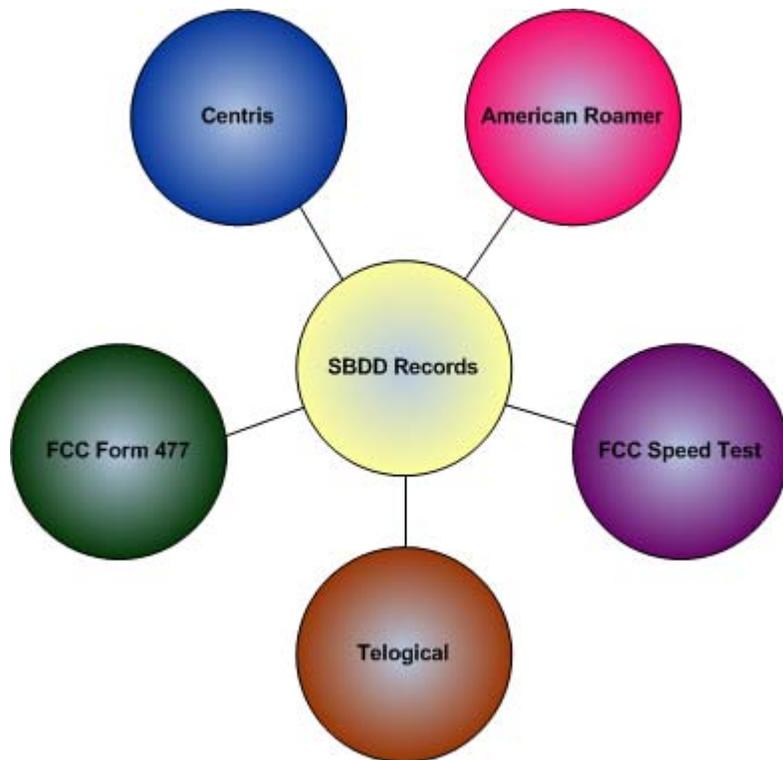




National Broadband Map Data Assessment

Data Comparison Methodology



Data Comparison Methodology

Prepared for Federal Communications Commission

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Introduction

The broadband SBDD data was validated against five other sources of broadband information; FCC speed test, FCC Form 477, American Roamer, Centris, and Telogical data sets. The American Roamer, Centris, and Telogical data sets are commercially available data purchased for use on this project. Each SBDD record is checked against each record in the appropriate validation dataset. If the provider name matches, then a check is performed for the technology of transmission code. If the technology of transmission code also matches, then the speed tier attributes are checked for matches.

The results of the comparisons are written to a results table with 'matches' recorded as a one (1), 'no match' recorded as a zero (0), and 'unable to perform comparison' recorded as a nine (9). An 'unable to perform comparison' value is recorded under the following circumstances:

1. A 9 will be populated in any validation field (V_*) of the RLT table, except V_PROVIDER_NAME, if one of the corresponding (either SBDD data or validation data) fields has a value of null and a valid comparison cannot be made.
2. A 9 will be populated in the four speed tier validation fields (V_*) of the RLT table to show that a comparison has been stopped due to the fact that a match in provider name + census block ID was made but not for technology for that record. When the technology values do not match, the speed tiers are not compared to avoid invalid comparisons.
3. A 9 will be populated in any of the four speed tier validation fields (V_*) if a validation source does not have information in regard to that speed tier.
4. A 9 will be populated in V_PROVIDER_NAME if a part of the record being compared falls outside of the state boundary and could not be intersected with a census block for the appropriate state.

Records in the validation data sets that contain provider name values that are not present in the SBDD data are written to NOT_USED tables. These records can be an indication of missing information in the SBDD data set, possible invalid records in the validation dataset, or could reflect errors in the provider name lookup table for that validation source.

Methodology

The data comparisons are performed at the census block level. This means that all of the address point records are assigned the number of the census block they intersect, and each road segment, wireless service area, and service overview polygon are split into new features by each census block they intersect. Once all of the comparisons are performed, the results for any road segment, wireless service area, or service overview polygon that had been split into multiple parts are added together and averaged, then assigned to the original single record. This section provides a high level overview of how each validation data set is used to validate the wireless SBDD records.

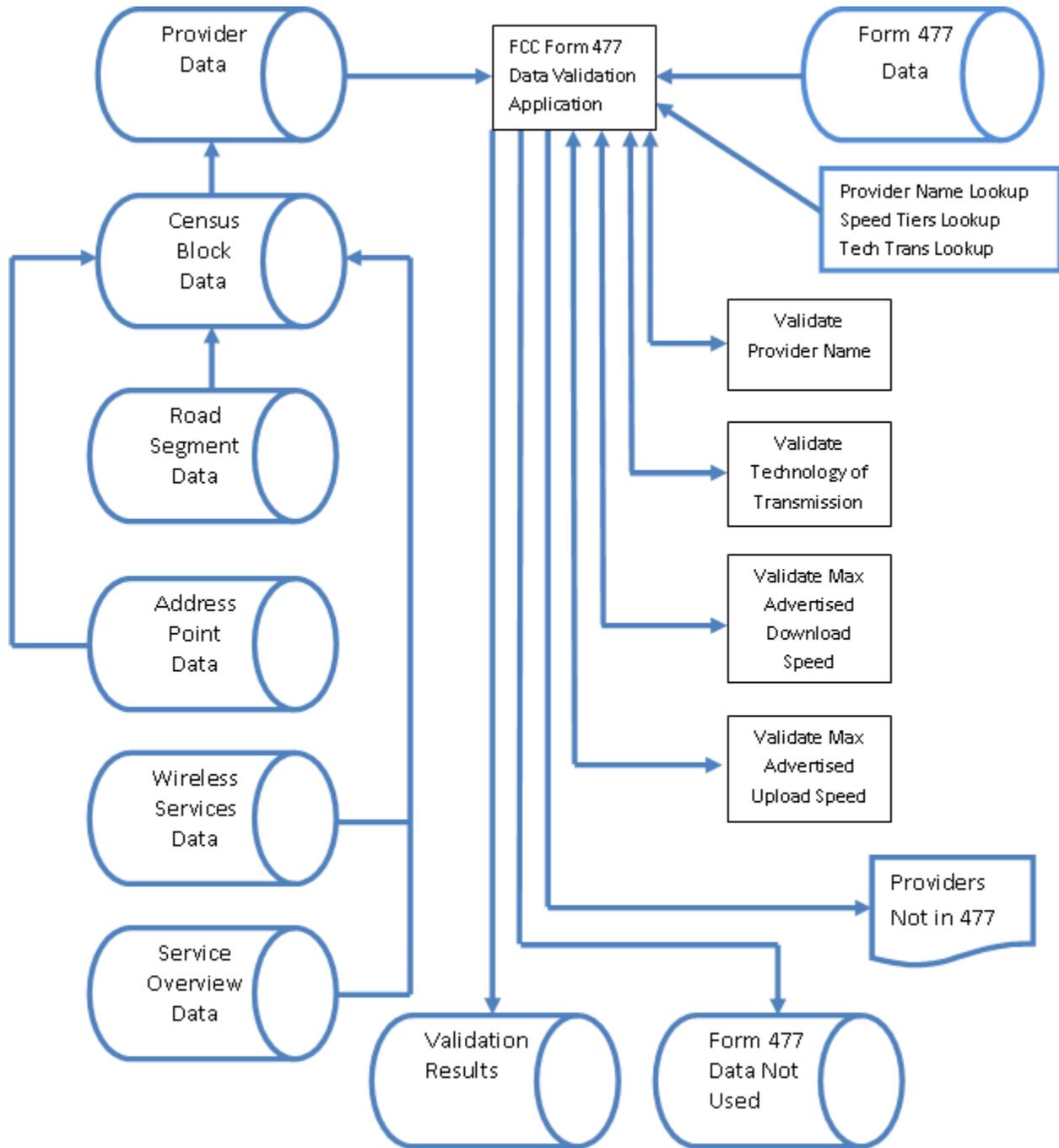
FCC Form 477

FCC Form 477 data is compared against the SBDD Awardee provided broadband service Census Blocks, Road Segments, Address Points, Wireless Service Areas and Service Overview Areas. This validation source contains Wireline and Wireless data and is used to compare Provider Names, Technology of Transmission, and Maximum Advertised Speeds at the Census Tract level. Form 477 provider names, speed tiers, and technology of transmission codes differ from SBDD data so lookup tables were created for matching purposes.

Comparison Fields

SBDD Data	FCC Form 477
PROVNAME	PARENT_COMPANY_NAME
TRANSTECH	TECHNOLOGY_CODE
MAXADDOWN	AD_DOWNLOAD_SPEED_CODE
MAXADUP	AD_UPLOAD_SPEED_CODE

Process



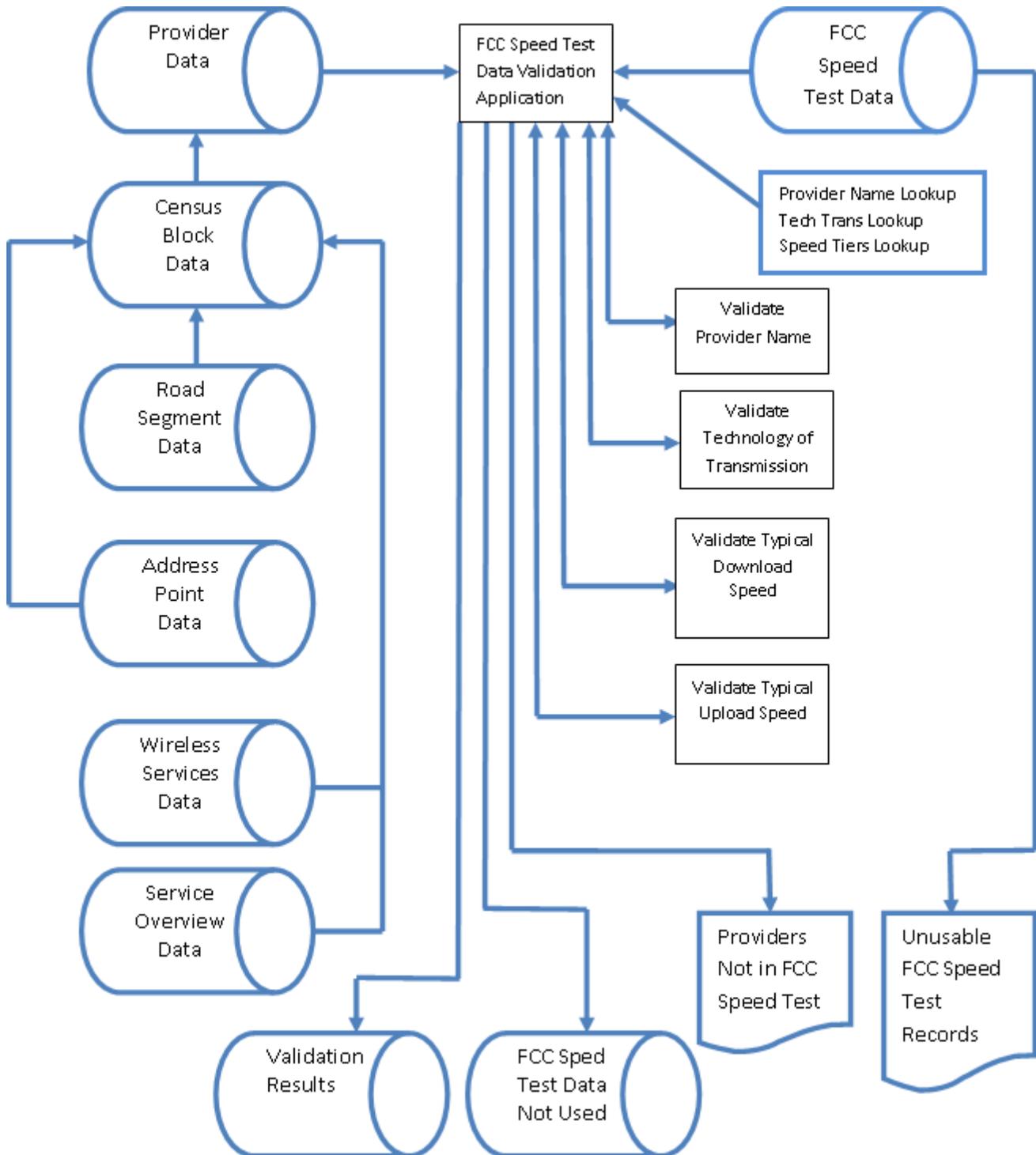
FCC SPEED TEST

FCC Speed Test data is compared against the SBDD Awardee provided Service Census Blocks, Road Segments, Address Points, Wireless Service Areas and Service Overview Areas. This validation source contains Wireline and Wireless data and compares Provider Names, Technology of Transmission, and Typical Speeds at the Census Block level. Baker created an IP Address provider names lookup tool to verify that the correct Speed Test record was being validated against the corresponding Provider Name. FCC Speed Test provider names, technology of transmission (wireline and wireless), and speed test results (KBPS to MBPS SBDD Speed Tiers) differ from SBDD data so lookup tables were created for matching purposes. Also, the Service Overview Areas do not include typical speed information that can be used to perform a comparison.

Comparison Fields

SBDD Data	FCC Speed Test
PROVNAME	IPISP (Baker generated)
TRANSTECH	CONNECTION (Baker generated)
TYPICDOWN	DOWNLOAD_SPEED
TYPICUP	UPLOAD_SPEED

Process



American Roamer

American Roamer market research data is compared against the SBDD Awardee provided Service Census Blocks, Road Segments, Address Points, Wireless Service Areas and Service Overview Areas. This validation source contains Wireless data and compares Provider Names and Technology of Transmission at the Census Block level. American Roamer provider names and technology of transmission codes differ from SBDD data so lookup tables were created for matching purposes.

Comparison Fields

SBDD Data	American Roamer
PROVNAME	MKTNAME
TRANSTECH	PROTOCOL

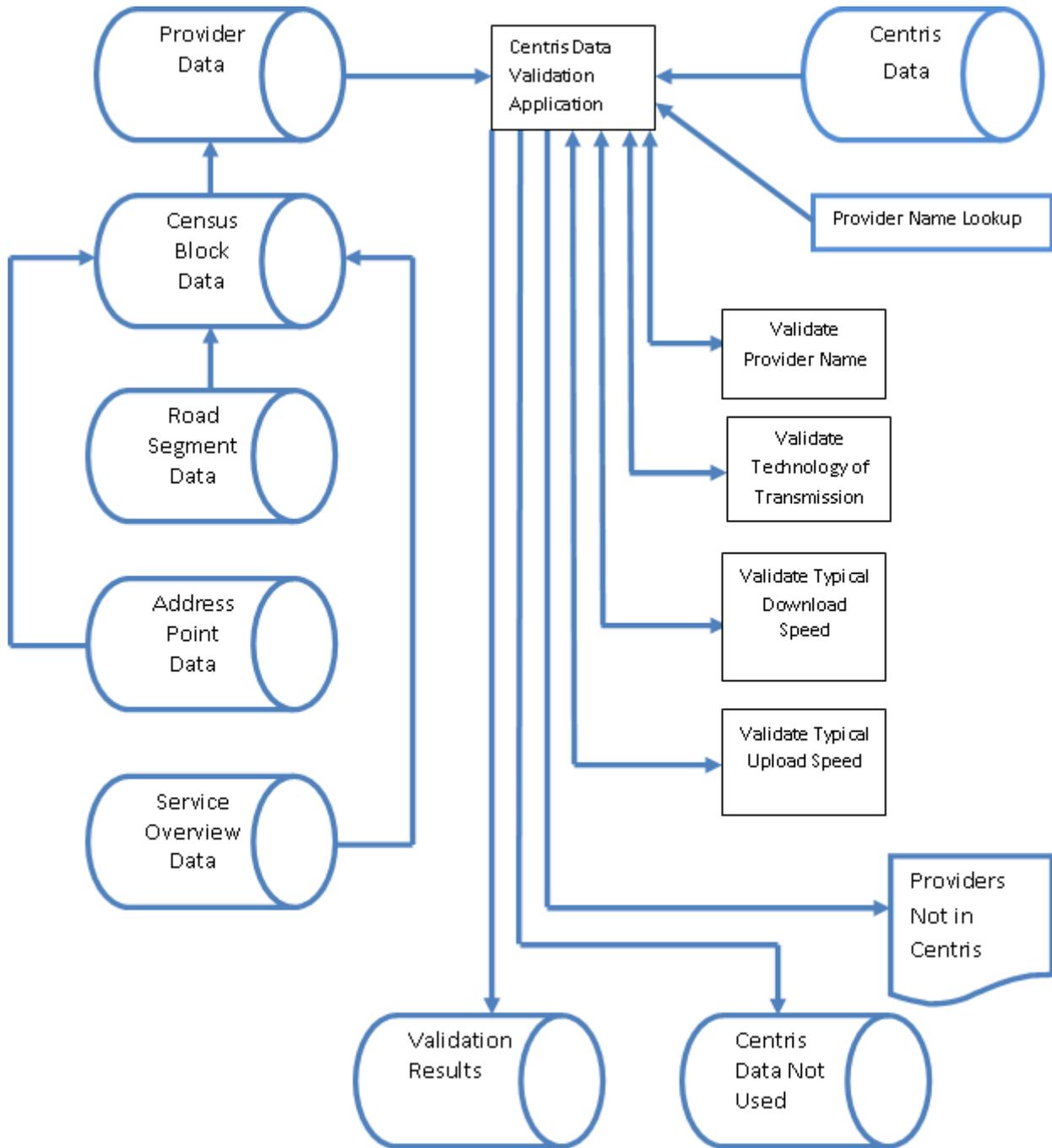
Centris

Centris market research data is compared against the SBDD Awardee provided Service Census Blocks, Road Segments, Address Points, and Service Overview Areas. This validation source contains Wireline data and compares Provider Names, Technology of Transmission, and Typical Speeds at the Census Block level. Centris provider names differ from SBDD data so lookup tables were created for matching purposes. Also, the Service Overview Areas do not include typical speed information that can be used to perform a comparison.

Comparison Fields

SBDD Data	Centris
PROVNAME	PROVIDER
TRANSTECH	technology_of_transmission
TYPICDOWN	Avg_DownloadSpeed_Tier
TYPICUP	Avg_UploadSpeed_Tier

Process



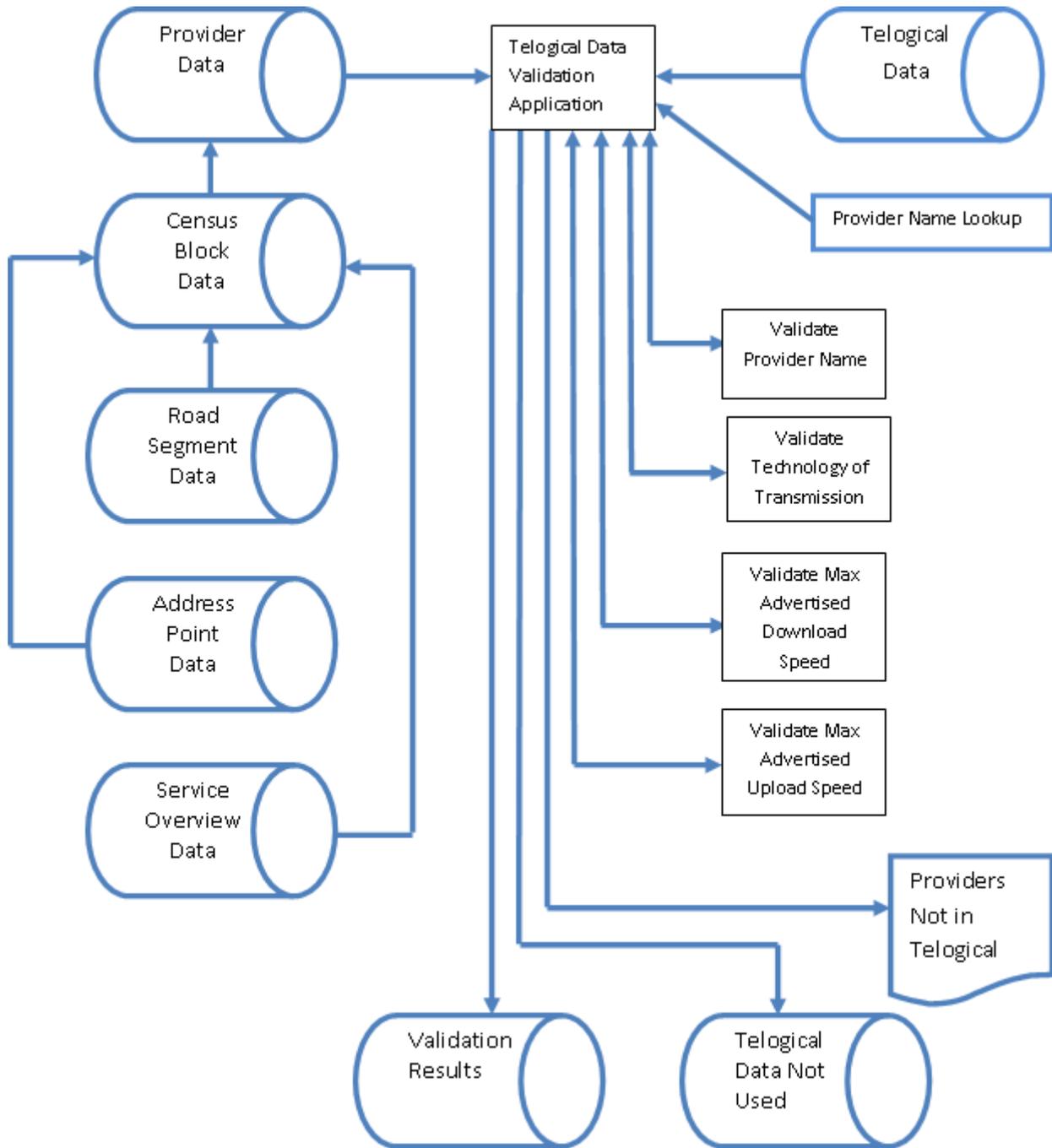
Tellogical

Tellogical market research data is compared against the SBDD Awardee provided Service Census Blocks, Road Segments, Address Points, and Service Overview Areas. This validation source contains Wireline data and compares Provider Names, Technology of Transmission, and Maximum Advertised Speeds at the Census Block level. Tellogical provider names differ from SBDD data so lookup tables were created for matching purposes.

Comparison Fields

SBDD Data	Tellogical
PROVNAME	COMPETITORNAME
TRANSTECH	TECHNOLOGY_OF_TRANSMISSION
MAXADDOWN	DOWNLOADSPEED_TIER
MAXADUP	UPLOADSPEED_TIER

Process



Other Comparison Procedures

Three other procedures are performed on the SBDD data. These results differ from the previous comparison results as they show Provider records who claim they serve areas that may not be serviceable or have been reported to the FCC as underserved or not served at all. The Provider records being pulled from SBDD Data are in the Census Block, Address Point, Road Segment, Wireless Service Area, and Service Overview Area feature classes.

FCC Dead Zone

FCC Dead Zone reports contain the 2000 Year Census Block that the geocoded point resides on. A process is then performed with the Dead Zone Census Block ID being queried against the SBDD data to determine if any providers claim they serve that Census Block. If the Available Indicator field is populated with a "Y" value then only those Provider's with the same Connection Type as that Dead Zone record are queried. If the Available Indicator contains an "N" value, then all Provider records are pulled for that Census Block.

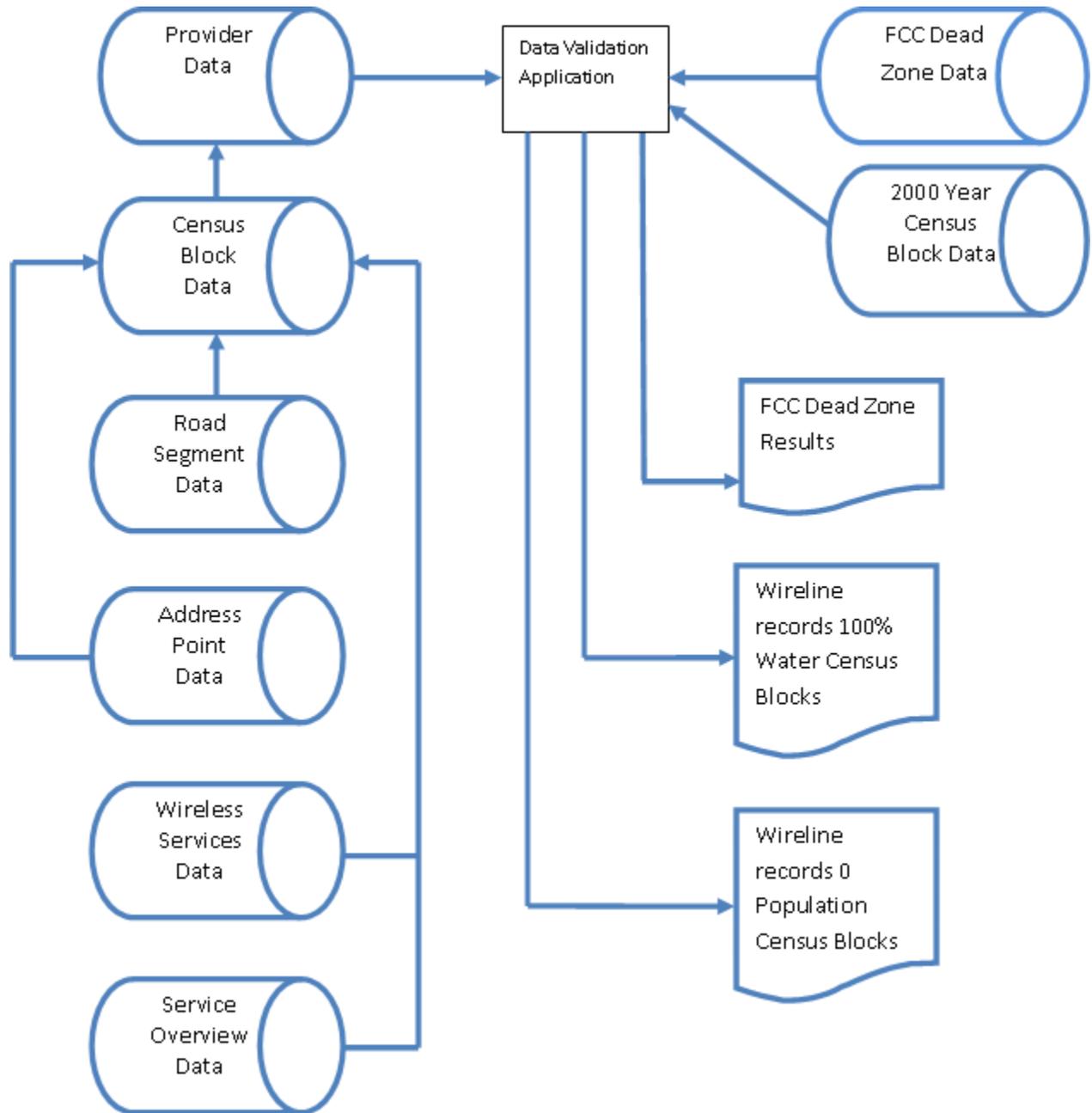
Wireline - 0 Population Census Blocks

All 2000 Year Census Blocks that have zero population are queried against SBDD data to pull Provider records who claim they serve that designated Census Block. This validation can be used to show that a provider is overstating their service area. This can also be used as a flag to give less confidence to a Provider. It should be noted that this data can be misconstrued because a Provider may claim to serve a Census Block with 0 population because they can provide service within 7 to 10 days.

Wireline - Water Census Blocks

All 2000 Year Census Blocks that are wholly contained by water are queried against SBDD data to pull Provider records who claim they serve that designated Census Block. This validation can be used to show that a provider is overstating their service area. This can also be used as a flag to give less confidence to a Provider.

Process



Final Results

Final results will be appended back to the original Awardee data (Census Blocks, Road Segments, Address Points, Wireless Service Areas, and Service Overview Areas) that the FCC provided Baker.

Description

Final Scores are created by combining the results of the Comparison Processes into an Accumulation Table. The SBDD records are broken up at the Census Block level for each Census Block the record intersects. Then a Matched Score Count and a possible Total Score count are calculated for each record per validation field. This presents a visual of the total number of matches a record has for all validation sources combined compared to the total number of possible matches available. Finally, the Accumulation Table provides a count of Wireline and Wireless Providers (unique per Provider + Technology) who serve the Census Block on which every record resides.

Once the Accumulation Table is created, the Matched Scores are tallied to find the total number of matches. Then the tallies are divided by the number of records that were created by the process of breaking the records up at the Census Block level. Final matching scores are then created and attached to the original FCC Oracle Data to be used for Web Mapping. There are 7 matching scores:

1. Provider Name
2. Technology of Transmission
3. Maximum Advertised Download Speed
4. Maximum Advertised Upload Speed
5. Typical Download Speed
6. Typical Upload Speed
7. Total Score

Total Score is the sum of the scores divided by the total possible score for that record. The denominator is different for Wireline records and Wireless records. The formulas used to calculate Total Score are provided below:

WIRELESS:

If TECH_OF_TRANS = 60, 70, 71, or 80

TOTAL_SCORE = (PN_SCORE + TT_SCORE + MADS_SCORE + MAUS_SCORE + TDS_SCORE + TUS_SCORE) / 10

WIRELIN:

For all other TECH_OF_TRANS (Including 0 and nulls)

TOTAL_SCORE = (PN_SCORE + TT_SCORE + MADS_SCORE + MAUS_SCORE + TDS_SCORE + TUS_SCORE) / 16

Process

