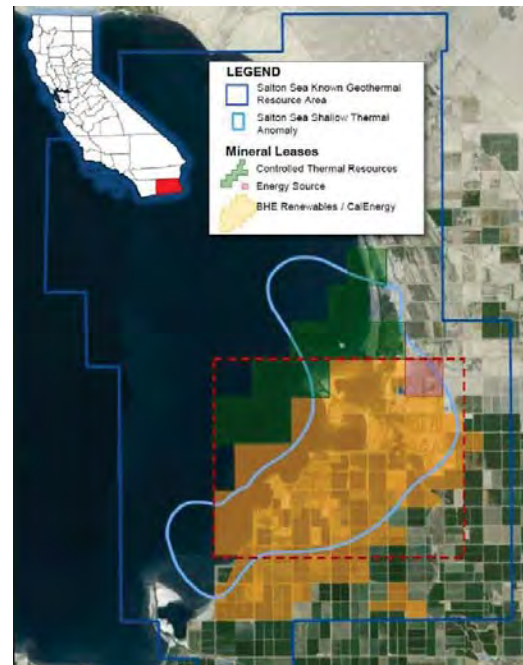
Announced expansion of the geothermal field over the next several years:

- BHER current = 345 MWe
- BHER additional = 395 MWe
- ESM current = 60 MWe
- CTR new Stage 1 = 50 MWe
- CTR new Stage 2 = 260 MWe

Total = 1,110 MWe x 288 tons LCE/MWe

= 320,000 metric tons LCE/yr **10M EVs/yr**

= 60% of global Li production in 2021 (532,000 metric tons of LCE)



BHER

How long might the Li production last?

For a fixed rate of 320 kt/y of LCE for the expanded geothermal field (1,110 MWe) (McKibben, 2022):

<u>“Reserves”</u>	<u>Annual depletion rate</u>	<u>Years of production</u>
5 Mt LCE (conservative)	6.4%	16 yrs
16 Mt LCE (half optimistic)	2.0%	50 yrs
32 Mt LCE (optimistic)	1.0%	100 yrs

But we need far more sophisticated reserve and depletion estimates that take into consideration **Li dilution** due to reinjection and **Li replenishment** due to reaction of reinjected brines with the Li-bearing reservoir rocks, all of which require a *better brine reservoir model*.

Where is the Li in the brines coming from? (controls solubility and replenishment)

Evaporites (gypsum), mudstones (shales) are possible candidates, but also: **rhyolites**



We are analyzing brines and rocks for their Li contents and Li isotope ratios, to fingerprint the rock sources.

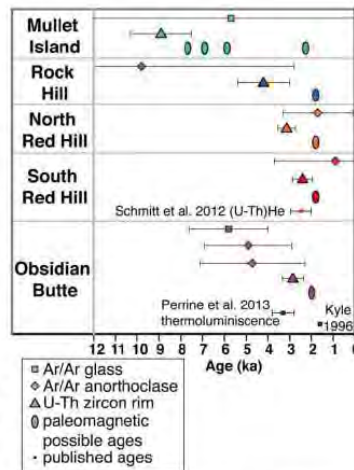


Figure 8. Compilation of $^{40}\text{Ar}/^{39}\text{Ar}$ and $^{238}\text{U}/^{232}\text{Th}$ age results (with 2 sigma uncertainties for Ar ages and 95% confidence intervals for U-Th ages) from this study, including permissible ages for paleomagnetic data within uncertainty limits of other age determinations and previously published age constraints for Salton Buttes surface domes.

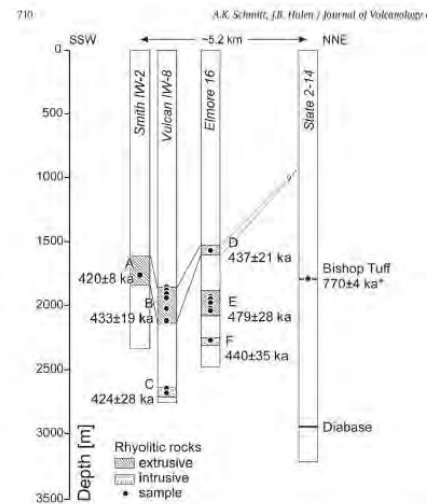


Fig. 2. Schematic well logs showing presence of volcanic rocks in studied Salton Sea Geothermal Field wells (after Hulen and Polka, 2001; Hulen, unpublished data; Herzig and Elders, 1988). All ages are U-Th zircon-model ages, except for (*) which is the $^{40}\text{Ar}/^{39}\text{Ar}$ sanidine age for Bishop Tuff (Sarna-Wojcicki et al., 2000; recalculated by Crowley et al., 2007). Letters refer to panels in Fig. 4. All age uncertainties quoted at 2 σ level.

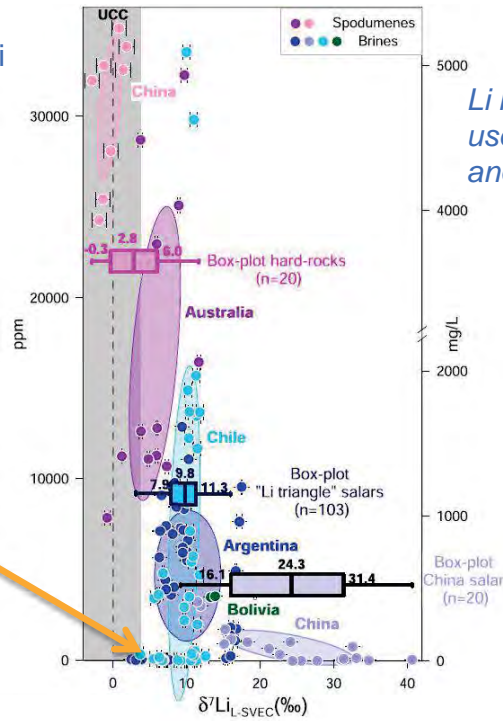
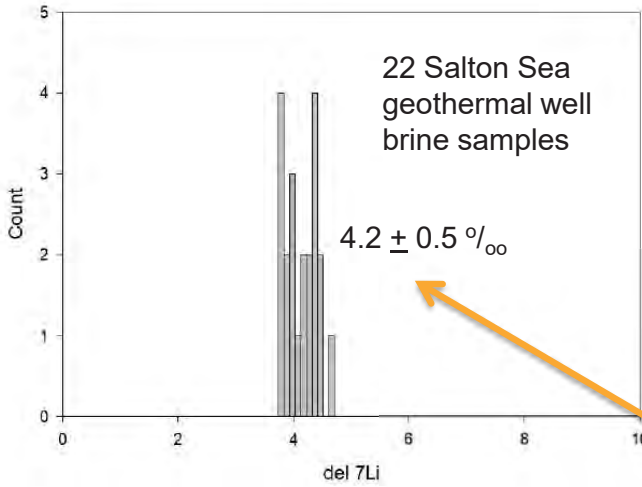
Wright et al. 2015

Schmitt and Hulen 2008

Isotopes of Li as source “fingerprints”

Desaulty et al. (2022)

Relatively light $\delta^7\text{Li}$ compared with most “cold” salar Li brines from around the world - closer to hard rock Li



Li isotopes can be used to fingerprint and verify Li sources

Brine handling and DLE at a Salton Sea geothermal power plant



Attachment: PowerPoint Presentation - Michael McKibben UC Riverside Salton Sea (Lithium Extraction in the Salton Sea)

BHER (owns 10 of the 11 current power plants):

- Just built a \$12M 1/10 scale **Direct Lithium Extraction** demonstration plant next to the clarifiers at Unit 5 power plant.
- Commissioned in April 2022.
- Building a second pilot plant to convert LiCl to Li₂CO₃, should be online this spring.
- If pilot tests go as planned, commercial scale plant will be built starting 2024, operational in 2026-2028.



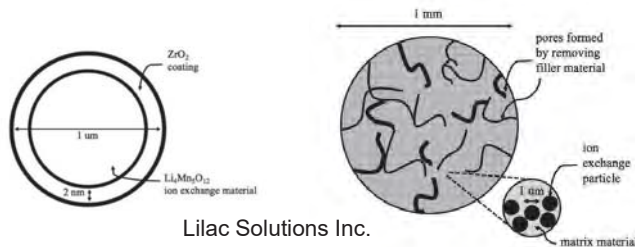
Attachment: PowerPoint Presentation - Michael McKibben UC Riverside Salton Sea (Lithium Extraction in the Salton Sea)

DLE: 3 types of adsorbent micro-* or nano-** materials in common use: Al, Mn or Ti oxides.

*one millionth of a meter
 **one billionth of a meter

“ion sieves” or sponges
 e.g. H₄Mn₅O₁₂
 H₂TiO₃

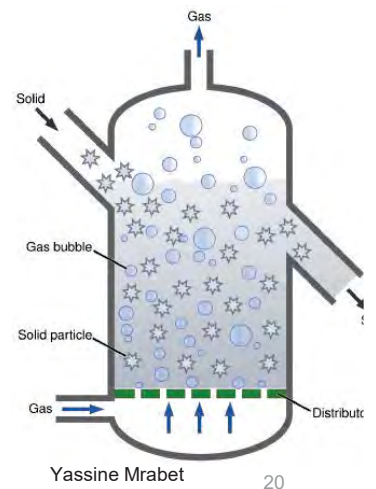
Li⁺ trades places with
 H⁺ during the ion
 exchange process



These adsorbent materials are embedded into a larger porous particle (e.g. **ceramic beads or pellets**) that can be packed in **fluidized bed reactors**, exposed to high brine flow, and then washed and eluted to release the Li ions.

Stringfellow, W.T.; Dobson, P.F., 2021, Technology for the Recovery of Lithium from Geothermal Brines. *Energies* 14, 6805. <https://doi.org/10.3390/en14206805>

Warren, Ian. 2021, *Techno-Economic Analysis of Lithium Extraction from Geothermal Brines*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5700-79178. <https://www.nrel.gov/docs/fy21osti/799178.pdf>



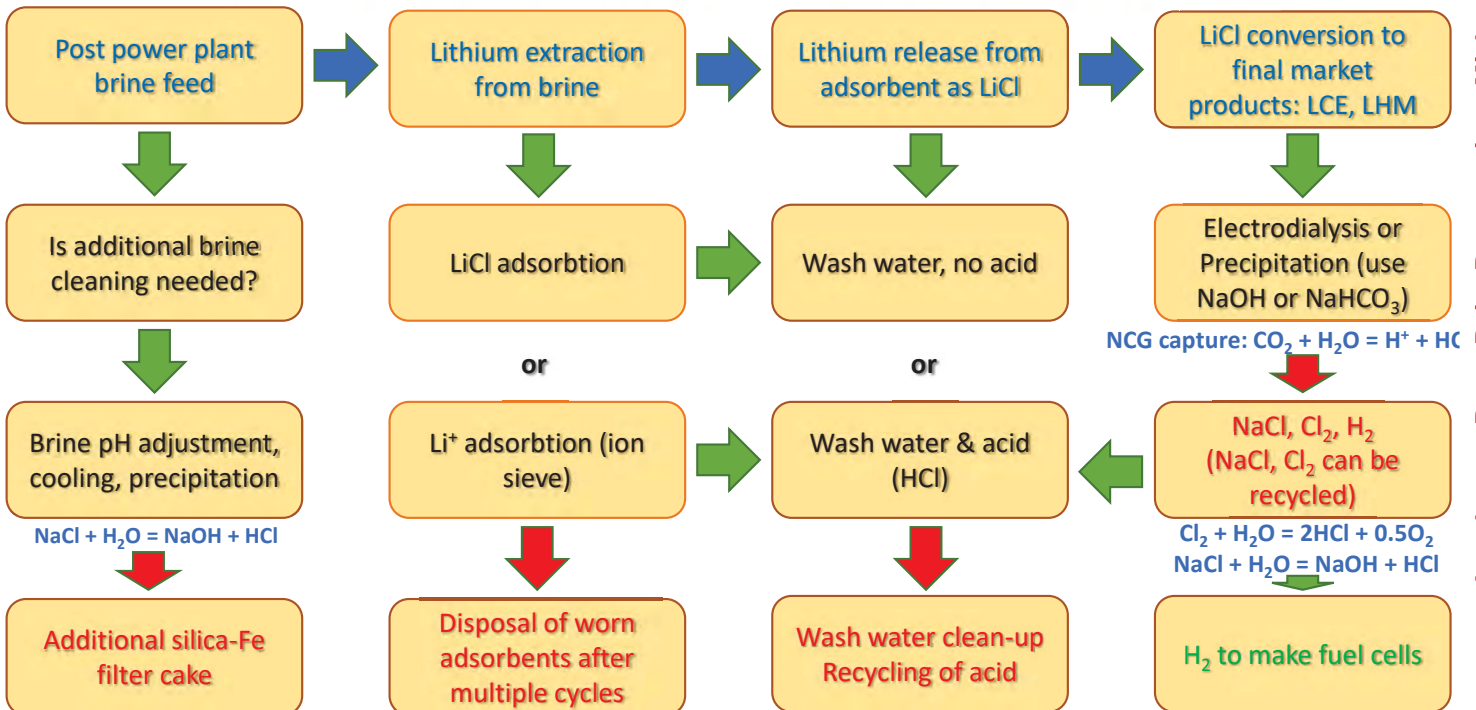
\$4M DOE Geothermal Li Extraction Prize
 40 teams applied, 15 semi-finalists, 5 finalists announced mid-July

Engineered Lithium-Ion Sieve Technology (E-LIST) for Direct Lithium Extraction and Lithium Hydroxide Production

Cornell University | University of Utah | University of California, Riverside



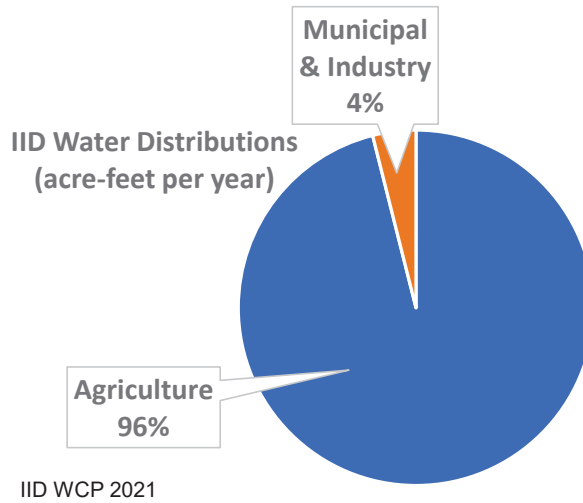
Steps for geothermal lithium extraction and processing



Attachment: PowerPoint Presentation - Michael McKibben UC Riverside Salton Sea (Lithium Extraction in the Salton Sea)

Mike McKibben, UC Riverside

Water usage

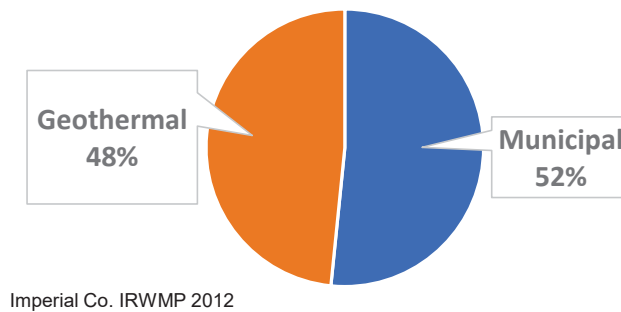


Context:

Agricultural water distribution is 25 times municipal + industrial distribution in the IID region.

Municipal versus Geothermal water use

IID Municipal and Geothermal Water Use (acre-feet per year, 10 year average)



Municipal 700-9,000 AFY each town vs. Geothermal 10-6,600 AFY each plant.
Totals 34,799 AFY all municipalities vs. 32,635 AFY all geothermal power plants.

Water use estimates for geothermal Li extraction

ESM EIR 2021: 3,456 AFY of IID canal water for scaled-up extraction operations = **62,600 gallons of water per metric ton of Lithium Carbonate**. BHER has said it will use **50,000 gallons of water per metric ton of Lithium Carbonate**, one tenth of the water needed in South American salar operations.

Potential water sources for geothermal Li extraction:

- IID canal water (but competes with ag, municipal)
- Brackish (non-potable) shallow groundwater (non-IID)
- Imported municipal grey water (e.g., The Geysers geothermal field)
- Steam condensate (self-generated by the geothermal operators)
- Desalination and importation of water from the Sea of Cortez (\$\$\$)

HR-2 Simbol Li plant EIR (never built)

TABLE 3-6 HR-2 ANNUAL WATER USAGE DURING OPERATIONS, BY SOURCE

OPERATION PHASE	DEMAND		SOURCE			
	ANNUAL DEMAND AFY	% OF TOTAL DEMAND ⁽²⁾	STEAM CONDENSATE		IID	
			VOLUME AFY	% OF SOURCE	VOLUME AFY	% OF SOURCE
Cooling Water	2,784	70%	2,740 ⁽¹⁾	100%	44	3%
Brine Dilution Water	1,124	29%	-	0%	1,124	93%
Fresh Water Pond Evaporation	20	1%	-	0%	20	2%
Miscellaneous Uses	12	0%	-	0%	12	1%
TOTAL	3,940	100%	2,740		1,200	
		% OF TOTAL DEMAND	70%		30%	

Source: Pangaea 2012

Note:

(1) Represents Supplemental Cooling Tower Make Up Water (98% of Cooling Tower Make Up Water Demand would be provided from HR-2 steam condensate).

(2) Rounded to nearest whole number.

Key:

AF = acre feet

AFY = acre feet per year

CO₂ emissions from Salton Sea geothermal power plants are published online at CARB web site: <https://ww2.arb.ca.gov/mrr-data>

Data for 2019:

Annual Summary of GHG Mandatory Reporting Non-Confidential Data for Calendar Year 2019			CALIFORNIA AIR RESOURCES BOARD		
See the "Introduction" tab and the "Column Descriptions" tab for important information about the data shown.			Total Emissions (metric tons CO ₂ e)		Emitter CO ₂ e from Non- Biogenic Sources and CH ₄ and N ₂ O from Biogenic Fuels
ARB ID	Facility Name	Report Year	Total CO ₂ e (combustion, process, vented, and supplier)	AEL	
100692	CalEnergy Operating Corporation - J J Elmore - Geothermal	2019	7,716	No	7,716
100703	CalEnergy Operating Corporation - J M Leathers - Geothermal	2019	21,456	No	21,456
100712	CalEnergy Operating Corporation - Region 1 - Geothermal	2019	70,992	No	70,992
100716	CalEnergy Operating Corporation - Region 2 - Geothermal	2019	35,590	No	35,590
104346	Hudson Ranch Power I - Geothermal	2019	24,890	No	0

160,644 metric tons/yr
= avg of 14,604 tons/yr per geothermal power plant

Compare with:

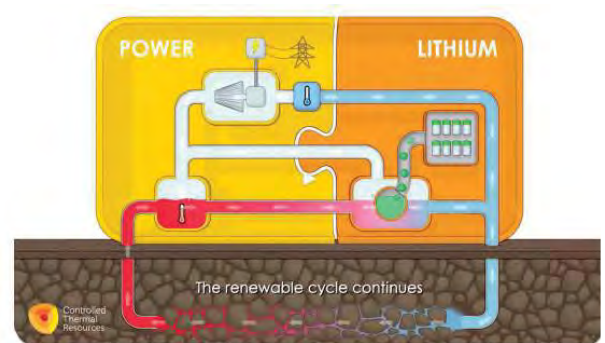
Chevron's Oil Refinery, El Segundo: 3,000,000 tons/yr
 CalPortland Cement plant, Oro Grande: 1,374,930 tons/yr
 Spreckels Sugar Co. plant, Brawley: 91,113 tons/yr
 U.S. Gypsum Co. plant, Plaster City: 69,943 tons/yr
 IID Gas Turbine plant, Niland: 57,533 tons/yr

Does geothermal Li extraction itself create emissions?

Only from the added **electrical energy** used, by adding a Li filter to the *existing* power plant.

Most geothermal power plants generate their own electrical power to use, called the "**parasitic power**" load, typically 10-20% of the total power produced.

If some or all this power can be used for Li extraction, it actually *reduces* CO₂ emissions that would otherwise be generated by using electricity generated elsewhere from fossil fuels – a **carbon credit**.



Conclusions

- Geothermal Li extraction is the **least destructive** of Li production methods and can help secure a stable supply chain for growing U.S. lithium needs.
- Infrastructure costs are minimized at the Salton Sea field because the bulk of the brine production and reinjection facilities **already exist** as geothermal power plants.
- The Salton Sea geothermal field's reservoir brines may contain **up to 32 million metric tons** of LCE, making it one of the largest Li deposits in the world.
- **Up to 115,000 metric tons/yr** of LCE could be produced from the current power plants, if Li extraction methods being piloted now are highly effective and can be scaled up to commercial production. **Enough Li for 4 million electric cars per year.** Expansion of the field over the next decade could generate **over 320,000 metric tons/yr** of LCE. **Enough for 10 million electric cars per year.**
- Lithium recovery may not add any new **CO₂ emissions**, but **water use** should be very carefully assessed. **Many alternatives to IID water exist, including municipal water.**
- Many chemicals (HCl = pool acid, NaHCO₃ = baking soda, NaCl = salt) can be **recycled and reused** in the lithium extraction and conversion processes.

IMPERIAL COUNTY & LITHIUM VALLEY



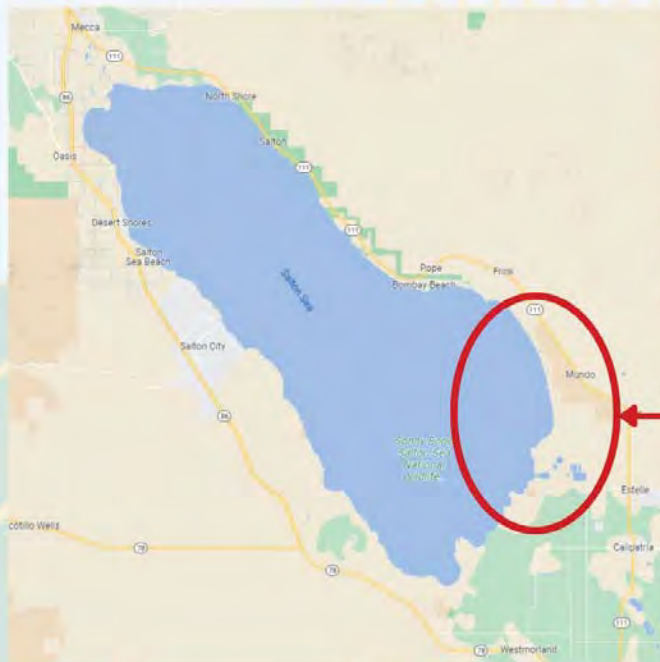
IMPERIAL COUNTY



IMPERIAL COUNTY



SALTON SEA



KNOWN GEOTHERMAL RESOURCE AREA (KGRA)



IMPERIAL COUNTY & LITHIUM VALLEY



THE CALIFORNIA BLUEPRINT

DEVELOPING LITHIUM VALLEY

- World class battery manufacturing ecosystem
- Improve renewable energy, create good jobs
- New regulatory certainty
- Spur private investment
- Labor and environmental standards
- Loan programs



NEEDS OF OUR COUNTY



Attachment: PowerPoint Presentation - Sup Kelley Lithium Valley SCAG Presentation 10-12-22 (Lithium Extraction in the Salton Sea)

LITHIUM VALLEY ECONOMIC OPPORTUNITY INVESTMENT PLAN



LITHIUM VALLEY ECONOMIC OPPORTUNITY INVESTMENT PLAN

Summary

Lithium/rare-mineral mining/processing/manufacturing and renewable energy generation/storage possess the opportunity to propel the economic future of Imperial County residents for generations.

Introduction

The County of Imperial desires to increase the overall wealth of its residents through private economic investment into the Imperial Valley Region in the form of lithium and rare mineral extraction, processing and manufacturing/packaging for end-user applications and renewable energy generation/storage in the form of geothermal, solar, wind and energy storage. The Imperial County Lithium Valley Economic Opportunity Investment Plan will be accomplished through specific actions of the County of Imperial, State of California and the United States Federal Government.

Lithium is a vital mineral in the rechargeable batteries used by consumers in portable computing devices, electric vehicles and battery storage. More than 80% of the world's raw lithium is mined in Australia, Chile, and China. Currently, currently, China controls more than half of the world's lithium processing and refining and has three-fourths of the lithium-ion battery mega factories in the world, according to the International Energy Agency.

Today, the United States has only 1% of global lithium being mined and processed, according to the U.S. Geological Survey. Imperial County, California is blessed with an abundance of Geothermal Brine at the Salton Sea. The earth heated brine is rich in critical minerals needed for the production of batteries and alloys, including lithium, manganese and zinc.

Industry professionals estimate there may be as much as fifteen (15) million tons of lithium in Imperial County that would take 50-100 years to extract. Additionally, there is an estimated 1,000-1,500 MW of additional geothermal energy generation available. The mining of lithium (and other rare-earth minerals) in addition to geothermal power generation provide the opportunity for the United States to have greater control over needed material in the supply chain for electric vehicles and consumer/commercial electronics while providing greater stability to our energy supply.

Benefits of Economic Investment

County (Local)

Employment opportunities (construction and operation).



Imperial County California
Ryan Kelley
Supervisor, District 4

LITHIUM VALLEY ECONOMIC OPPORTUNITY INVESTMENT PLAN REQUESTED SPECIFIC ACTIONS



STATE OF CALIFORNIA



U.S. FEDERAL GOVERNMENT

STATUS OF REQUESTS



THE CALIFORNIA BLUEPRINT

DEVELOPING LITHIUM VALLEY

- Revenue from lithium extraction:
 - 80% to locals
 - 20% to Salton Sea restoration
- Streamline geothermal permitting
- Sales and use tax exclusion
- Pathway for locals to get good jobs created by new industry
 - SDSU Brawley Center

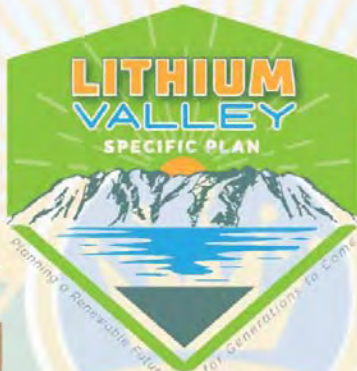


CONTINUING COUNTY EFFORTS



SB 125 Committee
PUBLIC RESOURCES: GEOTHERMAL RESOURCES, LITHIUM
California State Assembly

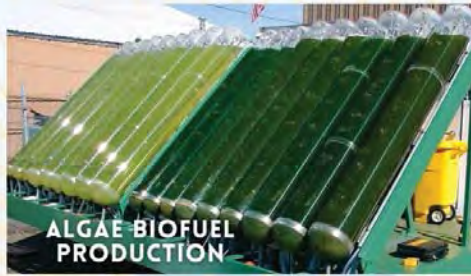
File # 105



INCENTIVES



NEW INDUSTRIES



**THANK YOU
PLEASE VISIT**

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Lithium Valley

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Lithium
6.04











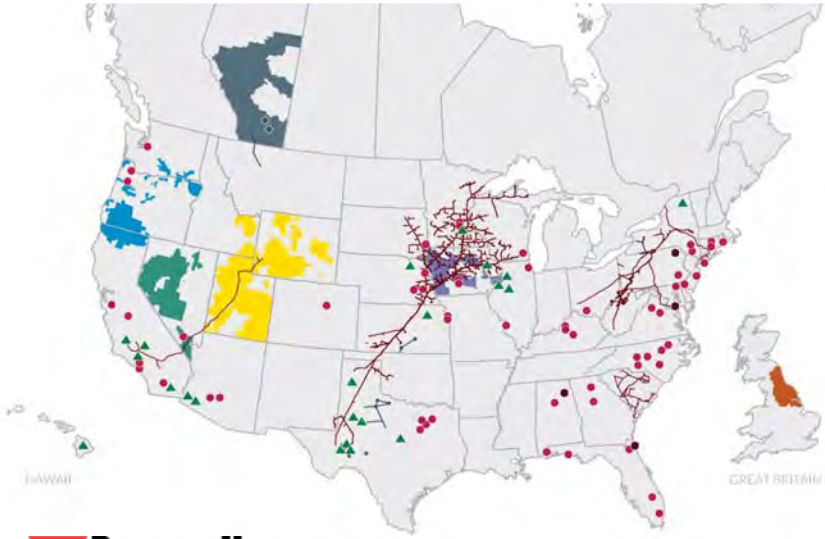
SCAG Emerging Technology Committee Meeting Lithium Projects

Jonathan Weisgall
VP, Government Relations, Berkshire Hathaway Energy
October 27, 2022

BERKSHIRE HATHAWAY ENERGY

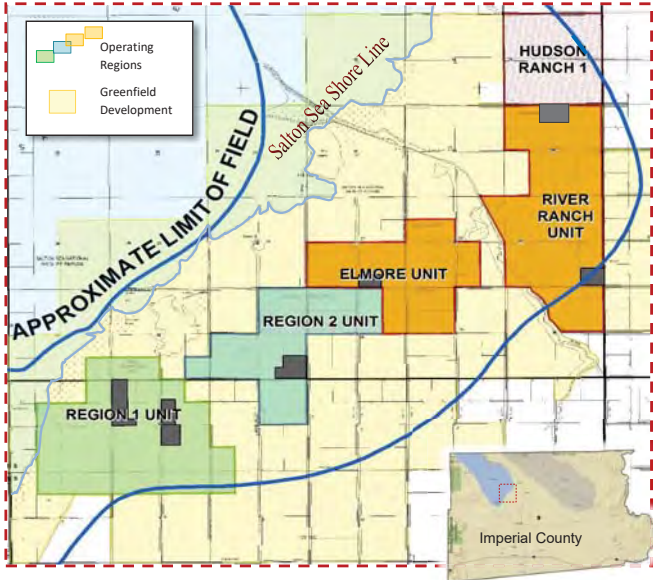
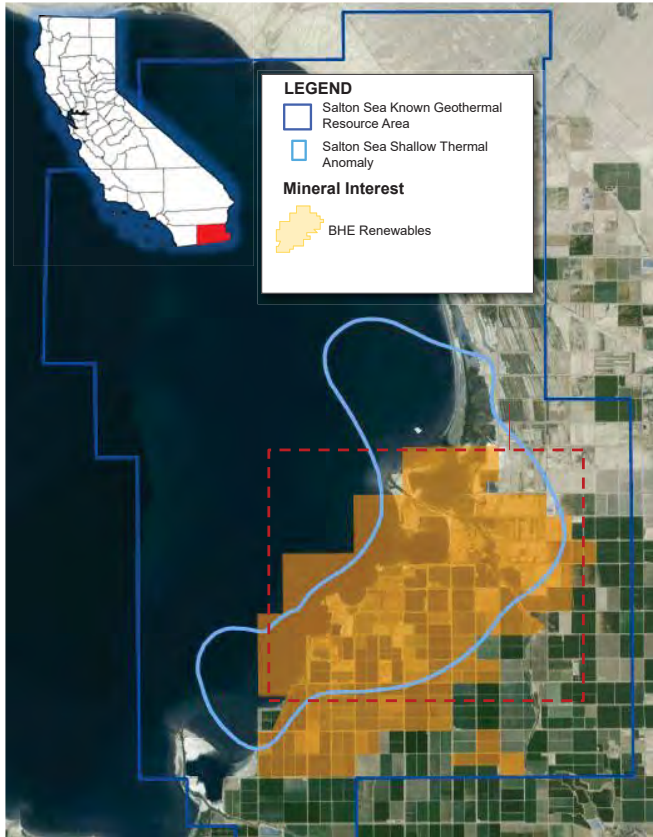
ABOUT US

-  • 12 million customers worldwide
-  • Top-rated service provider within the industry
-  • 24,000 employees
-  • 2021 OSHA Recordable Incident Rate of 0.35
-  • 36% renewable/noncarbon generation
-  • 63.5 MMT of CO2
-  • \$132.1b in total assets
-  • Exceptional cyber and physical protection



GEOHERMAL-LITHIUM RESOURCES



BHER Resources	Power (MW)	Potential Annual Mineral Production			
		Li ₂ CO ₃ (kt)	Zn (kt)	Mn (kt)	KCl (kt)
Operating	345	90	32	98	2,480
Greenfield	700	210	100	310	5,370

kt = 1,000 metric tons



BHER LITHIUM RECOVERY



Small physical footprint



Minimal water usage due to closed-loop process



No open-cut mining or evaporation ponds

BHE Renewables is advancing lithium production research, which could provide a major domestic source of lithium, bolster the local geothermal power industry and bring new economic opportunities to Imperial Valley communities





LITHIUM DEVELOPMENT



5

