Broadband and Digital Equity 101

The digital divide refers to the growing gap between the members of society who have reliable access to broadband service and an adequate device for connecting to the internet and those who do not - mainly people with limited incomes, seniors, tribal communities, and people in rural areas.

Access to broadband service is essential for modern life, and **unserved** and **underserved** residents don't have the same educational, economic and social opportunities as connected residents.

What is Broadband?

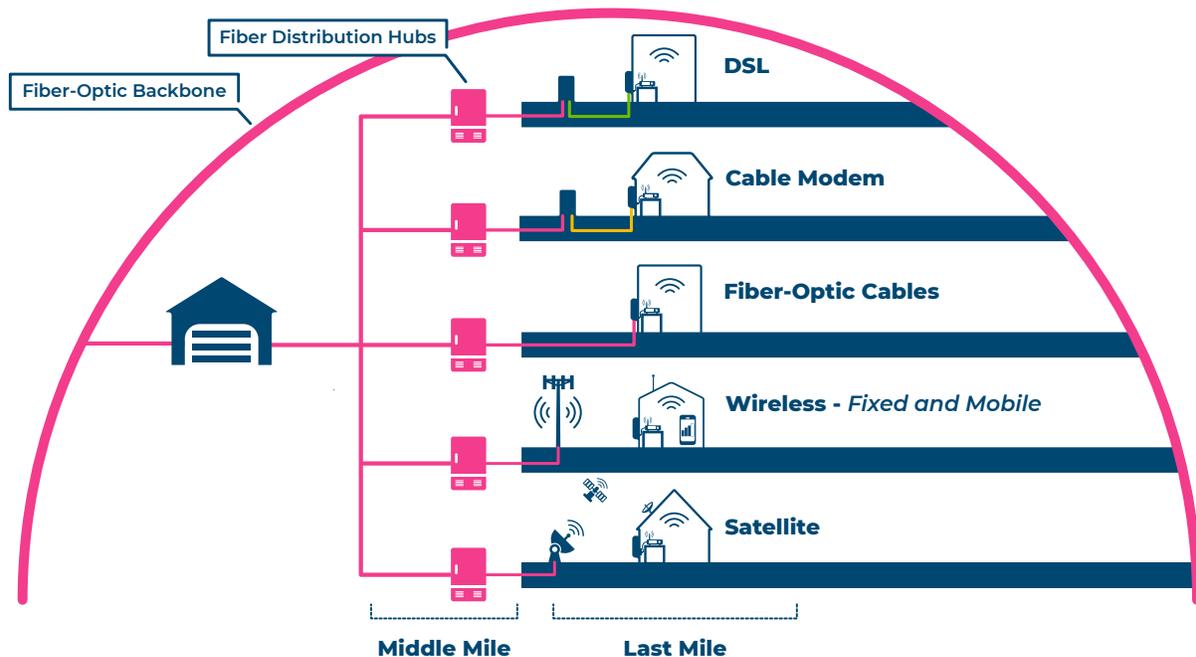High-speed internet access via a variety of wired and wireless networks

How does broadband work?

The broadband network is made up of first, middle, and last mile.

The **first mile** consists of a very high-capacity fiber optic backbone that transmits large amounts of data over long distances.

The **middle mile** links the backbone to the internet service providers (last mile) access network.

The **last mile** brings the connection to a home or business. The last mile can be provided using different transmission media.

Fiber Distribution Hubs

Fiber-Optic Backbone

DSL

Cable Modem

Fiber-Optic Cables

Wireless - *Fixed and Mobile*

Satellite

Middle Mile

Last Mile

Digital Subscriber Line (DSL) provides broadband connection over telephone lines.

Cable provides broadband connection over the same coaxial cables that deliver cable television service. It is the most prominent broadband technology in densely populated areas.

Fiber provides the fastest broadband connection. A fiber-optic cable is a glass filament that transmits data through light pulses. Fiber can handle vast amounts of data.

Wireless broadband connections use over the air radio waves between a cellular tower and the home. The middle mile connection to the tower is referred to as backhaul, and is typically over fiber, but in some cases may use microwave radio.

- **Fixed wireless** provides a connection between the tower and a device typically mounted on the roof or the side of a home.

- **Mobile** broadband provides a connection between the tower and a mobile device such as a laptop or a smartphone.

Satellite broadband connections use radio waves directly from satellites orbiting the earth to a fixed device typically mounted on the roof or side of a home. Satellites delivering home broadband can be in medium earth orbit (MEO) or low earth orbit (LEO).

What are the benefits of broadband?

When more people in our communities have access to affordable high-speed internet, it can mean improvements in a wide variety of areas:

- **Accessibility:** Broadband is an important tool to address the communication needs of people with disabilities. The hearing impaired can use webcams to communicate with one another through sign language. People who are blind or visually impaired can use screen reader programs that audibly describe website material to users.

- **Civic engagement:** Internet access provides residents a means to participate in civic life and gives them a means to communicate directly with public officials and receive essential government services.

- **Economic development:** Broadband can support business development and job growth. Studies have shown broadband also increases access to economic opportunity, boosting productivity and personal income.

- **Education:** Reliable internet access can help facilitate remote learning and ensure students have access to complete work assignments at home.
- **Equity:** Increasing access to affordable broadband can help bridge the digital divide and improve access to opportunities in historically underserved and systemically marginalized communities.
- **Public health:** Broadband can improve access to healthcare by making it easier for people to connect with medical professionals virtually, when an in-person visit is not necessary.
- **Public safety:** Police, fire, and other public safety agencies rely on broadband. Improvements to wireless broadband can enable advances to disaster response and early warning systems.
- **Sustainability:** Working from home and other remote access options have the potential to reduce car travel and the associated greenhouse gas emissions.
- **Transportation:** Broadband is critical to the future of transportation and technology advancements that can drastically improve transportation operations and safety.

Digital Equity

Digital equity can be achieved by ensuring everyone has access to high-quality broadband connectivity and the tools and skills needed to use technology to improve their lives. Digital Equity includes both **Access** and **Adoption**:

Access

- High-quality broadband service is available to every household in every community.
- Affordable high-quality broadband plans are available to everyone regardless of income.
- A secure device and privacy preserving access is available to everyone regardless of income.

Adoption

- Everyone has the digital skills, tools, and resources needed to safely and privately use information and communication technology to improve their lives.
- Digital content is designed for everyone to access with ease regardless of ability, age, income, or language.

State of Broadband Access in the San Diego Region