



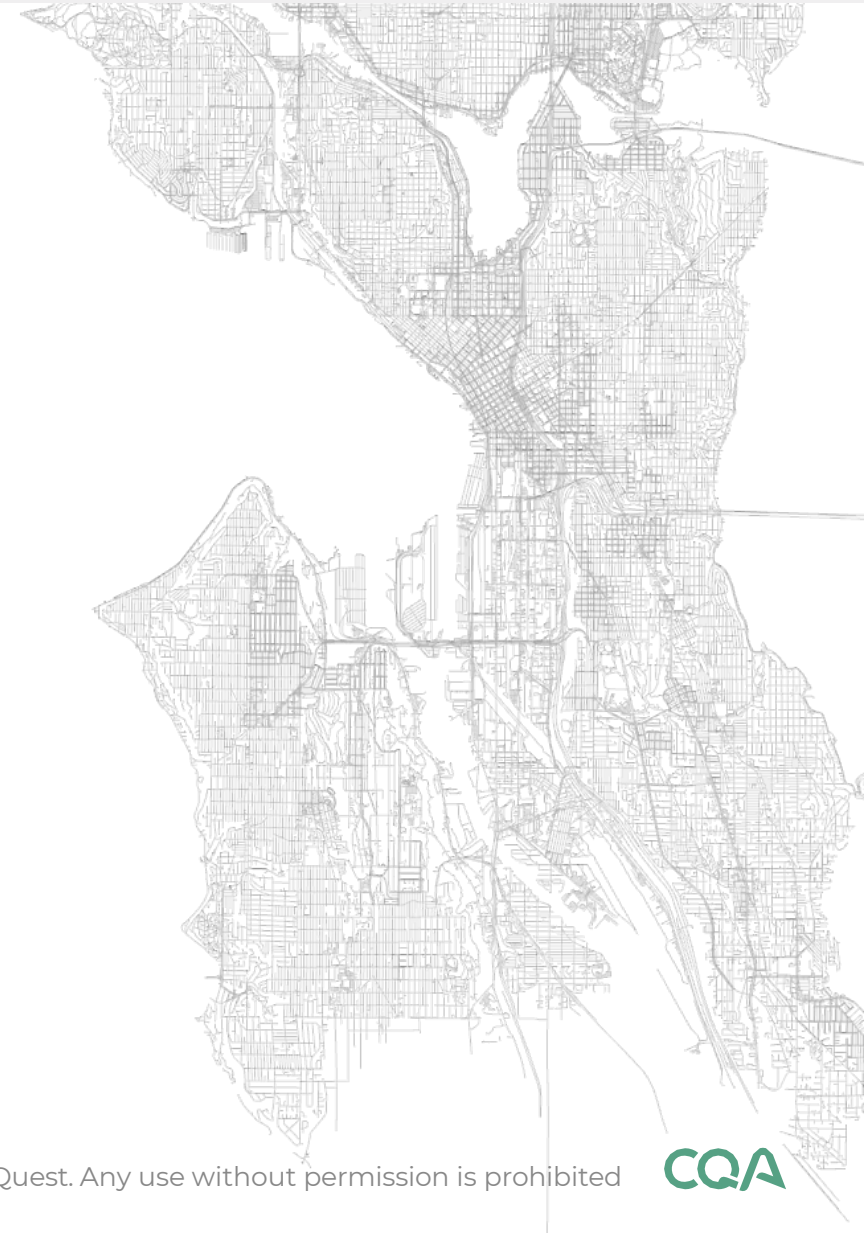
BUILT ON DATA

CostQuest Update – Broadband Fabric and Mapping for WTA Spring Educational Forum

April 2023

Overview

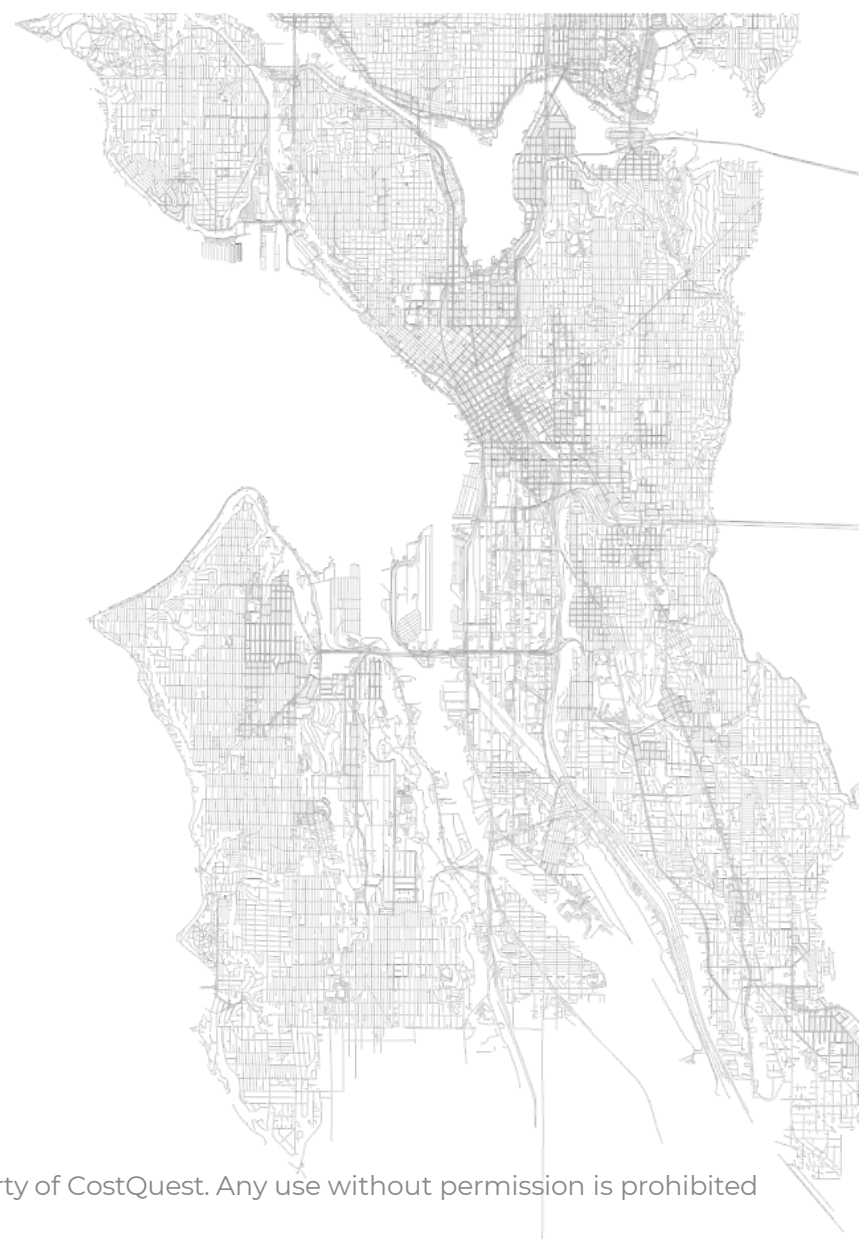
- CostQuest's role in the process of the iterative creation of the National Broadband Map
- Overview of CostQuest's National Broadband Serviceable Location Fabric
- Location Fabric improvements from V1 to V3
- Fabric Challenges
- License Update
- Q&A





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CostQuest's Role



WHAT'S ON THE NATIONAL BROADBAND MAP?

The National Broadband Map consists of 2 datasets, both of which can be challenged:

FABRIC LOCATIONS

- **What is it?**
 - The Fabric is a dataset of all locations in the United States and Territories where fixed broadband internet access service is or could be installed.
- **Who creates it?**
 - The Fabric is developed by CostQuest in consultation with the FCC and in accordance with FCC rules.
- **Challenges and updates timeline?**
 - The Fabric is updated twice per year.
 - For the best opportunity for challenges to be included in version 3 of the Fabric, challenges should be submitted by March 15, 2023.
- **What's on the current map?**
 - Version 1 of the Fabric is the base of the current public map. Version 2 of the Fabric is available to license holders to submit challenges, and for ISPs to submit their updated availability data.

BROADBAND AVAILABILITY

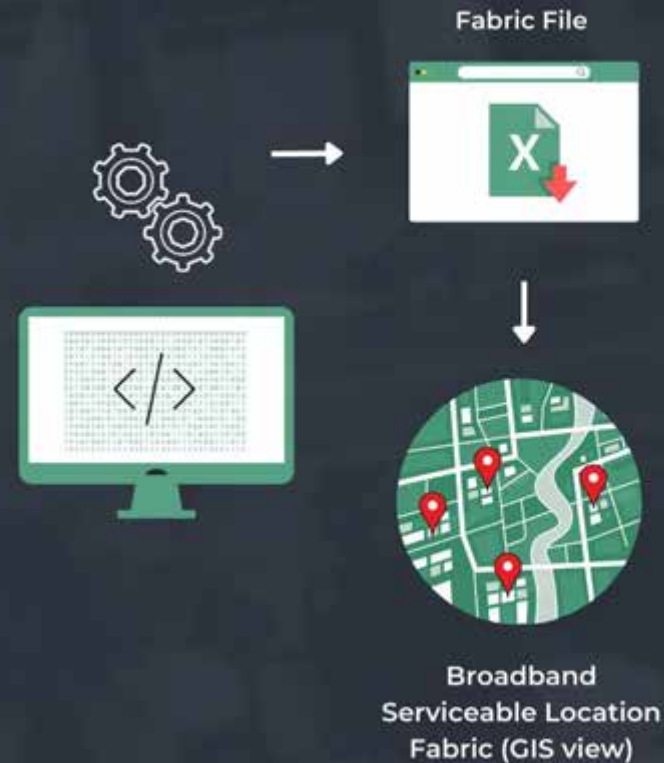
- **What is it?**
 - Broadband availability data shows what broadband services, if any, are available at locations included in the Fabric, as reported by internet service providers every 6 months.
- **Who creates it?**
 - Internet service providers report their availability data to the FCC every 6 months.
- **Challenges and updates timeline?**
 - Broadband availability data is updated consistently over time as challenges are resolved.
 - Challenges are accepted and resolved on a rolling and ongoing basis.
- **What's on the current map?**
 - The map shows availability data as-of June 30th, 2022. The map is also updated biweekly to reflect challenges that have been resolved.

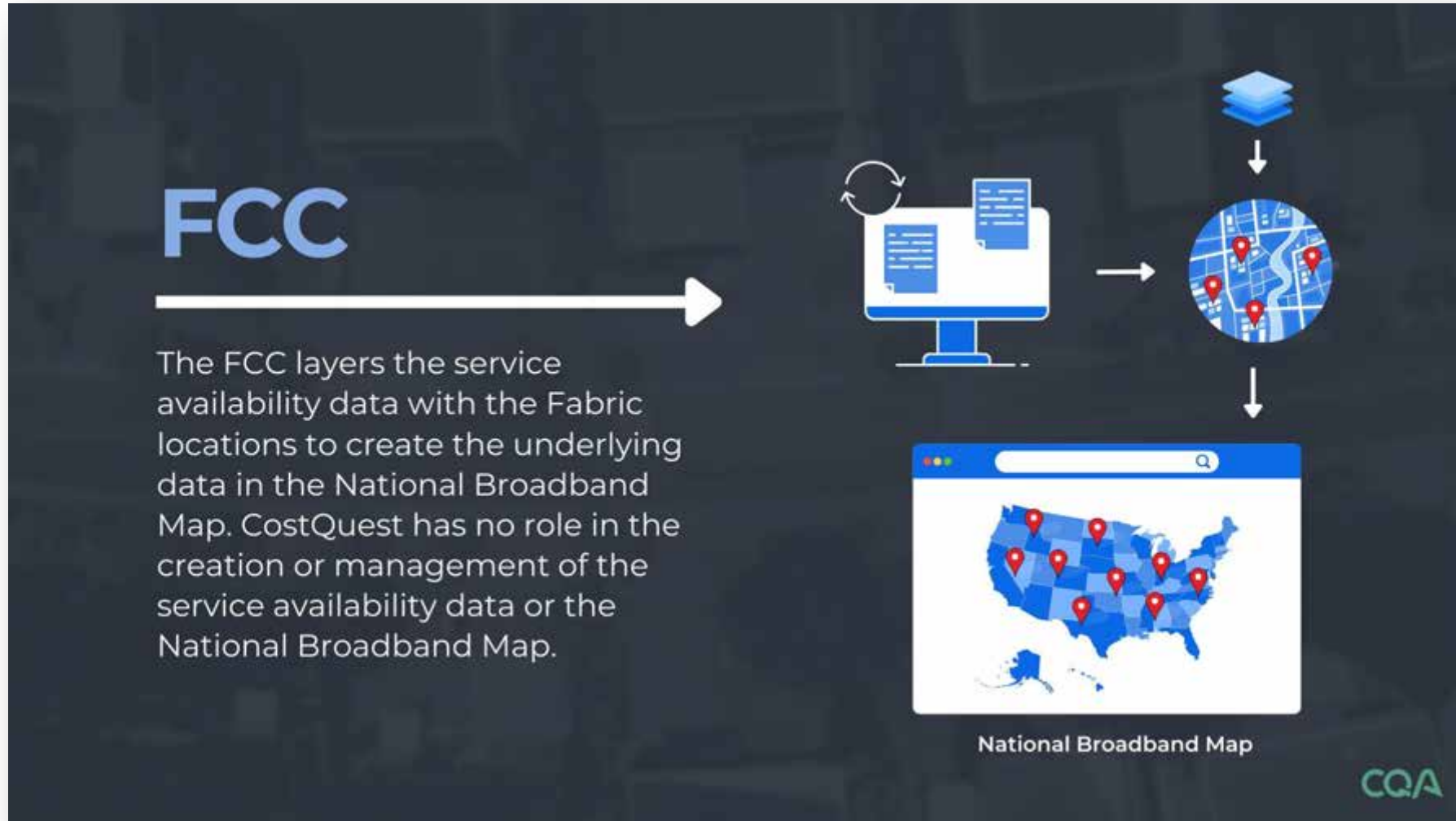
BroadbandMap.gov Rev. 3/1/2023

COSTQUEST



CostQuest identifies Broadband Serviceable Locations, builds the Fabric database, and conducts our own internal improvement processes to increase the accuracy of the Fabric data. CostQuest licenses and delivers the Fabric to the FCC for the BDC per the Broadband Serviceable Location Fabric contract between the FCC and CostQuest.





Roles Explained: Winemaking Analogy

Think of the Broadband Map
as a Napa Red Blend...



CostQuest



Fabric location data

FCC



Fabric +
Service Availability BDC
Submissions + Challenges

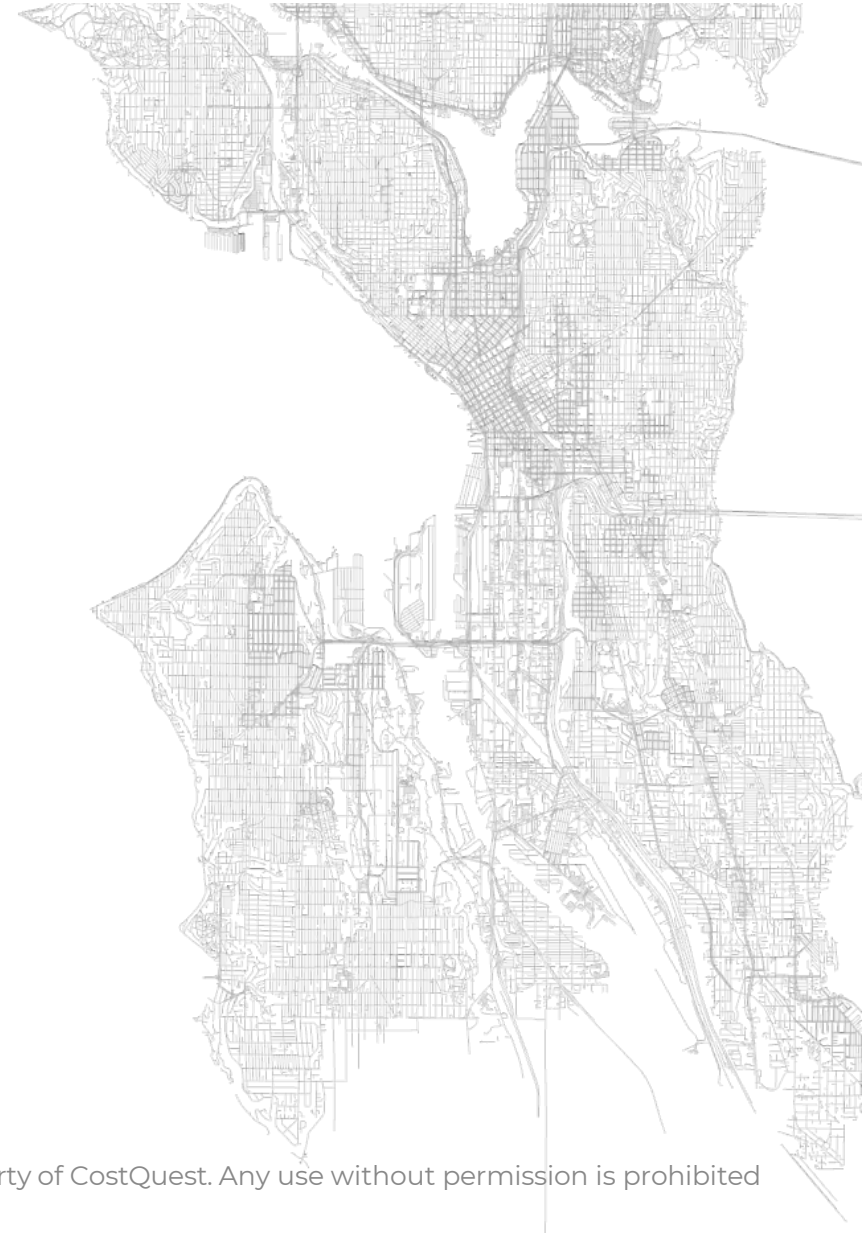
FCC



National Broadband Map



Overview of the National Fabric



What is the FCC Broadband Serviceable Location Fabric?

What is the FCC Broadband Serviceable Location Fabric?

- **The FCC Broadband Serviceable Location Fabric (FCC Fabric) is a geospatial data set of all locations (or structures) in the U.S. where fixed broadband internet access service is or could be installed**
- These locations are defined by latitude and longitude coordinates and make up the location points that appear on the **National Broadband Map**, called "**Broadband Serviceable Locations,**" as defined by the FCC
- ISP Fixed Service availability data submitted into the Broadband Data Collection (BDC) is overlaid on top of the Broadband Serviceable Location Fabric points
 - As we discussed earlier, CostQuest does not work on the availability side – we are only the data provider
- BSLs are NOT units or addresses - they are structures needing services
 - For example, a multi-dwelling unit such as an apartment building may have multiple addresses, however, the building structure is the BSL and will have the main address for that location
 - The BSL will capture the units in the structure as a separate field
 - **The BSL does include addresses**



Objective: Locate BSLs



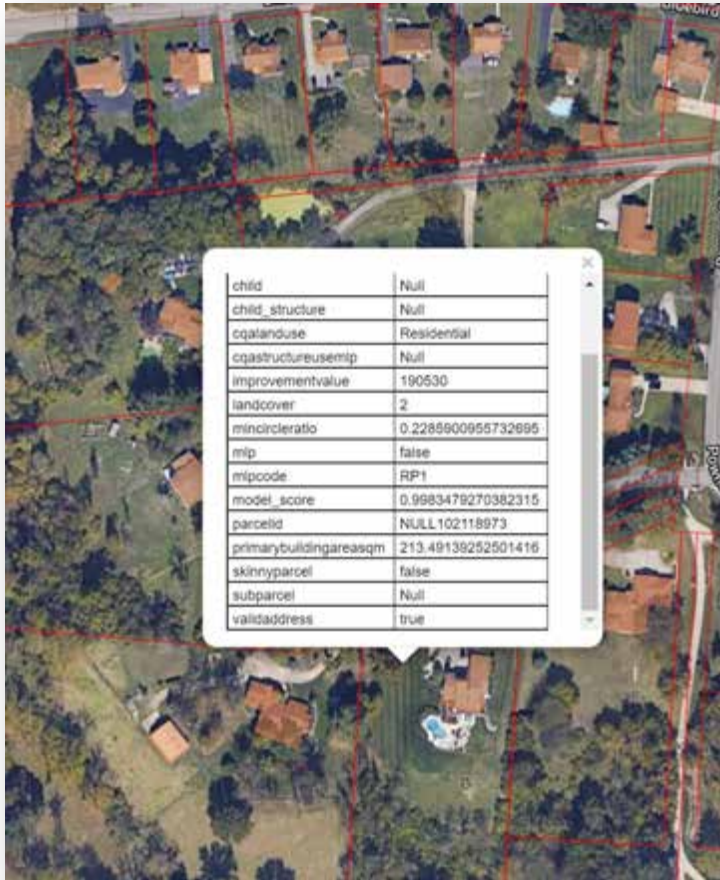
Process: Pull in Parcels



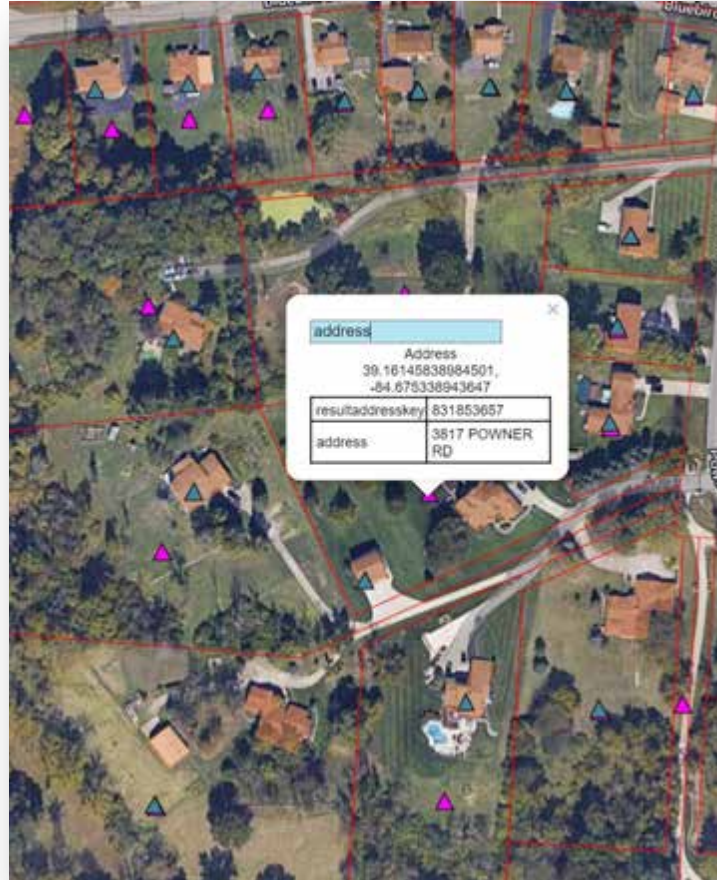
Process: Pull in footprints



Process: Link tax assessor data



Process: Link addresses



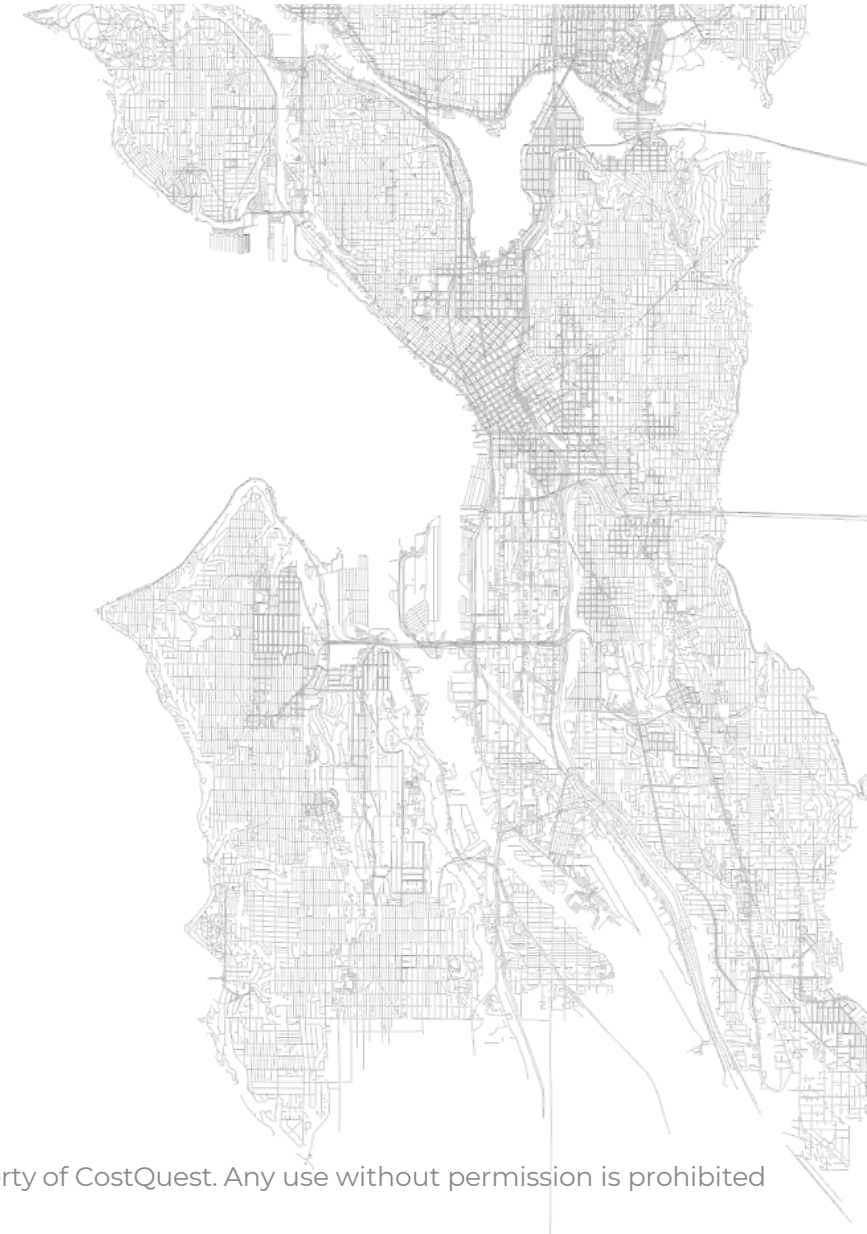
Process: Identify BSLs





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Fabric Continual Improvement



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Outside of the FCC Fabric Challenge process, CostQuest conducts “self-challenges” to continually improve the Fabric dataset

- **For each release we update source data**
 - Added parceled areas
 - Update tax attributes to match to parcels
 - Update tax assessor address to match to locations
 - Improved point placement accuracy
- **Improved exclusion zones further by incorporating additional areas with cutouts**
 - Exclusion zones prevent false positives in areas we know there cannot be active locations
 - Rocks in the desert, on glaciers, in forests
 - To date, 227,263 square miles of land have been identified as exclusion zones.
- **Improved approach to identify parcels as either multiple location or single location parcels**
 - These efforts help improve our accuracy in rural areas and across tribal lands
 - In V2, 58,267 square miles of parcels were visually reviewed
 - Parcels reviewed were added to our MLP/SLP repository to automatically identify the nature of these parcels
 - Using the parcels reviewed, we improved our model for those large parcels not reviewed
 - In V3, we are using new situational awareness of the structures to better identify those that are BSLs

- **Continually sourcing data to add footprints**

- In V2, CostQuest,
 - Using deep learning, was able to identify 316,832 building footprints across 446 communities in Alaska
 - Manually reviewed 20,843 1x1 mile grids in Alaska to improve output from deep learning model
 - This review cleaned up bad footprint data and captured additional buildings
 - In American Samoa, Northern Mariana Islands and Guam CostQuest identified 63,874 building footprints.
- In V3, CostQuest
 - Using deep learning, using the same process in V2, manually added in footprints in Alaska and Nevada
- Better footprint data results in improved identification of BSLs

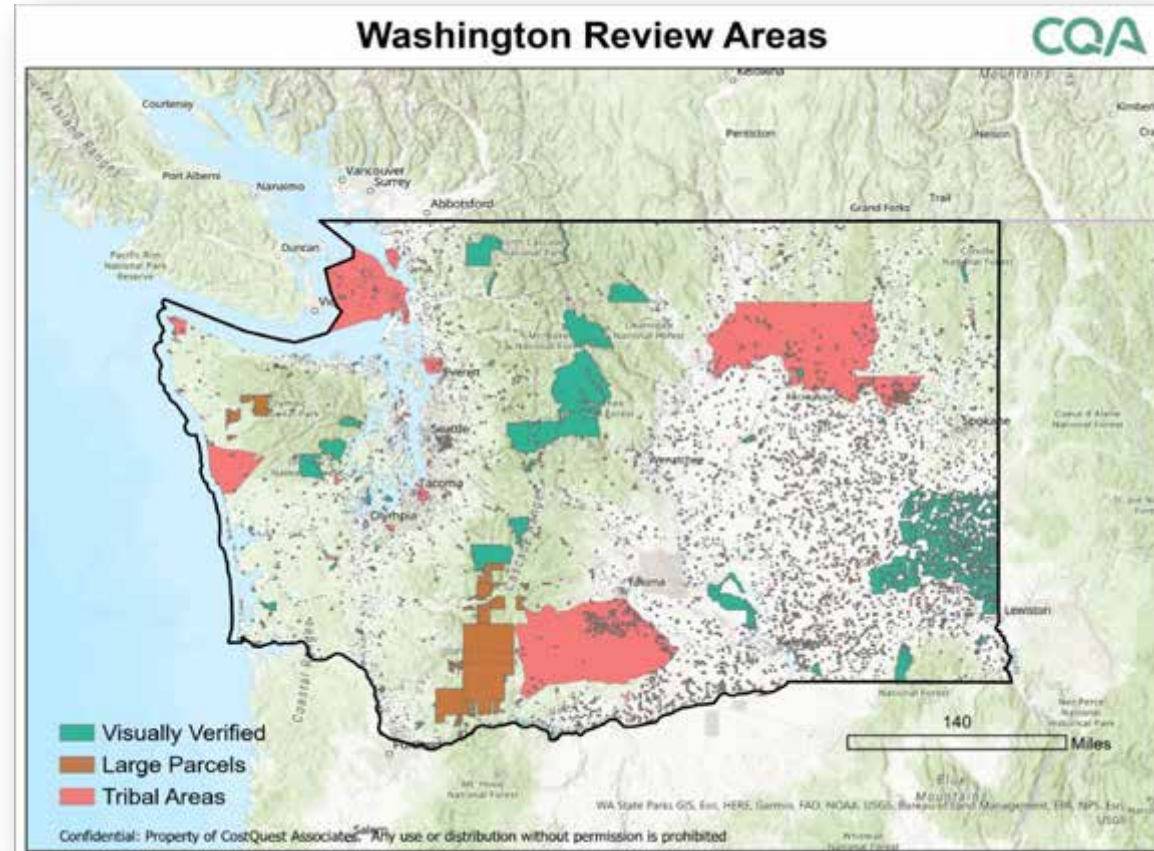
- **Visually verified**

- In V2, CostQuest, using our expert crowd, visually verified more than 800,000 records from the V1 dataset to verify our modeling conclusion
- In V3, CostQuest again visually verified close to 800,000 records from the V2 dataset to verify our modeling conclusion

- **In V2, improved identification of parcels of roads – increased footprint count**
 - Parcels inform the processing in the model
 - Parcels of roads led to some misinterpretation of structures
- **Improved addressing**
 - In V2, added secondary addresses to capture all units in a building/location
 - Also, updated an address sip code logic step, reducing interpolated records
 - In V3, improvements to address assignment
- **New sources of information to improve identification**
 - In V2, data set added for demolished houses in Detroit, monuments and memorials in DC
 - In V3, data set added for new addresses to better identify new construction areas
- **Improved statistical models to better select parcels with BSLs and the structures on the parcel that are the BSL**
 - In V2,
 - Correctly Identify a parcel with BSL 99.4% of time (17% reduction from V1 in misses)
 - Correctly Identify correct structure as BSL on parcel 98.8% of time (29% reduction from V1 in misses)
 - Overall Type I error rate (false positives) reduced 34% from V1
 - Overall Type II error rate (false negatives) reduced 19% from V1

An example of our internal continual improvement efforts:

This image of WA capture large parcel areas and visually verified areas that will improve V3



CostQuest's Fabric captures new construction over time, as datasets are refreshed between releases

The slides that follow capture an area in Utah in the two current releases and the test output of the planned June release this year

- Note that in all slides, the background imagery is current and does not necessarily represent the nature of the area at the time of our data creation

**June 22
Version**



CostQuest Internal Continual Improvement – Temporal Change

**December 22
Version**



**Potential June 23
Version**



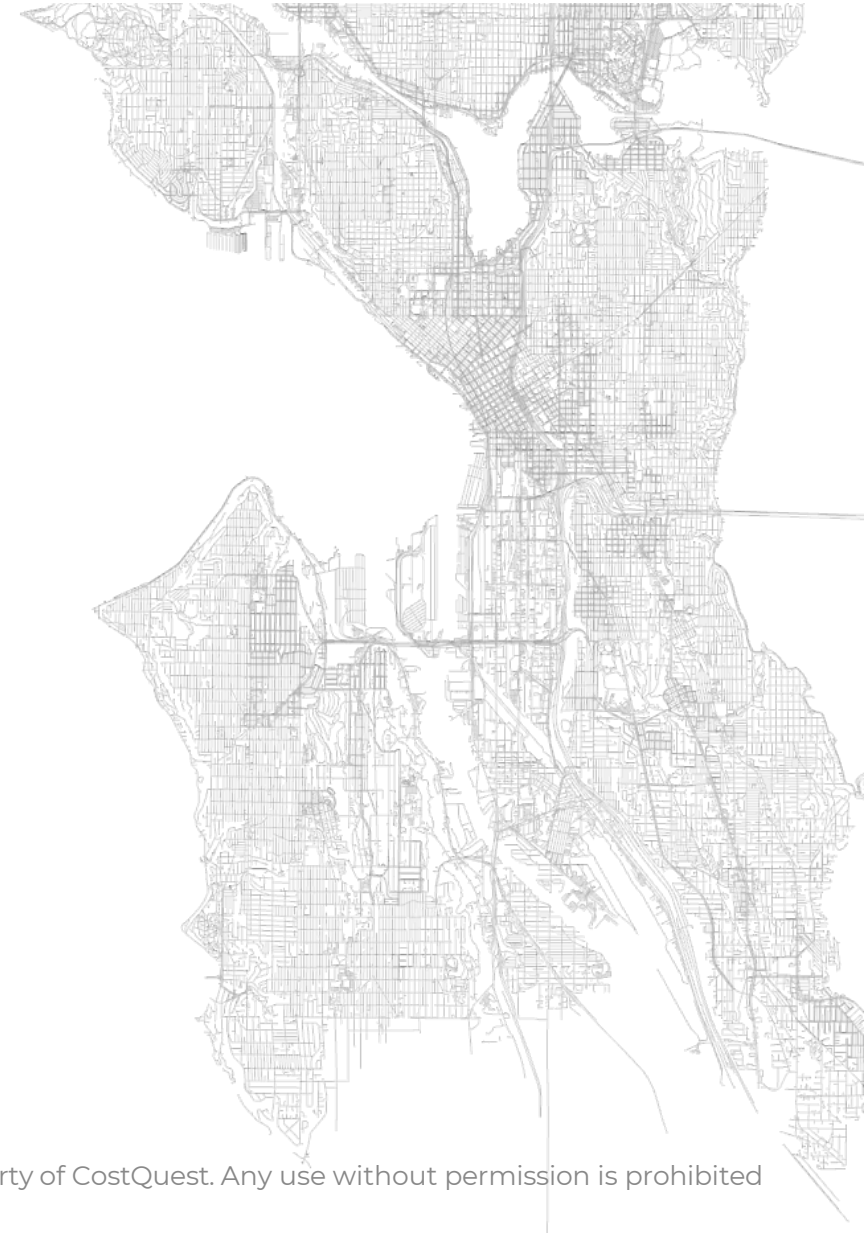
Next Fabric Version Release:

Version 3 of the Fabric will be released in conjunction with the BDC filing window for provider availability data as of June 30, 2023 and will appear along with provider reported availability data on Broadbandmap.gov in the Fall of 2023.



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Fabric Challenges



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Total	Location count
Total Location Records – V1	113,501,003
Successful Bulk Challenges (Added)	178,009
CostQuest Self Challenges (Added)	859,383
Total Location Records – V2	114,538,395

Reasons why challenges were rejected:

1. Challenge fell on existing BSL
2. Challenge fell on a single location parcel on which BSL has been selected
3. Invalid or duplicate address
4. Rejected in manual inspection
5. Latitude/longitude is invalid
6. Duplicate challenges

File in the correct challenge category

- **Type 1:** Missing Broadband Serviceable Location
- **Type 2:** Incorrect address
- **Type 3:** Incorrect unit count
- **Type 4:** Incorrect building type code
- **Type 5:** Location not within Footprint of correct building
- **Type 6:** Location is not broadband serviceable
- **Type 7:** Add an additional address for a location

Must meet challenge criteria*

- A location must be a residence or business that will purchase mass market broadband service
- Have a unique address we can validate
- Identify a new structure

** Process for adding new Fabric locations is rigorous, using a combination of automated checks and manual reviews to analyze challenges*

*[*More info on challenge categories:
https://help.bdc.fcc.gov/hc/en-us/articles/8103937932443](https://help.bdc.fcc.gov/hc/en-us/articles/8103937932443)*

Do you need to change an address? Or add a new BSL?

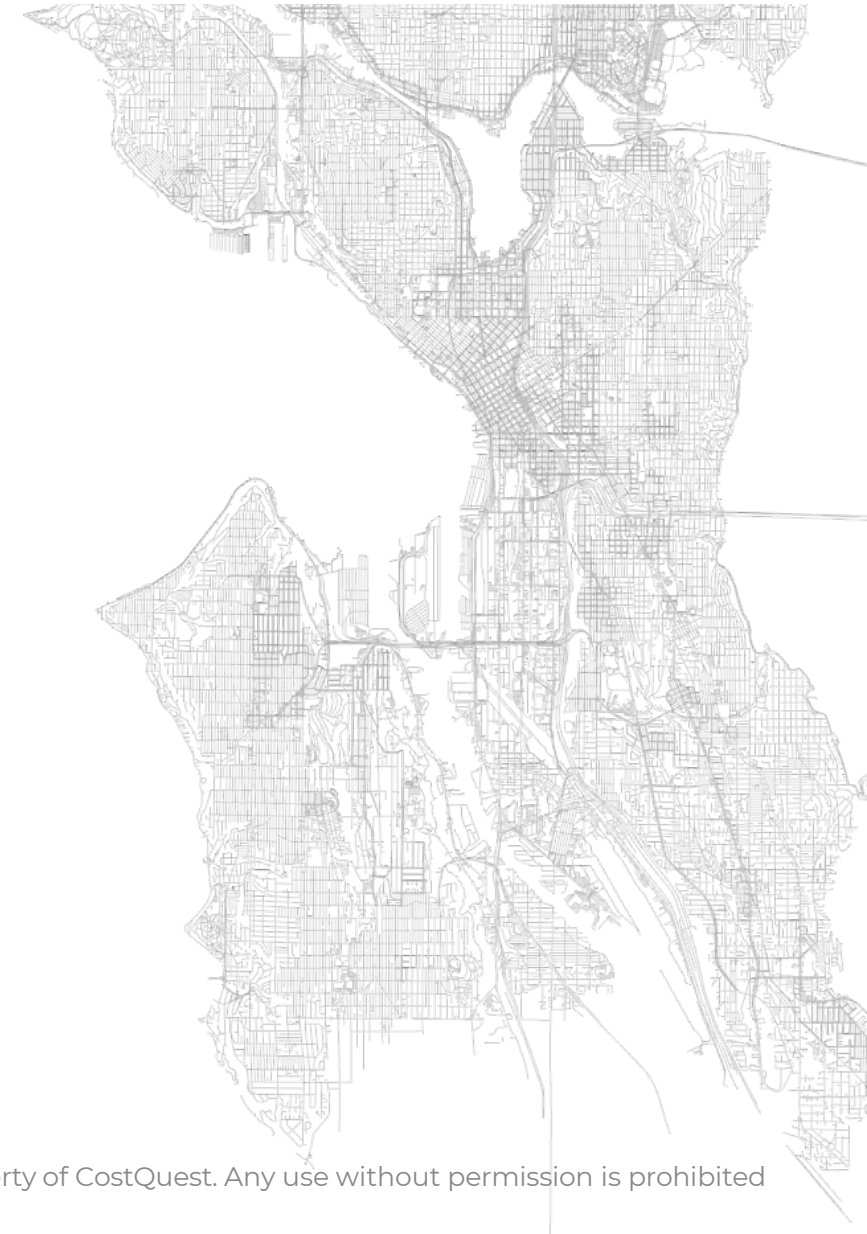
- **Correct or remove the address on that BSL by using a Type 2 challenge:**
 - Add correct address; or
 - Use a NULL address with the Null Address Flag set to True
- **Is there a BSL point already on the structure?**
 - Yes - Submit a Type 2 challenge to change the address
 - No - Submit a Type 1 challenge to add a new BSL

**All of these changes should be included in the same challenge submission file*



Update – Overview of the Use of the FCC and NTIA Licensed Data

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Tier 1: FCC

- Rights to use in BDC and on Broadband Map, publish summary results of coverage, publish served, unserved and underserved locations

Tier 2: ISPs, State, Local and Tribal Government Entities

- Rights to create BDC filing data, create challenge data, share with other licensees

Tier 2a: Designated Entities

- Tier 2 rights + ability to create consumer facing Broadband coverage maps, create derivative reports, collect coverage information from other Tier 2 entities

Tier 3: US Government Entities

- Rights to publish summary results of coverage, rights to create online map, rights to create challenges

Tier 4: Other parties

- Rights to create challenge data

Tier 4R: Research

- Rights to use the Fabric data for Research efforts

In general, FCC Licensees are prohibited from using Licensed Material for any other use including commercial use, publication, and other non-commercial, including internal, uses for purposes beyond their efforts for the FCC as part of the Broadband Data collection as required by the Broadband DATA Act, 47 U.S.C. § 641 et seq.

Under all licenses, the License allows the use of the data by the Licensee and their Authorized Users (i.e., subcontractors) for use in BDC efforts

- If third parties are not “subcontractors”, they can license the data under a Tier 4 license and, per the License terms, they can share information with other Licensees
 - This includes sharing BDC submission data with other Licensees

As license rights are expanded, CostQuest sends out notices to all licensed users in concert with the FCC issuing Public Notices

NTIA Contract

- Covers BEAD planning and implementation
- The agreement includes both the use of our Fabric data and Network Costing data
- In regard to the Fabric data, the agreement provides an expanded use over the FCC agreement
 - The expanded use allows NTIA and any Federal Broadband Granting Agency the rights to use the data for IIJA, the ACCESS BROADBAND Act, the Internet for All Initiatives and any future federal broadband deployment programs
- In regard to State and Territory access, based on our understanding, NTIA has been in touch with the State Broadband leaders about the upcoming data that will be provided and the rights that they will receive

Covers National Fabric and CostQuest's Fiber and Fixed Wireless Cost model data

License rights broadly cover:

Tier A: NTIA

- Rights to use in Federal Broadband Programs

Tier B: Federal Broadband Grant Administrators (e.g., USDA, Treasury, etc..)

- Rights to use in Federal Broadband Programs

Tier C: Pass Through Entities (e.g., States and Territories)

- Rights to use in Federal Broadband Programs

Tier D: Subgrantees (e.g., ISPs that participate in the program)

- Agreement being drafted – extended use of the just the Fabric Locations for BEAD program

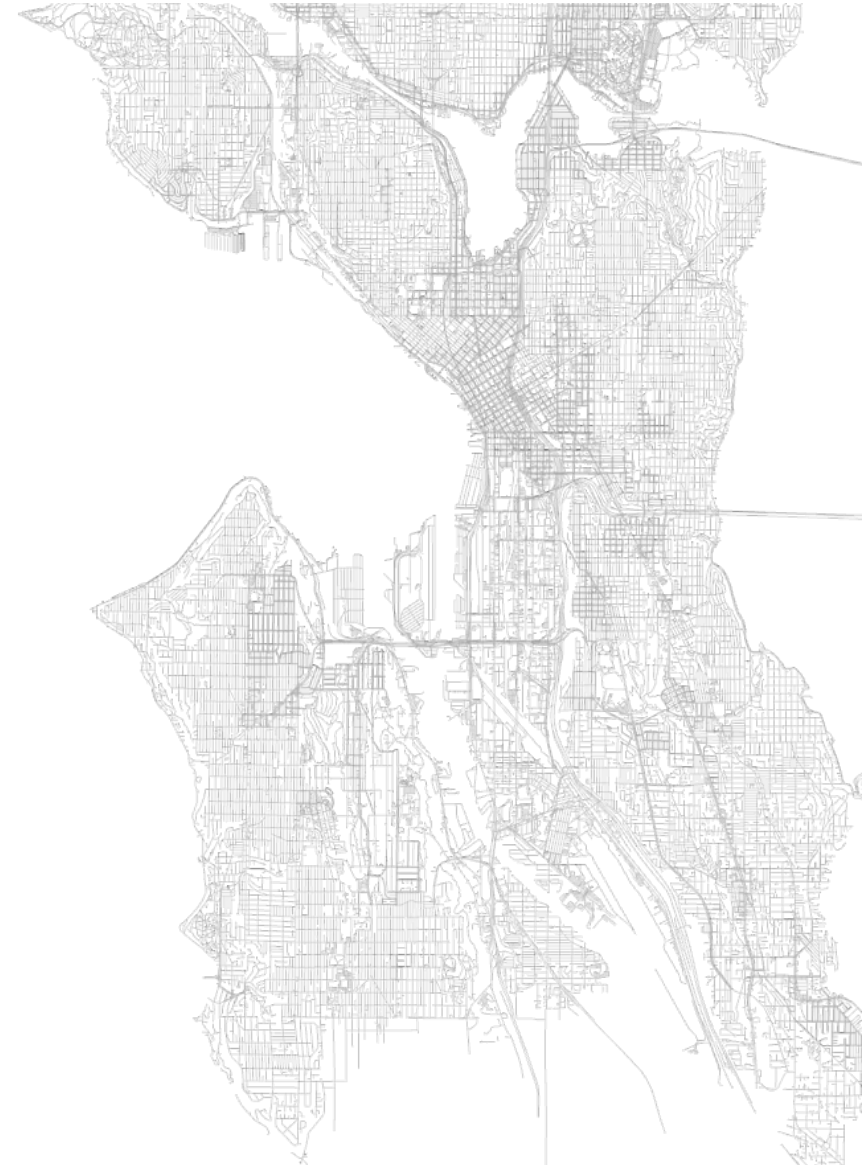
In general, Licensee is prohibited from using Licensed Material for any other use including commercial use, publication, and other non-commercial, including internal, uses for purposes beyond their efforts for Federal Broadband Programs

The NTIA license rights can be used across agencies under the Federal Broadband Granting Authority (FBGA):

- Department of Agriculture
- Department of Commerce
- Department of Education
- Department of Housing and Urban Development
- Department of Labor
- Department of the Interior
- Department of Treasury
- Federal Communications Commission
- Institute of Museum and Library Services (IMLS)
- National Science Foundation
- Northern Border Regional Commission (NBRC)
- Appalachian Regional Commission
- Delta Regional Authority
- Denali Commission

CQA

Q&A



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