

California Broadband Validation Methods:

Round 2016

(for data as of December 31, 2015)

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Round 2016 Validation Documentation

Validation Terms

Coverage: Validation resource has spatial overlap with ISP submission, but Validation resource speeds are below ISP submitted maximum advertised downstream and upstream speeds.

No Coverage: Validation resource has no spatial overlap with ISP submission or Validation resource indicates no coverage exists.

Downstream Pass: Validation resource has spatial overlap with ISP submission; Validation resource speeds meet or exceed ISP submitted maximum advertised downstream speeds

Upstream Pass: Validation resource has spatial overlap with ISP submission; Validation resource speeds meet or exceed ISP submitted maximum advertised upstream speeds

Downstream/Upstream Pass: Validation resource has spatial overlap with ISP submission; Validation resource speeds meet or exceed ISP submitted maximum advertised downstream and upstream speeds

No Validation Resource: No validation resources for ISP

Does Not Apply: Validation method does not apply to ISP technology

Redzone: A Redzone is an area for which no validation resource could validate the ISP services the area. A value of 0 indicates the coverage was not validated while a value of 1 indicates coverage has been validated.

Purplezone: A Purplezone is an area for which no validation resource could validate the speed but coverage may be validated. A value of 0 indicates the associated speed was not validated while a value of 1 indicates the associated speed was validated.

General

Validation is processed per ISP; the validation data is used only when the ISP name and technology in the validation data corresponds to the name and technology of the ISP.

Terrestrial Fixed Wireless (70), and Mobile Wireless (80) are spatially intersected with each validation resource and processed for validation.

Public Survey validation results take precedence over all other validation sources. CalSPEED results take precedence over the interpolated field test results at the census block level.

FCC 477/Subscription

FCC 477/Subscription field = FCC477

FCC 477/Subscription data was processed only for ISPs with any of the following technologies: Asymmetric DSL (10), ADSL2/ADSL2+ (11), VDSL (12), Symmetric DSL (20), Other Copper Wireline (30), Cable Modem – Other (40), Cable Modem DOCSIS 1/1.1/2.0 (41), Cable Modem – DOCSIS 3.0 (42), Optical Carrier/Fiber to the End User (50), and Terrestrial Fixed Wireless (70).

The FCC 477/Subscription validation includes subscription data submitted by the provider, or from the latest available FCC Form 477 data. Form 477 subscription data is available at the census tract level, whereas broadband deployment data is often supplied at the census block level. Any census blocks falling within a tract will pass coverage validation with Form 477 subscription data if a provider reports having a subscriber in the corresponding census tract, and will pass speed validation if a provider reports having a subscriber at the advertised speed in the corresponding tract.

For each of the ISP's census blocks/wireless coverage, if the downstream and upstream speeds are equal to or less than the highest downstream and upstream speeds of the corresponding FCC 477/Subscription census tract, the record is calculated as "Downstream/Upstream Pass".

For each of the ISP's census blocks/wireless coverage, if the downstream speed is equal to or less than the highest downstream speed of the corresponding FCC 477/Subscription census tract, and the ISP's upstream speed is greater than the corresponding FCC 477/Subscription census tract upstream speed, the record is calculated as "Downstream Pass".

For each of the ISP's census blocks/wireless coverage, if the upstream speed is equal to or less than the highest upstream speed of the corresponding FCC 477/Subscription census tract, and the ISP's downstream speed is greater than the corresponding FCC/Subscription census tract, the record is calculated as "Upstream Pass".

For each of the ISP's census blocks/wireless coverage, if the downstream and upstream speeds are greater than the highest downstream and upstream speeds of the corresponding FCC 477/Subscription census tract, the record is calculated as "Coverage".

For each of ISP's census blocks/wireless coverage that do not correspond to the FCC 477/Subscription census tracts, the record is calculated as "No Coverage".

If an ISP does not have corresponding FCC 477/Subscription data the records are calculated as "No Validation Resource".

Figure 1.1 and Figure 1.2 illustrate the FCC 477/Subscription validation process for wireline census blocks and fixed wireless coverage respectively.

Figure 1.1 Wireline Validation - FCC 477/Subscription or Subscriber Address Resources

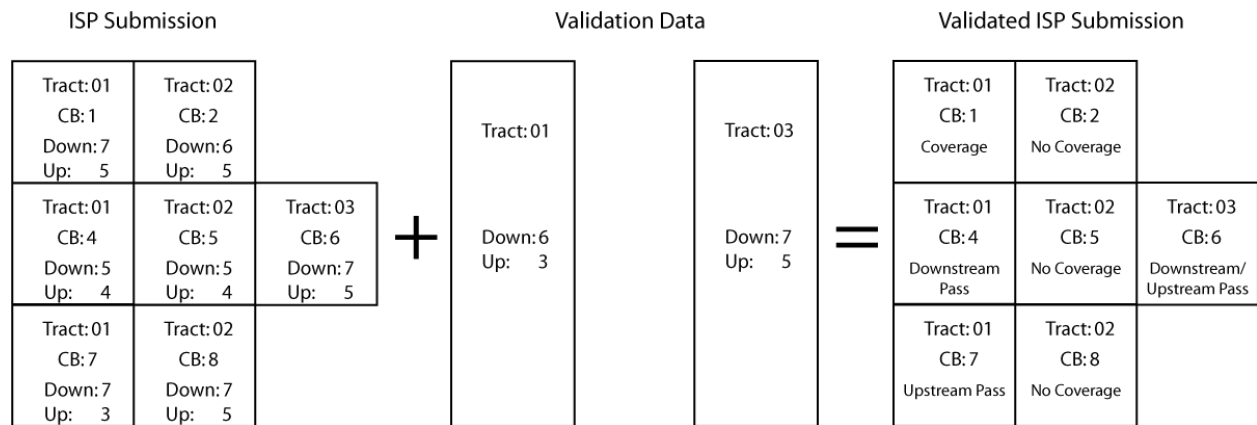
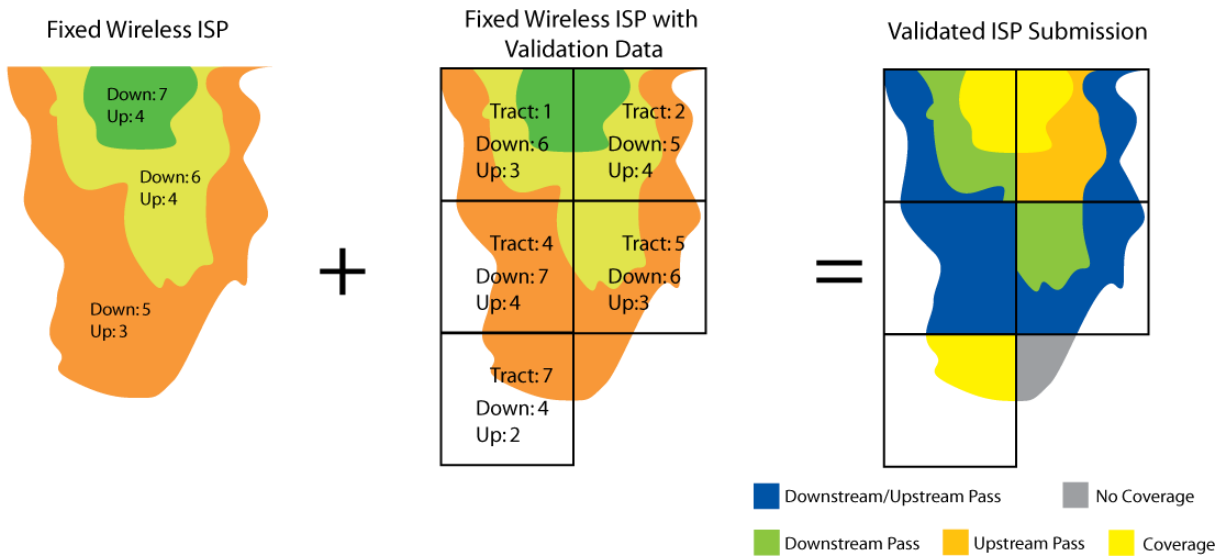


Figure 1.2 Fixed Wireless Validation - FCC477/Subscription and Subscriber Address Resources



TeleAtlas

TeleAtlas 12,000 foot Degradation field = TeleAtlas_WC_Degradation

TeleAtlas Degradation data were processed only for wireline ISPs with any of the following technologies: Asymmetric DSL (10), ADSL2/ADSL2+ (11), VDSL (12), Symmetric DSL (20), and Other Copper Wireline (30).

For each of the ISP's census blocks with spatially corresponding TeleAtlas 12,000 foot Degradation buffer, the record is calculated as "Coverage".

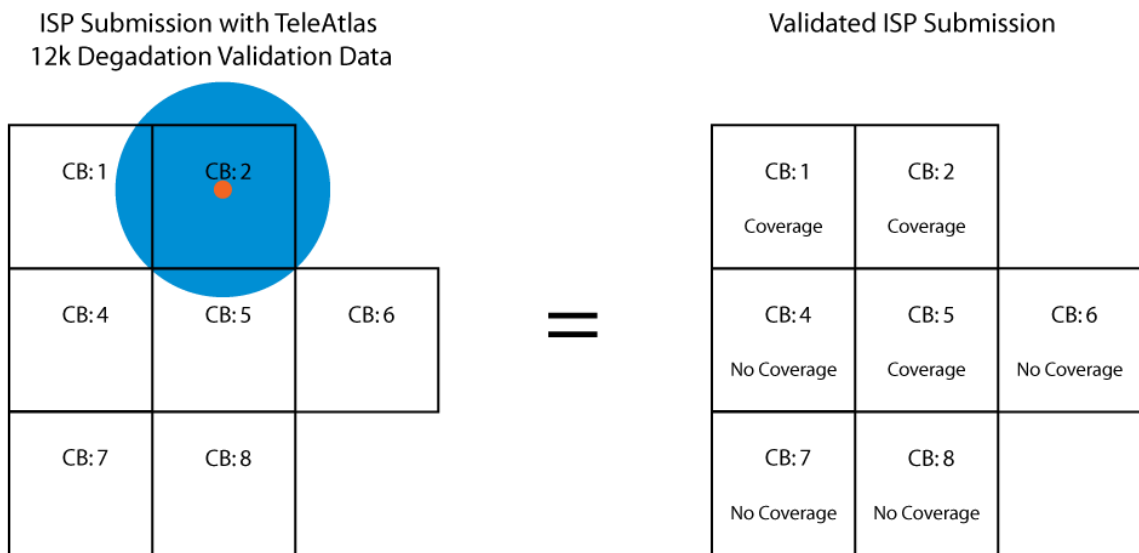
For each of ISP's census blocks that do not spatially correspond to the TeleAtlas 12,000 foot Degradation buffer, the record is calculated as "No Coverage".

If an ISP does not have corresponding TeleAtlas 12,000 foot Degradation buffer data, the records are calculated as "No Validation Data".

Wireline providers with technologies other than the technologies list above were calculated as "Does Not Apply".

Figure 2 illustrates the TeleAtlas validation process.

Figure 2. TeleAtlas 12k Degradation Validation Process



Subscriber Address

Subscriber Address field = Subscriber_Address

Subscriber Address validation data is primarily processed for Terrestrial Fixed Wireless (70). A small number of wireline ISP's (codes 10 – 50) also supply this data.

Subscriber addresses are geocoded and aggregated to census tract level in the same format as the FCC477/Subscription data.

For each of the ISP's census blocks/wireless coverage, if the downstream and upstream speeds are equal to or less than the highest downstream and upstream speeds of the corresponding subscriber address census tract, the record is calculated as "Downstream/Upstream Pass".

For each of the ISP's census blocks/wireless coverage, if the downstream speed is equal to or less than the highest downstream speed of the corresponding subscriber address census tract, and the ISP's upstream speed is greater than the corresponding subscriber address census tract upstream speed, the record is calculated as "Downstream Pass".

For each of the ISP's census blocks/wireless coverage, if the upstream speed is equal to or less than the highest upstream speed of the corresponding subscriber address census tract, and the ISP's downstream speed is greater than the corresponding subscriber address census tract, the record is calculated as "Upstream Pass".

For each of the ISP's census blocks/wireless coverage, if the downstream and upstream speeds are greater than the highest downstream and upstream speeds of the corresponding subscriber address census tract, the record is calculated as "Coverage"

For each of ISP's census blocks/wireless coverage that do not correspond to the subscriber address census tracts, the record is calculated as "No Coverage".

If an ISP does not have corresponding subscriber address data the records are calculated as "No Validation Resource".

Figure 1.1 and Figure 1.2 illustrate the Subscriber address validation process for wireline census blocks and fixed wireless coverage respectively.

Public Survey

Public Survey field = Public_Survey

Public Survey data was processed only for ISPs with any of the following technologies: Asymmetric DSL (10), ADSL2/ADSL2+ (11), VDSL (12), Symmetric DSL (20), Other Copper Wireline (30), Cable Modem – Other (40), Cable Modem DOCSIS 1/1.1/2.0 (41), Cable Modem – DOCSIS 3.0 (42), Optical Carrier/Fiber to the End User (50), and Terrestrial Fixed Wireless (70).

Public feedback from the CPUC Interactive Broadband Map and paper forms are geocoded and aggregated to the census block level.

For each of the ISP's census blocks/wireless coverage, if the public survey result indicates coverage existing and the downstream and upstream speeds are equal to or less than the highest downstream and upstream speeds of the corresponding public survey census block, the record is calculated as "Downstream/Upstream Pass".

For each of the ISP's census blocks/wireless coverage, if the public survey result indicates coverage existing and the downstream speed is equal to or less than the highest downstream speed of the corresponding public survey census block, and the ISP's upstream speed is greater than the corresponding public survey census block upstream speed, the record is calculated as "Downstream Pass".

For each of the ISP's census blocks/wireless coverage, if the public survey result indicates coverage existing and the upstream speed is equal to or less than the highest upstream speed of the corresponding public survey census block, and the ISP's downstream speed is greater than the corresponding public survey census block downstream speed, the record is calculated as "Upstream Pass".

For each of the ISP's census blocks/wireless coverage, if the public survey result indicates coverage existing and the downstream and upstream speeds are greater than the highest downstream and upstream speeds of the corresponding public survey census block, the record is calculated as "Coverage".

For each of the ISP's census blocks/wireless coverage, if the public survey results indicates internet is not available in the corresponding census block the record is calculated as "No Coverage".

For each census block/wireless coverage where there is no corresponding public survey census block, the record is calculated as "No Validation Resource".

If an ISP does not have corresponding Public Survey dataset the records are calculated as "No Validation Resource".

Figure 3.1 and Figure 3.2 illustrates the Subscriber address validation process for wireline census blocks and fixed wireless coverage respectively.

Figure 3.1 Public Survey Wireline Validation

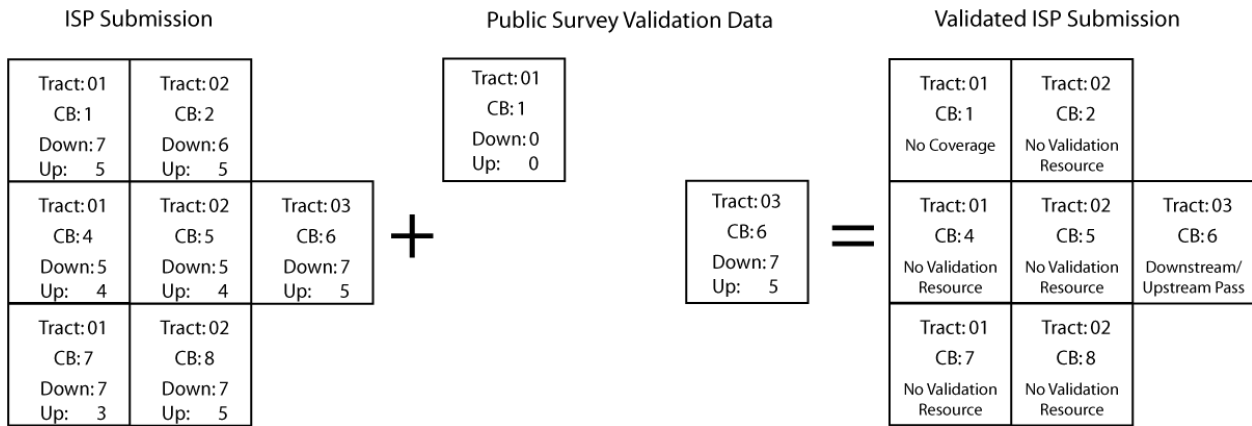
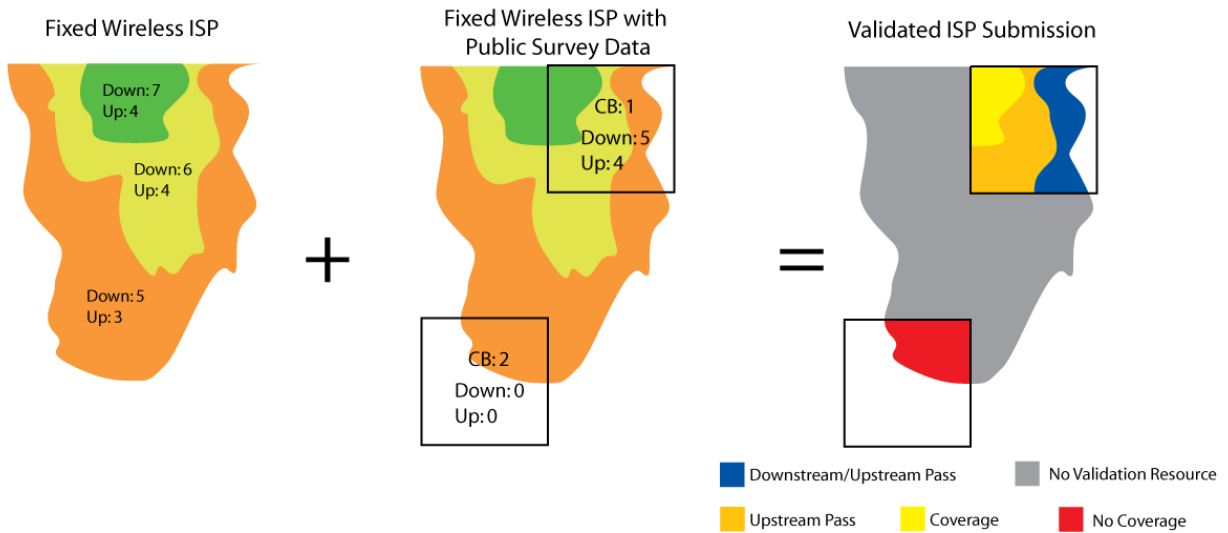


Figure 3.2 Public Survey Fixed Wireless Validation



EDX (Fixed wireless providers only)

EDX field = EDX

EDX validation data is processed only for Terrestrial Fixed Wireless (70) technology.

If a WISP supplies tower antenna data and their coverage footprint is generated with the EDX Wireless Signal software, the record is calculated as “Coverage”.

If the WISP’s coverage footprint was generated using census blocks geometry, the record is calculated as “No Coverage”.

Field Test

Field Test validation results are calculated directly into the Highest Category field (See Page 13).

The results of mobile field testing for validation apply to the mobile ISP's AT&T Mobility, Sprint, T-Mobile, and Verizon Wireless only. All other mobile providers, the highest category field is calculated based on the cumulative result of all validation resources.

The results of the statewide mobile field testing are interpolated into a raster surface, clipped to the providers advertised footprint and converted to polygon coverage. The result of this process replaces the provider submitted coverage footprint. The records are calculated as "Downstream/Upstream Pass".

CalSPEED

CalSPEED field = CalSPEED

CalSPEED validation data was processed for Mobile Wireless (80) technology.

CalSPEED test results were aggregated to census block level. Census blocks were spatially overlapped with mobile coverage polygons.

For each of the ISP's mobile coverage areas, if the downstream and upstream speed is equal to or less than the highest downstream and upstream speed of the corresponding CalSPEED census block, the record is calculated as "Downstream/Upstream Pass"

For each of the ISP's mobile coverage areas, if the downstream speed is equal to or less than the highest downstream speed of the corresponding CalSPEED census block, and the ISP's upstream speed is greater than the corresponding CalSPEED census block upstream speed, the record is calculated as "Downstream Pass".

For each of the ISP's mobile coverage areas, if the upstream speed is equal to or less than the highest upstream speed of the corresponding CalSPEED census block, and the ISP's downstream speed is greater than the corresponding CalSPEED census block downstream speed, the record is calculated as "Upstream Pass".

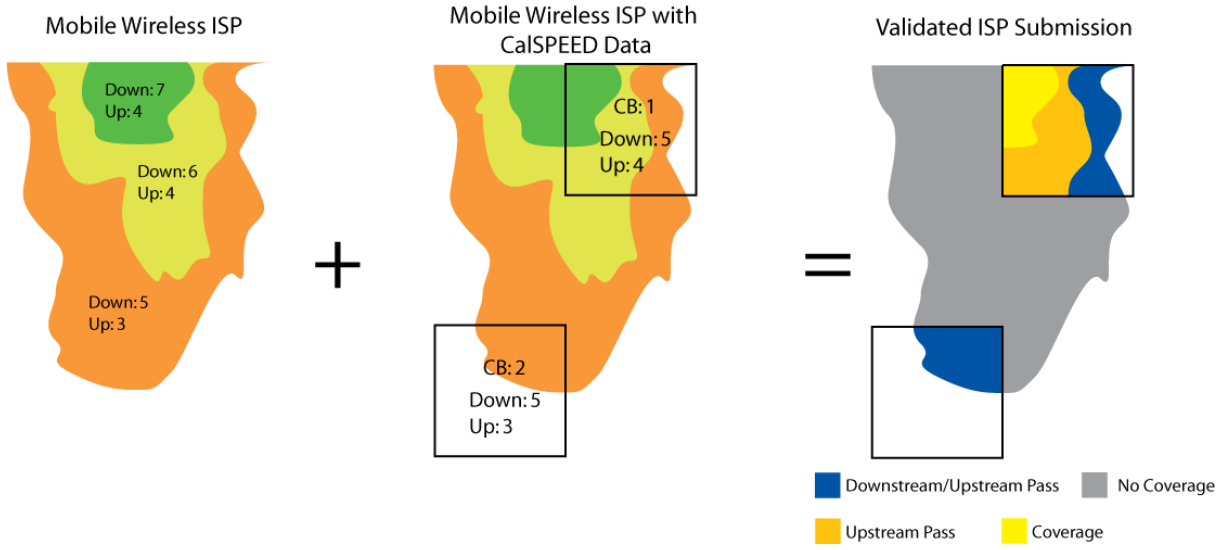
For each of the ISP's mobile coverage areas, if the downstream and upstream speed is greater than the highest downstream and upstream speed of the corresponding CalSPEED census block, the record is calculated as "Coverage"

For each of ISP's mobile coverage areas that do not correspond to the CalSPEED census blocks, the record is calculated as "No Validation Resource".

If an ISP does not have corresponding CalSPEED dataset the records are calculated as "No Validation Resource".

Figure 4 illustrates the CalSPEED validation process.

Figure 4 CalSPEED Mobile Wireless Validation



Highest Category

Highest Category field = HIGH_CAT

Highest Category is populated with the highest validation tier across each validation type using the hierarchy. (Figures 5 - 8) No field or method of validation has more weight than any other with the exception of Public Survey and CalSPEED. Results of Public Survey or CalSPEED override the result from other validation methods regardless of tier.

Figure 5. Wireline Highest Category Example Table

Tier 1	Downstream/ Upstream Pass		Overrules all other validation values	
Tier 2	Upstream Pass	Downstream Pass	Overrules all validation values from Tiers 3 and 4. If there is an upstream pass and a downstream pass in two separate validation fields for the same record the record is calculated as Downstream/Upstream Pass in the Highest Category field.	
Tier 3	Coverage		Overrules Tier 4	
Tier 4	No Coverage	No Validation Resources	Does not Apply	Is overruled by all validation values. "No Coverage" represents all of Tier 4 in the Highest Category field.

Figure 6. Wireline Highest Category Example Table

TECHNOLOGY	FCC477	TeleAtlas_WC_Degradation	Subscriber_Address	Public_Survey	HIGH_CAT
10	Coverage	Coverage	No Coverage	No Validation Resource	Coverage
10	No Coverage	No Coverage	No Coverage	No Validation Resource	No Coverage
10	Downstream Pass	Coverage	Upstream Pass	No Validation Resource	Downstream/Upstream Pass
20	Upstream Pass	Coverage	No Validation Resource	No Validation Resource	Upstream Pass
30	Downstream/Upstream Pass	No Coverage	Upstream Pass	No Validation Resource	Downstream/Upstream Pass
30	Coverage	Coverage	Downstream Pass	No Validation Resource	Downstream Pass
40	Downstream/Upstream Pass	Does Not Apply	Downstream Pass	No Validation Resource	Downstream/Upstream Pass
40	Coverage	Does Not Apply	Downstream Pass	No Validation Resource	Downstream Pass
41	Coverage	Does Not Apply	Coverage	No Validation Resource	Coverage
41	Downstream/Upstream Pass	Does Not Apply	No Coverage	No Coverage	No Coverage
50	Downstream/Upstream Pass	Does Not Apply	No Validation Resource	Upstream Pass	Upstream Pass
50	No Coverage	Does Not Apply	No Validation Resource	Downstream Pass	Downstream Pass
50	No Coverage	Does Not Apply	No Validation Resource	No Coverage	No Coverage
50	Upstream Pass	Does Not Apply	No Validation Resource	Downstream/Upstream Pass	Downstream/Upstream Pass
50	Downstream Pass	Does Not Apply	No Validation Resource	Coverage	Coverage

Figure 7. Terrestrial Fixed Wireless Highest Category Example Table

TECHNOLOGY	EDX	Subscriber_Address	FCC477	Public_Survey	HIGH_CAT
70	Coverage	Upstream Pass	Coverage	Downstream/Upstream Pass	Downstream/Upstream Pass
70	Coverage	Downstream/Upstream Pass	Downstream/Upstream Pass	No Validation Resource	Downstream/Upstream Pass
70	Coverage	Coverage	Downstream/Upstream Pass	Downstream Pass	Downstream Pass
70	Coverage	Coverage	Downstream/Upstream Pass	Coverage	Coverage
70	Coverage	Upstream Pass	Coverage	No Coverage	No Coverage
70	Coverage	Coverage	Upstream Pass	No Validation Resource	Upstream Pass
70	Coverage	No Coverage	No Coverage	No Validation Resource	Coverage
70	No Coverage	No Coverage	No Coverage	No Validation Resource	No Coverage

Figure 8. Terrestrial Mobile Wireless Highest Category Example Table

TECHNOLOGY	CaISPEED	HIGH_CAT
80	Downstream/Upstream Pass	Downstream/Upstream Pass
80	Downstream Pass	Downstream Pass
80	Upstream Pass	Upstream Pass
80	Coverage	Coverage
80	No Coverage	No Coverage
80	No Validation Resource	Downstream/Upstream Pass

Redzone/Purplezone

Redzone field = REDZONE

Records validated as Tier 1, Tier 2, or Tier 3 in the Highest Category field were calculated as “1” in the Redzone field. Records validated as Tier 4 in the Highest Category field were calculated as “0” in the Redzone field.

Purplezone Downstream field = PURPLEDOWN

Records validated as Tier 1 or Downstream Pass for Tier 2 in the Highest Category field were calculated as “1” in the Purplezone Downstream field. Records validated as Tier 3, Tier 4 or Upstream Pass for Tier 2 in the Highest Category field were calculated as “0” in the Purplezone Downstream field.

Purplezone Upstream field = PURPLE_UP

Records validated as Tier 1 or Upstream Pass for Tier 2 in the Highest Category field were calculated as “1” in the Purplezone Upstream field. Records validated as Tier 3, Tier 4 or Downstream Pass for Tier 2 in the Highest Category field were calculated as “0” in the Purplezone Upstream field.

Purple Downstream/Upstream field = PURPLE_CMB

Records validated as Tier 1 the Highest Category field were calculated as “1” in the Purplezone Downstream/Upstream field. Records validated as Tier 2, Tier 3, or Tier 4 for in the Highest Category field were calculated as “0” in the Purplezone Downstream/Upstream field.

Figure 10. Redzone/Purplezone Calculations

HIGH_CAT	REDZONE	PURPLEDOWN	PURPLE_UP	PURPLE_CMB
No Coverage	0	0	0	0
Coverage	1	0	0	0
Downstream Pass	1	1	0	0
Upstream Pass	1	0	1	0
Downstream/Upstream Pass	1	1	1	1