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USDA ReConnect Program

Service Area Validation Execution Guide

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Document Overview

The purpose of this guide is to provide a Service Area Validation (SAV) framework for approval by the United States Department of Agriculture (USDA) in support of the ReConnect Grant and Loan Program. The process provided in this document was drafted by Corner Alliance to support determinations of whether sufficient access to broadband exists in proposed service areas, per the requirements in Task Order 2 in the CLIN 002 performance work statement (PWS). This document reflects details consistent with the high-level framework presented to the USDA on May 23, 2019 entitled “USDA SAV Framework Memo submitted 5.23.19.docx” and approved on May 28, 2019.

Process Overview

SAV Purpose

The purpose of a SAV is to determine whether Proposed Funded Service Areas (PFSAs) submitted by applicants for the ReConnect Program meet eligibility requirements described in the Funding Opportunity Announcement. The SAV Review Team performs SAVs to determine the percentage of households in a PFSA that lack sufficient access to broadband. For applicants seeking 100% Grants, 100% of households within the PFSA must have less than 10 Mbps downstream speed and 1 Mbps upstream speed (10/1). For applicants seeking either a 100% Loan or 50% Loan/50% Grant combination must meet a threshold of 90% or more of households in the PFSA must lack sufficient access to 10/1.

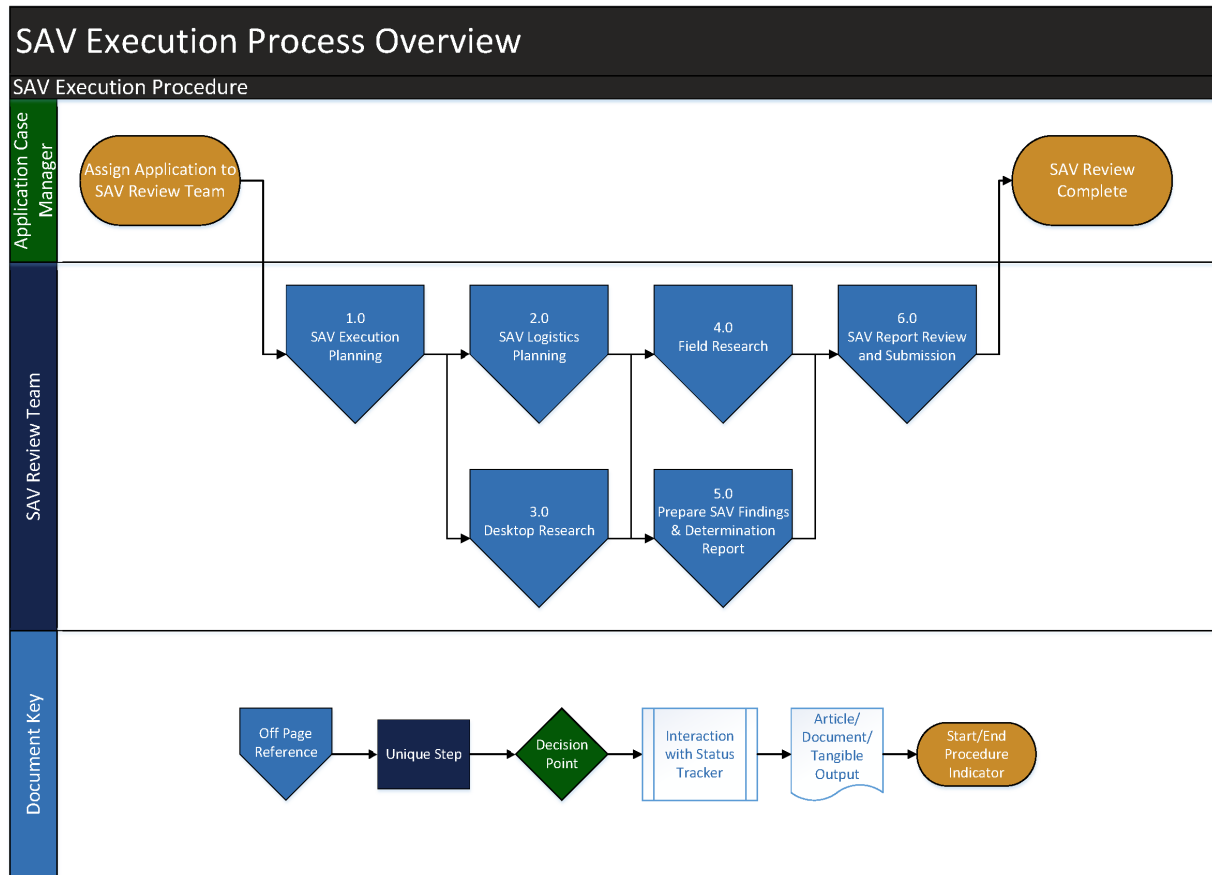
SAV Approach Summary

The SAV framework is a holistic approach leveraging past USDA practices followed during similar loan and grant programs. This framework is designed to apply a standardized approach to validating existing service, regardless of the availability of data and underlying characteristics for each service area included across all applications. This approach takes into consideration validation processes from the Federal Communications Commission (FCC) to assist with incumbent service provider speed determinations. Throughout the execution of SAVs, the SAV Review Team adheres to the following USDA guidance:

- The SAV Review Team is not permitted to knock on the doors of households.
- The SAV Review Team is not permitted to enter a household.
- The SAV Review Team is not permitted to use crowdsourced speed test data provided by a third-party aggregator, such as Ookla, to inform the determination of a service area.

The figure below details the SAV review process, which demonstrates notification of a SAV assignment, SAV Review Team staffing, and production and routing of the SAV determination into the application system. The determination entered into the application system shall be treated as a single component of the full application evaluated by USDA when making award decisions. This process is illustrated in **Figure 1**.

Figure 1: Illustrative Process Overview



SAV Data Collection and Field Validation Approach

To maintain consistent treatment of PFSA validations, SAV determinations are a result of four primary activities: Desktop Research, incumbent service provider speed validations, Field Research, and network calculations. Each activity includes a series of steps to collect a broad range of data points that ultimately support the overall determination. The SAV Review Team commits to the following:

1. **Desktop Research:** Examines publicly available data sources to corroborate field level findings. The research includes but is not limited to: FCC Form 477, government and non-profit geolocation datasets such as the USAC map, alternative map data validation, service providers, technologies, broadbandnow.com, Public Notice Response (PNR) specifics, local contacts, household distribution in geography, and other data sources determined as acceptable. If a PNR is not submitted for a PFSA, the SAV Review Team completes Desktop Research utilizing publicly available end-user generated speed test data from identified service providers in the area, in addition to the previously listed sources.

2. **Incumbent Service Provider Speed Validations:** Consistent with FCC processes to validate speed in wireline networks, the SAV Review Team requests and examines datasets from the PNR service provider including data generated by certain network elements or network management systems (NMSs). The request includes data during peak and non-peak network load timeframes. In the event no service provider has responded to USDA's public notice, the SAV Review Team conducts research to identify any service providers in the given PFSA and submit similar requests to those identified competitors. The SAV Review Team expects its requests may not be responded to by the service providers.
3. **Field Research:** Conducts interviews with service provider technical personnel, government officials, representatives of community anchor institutions and subscribers of the service providers. For technical personnel, the focus is on gaining a detailed understanding of the technologies providing service and the infrastructure supporting the service. For subscribers, the focus is on understanding the user perceived speed of the network. The SAV Review Team performs physical network observations in the field regardless if a PNR has or has not been submitted for a particular PFSA.
4. **Network Calculations:** Based on the technology deployed, certain high-level calculations are made to validate the sufficiency of infrastructure to support 10/1. This process is completed regardless the presence of a PNR and it is noted that information necessary to perform the calculations may not be made available by the provider(s).

Assumptions of the SAV Approach

As the SAV Review Team executes the SAV approach, several key assumptions are observed. Local community members are likely not experts in broadband capabilities and may be unable to accurately convey a locality's broadband speed. In addition, there are many links in any given data communications chain that ultimately determine speed. The SAV Review Team only evaluates the links that are under the providers control. In the event there are no other providers involved in the service delivery, the point of demarcation for evaluating the links will be where the traffic is handed off such as a Central Office or Point of Presence. The SAV Review Team is not able to evaluate any variables that may occur within the walls of a household (such as a dysfunctional router, etc.). SAV findings provide a determination on whether the service area is eligible or not in accordance to this validation process.

While the guide below details the SAV approach to all applications submitted under the ReConnect Program, each application is unique. Applications will vary across a number of variables which will determine the time and effort to complete. These include:

- The number of PFSAs;
- The size of PFSAs;
- The relative distance between PFSAs;
- The number of service providers operating in, and/or in close proximity to PFSAs;
- The number of SAV resources and staff; and,
- The availability of, and access to, data analyzed during the SAV process.

Service Area Validation Findings and Determination

For 100% Grants, the Team makes its determination in the following manner:

1. If SAV activities and data points gathered in the four activities described above suggest the service area has sufficient access to the required speed and coverage threshold, the SAV Review Team's determination states whether sufficient access to broadband exists.
2. If findings from the four activities described above suggest the service area does not have the required speed and coverage, the SAV Review Team's determination states sufficient access to broadband does not exist.

For the 50% Loan/ 50% Grant combination and 100% Loan applications, the SAV Review Team makes a determination in the same manner. Since these applications require only 90% of households lack sufficient access, the SAV Review Team determination is based on available information and data, which may need to be extrapolated out to assess the 90% threshold.

The nature of certain projects and service areas may limit the data available for analysis. Under such circumstances, the determination is based on the data available. The SAV Review Team provides USDA a report of data sources, the data captured, and a determination based on that dataset. The data points that are collected and memorialized in the SAV Findings and Determination Report, as available, for each SAV are provided in **Table 1**.

Table 1: SAV Data Points for Evaluation

Data Point	Description
In-Field Interviews	Questions and answers asked of local officials, competitor service provider technicians, the point of contact on the PNR, and citizens for a given PFSA. Questions vary depending on the persons interviewed.
Network Calculations	Transmission technology-dependent network calculations. Data is collected by Field Research Team and populated into the SAV Execution Tool. Calculation expressions are provided under 4.0, Field Research.
Network Observations	Qualitative observations of network infrastructure. If material deficiencies are observed, the Field Research Team is to record them in the SAV Execution Tool.
Other Public Data Sources	Speed test data observations collected from sources not explicitly listed in this guide.
Public Notice Response Information	Notes describing the quality and validity of claims provided in PNR responses collected by Desktop and Field Research Teams.
Service Provider Marketing Collateral	Any advertisements or public assertions of speeds delivered to customers.
Speed Test Data from Network Infrastructure	Network generated speed data requested from a provider's (non-applicant) Customer Premise Equipment (CPE), Network Management Systems (NMS), or other self-developed Transmission Control Protocol (TCP) based speed application.

Table 2 below contains a list of the various roles referenced throughout the SAV Execution Guide.

Table 2: SAV Roles

Term	Description/Definition
Application Case Manager	Member of the application review team who assigns applications to the SAV Review Team. Serves as a liaison between the application review team and the SAV Review Team.
Broadband Subject Matter Expert (SME)	Adjudicates the final SAV determination when concurrences cannot be met throughout the SAV process. The Broadband SME provides on-call advisory throughout the SAV lifecycle to various Team members as needed.
Desktop Advisor	Oversees the execution of Desktop Research activities. The Desktop Advisor is responsible for the production of initial SAV Desktop Research Report and serves as the liaison between Desktop Research Team and SAV Coordinator. Sends initial SAV Findings and Determination Report to SAV Review Lead.
Desktop Researcher	Desktop Research staff and Leads responsible for creating Desktop Research Reports for a SAV of a given PFSA. Desktop Researchers are assigned to individual SAVs with one Primary Desktop Researcher if multiple Desktop Researchers are assigned to a single SAV.
Field Researcher	Field Research staff and Leads responsible for creating Field Research Reports for a SAV of a given PFSA. Field Researchers are divided into Regionals Teams. Teams are located in Arlington, Chicago, and Seattle responsible for executing SAV Field Research in Eastern, Central, and Western states, respectively.
Primary Desktop Researcher	Supports the Desktop Advisor in the coordination of the execution of Desktop Research. Responsible for the coordination of the Desktop Research Team when multiple staff are working on a single SAV.
QC Lead	Member of the Desktop Research Team responsible for updating references, heading numbers, table and figure captions throughout the entire SAV Findings & Determination Report.
ReConnect Program Manager	USDA staff member responsible for managing the ReConnect Program.
Regional Lead	Oversees Field Research activities within their Regions and is responsible for quality assurance of Field Research activities. If unable to arrive at concurrence, the Regional Leads escalate the report to the Broadband SME for adjudication.
SAV Coordinator	Liaison between SAV Review Lead and Desktop and Field Research Teams in planning SAV research efforts.
SAV Leadership Team	Composed of the SAV Review Lead, Regional Leads, Broadband SME and SAV Coordinator, the SAV Leadership Team determines the SAV Execution Order.
SAV Review Lead	Oversees Desktop and Field Research efforts, conducts final checks on each report to ensure completeness and adherence to key report criteria.
SAV Review Team	The entire Team responsible for reviewing a SAV application consisting of: SAV Review Lead, SAV Coordinator, Broadband

Term	Description/Definition
	SME, Desktop Advisor, Desktop Research Team, and Field Research Team.

Table 3 contains a list of SAV articles, outputs, and frequently used terms in the guide.

Table 3: SAV Articles and Terminology

Term	Description/Definition
Desktop Research Report	Report assessing the eligibility of PFSA's via the claims made on an application as well as online research in order to isolate key data points and information, with details culminating in the final SAV report.
Key Network Facilities and Infrastructure	Important network buildings located in a given PFSA to be evaluated by Field Research Team on a SAV.
Local Institutions	Key institutions located in a given PFSA where broadband connectivity measurements are taken by the Field Researchers.
Notification of Assignment	Written notification in the form of an email stating a SAV has been assigned by the Case Manager to the SAV Review Team. The Notification states who is responsible for completing the assigned research by the prescribed deadline.
Notification of Incompleteness	Written notification in the form of an email to the Case Manager containing an itemized list of missing components to from the SAV review packet.
Proposed Funded Service Area (PFSA)	The area (whether all of part of an existing or new service area) where the applicant is requesting funds to provide broadband service. Multiple service areas will be treated as separate stand-alone service areas for the purpose of determining how much of the proposed funded service area does not have sufficient access to broadband. Each service area must meet the minimum requirements for the appropriate funding category to be an eligible area.
Public Notice Response (PNR)	Response to a Public Notice Filing (PNF).
SAV Checklist	A checklist of all required service area information and supporting documentation needed for SAV execution as well as a procedure checklist to be updated throughout the duration of the review to indicate which steps have been completed.
SAV Document Library	The SAV Document Library is stored on SharePoint to be used to log desktop research files and maintain the SAV Execution Tool throughout the Desktop Research Report procedure.
SAV Execution Order	Sequential order of applications and underlying PFSA's that are to be validated. The SAV Execution Order also establishes a proposed SAV Execution Timeline, and key considerations and assumptions.
SAV Execution Tool	VBA-Enabled MS Excel workbook used to record findings and data compiled by Desktop Research Team and Field Research Team. This tool enables execution of a SAV and serve as the data repository from which SAV reports are generated.
SAV Field Worksheet	A checklist of the data logged by Field Researchers.

Term	Description/Definition
SAV Findings and Determination Report	Final version of the report that is sent to the Application Case Manager. The report package includes a decisive and clear eligibility determination along with key information collected throughout the SAV process that contributed to the final determination.
SAV Status Tracker	Tool within SharePoint that logs the review status of each SAV application. The SAV Status Tracker is owned by the SAV Coordinator.
Service Provider	Broadband Service Providers
Travel Itinerary and Cost Estimate	Built from the SAV Execution Tool, the Travel Itinerary and Cost Estimate is a compilation of travel information for a given SAV trip, including the location of lodging, timing of flights, and the availability of rental cars at starting and ending destinations.

1.0 SAV Execution Planning

SAV Execution Planning marks the beginning of the SAV Review Team’s involvement in the broader application review process for the ReConnect Program. In order to streamline and expedite reviews, the SAV Review Team adheres to the Execution Planning procedures illustrated below, which consider resource availability and PFSA location(s) for a given application. The procedure kicks off with a review of the service area information materials in a given application routed from the Application Case Manager and culminates with a written request to the SAV Coordinator to organize and schedule Field Research activities.

Independent Operation
When an application is assigned to the SAV Review Status SharePoint List by the Application Case Manager, the SAV Coordinator is responsible for generating the SAV Document Library and items recorded in the SAV Status Tracker List. When the SAV Coordinator changes the field “Generate Directory Structure” on the SAV Review Status SharePoint List, a SharePoint workflow is triggered, automatically creating the directory structure and status tracking record for the application.

The SAV Execution Planning process outputs are provided in **Table 4**.

Table 4: SAV Execution Planning Outputs

Output Item	Required?	Description
Notification of Incompleteness	No	The SAV Coordinator provides written notification in the form of an email to the Application Case Manager and the ReConnect Program Manager containing an itemized list of missing SAV review packet components needed to execute the SAV review.
SAV Checklist	Yes	A checklist of all required service area information and supporting documentation is needed for SAV execution, as well as a procedure checklist that is updated throughout the duration of the review.
Proposed SAV Execution Order	Yes	Based on the analysis performed by the SAV Leadership Team, the SAV Coordinator develops, a priority list of when PFSA’s should be validated.
Final SAV Execution Order	Yes	Upon receipt of USDA concurrence, the SAV Review Lead archives the final SAV Execution Order.
Notification of Assignment for Regional Teams	Yes	The SAV Coordinator provides written notification in the form of an email to the appropriate Regional Team stating a SAV in their region has been assigned. The Regional Team is responsible for completing the Field Research procedure by the prescribed deadline.
Notification of Assignment for Desktop Team	Yes	The SAV Coordinator provides written notification in the form of an email to the assigned Desktop Research Team stating a SAV has been assigned. It states who is responsible for completing the Desktop Research procedure by the prescribed deadline.

SAV Execution Planning Procedure

1.1 Review Service Area Information for Completeness

Resource planning begins with a review of the application associated with the PFSA assigned to the SAV Review Team’s queue by the Application Case Manager. The SAV Coordinator checks that the SAV review packet contains the following:

- Applicant name and number
- Project descriptions or service area description
- Map of PFSA's and associated metadata, including:
 - Number of households,
 - Square mileage,
 - Census Data, etc.
- Competitor service offerings (no price)
- PNF and PNR package

The SAV Coordinator prepares the *SAV Checklist*, as shown in **Table 5** below, that is included as an attachment in the *Notification of Assignments for Desktop Research and Regional Teams*.

Table 5: SAV Checklist

Item	Observations					
	Complete?				Initial	Date
Master Checklist						
SAV Review Package received?	[Yes or No]					
SAV Execution Order established?	[Yes or No]					
Travel authorized?	[Yes or No]					
Field logistics finalized?	[Yes or No]					
Desktop Research complete?	[Yes or No]					
Field Research complete?	[Yes or No]					
Determination made?	[Yes or No]					
Quality Check complete?	[Yes or No]					
Concurrence/approval on determination?	[Yes or No]					
SAV report submitted?	[Yes or No]					
Data archived?	[Yes or No]					
Desktop Research Checklist (for each PFSA)	Competitive Service Provider review complete?	Speed Test complete?	PNR review complete?	Local Contact Information complete?	Initial	Date
[PFSA Name]	[Yes or No]	[Yes or No]	[Yes or No]	[Yes or No]		

Item	Observations					
[PFSA Name]	[Yes or No]	[Yes or No]	[Yes or No]	[Yes or No]		
Field Research Checklist (for each PFSA)	Field Research complete?	Eligibility determination		Initial	Date	
[PFSA Name]	[Yes or No]	[Eligible or Ineligible]				
[PFSA Name]	[Yes or No]	[Eligible or Ineligible]				

1.1.1 Decision Point—Service Area Information Sufficiently Complete?

If the review packet associated with the PFSA under review is incomplete or missing service area information needed to conduct the SAV, the SAV Coordinator with the support of the SAV Review Lead proceeds to step 1.1.2. If the service area information is sufficiently “complete” and contains the minimum required information, data, and documentation to execute the SAV, the SAV Coordinator proceeds to step 1.1.2.1.3.

1.1.2 Obtain Missing Service Area Information From Case Manager

If the SAV Coordinator determines there are missing items needed for SAV execution, the SAV Coordinator prepares the *Notification of Incompleteness* and promptly routes the notice to the Application Case Manager and the ReConnect Program Manager. The notification must contain an itemized list of missing service area materials, information, and data. The SAV Coordinator includes any additional materials, information, and data obtained as a result of the completeness check as supplemental attachments to the *SAV Findings and Determination Report* and ensures the materials are archived in the application-specific folder on SharePoint. In the event that the Application Case Manager does not have additional materials to provide, then the SAV Review packet is incomplete and the ReConnect Program is notified.

1.1.3 Identify PFSA Region

After the completeness check has been processed, the SAV Coordinator determines the region in which the PFSAs for a given application is located. To improve efficiency and reduce review time, the country has been stratified into three distinct regions that are within reasonable travel time of the regional home offices. **Table 6** provides an itemized list of U.S. states and territories that constitute each region.

Table 6: Regional Stratification of U.S. States

West	Central	East
Alaska	Arkansas	Alabama
Arizona	Colorado	Connecticut
California	Illinois	Delaware
Hawaii	Iowa	Florida
Idaho	Kansas	Georgia
Nevada	Louisiana	Indiana

West	Central	East
Oregon	Minnesota	Kentucky
Utah	Mississippi	Maine
Washington	Missouri	Maryland
American Samoa*	Montana	Massachusetts
Guam*	Nebraska	Michigan
Northern Mariana Islands*	New Mexico	New Hampshire
	North Dakota	New Jersey
	Oklahoma	New York
	South Dakota	North Carolina
	Texas	Ohio
	Wisconsin	Pennsylvania
	Wyoming	Rhode Island
		South Carolina
		Tennessee
		Vermont
		Virginia
		West Virginia
		Puerto Rico*
		U.S. Virgin Islands*

*U.S. territories will only receive a SAV after a complete review of the application.

1.2 Analyze PFSAs for Priority Ranking

Once the application region has been identified, the SAV Review Lead, SAV Coordinator, Desktop Advisor, Regional Lead, and Broadband SME analyze the cohort of applications and underlying PFSAs to determine a proposed priority ranking for a *SAV Execution Order*. Collectively, the SAV Leadership Team considers the total number of square miles, population density, score number of PFSAs and relative proximity to one another to determine an ordering in which PFSAs are validated.

As 100% loan applications are submitted and reviewed on a rolling, first-come, first-serve basis, the analysis excludes 100% loan applications from the ranking. Upon receipt of 100% loan applications, the SAV Review Lead proposes a start and end date to conduct the SAV for the loan application around the time when other SAVs are conducted in nearby areas.

1.3 Propose Application and SAV Execution Order

Once the SAV Leadership Team has prepared the *SAV Execution Order*, the SAV Review Lead routes the proposal to USDA for concurrence reviews. The SAV Review Lead may set up meetings with USDA stakeholders to explain assumptions underlying the proposal and address any questions. A proposed *SAV Execution Order* includes the items provided in **Table 7**.

Table 7: Proposed SAV Execution Order Package

Proposal Item	Required?	Description
Proposed SAV Execution Order	Yes	Based on an analysis performed by the SAV Review Team, PFSAs are listed in order of priority and batched into groups.

Proposal Item	Required?	Description
Proposed SAV Execution Timeline	Yes	A Gantt chart illustrating the proposed processing of applications given the proposed priority ranking. If service areas for multiple applications are addressed in a single visit, the timeline illustrates clusters of applications.
Key Considerations and Assumptions	Yes	The SAV Review Team includes any and all assumptions used to support the proposal.

1.3.1 Decision Point—Concur on SAV Execution Order?

Upon receipt of the proposed *SAV Execution Order*, USDA reviews the proposal and provides concurrence. If the USDA objects to the proposal, the SAV Review Team, led by the SAV Review Lead, adjusts the proposal accordingly until concurrence is achieved by proceeding back to step 1.2. Once concurrence is achieved, the SAV Coordinator archives the final *SAV Execution Order* as described under step 1.4.

1.4 Archive Final SAV Execution Order and Update SAV Checklist

Once concurrence from USDA is obtained, the SAV Coordinator archives the final *SAV Execution Order* in the SAV Document Library on SharePoint and updates the *SAV Checklist*.

1.5 Send Notifications of Assignments to Regional Leads and Desktop Research Team

Upon receipt of concurrence from the USDA, the SAV Coordinator prepares the *Notification of Assignment for the [Identified] Regional Team* and the *Notification of Assignment for Desktop Research Team*. The notifications are prepared in email format and routed to the appropriate Teams stating which applications and underlying PFSA they are responsible for validating. Furthermore, these notifications include the estimated completion dates for each SAV. The notifications of assignments should be prepared and delivered upon receipt of concurrence from USDA on the final *SAV Execution Order*. The information, items and data provided in **Table 8** are included in the notification message. Additionally, all official communications, including emails, are archived in the SAV Document Library for audit purposes.

Table 8: Notification of Assignments Package

Notification Materials	Required?	Description
A PDF of the application associated with the PFSA assigned for review	Yes	The application PDF provided by the case manager, available in the SAV Review queue.
Application number	Yes	The ReConnect application number.
Common name of the applicant	Yes	The common name of the applicant as provided in the application.
PFSA location details	Yes	PFSA location details include the following at a minimum: <ul style="list-style-type: none"> • State • Number of households • Population center

Notification Materials	Required?	Description
		<ul style="list-style-type: none"> Counties (as available) Zip codes (as available) Geographic coordinates (as available)
SAV Checklist	Yes	A checklist of all required service area information and supporting documentation needed for SAV execution.
Additional materials acquired during the completeness check	As Available	All additional information, materials, and data acquired from the Case Manager as a result of the completeness check.
PNR Status	Yes	An indication of the status and availability of a PNR submitted in response to the PNF for the PFSA under review. If a PNR has been submitted, all PNR materials are included as attachments in the notification delivery.
Desktop and Field Research start and end dates	Yes	The start and end dates for which the Desktop and Field Research is to be completed as provided by the SAV Review Lead in SharePoint.
Regional Team Contact Information	Yes	Email addresses and mobile phone numbers for the Field Research staff operating in the appropriate region.
SAV Document Library File Path	Yes	The location of the SAV Document Library on SharePoint.

1.6 Log Assignment

Upon receipt of the *Notification of Assignment for the Regional Team*, the Regional Lead logs the *Notification of Assignment* in the SAV Document Library.

1.6.1 Decision Point—Does the Volume of Applications Warrant Changes in Current Staffing Levels?

Based on the number of applications received for a given funding category, the Regional Team determines whether current staffing levels are sufficient to conduct all SAVs in the timeline established by USDA. If additional resources are needed, the SAV Review Lead and Regional Team proceed to step **1.6.2**. If additional resources are not needed to execute the SAVs, the SAV Review Lead and Regional Team proceed to step **1.7**.

1.6.2 Allocate Additional Resources & Schedule Training Sessions

If the need for additional resources is required to successfully complete all SAVs, the SAV Review Lead and Regional Team procure additional resources and schedule training. Additional resources meet the qualifications approved by USDA and complete the training before deployment.

1.7 Update Status Tracker

After the SAV assignments have been routed to the Regional Leads, and the need for additional Field Research staff has been determined, the SAV Coordinator updates the SAV Status Tracker

for each application, documenting the anticipated start and end dates of Desktop and Field Research.

2.0 SAV Logistics Planning

Field Research scheduling procedures are designed to increase efficiency and enable the Regional Teams to sync with the Desktop Research staff and SAV Coordinator as the Field Research staff prepare to enter the field. Scheduling Field Research activities must be preceded by successful completion of the Execution Planning procedure described in section 1.0, but the scheduling of these activities can be executed concurrently with the Desktop Research procedure described in section 3.0. In order to streamline and expedite reviews, the SAV Coordinator, SAV Review Lead, and applicable Regional Team adhere to the procedure below which is designed to ensure efficiency in the execution of the SAVs and compliance with federal travel regulations. The procedure kicks off with approval from USDA on the *SAV Execution Order* and culminates with a suggested travel itinerary and cost estimate.

2.1 Receive and Review SAV Execution Order

Once concurrence on the *SAV Execution Order* has been obtained from the USDA, the SAV Review Lead routes the order to the SAV Coordinator. The SAV Coordinator acknowledges receipt, indicating the request from the SAV Review Lead is in process.

In order to assist the Field Research staff with their reviews, the SAV Coordinator reviews the *SAV Execution Order* to determine the most cost/time efficient routes for conducting validations in the PFSAs. Equipped with the *SAV Execution Order*, the SAV Coordinator considers the locations of specific areas within PFSAs, their relative distance to one another, and the estimated travel time from one PFSA to another in the approved priority order. This analysis serves as a critical input to developing the draft travel itinerary and cost estimate as described under step 2.3. The SAV Coordinator may solicit the Desktop Research Team and Regional Team Lead in this review of PFSAs.

2.2 Identify Travel Logistics

Upon review of the *SAV Execution Order* and the locations of areas within a PFSA within an application, the SAV Coordinator determines if it is faster to drive or fly from one PFSA to the next. For Field Research activities that require air travel within a given market, the SAV Coordinator identifies regional and/or national airports within close proximity to PFSAs to be reviewed. Given the priority ranking and sequencing of application processing, the SAV Coordinator suggests preferred airports and locations of lodging.

2.3 Prepare Draft Travel Itinerary and Cost Estimate

After the *SAV Execution Order* has been determined and whether there is a need to fly to particular locations during a deployment, the SAV Coordinator prepares the draft travel itinerary and cost estimate for the Regional Team's Field Research activities. This itinerary includes the airport the Regional Team must fly in and out of, location for potential lodging facilities, and the applicable U.S General Services Administration (GSA) per diem rates. Once this is prepared, the SAV Coordinator ensures all pre-travel authorizations are completed prior to step 2.4.

Table 9: Draft Travel Itinerary Items

Itinerary Items	Required?	Description
Sequential ordering of airports and travel dates thereto	Yes	Based on the <i>SAV Execution Order</i> approved by USDA, the SAV Coordinator prepares a list of locations, highlighting key considerations, airports, and dates in sequential order.
Location of lodging facilities	Yes	For each trip, the SAV Coordinator identifies general locations of lodging facilities in which Field Researchers can obtain overnight accommodations.
Per Diem Rates	Yes	Based on the GSA tax jurisdictions identified by the SAV Coordinator, the appropriate rates are added to the draft itinerary for the Regional Team's awareness.

2.4 Route Draft Itinerary to Regional Team for Booking

Upon approval from the D.C. office, the SAV Coordinator routes the draft itinerary to the assigned Regional Team for booking. **Table 9** above provides the materials to be shared with the Regional Team.

2.5 Book Travel

Upon receipt of the draft itinerary from the SAV Coordinator, the Regional Team books their travel arrangements. Travel arrangements are booked at the lowest available rate at the time of booking, unless the lowest available fares and rates do not allow the Regional Team to meet the mission objectives and timelines. In order to give assurance of lowest available rates on flights and car rentals, the individual booking travel provides documentation. If a flight not at lowest cost is being considered, the Regional Team must return to the SAV Coordinator for approval. Additional justification is provided for why the higher cost is appropriate to meet the mission objectives and timelines.

2.6 Route Booked Travel Itinerary to SAV Coordinator

Once the Regional Team has received confirmation of their travel bookings, they route the final itinerary to the SAV Coordinator.

2.7 Archive Final Itinerary, Update SAV Checklist and Notify SAV Review Lead

The SAV Coordinator promptly archives the final, booked itinerary obtained from the Regional Team, and provides written notification via email to the SAV Review Lead, indicating that travel arrangements have been confirmed. The SAV Coordinator also updates the *SAV Checklist* indicating step 2.0 is complete. **Table 10** contains the materials and information to be included in the Final Itinerary package.

Table 10: Final Itinerary

Itinerary Items	Required?	Description
Final itinerary	Yes	Based on the <i>SAV Execution Order</i> approved by USDA, the SAV Coordinator prepares a list of locations, highlighting key considerations, airports, lodging facilities, and dates in sequential order.
Applications to be reviewed during the trip	Yes	If all PFSA's for a given application are validated during this trip, the SAV Coordinator provides that information. PFSA's may be

Itinerary Items	Required?	Description
		completed in various trips depending on the geographic locations and the number of PFSA's.

3.0 Desktop Research

Desktop Research activities serve as a core SAV exercise. The objective of Desktop Research is to assess the eligibility of PFSAs via the claims made on the application as well as online research in order to isolate key data points and information. The outputs of this procedure are considered by the Field Research Team as they perform the procedure described under section 4.0, Field Research. This procedure begins with the creation of application directories on SharePoint and culminates with the production of the *Desktop Research Report*.

Desktop Research Procedure

3.1 Initiate Desktop Research and Conduct Data Collection

Once the SAV Document Library for the application is added to SharePoint, the Desktop Researchers assigned to the review begin Desktop Research activities. Using the information provided in the application materials and *Notification of Assignment for Desktop Research Team*, the Desktop Research Team starts populating the *SAV Execution Tool*. The data provided is pulled into the draft *Desktop Research Report*, prepared during procedure 5.0, Prepare SAV Findings and Determination Report.

The Desktop Researcher(s) assigned to the application work collaboratively to locate and record the Desktop Research findings. If multiple Desktop Researchers are assigned to an application, Desktop Researchers upload the *SAV Execution Tool* to SharePoint as a way to hand off the tool to one another. If Desktop Research takes multiple days, the SAV Execution Tool the Desktop Researcher uploads the *SAV Execution Tool* to SharePoint at the end of each day. If the Desktop Research Team believes the findings suggest a service area is ineligible based on the data found through Desktop Research, they are to alert the SAV Review Lead, who coordinates with USDA and the application review team.

Table 11 lists the summary of Desktop Research findings for an application, produced in the Desktop Research *SAV Execution Tool*.

Table 11: Desktop Research Data Fields

Field	Observation Description
SAV Review Lead	[Last Name, First Name, (Credential)]
Desktop Researcher	[Last Name, First Name, (Credential)]
Desktop Researcher	[Last Name, First Name, (Credential)]
Application Name (Number)	[As provided on the Application]
Common Name of the Borrower	[As provided on the Application]
State(s)	[As provided on the Application]
Funding Category	[As provided on the Application]
Total Number of PFSAs	[As provided on the Application]

Field	Observation Description
Proposed Geographic Footprint	[Total Square Miles]
Preliminary Eligibility Determination	["Eligible" or "Ineligible"]
Desktop Research Summary of Findings	[Free form text response justifying eligibility finding]

Desktop Research activities include four main components: review PNR submissions, identify contact information for local stakeholders, research publicly available speed test data, and identify competitor service providers.

3.1.1 Decision Point—Was a PNR Submitted for any PFSA's?

If a PNR was submitted, the Desktop Research Team proceeds to step **3.1.2**. If no PNR was submitted, the Desktop Research Team proceeds to step **3.1.3**.

3.1.2 Execute PNR Evaluation Procedure for the PFSA

Upon receipt of the PNR for a given application, the Desktop Research Team validates the claims provided by the PNR respondent. To complete this step, the Desktop Research Team:

1. Contacts the respondent: The Desktop Research Team may make up to three attempts to get in contact with the respondent. During this step, the Desktop Research Team confirms the information provided in the PNR with a representative of the respondent service provider and collects any missing information from blank fields on the PNR. The Desktop Research Team records any claims that contradict information provided in the PNR and inquires as to why these claims should be considered over the original claims provided in the PNR. If the call is with another representative other than the point of contact (POC) listed on the PNR, the Desktop Research Team verifies the contradictions with the designated POC. Once the contact is complete, the Desktop Research Team archives materials and data collected during the call in the SAV Execution Tool and SAV Document Library. Desktop Researchers confirm the following during PNR review:
 - a. Respondent (service provider)
 - b. Upload and download speeds (Mbps)
 - c. Service offerings and types
 - d. Number and location of residential customers (households) claimed to have sufficient access to broadband within the PFSA
 - e. Subscriber count
 - f. Square miles
2. Collects contact information for Field Researchers to schedule and conduct field interviews with representatives of the respondents.
3. Cross-references the claims against publicly available speed test data as described under step **3.1.4**.

3.1.3 Prepare Local Stakeholder List

During this step, the Desktop Research Team researches local institutions, locations of key network facilities and infrastructure, the physical addresses of the non-applicant service providers located in a given PFSA, and other locations that may be visited during Field Research.

Once the PFSA location details have been identified, the Desktop Research Team reviews the application materials to identify PFSA stakeholders. PFSA stakeholders may include technicians from service providers, operating in the PFSA or in areas that are located in close proximity to the PFSA boundaries, local government or municipality officials operating in the PFSA, and other service providers operating in close proximity to the PFSA identified through Desktop Research. State Broadband Coordinators or other representatives from the Governor's office are local stakeholders that must be identified and contacted to inform them of Field Research activities that will take place.

Generally, the people identified during this step serve as resources that can corroborate or opine on the access to service and claims made in the application regarding speed and coverage in the PFSA. The Desktop Research Team is responsible for finalizing the list of contact information which is included in the draft *Desktop Research Report*. Addresses of local stakeholders may also be helpful while conducting research on publicly available speed test data.

3.1.4 Research Publicly Available Speed Test Data

Table 12 summarizes the data observations captured when the Desktop Research staff review third party publicly available speed test data for a particular PFSA for a given application.

Table 12: Speed Test Data Provider Fields

Form	Information Collected
3rd Party Speed Test Data Observations	
M-Lab	<ul style="list-style-type: none"> • PFSA Observed • Search Location Details • Service Provider Name • Download Speed (last 3 months) • Upload Speed (last 3 months) • URL • Notes • Finding

Form	Information Collected
USAC	<ul style="list-style-type: none"> • PFSA Observed • Search Location Details • Service Provider Name • Download Speed • Upload Speed • Longitude • Latitude • URL • Notes • Finding
BroadbandNow.com	<ul style="list-style-type: none"> • PFSA Observed • Zip Code Search • Service Provider Name • Download Speed (Past month) • URL • Notes • Finding
FCC Form 477	<ul style="list-style-type: none"> • PFSA Observed • Search Location Details • Service Provider Name • Download Speed (Most recent) • Upload Speed (Most recent) • URL • Notes • Finding
I3 Connectivity Explorer	<ul style="list-style-type: none"> • PFSA Observed • County Searched • Download Speed • Upload Speed • % of Blocks without providers at 10/1 or faster • % of Blocks with at least one provider at 10/1 or faster • URL • Notes • Finding

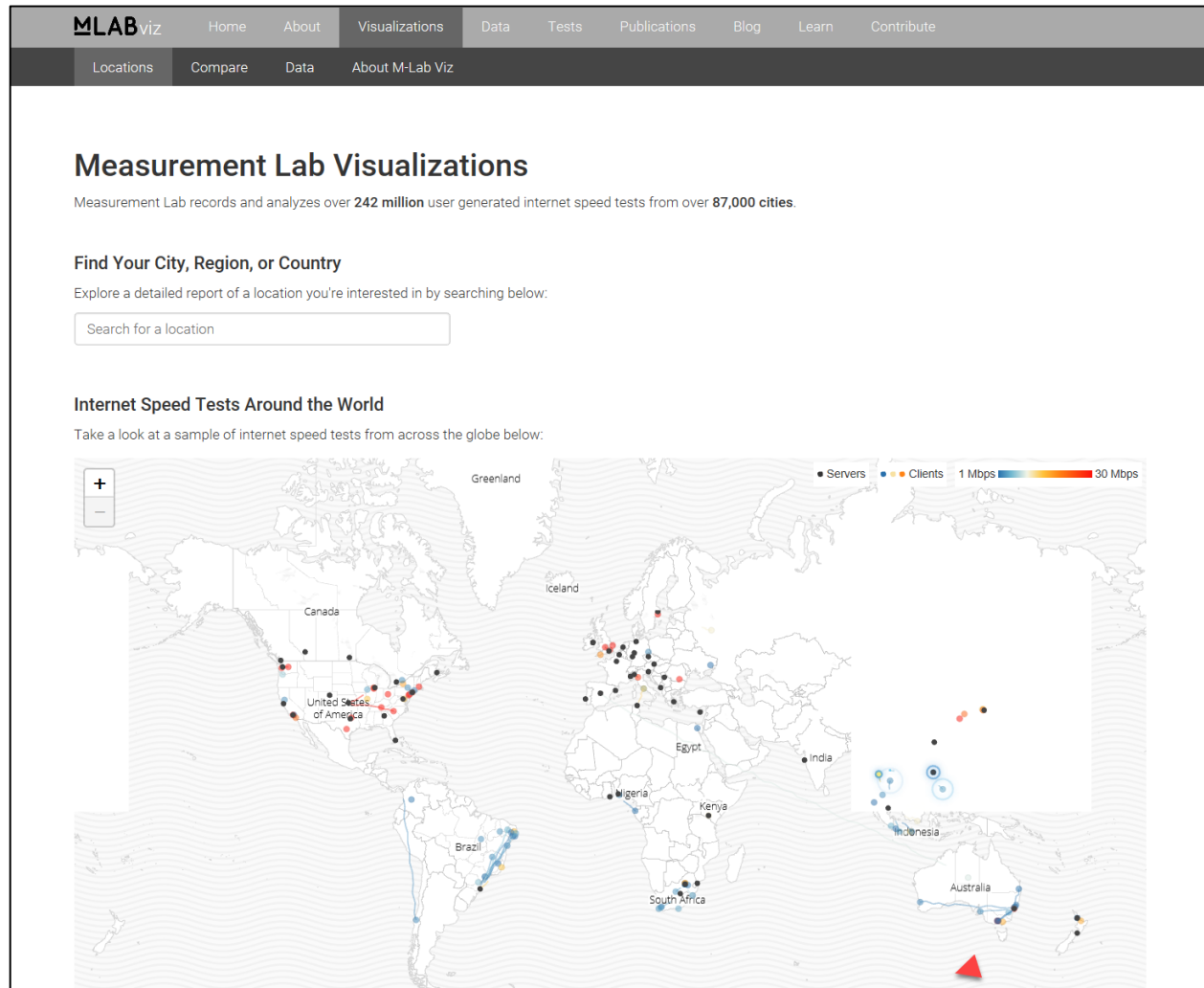
Desktop Research staff are to adhere to the following procedures when reviewing the publicly available broadband speed test data provider websites. All Desktop Research findings are recorded in the *SAV Execution Tool*.

1—M-Lab

1. Navigate to M-Lab via the hyperlink: <https://viz.measurementlab.net>
2. Once in the webpage, select Locations from the top menu. This page allows you to search by City, Region, or Country to obtain a detailed report of the selected location. Desktop Researcher selects an appropriate location within the PFSA, such as large population

centers, to conduct this search. Parameters for selection include population centers, towns, zip codes, etc. Desktop Researchers may select multiple locations to search if the size or irregularity of PFSA shape dictates the need for multiple search areas.

Figure 2: M-Lab Locations Sub-Page Illustration



- Speed time can be calculated by the hour and reviewed from as far back as a year. The Desktop Research Team should evaluate speeds during peak times, between 5pm and 11pm local time. The metrics can also be compared in intervals and can include different client service providers. **Figure 3** through **Figure 5** illustrate a case example walkthrough.

Figure 3: M-Lab Speed Observations

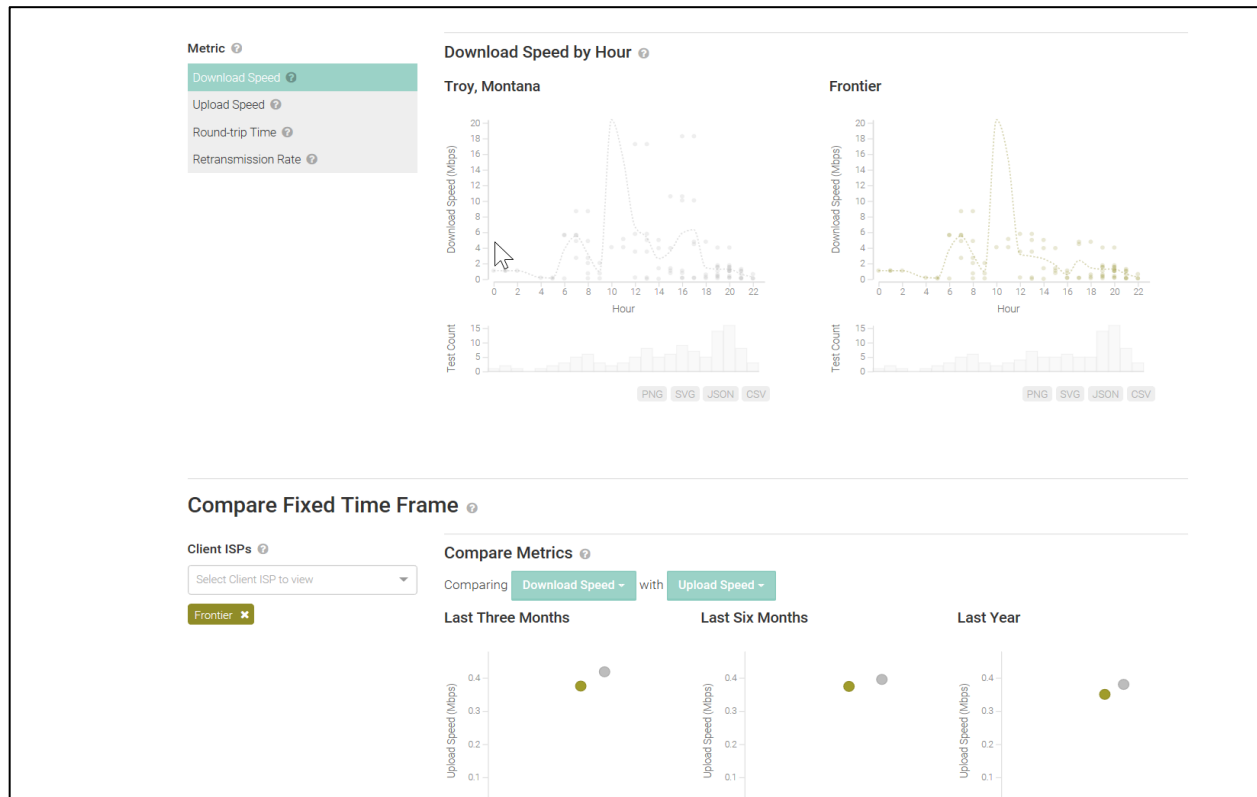
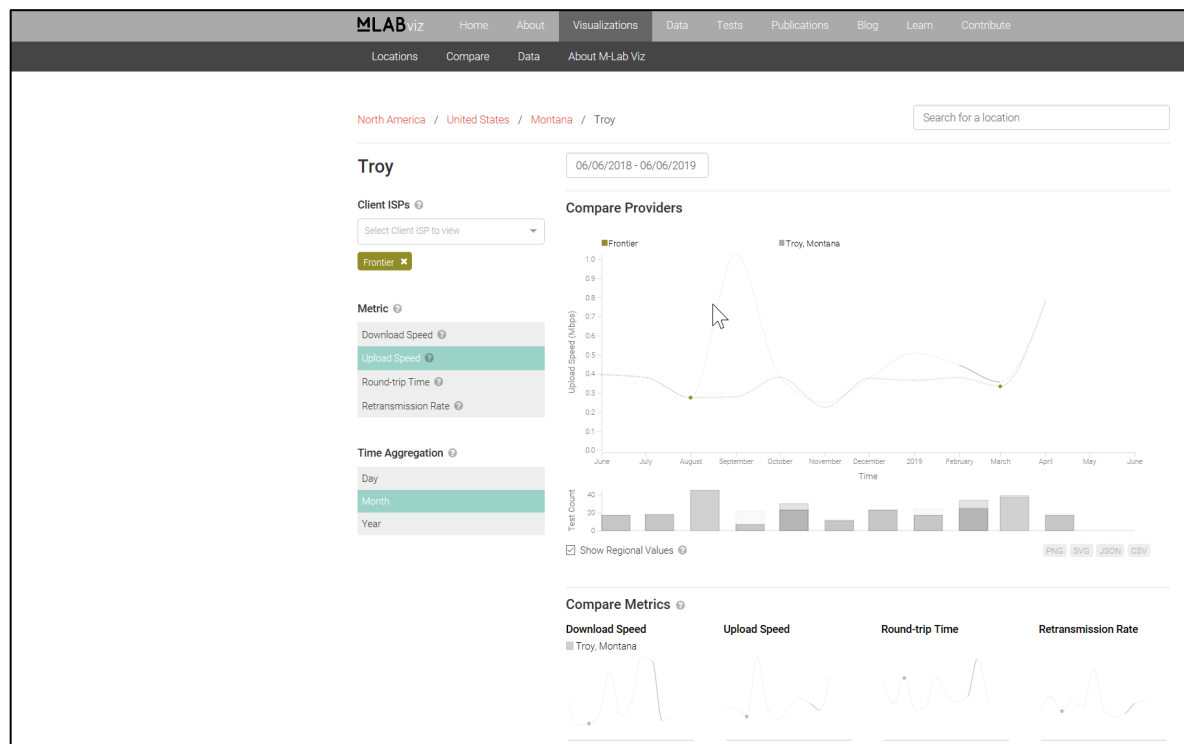


Figure 4: Additional M-Lab Speed Observations



- Once the location is designated, a detailed comparison summary is provided at the end of the report. This report contains tested download/upload speed averages over the course of a year as shown in **Figure 5**.

Figure 5: Historical Download and Upload Speeds

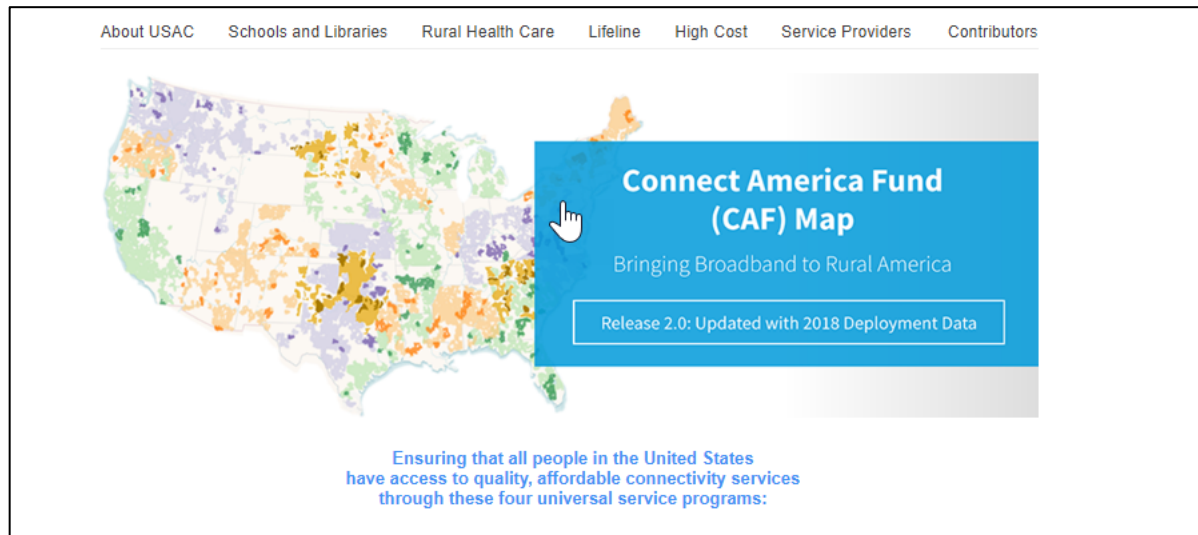
Summary Data													
Last Three Months													
Name	Tests	Download Speed (Mbps)					Upload Speed (Mbps)					Retransmit	RTT
		Median	Avg	SD	Min	Max	Median	Avg	SD	Min	Max	Avg	Avg
Frontier	81	1.4	3.0	4.7	0.0	36.7	0.4	0.7	1.6	0.0	8.5	3.1%	96.19ms
Troy, Montana	95	1.8	4.6	6.7	0.0	36.7	0.4	1.0	1.6	0.0	8.5	2.8%	92.92ms
Last Six Months													
Name	Tests	Download Speed (Mbps)					Upload Speed (Mbps)					Retransmit	RTT
		Median	Avg	SD	Min	Max	Median	Avg	SD	Min	Max	Avg	Avg
Frontier	141	1.6	3.3	4.7	0.0	36.7	0.4	0.6	1.2	0.0	8.5	3.2%	91.51ms
Troy, Montana	163	2.1	4.8	6.8	0.0	37.0	0.4	0.8	1.3	0.0	8.5	2.9%	84.36ms
Last Year													
Name	Tests	Download Speed (Mbps)					Upload Speed (Mbps)					Retransmit	RTT
		Median	Avg	SD	Min	Max	Median	Avg	SD	Min	Max	Avg	Avg
Frontier	257	1.6	3.4	4.6	0.0	36.7	0.3	0.5	0.9	0.0	8.5	3.1%	94.08ms
Troy, Montana	301	1.8	4.6	6.7	0.0	37.0	0.4	0.7	1.0	0.0	8.5	2.9%	79.08ms

- For each location observed on M-Lab, users enter the median observed upload and download speeds for the preceding 3 months for each service provider. The Desktop Research Team also documents the URL for the web pages observed in the SAV Execution Tool. In the event no service provider is listed, the Desktop Researcher enters “no provider” in the appropriate field in *SAV Execution Tool* and explain in the notes section.
- Desktop Researchers may reference *the SAV Execution Tool User Guide* for additional guidance on data entry.
- Take screen shots of the website and save the screenshots to the application folder of the SharePoint site.

2—USAC

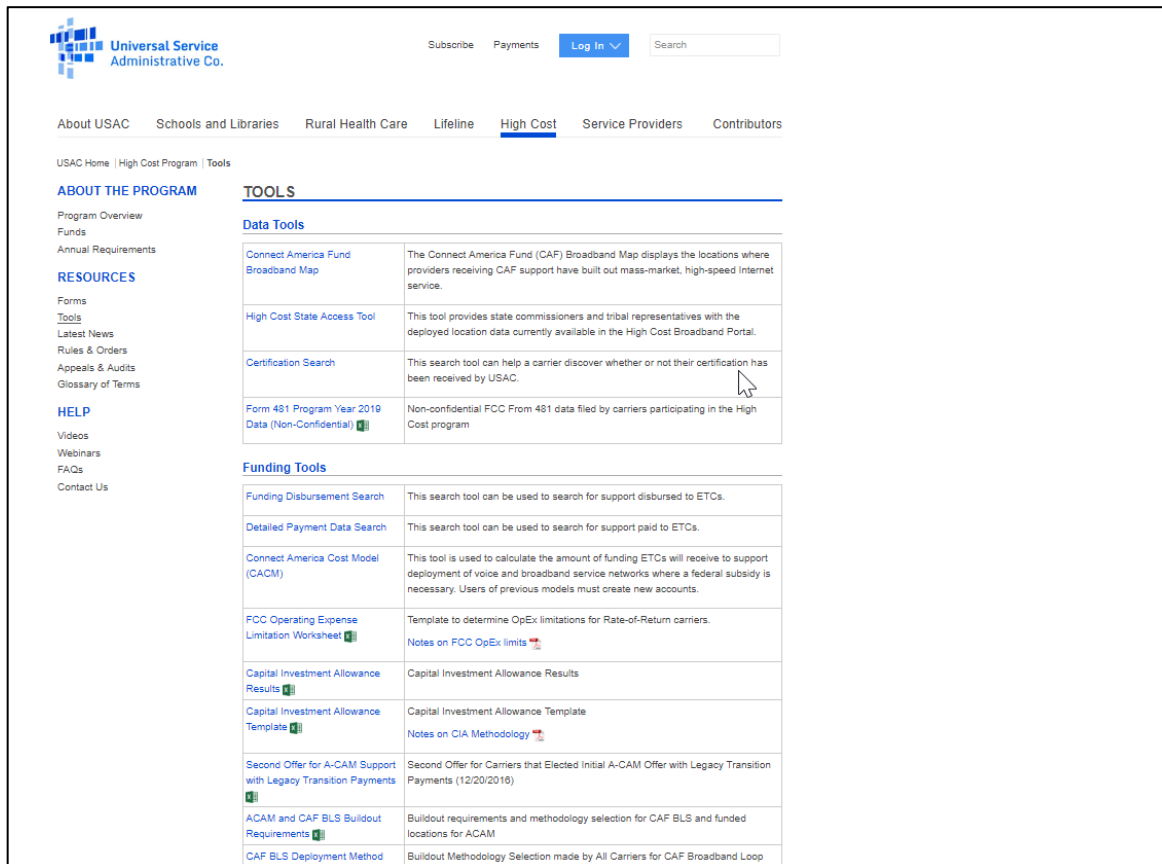
- Navigate to the USAC website <https://www.usac.org/>
- Click the “Connect America Fund (CAF) Map” link featured at the top of the webpage.
 - Navigate to the “High Cost” link at the top of the USAC home page as shown in **Figure 6**.

Figure 6: Accessing USAC Speed Test Data



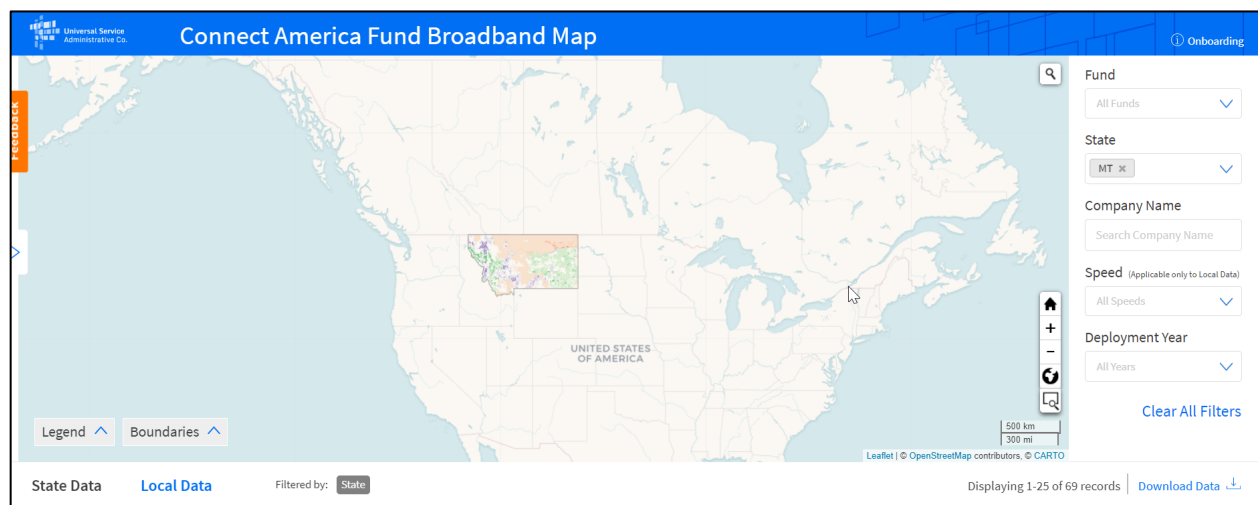
- b. Click the “Connect America Fund Broadband Map” link, under the Data Tools section. Once the map appears, search by state then zoom in further to find the PFSA to be observed.

Figure 7: The Connect America Fund Map



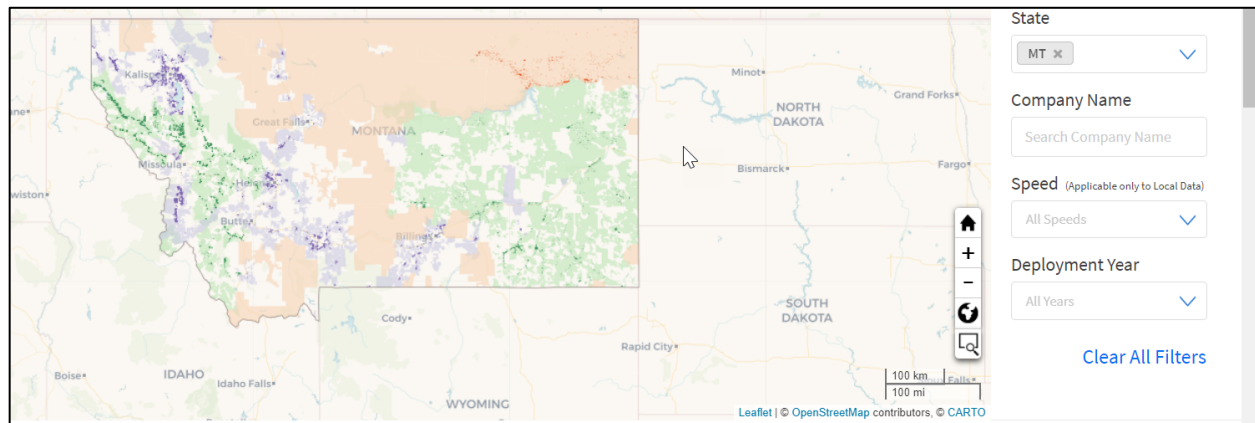
- c. Navigate to the State drop-down menu located on the right side of the page, click and select the appropriate state for location details: in this example, MT.

Figure 8: Filter by State



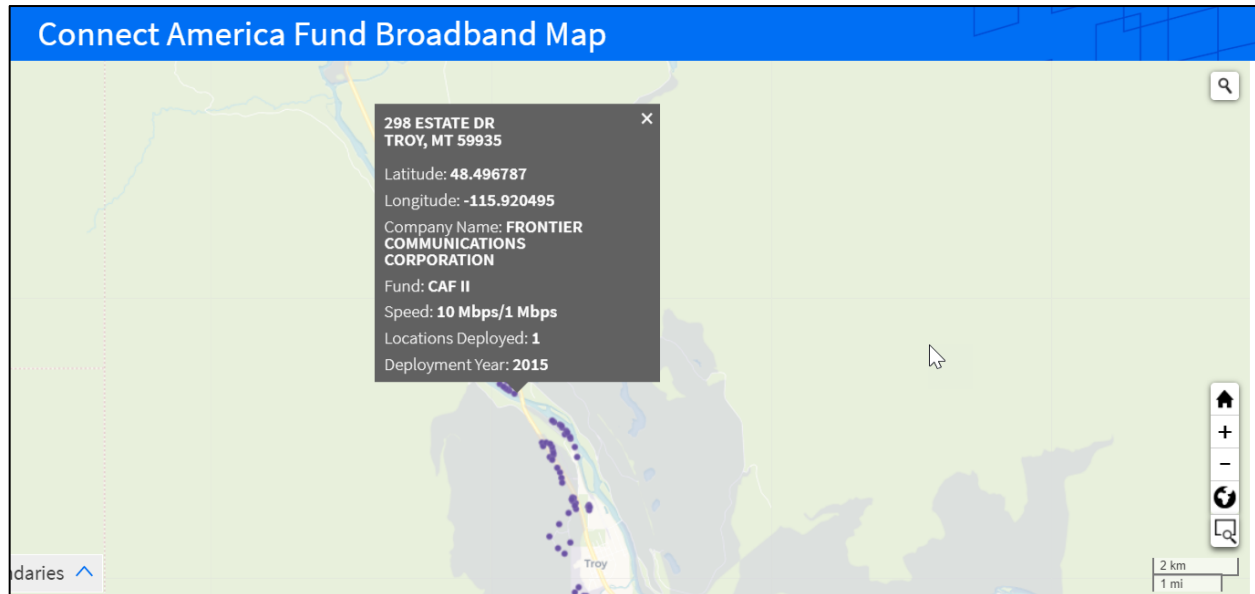
- d. Click on the desired region of the map in which the PFSA/county/zip code lies, then click the zoom “+” button on the map to zoom into the region.

Figure 9: Zoom into Desired Region



- e. Once zoomed in, click on any of the colored dots, representing “deployed locations,” in the PFSA/county/zip code to determine the download speeds.

Figure 10: Service Area Details



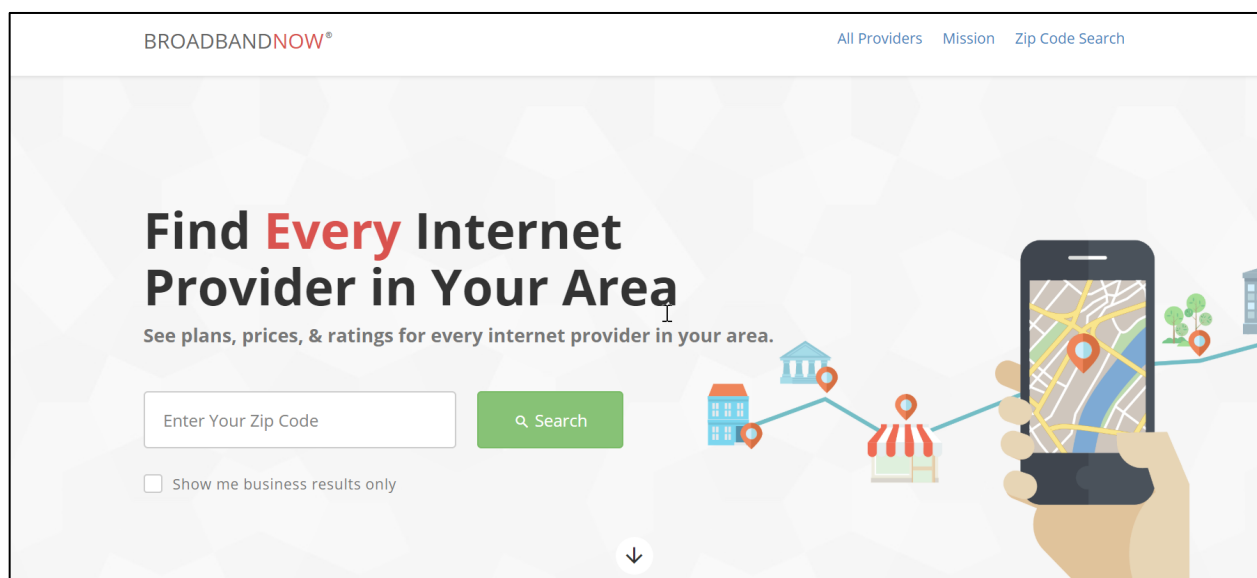
- f. Add the observed download and upload speeds to the fields in the SAV Execution Tool.
3. Desktop Researchers may reference *the SAV Execution Tool User Guide* for additional guidance on data entry.

4. Take a screen shot of the map on the website and save the screenshot to the application folder of the SharePoint site.

3—*BroadbandNow.com*

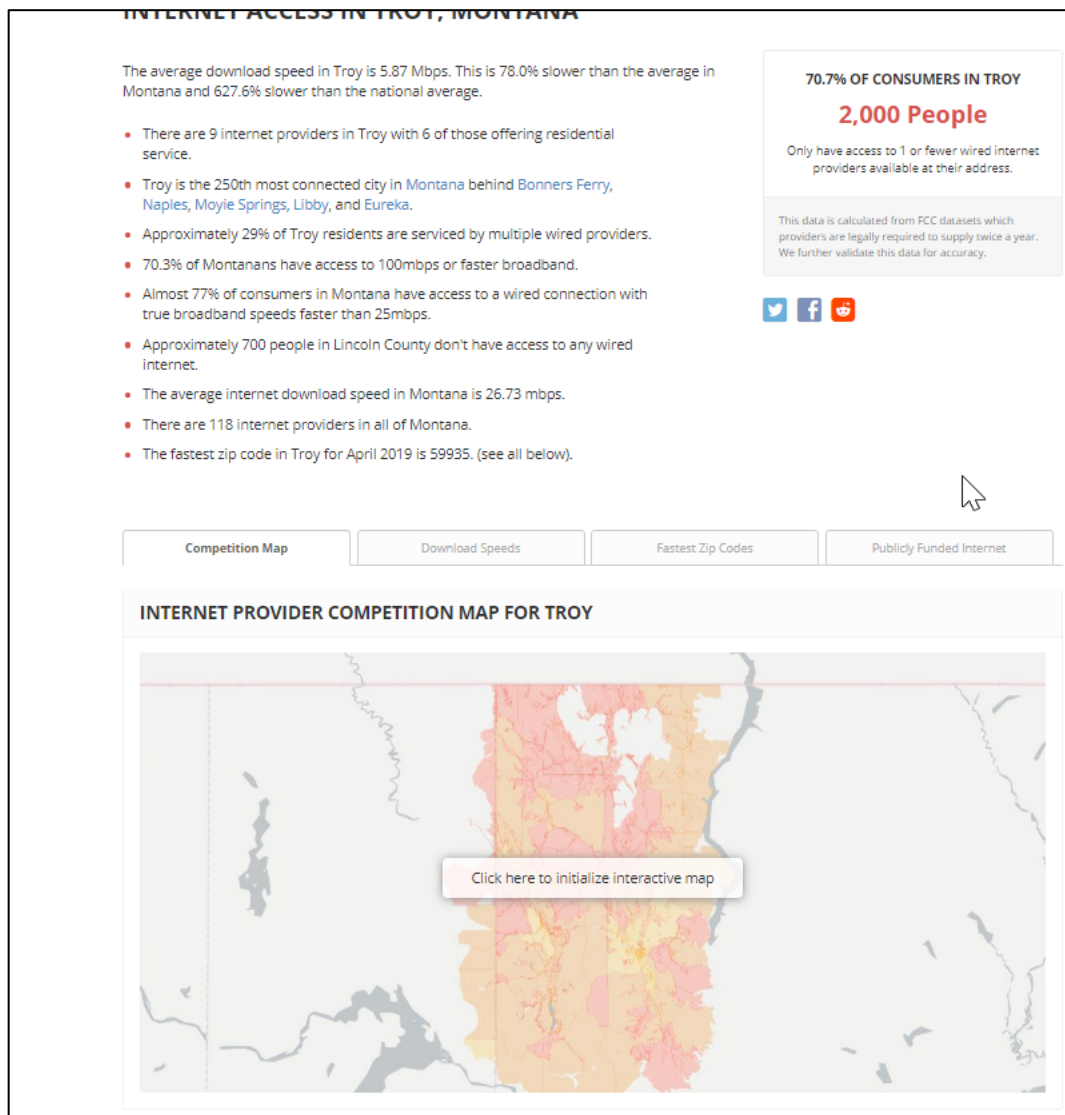
1. Navigate to <https://broadbandnow.com>
2. Input the zip code for the desired region in the zip code search field on the home page. In this example, add 59935 as the zip code for Troy, Montana.

Figure 11: Search by Zip Code



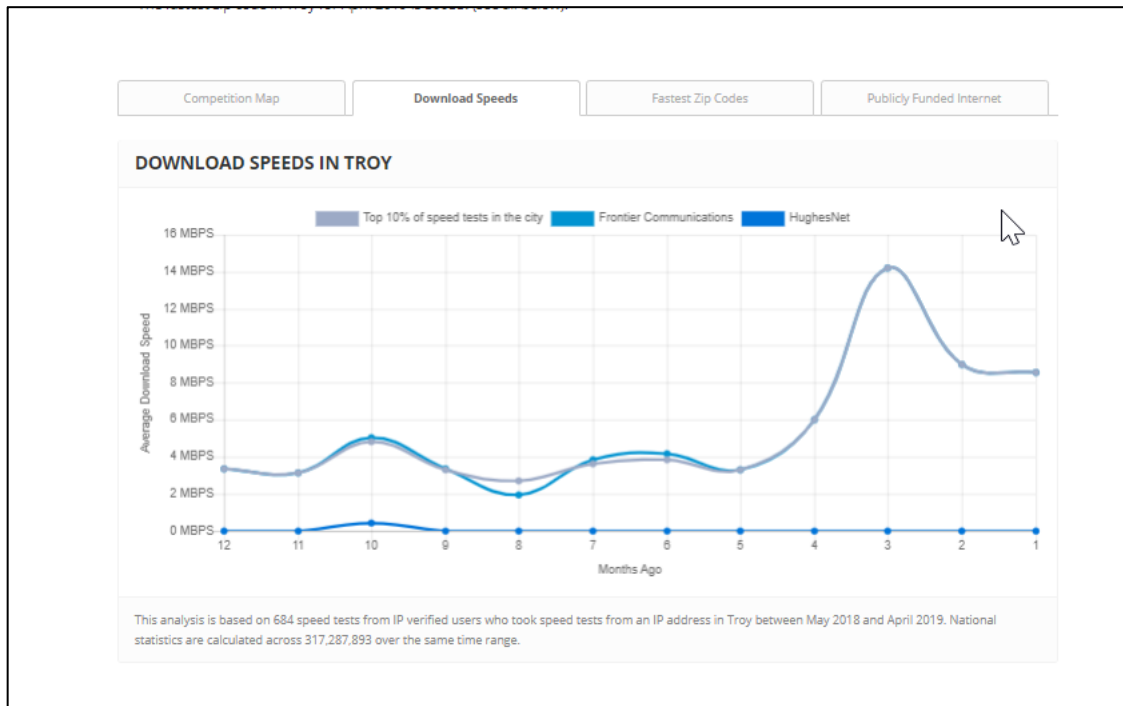
3. Scroll down to the bottom of the page to observe maps, internet speeds by internet service provider, and a summary of internet statistics for the region.
 - a. Click the “Download Speeds” tab located above the “Interactive Competition Map.”

Figure 12: Locate Download Speed Details



- Observe the graph and statistics. Record the most recent average download speed in the SAV Execution Tool.

Figure 13: Most Recent Download Speeds

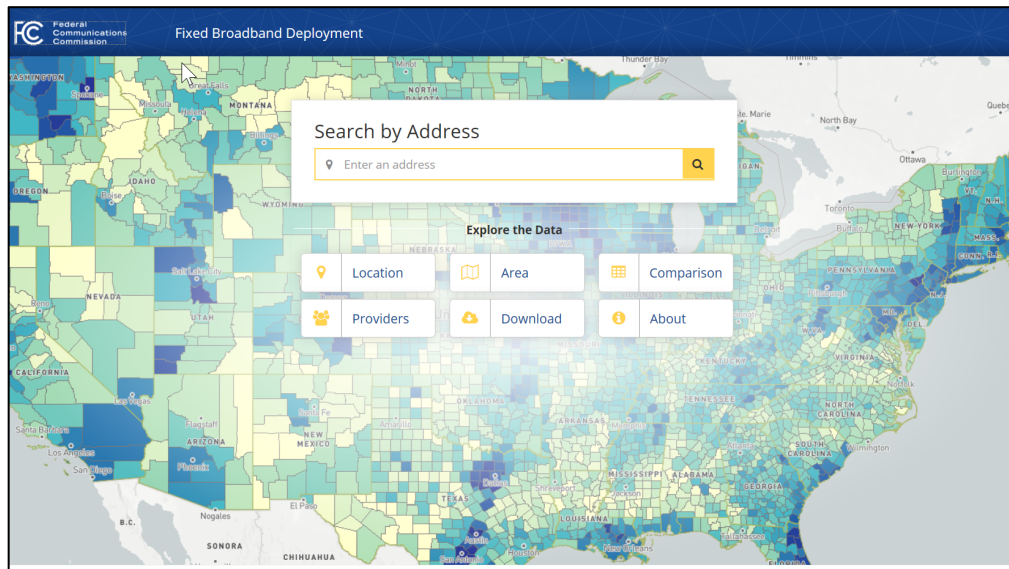


4. Document the service providers found on the website to identify contacts for Field Research activities.
5. Desktop Researchers may reference *the SAV Execution Tool User Guide* for additional guidance on data entry.
6. Take a screen shot of the results and charts, then save them in the application folder of the SharePoint site.

4—FCC Form 477

1. Navigate to the Federal Communications Commission (FCC.gov) website:
 - a. <https://broadbandmap.fcc.gov/#/>
 - b. *Note: Internet Explorer may work best for the necessary functionality*
2. Search for the PFSA location as shown in **Figure 14**.

Figure 14: Search by Address



- After the search is complete, the speeds are generated in the Location Summary tab shown in **Figure 15: Location Summary**. In this section, users can see additional information, including the broadband providers, Technology type, and comparison of their speeds. Users can also filter for download and upload speeds by selecting the gear icon shown below.

Figure 16: Filter by Speed

Application Settings

Data version

Dec. 2017 (latest)

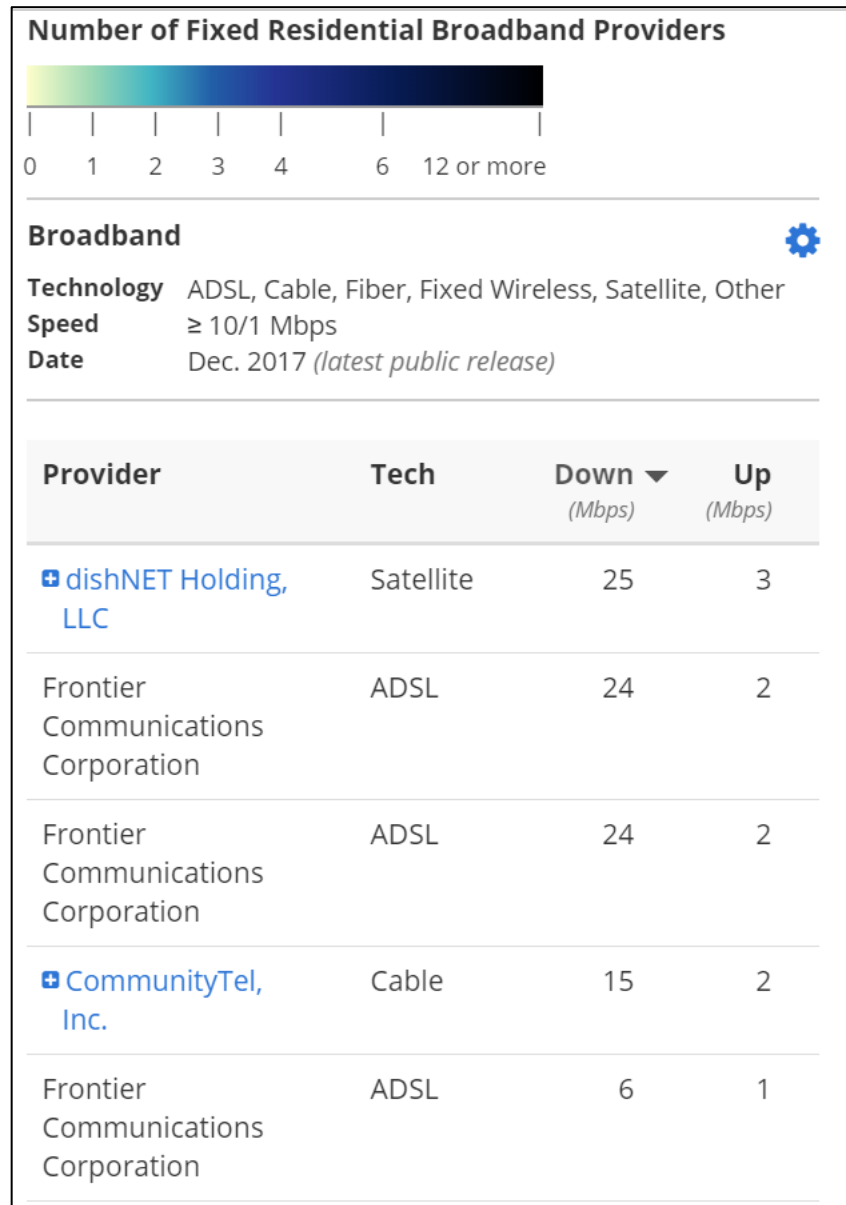
Broadband

Technologies	Speed (Mbps)
<input checked="" type="checkbox"/> ADSL	<input type="radio"/> ≥ 0.2/0.2
<input checked="" type="checkbox"/> Cable	<input type="radio"/> ≥ 4/1
<input checked="" type="checkbox"/> Fiber	<input checked="" type="radio"/> ≥ 10/1
<input checked="" type="checkbox"/> Fixed Wireless	<input type="radio"/> ≥ 25/3
<input type="checkbox"/> Satellite	<input type="radio"/> ≥ 100/10
<input checked="" type="checkbox"/> Other	<input type="radio"/> ≥ 250/25
	<input type="radio"/> ≥ 1000/100

Close

- Observe the download speed and upload speed in the “Download/Upload” fields as shown in **Figure 17** and record the findings by service provider in the appropriate user form in the *SAV Execution Tool*.

Figure 17: FCC Form 477 Service Provider Results



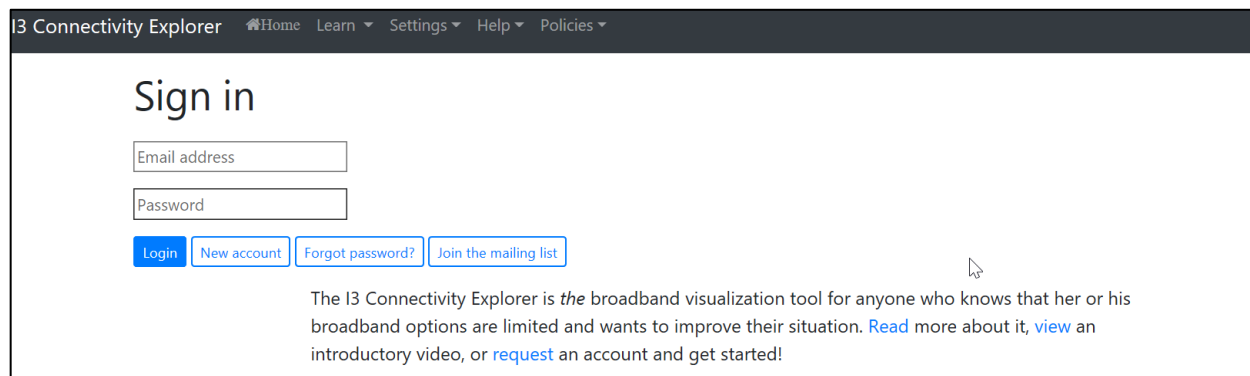
6. Desktop Researchers may reference *the SAV Execution Tool User Guide* for additional guidance on data entry.
7. Take screenshots of findings and save in the appropriate application folder on SharePoint.

5—i3 Connectivity Explorer

1. Creating your i3 Connectivity Explorer Account.

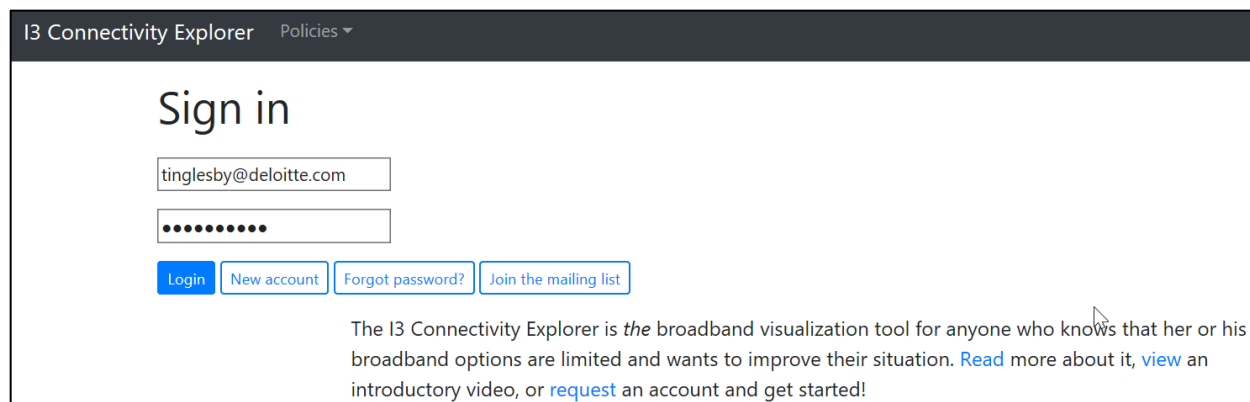
- a. Navigate to <https://i3cex.internet-is-infrastructure.org/sessions/new>
2. Create a new user account by clicking the “New account” button.

Figure 18: Create your i3 Connectivity Account



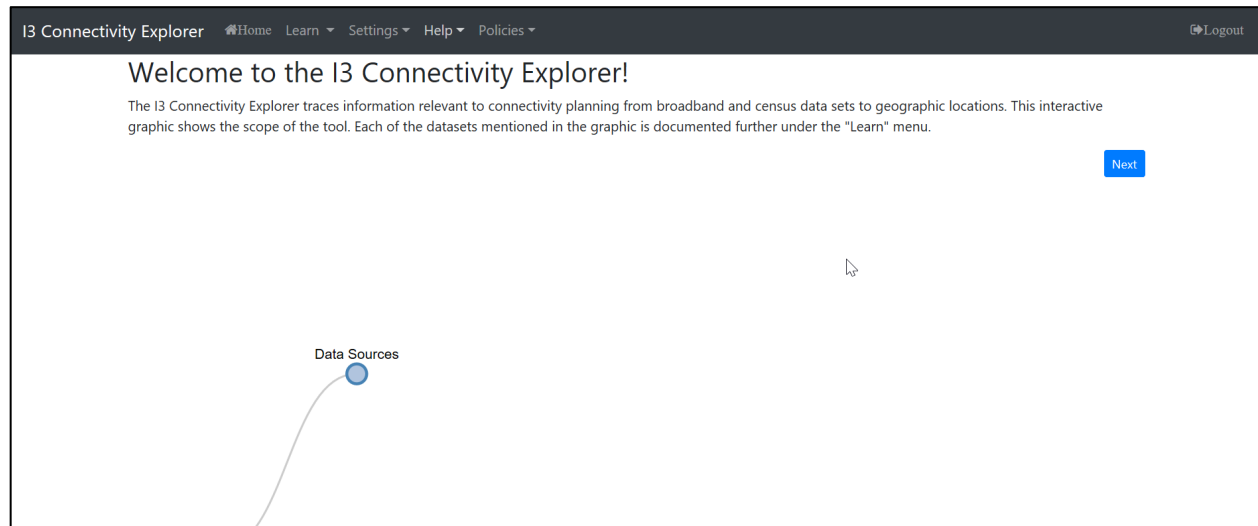
- a. Provide the appropriate information to create a new username.
- b. A confirmation is sent to the new user's email. Follow the instructions provided in the email to gain access to the new account.
- c. Enter username and password to log in and access the site.

Figure 19: i3 Login Prompt



3. Click the blue “Next” button located on the right side of the screen shown in **Figure 20**.

Figure 20: Navigating the Site



4. Provide a title and description of the notebook, preferably denotative of the location of the PFSA and associated application.

Figure 21: Create New Workbook

Create a New Notebook

Title

Troy, Montana

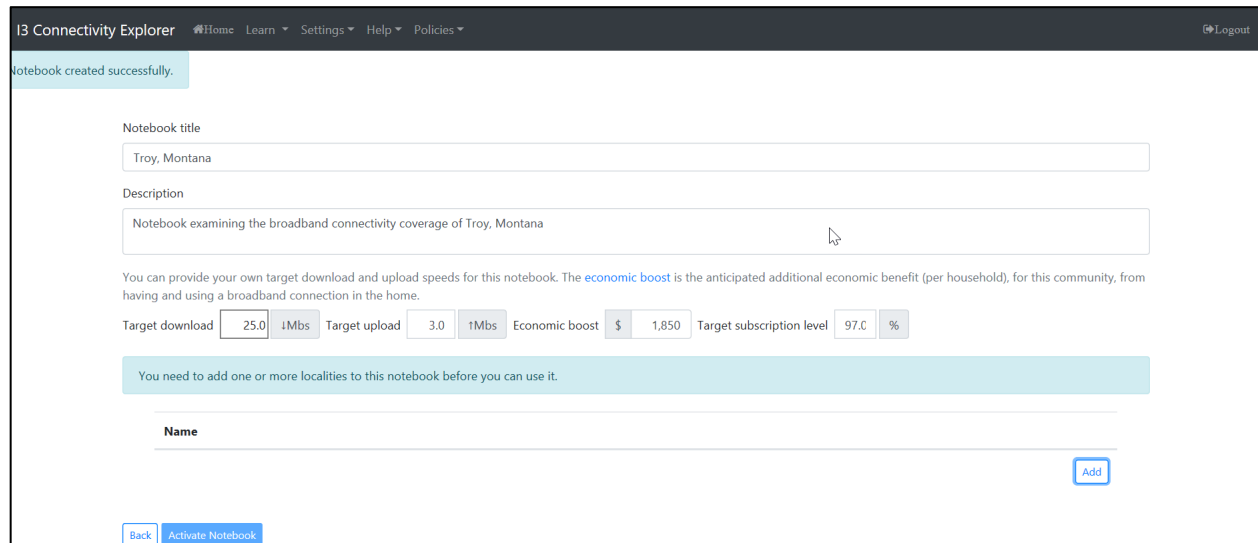
Description

Notebook examining the broadband connectivity coverage of Troy, Montana

Cancel Create

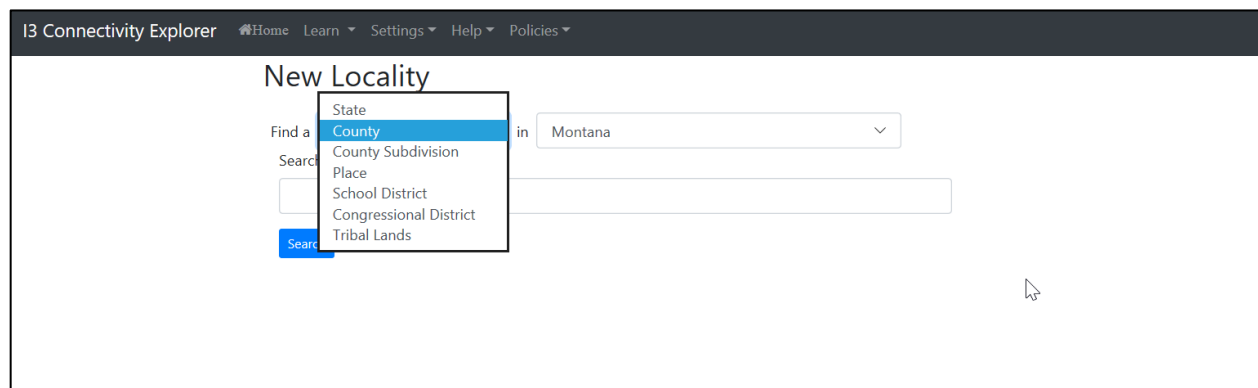
5. On the next page, click the “Add” button located on the bottom right-hand section of the screen to add the appropriate geographic locality.

Figure 22: Populate PFSA Details



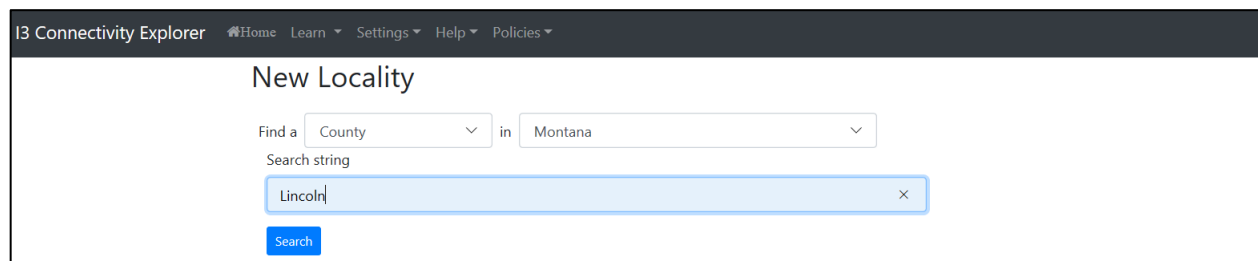
6. On the next page, click the two drop down menus to specify the appropriate state and type of locality.

Figure 23: Select Locality Type for Observation



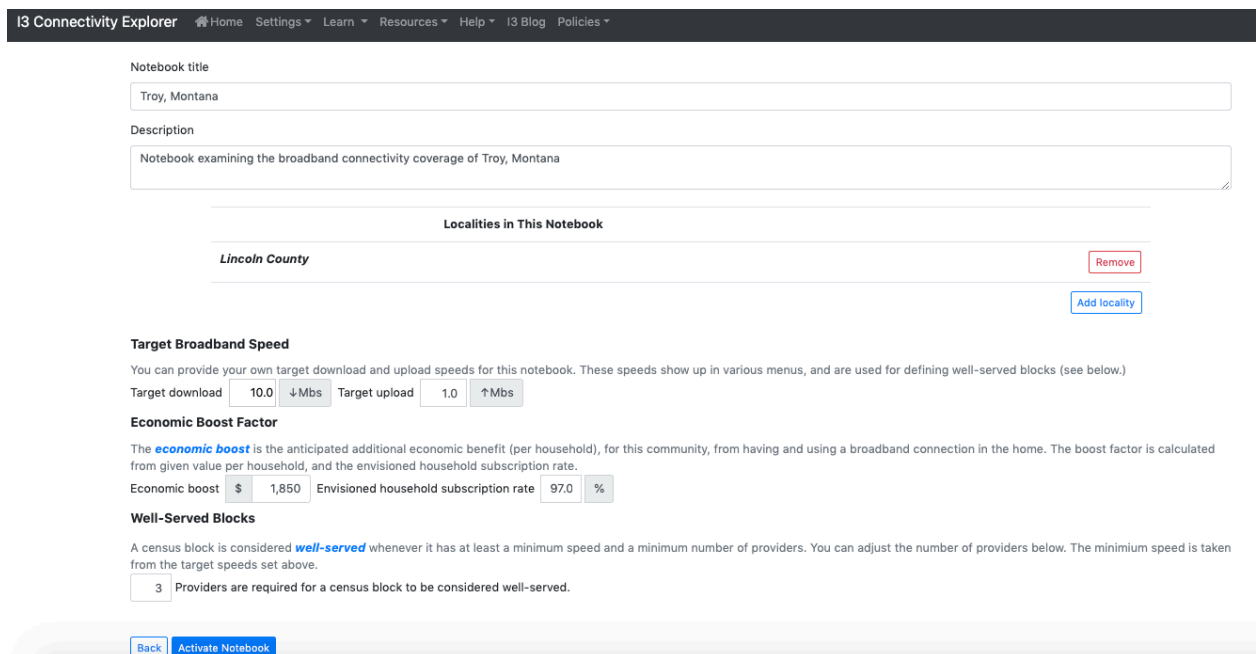
7. In the “Search string” box, above the blue “Search” button, provide information pertaining to the appropriate locality. In the present example, provide the county in which the PFSA is located (Lincoln County).
8. Once the Locality Type, State, and Search string have been specified, click the blue “Search” button below to search for the desired locality in that state: in this example, Montana.

Figure 24: Populate PFSA Details



- On the main Notebook page, a notebook of the selected state (e.g. Lincoln County, Montana) should have generated. Users can toggle between broadband speeds, to identify which areas of this region have a given connectivity range. Users may also examine other features such as “Economic Boost” and “Target Subscription” level, but for this exercise the key feature is Download and Upload speeds. Specify the Target download speed to be “10” Mbps and the Target upload speed to be “1” Mbps in the appropriate boxes, then click the blue “Activate Notebook” button to see the results.

Figure 25: Filter for Target Upload and Download Speeds



- The following map generated provides summary statistics on the region including Coverage Assessment denoted by the red arrow below.

Figure 26: i3 Connectivity Search Output

Troy, Montana

Montana

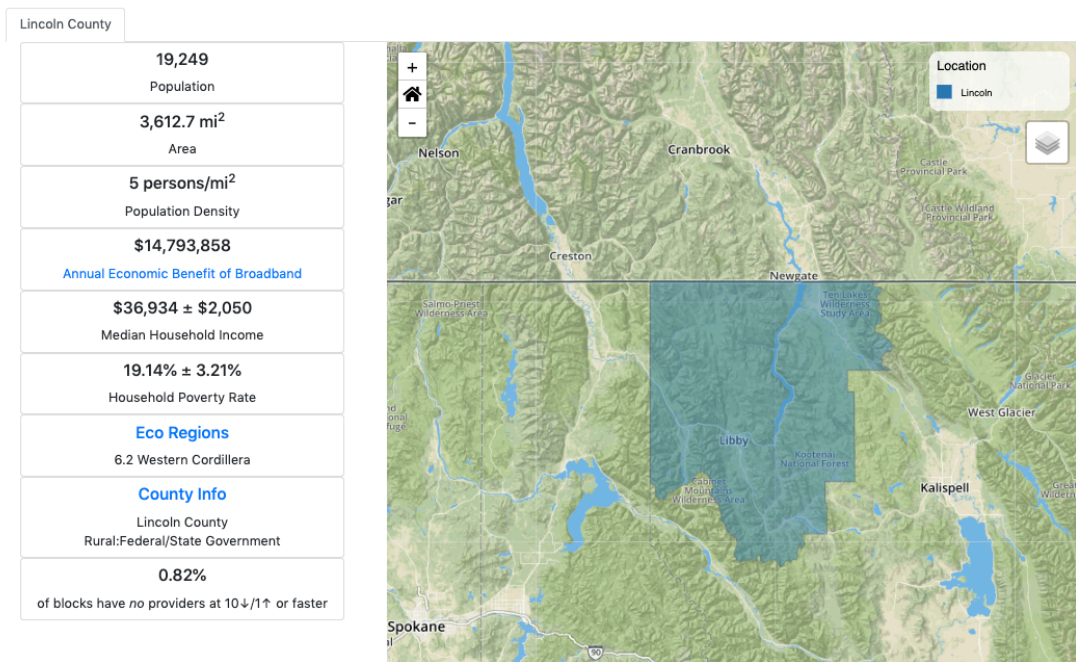
Demographics

ACS » Internet

Wireless

Wireline

Speedtests



- Enter the download and upload speeds, the Coverage Estimate (in this case 100% - 0.82% = 99.18%) and document the URL for the web pages observed in the SAV Execution Tool. Note that the Coverage Estimate only indicates the percentage of blocks that have no providers at 10/1 Mbps service or greater. Subtract this percentage from 100% to determine the percentage of blocks with one or more providers at 10/1 Mbps service or greater.
- Desktop Researchers may reference *the SAV Execution Tool User Guide* for additional guidance on data entry.
- Take a screen shot of the map on the website and save the screenshot to the application folder of the SharePoint site.

3.1.5 Identify Competitor Service Providers

Desktop Researchers review the competitor service providers as documented in an application. If there are any competitive service offerings, the Desktop Researcher assigned to the PFSA notes the information in **Table 13** below in the SAV Execution Tool. Once an incumbent service provider is identified, as long as they did not also submit a PNR, the Desktop Researcher contacts the company to determine if there is an individual that the Field Researchers can interview on the ground. The Desktop Researcher enters service provider information in the *SAV Execution Tool* for any other competitors identified throughout the Desktop Research process as well, specifically through the third party speed test data collection.

Table 13 lists data fields populated for each competitive service provider identified by the applicant or through Desktop Research activities.

Table 13: Competitor Service Provider Data Fields

Field	Observation Description
Entity	[Insert]
PNR Respondent?	["Yes" or "No"]
PFSA Name	[As provided on the Application]
Customer Type	[Insert]
Service Offering	[As provided on the Application]
Download Speed (Mbps)	[Insert]
Upload Speed (Mbps)	[Insert]
Unit Price	[Insert]
Description/Notes	[Insert]
Data/Information Source	["Application" OR "Name of Speed Test Data Provider"]

3.2 Archive Source Documentation and Materials to SharePoint

Archive all supporting documentation and materials to the SAV Document Library. This step should be concurrent with the desktop research findings data entry into the *SAV Execution Tool* and subsequent to the initiation of Desktop Research. Note if the source document is web-based and include a link to the website on a word document stored in SharePoint. All other electronic files are stored and named descriptively in the application-specific folder. If the materials are specific to one of multiple PFSAs associated with the application, create sub-directories named according to the PFSA. The logging of source documentation and materials to SharePoint occurs immediately after the source is used to support a finding recorded in the SAV Document Library.

3.3 Archive Desktop Findings to SAV Execution Tool

The Desktop Research Team concurrently logs documents and materials into the SAV Document Library on SharePoint and populates the SAV Execution Tool for the application. The Desktop Research findings and data points are listed in **Table 11** through **Table 13**. The Desktop Research Team completes the following steps:

1. Open the *SAV Execution Tool* MS Excel Workbook.
2. Depending on the data being added to the *SAV Execution Tool*, select the appropriate button to launch the user form.

3. Populate the required application and PFSA-specific fields with information pulled from the application under review. Data observed from sources other than the application are also populated in the *SAV Execution Tool*.
4. Select the save button on each user form to archive the finding.

Backend Operation

By selecting the “Save” button on the user forms, the data captured in the user form will be written to a log in the *SAV Execution Tool*. When generating reports, the log will be queried to pull all desktop research findings into the *Desktop Research Report Template*.

The data entry described under this step should be completed as information is discovered.

3.4 Update SAV Checklist

After the preliminary Desktop Research is complete, the Desktop Research Team updates the *SAV Checklist* to confirm that for a given application, the findings are logged in the *SAV Execution Tool* and the supporting documentation and materials are archived in the SAV Document Library.

3.4.1 Decision Point—Desktop Research Complete?

After the *SAV Checklist* is updated, the primary Desktop Researcher reviews the *SAV Execution Tool*, SAV Document Library, and *SAV Checklist* for completion. If there are missing items or data entry errors, the Desktop Researcher coordinates with the Desktop Research Team to update the information in SharePoint and the *SAV Execution Tool* by adhering to the procedures from step 3.1. Once the *SAV Execution Tool* and Document Library are sufficiently complete, proceed to step 3.5.

3.5 Prepare and Export Desktop Research Report

Once the Desktop Research completeness check is completed, the Desktop Research Team collaboratively reviews and concurs that the *SAV Execution Tool* accurately reflects the data observed during Desktop Research and is consistent with the source documentation and materials archived on SharePoint.

Once concurrence is achieved by the Desktop Research Team and any conflicts have been resolved by the Broadband SME, the Desktop Research Team initiates production of the *Desktop Research Report*. To do so, one member of the Desktop Research Team executes the “Generate Desktop Research Report” subroutine in the *SAV Execution Tool* by selecting the “Generate Report” button. Once the report is prepared, the Desktop Research Team reviews the draft against the log in the *SAV Execution Tool* to confirm the data pull was successful.

Backend Operation

By changing the “Generate Report”, a VBA-enabled subroutine is triggered to pull the data from the log into the Desktop Research Report template. The populated template should be saved in the application-specific document library for record keeping and review.

3.6 Review Desktop Research Report

Once the draft *Desktop Research Report* is generated and the Desktop Research Team has notified the Desktop Advisor that the *SAV Execution Tool* is saved on SharePoint, the Desktop Advisor reviews the report for completeness and ensures the findings in the report satisfy the Desktop Research requirements.

3.6.1 Decision Point—Desktop Research Sufficiently Complete?

If the Desktop Advisor finds there is a material deficiency in the *SAV Execution Tool*, the Desktop Advisor engages the Broadband SME as described under step 3.6.2. For example, a summary statement of findings that does not clearly state the eligibility of a PFSA as suggested by third party data providers. The Desktop Advisor is responsible for routing the *SAV Execution Tool* to the Broadband SME and highlighting the areas of the report that require the Broadband SME's attention. If there are no material deficiencies in the *SAV Execution Tool* proceed to step 3.7.

3.6.2 Resolve Desktop Research Issues

Upon receipt of an initial *Desktop Research Report* that requires SME intervention, the Broadband SME reviews the fields in the report identified by the Desktop Advisor and adjusts the findings as necessary. The Broadband SME may engage the Desktop Research Team directly for further clarification or to request specific edits to the *SAV Execution Tool*.

3.6.3 Update Desktop Research Report and SAV Execution Tool

If the Broadband SME determines adjustments to the *SAV Execution Tool* are required, the Desktop Research Team updates the *SAV Execution Tool* according to the instructions issued by the Broadband SME.

3.7 Archive Desktop Research Report and Route to Regional Lead

Concurrent with the updates made to the SAV Status Tracker, the Desktop Advisor ensures that the *SAV Execution Tool* and *Desktop Research Report* are saved in the appropriate folder in the SAV Document Library on SharePoint. The Desktop Advisor updates the *SAV Checklist* then routes the *SAV Execution Tool*, *Desktop Research Report*, and *SAV Checklist* as an attachment to the Regional Lead and SAV Review Lead. This step is completed promptly after the completeness check described in step 3.6.1 is executed.

3.8 Update SAV Status Tracker

Once the *Desktop Research Report* and *SAV Execution Tool* are sufficiently reviewed by the Desktop Advisor (and Broadband SME as needed), the Desktop Advisor sends notice via email to the SAV Coordinator to update the SAV Status Tracker for the appropriate application record on SharePoint.

4.0 Field Research

This procedure begins with the review of the desktop findings summary per PFSA developed in procedure **3.0, Desktop Research** and culminates with the production of the final *Field Research Report*.

Field Research and Data Aggregation Procedure

4.1 Review Desktop Research Findings Report

The Desktop Advisor routes the *Desktop Research Report* as described in step **3.7** to the Regional Lead assigned to the application. The Regional Team reviews the *Desktop Research Report* received from the Regional Lead for each PFSA (as represented by **Table 14**) and identifies any sections/data included in the report that may be materially deficient.

Table 14: PFSA Summary Information

Field	Observation
PFSA Name	[As provided on the Application]
New or Existing PFSA	["New" or "Existing" as provided on the Application]
Alternative Household Data Provided?	["Yes" or "No"]
Geographic Footprint	[Square miles from the map metadata]
Number of Households	[As provided from the map metadata]
Technology Type	[As provided on the Application]
Service Offering	[As identified by Desktop Research]
Desktop Research Eligibility Finding	["Eligible" or "Ineligible"]

4.1.1 Decision Point – Questions about report?

If the Regional Team has any questions about the content of the report, send comments via email to the Desktop Advisor, copying the Regional Lead. If there are no questions from the Regional Team during review of the desktop findings, the Regional Team proceeds to step **4.2**.

4.1.2 Clarify Desktop Findings

The Desktop Advisor responds via email to the Regional Team with any clarifying questions necessary. The Desktop Advisor may solicit the help of the Desktop Research Team to answer the Regional Teams questions. If a follow-up phone conversation is needed to clarify answers provided to the Regional Team, the call should be documented including formal meeting minutes. Archive the resulting documentation in the SAV Document Library on SharePoint. The Regional Lead should be included on the phone call as an optional attendee.

4.2 Initiate Validation of Desktop Findings

After the *Desktop Research Report* is reviewed by the Regional Team and any clarifications are made, the Regional Team initiates validation of the findings from the Desktop Research. For example, if a service provider or local stakeholder was found in the PFSA during desktop research and an interviewee was identified, the Regional Team schedules and conducts the interview as detailed in step 4.4. The information in **Table 14** is validated by the Regional Team throughout the steps detailed throughout the rest of this procedure.

4.2.1 Decision Point – PNR(s) for Application?

After the initiation of desktop findings, the Regional Team documents any PNRs associated with the PFSA undergoing validation, if applicable. If any PNRs associated with the PFSA are documented, the Regional Team moves to step 4.3, prioritizing the interviews of PNR respondents. However, once the PNR respondent interviews are complete, the Regional Team continues with step 4.4. If there are no PNRs associated with the PFSA, the Regional Team proceeds to step 4.4.

4.3 Conduct PNR Respondent Interviews

For each PNR submitted, the Regional Team conducts PNR Respondent Interviews. The questions on the PNR Respondent Questionnaire (**Table 15**) are asked and data collected in the SAV Execution Tool for the appropriate application and PFSA being validated. The Regional Team asks the PNR Respondent to identify any additional information which may not have been submitted online in the PNR. Consistent with FCC processes to validate speed in wireline networks, the SAV Review Team requests and examines datasets from the public notice response service provider including data generated by certain network elements or Network Management Systems (NMSs). The request should include data during peak and non-peak network load timeframes. In the event no service provider has responded to the application's PNF, the Regional Team submits similar requests to any service providers found to be operating in the PFSA by the Desktop Research Team. The Regional Team understands its requests may not be responded to by the service providers (if any were identified within the PFSA). The Regional Team repeats this step for the number of incumbents that submitted a PNR for each PFSA under review. As described in the Desktop Research process, step 3.0, PNR Respondents are contacted no more than three times and non-PNR respondents are contacted no more than two times.

At the time a PNR respondent submits their response, the PNR respondent is not required to submit the information as detailed in **Table 15**. Therefore, the questions below are only asked if they were not answered previously in submission of the PNR.

Table 15: PNR Respondent Questionnaire

Question	Observation
Type of Interviewee	[Insert]
Name of Interviewee	[Insert]

Question	Observation
Interviewee Contact Information	[Insert]
Date of Interview	[MM/DD/YYYY]
Local Time of Interview (Start)	[Insert]
Local Time of Interview (End)	[Insert]
Location of Interview	[Insert town, county, state, location, address]
Name of Regional Team Member(s) Conducting Interview	[Insert]
Relative PFSA Name	[Insert as provided on application]
Funding Type of Application	[Insert as provided on application]
Common Name of Applicant	[Insert as provided on application]
How many residential customers within the applicant's service area are currently purchasing broadband service, defined as at a minimum speed of 10 Mbps downstream and 1 Mbps upstream?	[Insert number]
What are the locations of those residential customers within the applicant's service area are currently purchasing broadband service, defined as at a minimum speed of 10 Mbps downstream and 1 Mbps upstream?	[Insert locations]
Where are the rates of data transmission being offered?	[Insert number]
Who is the service provider?	[Insert name of service provider]
What are the service(s)?	[Insert services]
What are the service packages?	[Insert service packages]
Can you provide data generated by Network Management Systems (NMSs)?	[Yes/No]
If yes, please provide data during peak network load timeframes.	[Insert speed data at peak timeframes]
If yes, please provide data during non-peak network load timeframes.	[Insert speed data at non-peak timeframes]
Please provide network generated speed data from at least one of the following: - Customer Premise Equipment (CPE) - Network Management Systems (NMS) - Self developed ping-based speed data	[Insert applicable speed data]

4.3.1 Decision Point – Discrepancies from Submitted PNR?

Once the PNR Respondent interviews are completed, the Regional Team must inform the Regional Lead following the interview if there are any discrepancies with the information from the submitted PNR and data collected during the PNR evaluation process. Both Regional Team members are required to cross-reference the PNR submitted data with the data collected during the interview of the PNR respondent. If there are discrepancies, the procedure continues to step 4.3.2. Alternatively, if no discrepancies exist, the process continues to step 4.4.

4.3.2 Research PNR Discrepancies

In the event the Regional Team identifies any discrepancies between claims made in the PNR and information collected during the PNR interview, the Regional Team escalates the observation to the Regional Lead via email detailing what discrepancies were identified. The Regional Lead then reviews the discrepancies. If there is a need for the Regional Lead to have a phone call with the Regional Team and the PNR respondent, the Regional Team must record formal meeting minutes and archive them in the SAV Document Library on SharePoint. If the Regional Lead does not resolve identified discrepancies following the discussion with the PNR respondent, they ask the Broadband SME for adjudication.

4.3.3 Render Opinion of Discrepancies

Once the Broadband SME receives notification from the Regional Lead, the Broadband SME renders an opinion if there needs to be another discussion with the POC of the PNR Respondent. Should there be any discrepancies, such as inconclusive information from interviewees in the field, the Broadband SME advises if the field Team should conduct additional in-field interview questions of the PNR respondent.

4.4 Conduct Field Interviews, Collect Information From Other Public Data Sources, and Conduct Network Observations

The following procedures within this step can be executed at any time while the Regional Team is in the field validating a PFSA. It is the responsibility of the Regional Team to gather as much quantifiable information while validating a PFSA as possible. As detailed in step 1.0, the Regional Team validates PFSA's in a specific sequence to maximize efficiencies during the validation of multiple PFSA's within an application.

Conduct Field Interviews

If the Regional Team does not identify any PNRs associated with the PFSA being validated, the Regional Team conducts interviews with service provider technicians, government officials, representatives of community anchor institutions and subscribers (residents) of the service providers within the PFSA. Note, government officials and anchor institutions can be interviewed, however, service delivered to them does not count towards eligibility determinations. Therefore, the Regional Team documents this notation for any of the relative parties interviewed. For technical personnel, the focus of the interviews is on gaining a detailed understanding of the technologies providing broadband service and the infrastructure supporting broadband service. For subscribers, the focus is on understanding the user perceived speed of the network.

Types of interviews:

- General Interview (e.g. resident/subscriber, applicant employee, business owner, local official, etc.) – **Table 16**
- Digital Subscriber Line Technician Interview – **Table 17**
- Cable Modem Termination Systems (CMTS) Technician Interview – **Table 18**
- Fixed Wireless Technician Interview – **Table 19**
- Fiber to the Premises Technican Interview – **Table 21**

The Regional Team gathers data from these interviews in the *SAV Execution Tool* for each PFSA being validated. The Regional Team attempts to conduct the different types of interviews in every visited PFSA. However, the Regional Team acknowledges and documents if they are unable to conduct an interview in the PFSA and the reasoning why the interview was not conducted. The time to complete each interview depends on how quickly the Regional Team is able to collect a sufficient amount of data.

In the event a scheduled interviewee does not show up for a scheduled interview, the Regional Team should attempt to contact the interviewee to confirm the interview is either postponed or cancelled. The Regional Team then documents the communication on the appropriate questionnaire.

Table 16: General Questionnaire

General Questionnaire	
Question	Purpose/Reasoning
Who is your internet provider?	To determine if there are other ISPs that we have not identified and to establish linkage between ISPs and household network performance.
Are there alternate providers?	To determine if there are other Service Providers that we have not identified
Do you know what technology they use?	To corroborate our understanding of what technology the Service Provider has deployed

General Questionnaire	
What is your overall perception of internet speed?	To gain an understanding of the performance of the network
What is your overall perception of internet availability?	To gain an understanding of the reliability of the network
Are you able to stream the following without buffering? <ul style="list-style-type: none"> • Netflix movies in SD • Facebook videos • YouTube videos 	To determine if sufficient speeds exist to execute certain well understood applications
Are you able to send and receive e-mail attachments?	Service Providers typically configure their Simple Mail Transfer Protocol mail servers to timeout. Frequent mail timeouts may indicate insufficient bandwidth
Which is faster, your mobile internet or your home internet?	Which is faster, your mobile internet or your home internet?

Table 17: Digital Subscriber Line Technician Questionnaire

Digital Subscriber Line Technician Questionnaire	
Question	Purpose/Reasoning
What type of DSL, Asymmetric Digital Subscriber Line (ADSL), Very High Speed Digital Subscriber Lines (VDSL), etc.)?	Different flavors of DSL have different attenuation characteristics
Is your flavor consistent throughout the network?	To gain an understanding of whether multiple different speeds may be experienced by users depending on location
When was the network deployed?	Hardware and software versions ultimately determine speed. The age of the infrastructure helps gain an understanding of what hardware and software is deployed.
Have any enhancements or modifications to the network been made since the initial deployment?	Hardware and software versions ultimately determine speed. The age of the infrastructure helps gain an understanding of what hardware and software is deployed.
How many Digital Subscriber Line Access Multiplexer (DSLAM) do you have in the PFSA?	To help understand the distances from households to infrastructure
How many DSLAMs do you have in the PFSA?	To understand the infrastructure is in place within the PFSA.
Where are those DSLAMs located?	To understand where the infrastructure is located within the PFSA.

Digital Subscriber Line Technician Questionnaire	
Can you show them to me? (take pictures and note location)	To understand what infrastructure is in place and where it is physically located.
What vendor and model number are your DSLAMs?	To understand the technical capacities of the infrastructure
What software version are your DSLAMs using?	Certain software versions have speed limitations.
What is the backplane capacity of the DSLAMs?	To understand the capacity of the infrastructure.
How do the DSLAMs get muxed to the Central Office (CO)?	To determine how the network provides service
Are the field DSLAMs connected through fiber?	Fiber based distribution networks are faster than Plain Old Telephone Service (POTS) lines. May indicate a network with greater capacity than a pure POTS
What is the capacity of your transport facilities in place from your consolidation location?	To determine if transport facilities have appropriate bandwidth to provide service
Where is your interconnect location (if any)?	To determine distance for interconnect
What is the furthest household from its nearest DSLAM?	To determine maximum attenuation of households
Can you provide CPE generated evidence of household speed?	To determine network speed.
Can you provide NMS generated evidence of household speed?	To determine network speed.
Can you provide network generated evidence of household speed?	To determine network speed.
What is the maximum download speed your network can deliver?	To find out if the Service Provider is capable of providing 10/1 service or not
What is the maximum upload speed your network can deliver?	To find out if the Service Provider is capable of providing 10/1 service or not

Table 18: Cable Modem Termination Systems Technician Questionnaire

Cable Modem Termination Systems (CMTS) Technician Questionnaire	
Question	Purpose/Reasoning
How many headends do you have?	The number of headends deployed in the network partially determines available capacity to users.
How many subscribers does the network support?	Since cable is a shared medium the number of subscribers creating traffic on the network directly affects network speeds experienced by users.

Cable Modem Termination Systems (CMTS) Technician Questionnaire	
Where are those headends located?	To validate that infrastructure is located within proximity to the markets served.
Can you show them to me? (pictures)	To validate the information provided is accurate regarding infrastructure deployed.
Is your solution pure cable or Hybrid Fiber Coax (HFC)?	Fiber is a faster medium than cable plant and may indicate additional capacity in the network.
What is the backplane capacity of your aggregation router?	To determine whether infrastructure has capacity sufficient to serve the service area.
What software version is your aggregation router using?	Software versions may have Original Equipment Manufacturer (OEM) published speed limitations.
What Data Over Cable Service Interface Specification (DOCSIS) version is in your CMTS?	Certain DOCSIS versions have published standards for speed.
What is the capacity of you transport facilities in place from your consolidation location?	To determine if transport facilities have appropriate bandwidth to provide service
Where is your interconnect location? (if any)	To understand the distance traffic is required to travel before hitting the measurement point of demarcation.
Is all CPE in the network on the same DOCSIS version?	The network can only operate at speeds consistent with the lowest DOCSIS version deployed in the network.
What versions of DOCSIS are in CPE in the network?	To determine the lowest version of DOCSIS presently in the network.
Can you provide CPE generated evidence of household speed?	To determine network speed.
What is the maximum download speed your network can deliver?	To find out if the Service Provider is capable of providing 10/1 service or not
What is the maximum upload speed your network can deliver?	To find out if the Service Provider is capable of providing 10/1 service or not

Table 19: Fixed Wireless Technician Questionnaire

Fixed Wireless Technician Questionnaire	
Question	Purpose/Reasoning
How many sites do you have?	To determine overall Radio Frequency (RF) coverage footprint.
Where are your sites located?	To determine overall RF coverage footprint.
How many subscribers does your network support?	The number of subscribers on a network determine the load on the network.

Fixed Wireless Technician Questionnaire	
What model and version of CPE do you use?	Assists in determining difficulty of receiving signal at households.
Do you operate in licensed spectrum?	If an operator uses licensed spectrum than we should have the ability to find
What is your total transmit bandwidth?	Required to calculate theoretical capacity
What is your total receipt bandwidth?	Required to calculate theoretical capacity
What power do you transmit at?	Necessary information for coverage calculations.
What modulation scheme do you use? <i>*(See MCS Translation Table below for Reference)</i>	Necessary input for theoretical speed calculations.
How high are your antennas?	Necessary for coverage calculations.
What is your RF footprint (test line of sight)?	Assist in determining the number of households in a PFSA that are within coverage.
Do you have a receiver we could test in the field?	To validate information on household signal strength.
How do you backhaul traffic?	Assists in determining if sufficient backhaul capacity exists to enable service.
What is the capacity of your backhaul link(s)?	Assists in determining if sufficient backhaul capacity exists to enable service.
Where are the backhaul links muxed (if more than one site)?	Assists in determining if sufficient backhaul capacity exists to enable service.
What is the capacity of you transport facilities in place from your consolidation location?	To determine if transport facilities have appropriate bandwidth to provide service
Where is your interconnect location (if any)?	To determine distance for interconnect
Can you provide CPE generated evidence of household speed?	To determine network speed.
What is the maximum download speed your network can deliver?	To find out if the Service Provider is capable of providing 10/1 service or not
What is the maximum upload speed your network can deliver?	To find out if the Service Provider is capable of providing 10/1 service or not

During a Fixed Wireless technician interview, a Field Researcher asks about the modulation for the network. Should a Field Researcher encounter Modulation and Coding Scheme (MCS) Index Values while researching Fixed Wireless service, the table below can be used to translate the MCS Index Value to the corresponding Modulation Scheme for which they input into the SAV Execution Tool. During the Fixed Wireless interview with the technician, the Field Researcher

clarifies that they need the modulation scheme to be able to calculate the theoretical speed calculation shown in section 4.6.

Table 20: Translation from MCS to Modulation Scheme

MCS Index	Spatial Streams	Modulation Type	Coding Rate	Data Rate (Mbit/s)			
				20 MHz Channel		40 MHz Channel	
				800 ns GI	400 ns GI	800 ns GI	400 ns GI
0	1	BPSK	1/2	6.50	7.20	13.50	15.00
1	1	QPSK	1/2	13.00	14.40	27.00	30.00
2	1	QPSK	3/4	19.50	21.70	40.50	45.00
3	1	16-QAM	1/2	26.00	28.90	54.00	60.00
4	1	16-QAM	3/4	39.00	43.30	81.00	90.00
5	1	64-QAM	2/3	52.00	57.80	108.00	120.00
6	1	64-QAM	3/4	58.50	65.00	121.50	135.00
7	1	64-QAM	5/6	65.00	72.20	135.00	150.00
8	2	BPSK	1/2	13.00	14.40	27.00	30.00
9	2	QPSK	1/2	26.00	28.90	54.00	60.00
10	2	QPSK	3/4	39.00	43.30	81.00	90.00
11	2	16-QAM	1/2	52.00	57.80	108.00	120.00
12	2	16-QAM	3/4	78.00	86.70	162.00	180.00
13	2	64-QAM	2/3	104.00	115.60	216.00	240.00
14	2	64-QAM	3/4	117.00	130.00	243.00	270.00
15	2	64-QAM	5/6	130.00	144.40	270.00	300.00
16	3	BPSK	1/2	19.50	21.70	40.50	45.00
17	3	QPSK	1/2	39.00	43.30	81.00	90.00
18	3	QPSK	3/4	58.50	65.00	121.50	135.00
19	3	16-QAM	1/2	78.00	86.70	162.00	180.00
20	3	16-QAM	3/4	117.00	130.00	243.00	270.00
21	3	64-QAM	2/3	156.00	173.30	324.00	360.00
22	3	64-QAM	3/4	175.50	195.00	364.50	405.00
23	3	64-QAM	5/6	195.00	216.70	405.00	450.00
24	4	BPSK	1/2	26.00	28.80	54.00	60.00
25	4	QPSK	1/2	52.00	57.60	108.00	120.00
26	4	QPSK	3/4	78.00	86.80	162.00	180.00
27	4	16-QAM	1/2	104.00	115.60	216.00	240.00
28	4	16-QAM	3/4	156.00	173.20	324.00	360.00
29	4	64-QAM	2/3	208.00	231.20	432.00	480.00
30	4	64-QAM	3/4	234.00	260.00	486.00	540.00
31	4	64-QAM	5/6	260.00	288.80	540.00	600.00

Table 21: Fiber to the Premises Technician Questionnaire

Fiber to the Premises Technician Questionnaire	
Question	Purpose/Reasoning
Is the network passive or active?	Active networks have more routing equipment thus creating more potential choke points
How many subscribers does your network support?	The number of subscribers on a network determine the load on the network.
Where is the traffic muxed?	Multiplexing almost always introduces latency and may be a good place to check speed.
What is the backplane capacity of your aggregation router?	To understand the capacity of the infrastructure.
What is the maximum download speed your network can deliver?	To find out if the Service Provider is capable of providing 10/1 service or not
What is the maximum upload speed your network can deliver?	To find out if the Service Provider is capable of providing 10/1 service or not
What is the capacity of your transport facilities in place from your consolidation location?	To determine if transport facilities have appropriate bandwidth to provide service

Collect Information From Other Public Data Sources

While the Regional Team is deployed in a PFSA, the Regional Team observes and documents any sources of public data that help to determine whether or not broadband exists in the PFSA. Examples of public data sources the Regional Team should look for while traveling include, but are not limited to:

- Newspaper ads
- Magazine articles
- Billboards for advertised speeds of local service providers
- Unsolicited CPE speed data provided by one or multiple subscriber(s) located within the PFSA undergoing validation
- Signs on/in businesses

The Regional Team documents any findings during the site visit on the Public Data Source Collection Form shown in **Table 22** and includes pictures for evidence findings.

Table 22: Public Data Source Collection Form

Question	Observation
Type of public data source	[Newspaper ad, magazine article, billboard, unsolicited CPE speed data, signs, etc.] Insert pictures of public data source below
Information provided by public data source	[Insert description]
Date of information found	[MM/DD/YYYY]
Local time of information found	[Insert]
Location where information was found	[Insert town, county, state, location, address]
Name of Regional Team member(s) responsible for finding data source	[Insert]
Relative PFSA Name	[Insert as provided on application]
Funding Type of Application	[Insert as provided on application]
Common Name of Applicant	[Insert as provided on application]

Conduct Network Observations

While the Regional Team is deployed and validating PFSAs, the Regional Team conducts physical network observations of the infrastructure within the PFSAs that are being validated. PFSAs are known to range in size, however, network observations are documented from every PFSA a Regional Team visits. In addition, two Field Researchers on the Team may collect observations and document them with pictures and details supporting their findings. For example, if one PFSA is small and covers an entire town, it is expected that the Regional Team observes the PFSA in its entirety. If the Team does not locate network infrastructure within the PFSA for any reason (i.e. vegetation overgrowth), the Team still documents the work the Team conducted by taking a picture within the PFSA noting “No network infrastructure observed within PFSA”. The Team documents “N/A” for the data fields identified in the Network Observation Documentation Form in **Table 23**.

A large PFSA could require a team of two Field Researchers that are not expected to cover every square mile of the PFSA. In these instances, the Regional Team prioritizes conducting observations in the more populous areas of the PFSA. The observations for these areas are also documented in the Network Observation Data Collection Template.

Network observations are done at any time while the Regional Team is deployed in the PFSA (e.g. on the way from an interview to a hotel). The Regional Team must attempt to conduct network observations at least one time while validating a PFSA.

Table 23: Network Observation Documentation Form

Question	Observation
Type of network infrastructure observed	[Insert type of infrastructure]
List the Service Provider who owns the observed network infrastructure (if identifiable)	[Insert SP name; state how the owner was identified]
Physical condition of network infrastructure	[Good/Fair/Poor] Insert supporting pictures below
Why was the network infrastructure rated, Good, Fair, or Poor?	[Insert description]
Date of observation made	[MM/DD/YYYY]
Local time of observation made	[Insert]
Location where information was found	[Insert town, county, state, location, address]
Name of Regional Team member(s) who conducted the observation	[Insert]
Relative PFSA Name	[Insert as provided on application]
Funding Type of Application	[Insert as provided on application]
Common Name of Applicant	[Insert as provided on application]

4.5 Cross-reference with Desktop Findings

After the Regional Team collects quantifiable information from field interviews, public data sources, and network observations, the Team cross references findings with information that was found during the Desktop Research. The Regional Team documents findings from the field that are different from the desktop findings. If the Regional Team identifies a provider not listed in the Desktop Research, the Regional Team goes back to the Lead Desktop Researcher assigned to the PFSA. The Desktop Researcher then conducts a review of the new providers' data and amends the Desktop Research Report.

4.6 Run Network Calculations

Once the Regional Team cross-references findings from the field with the Desktop Research findings, the Regional Team conducts high-level calculations to validate the sufficiency of infrastructure to support 10/1 service within the PFSA being validated. This process is conducted regardless of whether a PNR exists in a PFSA. Calculations can only be conducted for PFSA's from data obtained during field interviews as detailed in step 4.4. If there is not enough information to conduct such network calculations, the Regional Team notes that within the *SAV Execution Tool* for documentation purposes.

The first set of potential calculations performed use inputs from the CMTS Technician Questionnaire as referenced in step 4.4. The DOCSIS Version recorded in the questionnaire will be a number (1.0, 1.1, 2.0, 3.0, or 3.1) and the denominator (Number of Subscribers) will be the

number given by the Interviewee and will reflect peak network load. The solution to this equation is the Maximum Mbps per subscriber as depicted below. Based on the DOCSIS Version number provided by the interviewee, the numerator (Max Mbps per DOCSIS Version) in Equations 1 through 8 below are automatically generated by the *SAV Execution Tool* and input into the calculation. **Table 24** represents the potential values which are placed in the numerator for Equations 1 through 8 based upon the Interviewee's DOCSIS Version. Since cable is a shared medium, it is important to understand the maximum capacity available to each subscriber. By performing this calculation, the Regional Team is able to understand the maximum downstream and upstream capacity is available to each user within the network.

Table 24: International Telecommunications Union Maximum DOCSIS Speeds

DOCSIS Version	Max Downstream Speed (Mbps)	Max Upstream Speed (Mbps)
1.0	40	10
1.1	40	10
2.0	40	30
3.0	1,200	200
3.1	10,000	2,000

Equation 1: DOCSIS Version 1.0/1.1 - Maximum Downstream Mbps per Subscriber

$$\frac{\text{Max Mbps per DOCSIS Version}}{\text{Number of Subscribers}} = \text{Theoretical Maximum Mbps per subscriber}$$

Equation 2: DOCSIS Version 1.0/1.1 - Maximum Upstream Mbps per Subscriber

$$\frac{\text{Max Mbps per DOCSIS Version}}{\text{Number of Subscribers}} = \text{Theoretical Maximum Mbps per subscriber}$$

Equation 3: DOCSIS Version 2.0 - Maximum Downstream Mbps per Subscriber

$$\frac{\text{Max Mbps per DOCSIS Version}}{\text{Number of Subscribers}} = \text{Theoretical Maximum Mbps per subscriber}$$

Equation 4: DOCSIS Version 2.0 - Maximum Upstream Mbps per Subscriber

$$\frac{\text{Max Mbps per DOCSIS Version}}{\text{Number of Subscribers}} = \text{Theoretical Maximum Mbps per subscriber}$$

Equation 5: DOCSIS Version 3.0 - Maximum Downstream Mbps per Subscriber

$$\frac{\text{Max Mbps per DOCSIS Version}}{\text{Number of Subscribers}} = \text{Theoretical Maximum Mbps per subscriber}$$

Equation 6: DOCSIS Version 3.0 - Maximum Upstream Mbps per Subscriber

$$\frac{\text{Max Mbps per DOCSIS Version}}{\text{Number of Subscribers}} = \text{Theoretical Maximum Mbps per subscriber}$$

Equation 7: DOCSIS Version 3.1 - Maximum Downstream Mbps per Subscriber

$$\frac{\text{Max Mbps per DOCSIS Version}}{\text{Number of Subscribers}} = \text{Theoretical Maximum Mbps per subscriber}$$

Equation 8: DOCSIS Version 3.1 - Maximum Upstream Mbps per Subscriber

$$\frac{\text{Max Mbps per DOCSIS Version}}{\text{Number of Subscribers}} = \text{Theoretical Maximum Mbps per subscriber}$$

The ninth potential calculation performed uses inputs from the DSL Technician Questionnaire as referenced in step 4.4. The numerator (Number of PFSA Square Miles) is input into the DSL Technician Questionnaire by the Regional Team and the *SAV Execution Tool* automatically pulls this value into the equation. The denominator (Number of DSLAMS in PFSA) is based on the answer provided by the interviewee. The *SAV Execution Tool* also automatically pulls this value into the equation. The solution to this equation is Square Miles per DSLAMS. Since DSL technology is sensitive to distance, by performing this calculation, the Regional Team is able to discern the implications of any distance limitations with DSL technology. Once the solution to this equation (Square Miles per DSLAM) is determined, the *SAV Execution Tool* automatically calculates a distance in feet which each DSLAM covers in any direction. The Regional Team needs to cross-reference this value with **Table 25** to discern where speeds decrease/fall off based on distance and flavor of DSL. Flavor of DSL is asked of the interviewee as referenced in step 4.4.

Equation 9: DSLAMS Coverage Distance

$$\frac{\text{Number of PFSA Square Miles}}{\text{Number of DSLAMS in PFSA}} = \text{Square Miles per DSLAM}$$

Table 25: DSL Attenuation Chart via VersaTechnology

Flavor of DSL	Download Speed (Mbps)	Upload Speed (Mbps)	Distance (ft)
G.lite	1.5	.512	18,000
ADSL	6-8	.640	12,000 – 18,000
ADSL2	12	1	6,000
ADSL2+	27	1	3,000
VDSL	13-52	1.5 – 2.3	4,500
VDSL2	200	200	6,600
IDSL	.14	.14	> 2,000
SDSL	1.5	1.5	10,000 – 18,000
HDSL	2.3	2.3	12,000

The next set of potential calculations (Equations 10 and 11) performed uses inputs from the FW Technician Questionnaire as referenced in step 4.4. **Table 26** shows the six options the FW Technician chooses from during the interview. Based on the response of the interviewee, there is a relative Bits/Hz value for each Modulation Scheme. Equation 10 has a numerator that consists of two multipliers, Bits/Hz, which are automatically generated by the *SAV Execution Tool* based on the Modulation Scheme the interviewee selects and the Total Receipt Bandwidth, which is in Megahertz (MHz) and provided by the interviewee. The denominator (Number of Subscribers) is also the number provided by the interviewee and reflects peak network load. The solution to this equation is the Theoretical Maximum Capacity which is in Mbps. Equation 11 also starts with a multiplier (Bits/Hz), which is automatically generated by the *SAV Execution Tool* based on the Modulation Scheme the interviewee selects. That value is then multiplied by the Total Transmit Bandwidth which is in Megahertz (MHz) and provided by the interviewee. The solution to this equation is the Maximum Theoretical Capacity which is in Mbps. By performing this calculation, the Regional Team is able to understand the theoretical maximum downstream and upstream capacity available to each user within the network.

Table 26: Fixed Wireless Modulation Scheme Conversions

Modulation Schemes	Bits/Hz
8	3
16	4
32	5
64	6
128	7
256	8

Equation 10: Fixed Wireless Upstream Modulation Capacity

$$\frac{\left(\frac{\text{Bits}}{\text{Hz}}\right) \times (\text{Total Receipt Bandwidth})}{\text{Number of Subscribers}} = \text{Theoretical Maximum Capacity per subscriber}$$

Equation 11: Fixed Wireless Downstream Modulation Capacity

$$\frac{\left(\frac{\text{Bits}}{\text{Hz}}\right) \times (\text{Total Transmit Bandwidth})}{\text{Number of Subscribers}} = \text{Theoretical Maximum Capacity per subscriber}$$

Equations 12 through 15 use inputs from multiple Technician Questionnaires (DSL, CMTS, FW, and FTTP) as referenced in step 4.4. The common question across the Questionnaires is, “What is the capacity of you transport facilities in place from your consolidation location?”. The calculation(s) performed are based upon the types of technology within the PFSA being evaluated, therefore the equations below may not be calculated for every PFSA validated. The numerator (Circuit Capacity) of this equation is in Mbps and automatically pulled into the calculation by the *SAV Execution Tool* from the relative Technician Questionnaire. The

denominator (Number of Subscribers) is also automatically pulled into the equation using the same method. The solution to these equations is the Maximum Capacity per user which is shown in Mbps. By performing these calculations, the Regional Team is able to discern the Maximum Capacity per user of the transport facilities. This solution directly informs the Regional Team if the network can deliver service less or greater than 10Mbps at the transport layer.

Equation 12: DSL - Maximum Transport Circuit Capacity per user

$$\frac{\text{Circuit Capacity}}{\text{Number of Subscribers}} = \text{Maximum Transport Circuit Capacity per user}$$

Equation 13: CMTS - Maximum Transport Circuit Capacity per user

$$\frac{\text{Circuit Capacity}}{\text{Number of Subscribers}} = \text{Maximum Transport Circuit Capacity per user}$$

Equation 14: FW - Maximum Transport Circuit Capacity per user

$$\frac{\text{Circuit Capacity}}{\text{Number of Subscribers}} = \text{Maximum Transport Circuit Capacity per user}$$

Equation 15: FTTP - Maximum Transport Circuit Capacity per user

$$\frac{\text{Circuit Capacity}}{\text{Number of Subscribers}} = \text{Maximum Transport Circuit Capacity per user}$$

Equation 16 is the final potential type of calculation to be performed by the Regional Team during the validation of individual PFSAs. This equation uses inputs from the FTTP Technician Questionnaire as referenced in step 4.4. The numerator (Aggregation Router Backplane Capacity), is provided in Mbps by the interviewee and automatically pulled into the calculation by the *SAV Execution Tool*. The denominator (Number of Subscribers), is also provided by the interviewee and pulled into the calculation by the same method. The solution to this equation is the Maximum Capacity per user which is also in Mbps. By performing this calculation, the Regional Team is able to discern the Maximum Capacity per user of the access facilities. This directly informs the Regional Team if the network can deliver service less or greater than 10Mbps at the access layer.

Equation 16: FTTP Maximum Capacity per user

$$\frac{\text{Aggregation Router Backplane Capacity}}{\text{Number of Subscribers}} = \text{Maximum Capacity per user}$$

4.7 Update SAV Field Worksheet

After the findings are logged within the *SAV Execution Tool*, the Regional Team updates the *SAV Field Worksheet* (as shown in **Table 27**), confirming they have prepared the application record and logged the supporting documentation and materials in the appropriate folder in the SAV Document Library.

Table 27: SAV Field Worksheet

Item	Observation
Relative PFSA Name	[Insert as provided on application]
Funding Type of Application	[Insert as provided on application]
Common Name of Applicant	[Insert as provided on application]
The below checklist items are to be conducted as part of Step 4.7 ONLY	
Date of checklist started	[MM/DD/YYYY]
Date of checklist completed	[MM/DD/YYYY]
Local time checklist started	[Insert]
Local time checklist completed	[Insert]
Field Interviews complete?	[Yes/No]
Collected/attempted to collect information from other public data sources?	[Yes/No]
Conducted/attempted to observe physical network infrastructure?	[Yes/No]
Conducted/attempted network calculations?	[Yes/No]
Regional Lead solved any PNR discrepancies?	[Yes/No]
Any unsolved PNR discrepancies were escalated to USDA?	[Yes/No]
Name(s) of Regional Team Member(s) who completed the above checklist items?	[Insert name(s)]
The below checklist items are to be conducted as part of Step 4.10 ONLY	
Date of checklist started	[MM/DD/YYYY]
Date of checklist completed	[MM/DD/YYYY]
Local time checklist started	[Insert]
Local time checklist completed	[Insert]
Field Research Report generated?	[Yes/No]
Field Research Report Findings concurred on by Regional Lead?	[Yes/No]
Did the Broadband SME render opinion on findings objection?	[Yes/No/Non-Applicable because there was concurrence]

Item	Observation
Was the SAV Execution Tool updated after Broadband SME provided opinion?	[Yes/No/Non-Applicable because there was concurrence]
If there was no concurrence, did the Regional Team regenerate the Field Research Report and complete steps 4.8 and gain concurrence from the Regional Lead? If no, steps 4.8.2 and 4.8.3 are repeated as necessary.	[Yes/No]
Is the Field Research Report ready for delivery to the Desktop Advisor?	[Yes/No]
If the Field Research Report is not ready for delivery to the Desktop Advisor, did the Regional Team repeat steps 4.8 through 4.8.3 until the Field Research Report was ready for delivery to the SAV Review Lead?	[Yes/No]
Is the Field Research Report ready to be routed to the Desktop Advisor?	[Yes/No]
Name(s) of Regional Team Member(s) who completed the above checklist items?	[Insert name(s)]

4.8 Generate Field Research Report

After the *SAV Field Worksheet* items are deemed complete by the Regional Team, the Regional Team runs the report by clicking “Report” in the *SAV Execution Tool*. This pulls data into a summary report of the PFSAs for a relative application and is stored within the *SAV Execution Tool* until step 4.9. In this summary report, the Regional Team adds a text summary of the findings and determination for the PFSAs associated with the application in a free form text box. This finalizes the initial draft *SAV Findings & Determination Report*. Once the report is prepared, the Regional Team reviews the draft against the log in the *SAV Execution Tool* to confirm the data pull was successful. Once this is complete, the Regional Team sends the draft *SAV Findings & Determination Report* to the SAV Coordinator for archiving via email and copies the Regional Lead.

4.8.1 Decision Point – Concurrence on Findings?

The Regional Lead accesses SharePoint and reviews the draft *SAV Findings & Determination Report*. If the Regional Lead does not concur with the findings of the Regional Team, the Regional Lead engages the Broadband SME as described in step 4.8.2. If the Regional Lead concurs with the findings of the Regional Team, the Regional Lead proceeds with step 4.9.

4.8.2 Render Opinion on Findings Objection

If the Regional Lead does not concur with the findings of the Regional Team, the Regional Lead engages the Broadband SME to render an opinion on the discrepancies identified by the Regional Team. The Regional Lead sends a detailed email to the Broadband SME to ask their opinion on the comments left in the draft *SAV Findings & Determination Report*. The Broadband SME

renders an opinion within the draft *SAV Findings & Determination Report* and sends the updated draft *SAV Findings & Determination Report* to the Regional Lead. The Regional Lead forwards that email to the Regional Team and directs them to review the opinion. If necessary, the Regional Lead facilitates a conference call between the Regional Team, Regional Lead and Broadband SME. Once a determination is agreed upon, the Regional Team updates the *SAV Execution Tool* as described in step 4.8.3. If a determination cannot be agreed upon by all parties, the matter is brought to the attention of the ReConnect Program Manager.

4.8.3 Update SAV Execution Tool

Once a findings determination is agreed upon, the Regional Team updates the information in the *SAV Execution Tool* as detailed via email from the Regional Lead. Once the *SAV Execution Tool* is updated, the Regional Team continues with the remaining steps in the process. This step must be repeated until there is concurrence on the findings in the draft *SAV Findings & Determination Report* before proceeding to step 4.9. Once there is concurrence, the Regional Lead notifies the SAV Coordinator to execute step 4.9.

4.9 Archive SAV Execution Tool on SharePoint

After the Regional Lead concurs with the findings of the Regional Team, the Regional Lead notifies the SAV Coordinator by email and the SAV Coordinator archives all supporting documentation and materials to the SAV Document Library for record keeping on SharePoint. If the materials are specific to one or multiple PFSA's associated with the application, sub-directory names according to the PFSA are created.

4.10 Update SAV Field Worksheet

Once the *SAV Execution Tool* is archived on SharePoint, the Regional Lead updates the *SAV Field Worksheet* started in step 4.7, confirming the Regional Lead has concurred on the Field Research findings and all supporting documentation and materials in the *SAV Execution Tool* are archived on SharePoint.

4.11 Route Field Research Report to Desktop Advisor

After the Regional Lead completes the *SAV Field Worksheet*, the Regional Lead sends the Desktop Advisor an email with the link to the draft *SAV Findings & Determination Report* on SharePoint as well as a soft copy of the completed draft *SAV Findings & Determination Report*. The Regional Lead copies the SAV Coordinator on the same email to notify them to update the SAV Status Tracker. The Regional Lead then updates the SAV Checklist to indicate Field Research is complete.

4.12 Update SAV Status Tracker

Once the SAV Coordinator receives the email from the Regional Lead, the SAV Coordinator updates the SAV Status Tracker for the appropriate application record on SharePoint. The status update should be completed immediately upon receipt of the notification from the Regional Lead.

5.0 Prepare SAV Findings & Determination Report

After the Desktop and Field Research procedures are complete, the SAV findings are compiled into the draft *SAV Findings and Determination Report*, exported from the *SAV Execution Tool* for each application. The initial draft is reviewed by the Desktop Advisor before routing up to the SAV Review Lead and Regional Leads for additional quality assurance checks and concurrence reviews. The production of this draft report should take approximately two business days to complete. The outputs of this procedure are provided on **Table 28**.

Table 28: Prepare SAV Findings & Determination Report Procedure Outputs

Output Item	Required?	Description
Draft SAV Report	Yes	The first draft report that includes the outputs of the Desktop and Field Research procedures.
Notification of Closeout	Yes	A notification signaling the end of the Desktop and Field Research Teams supporting procedures 3.0 and 4.0 activities involvement in the SAV for the given application.

Prepare SAV Findings & Determination Report Procedure

5.1 Review Draft SAV Findings & Determination Report

Once the draft *SAV Findings & Determination Report* and *SAV Execution Tool* have been saved on SharePoint for a SAV, the QC Lead reviews the draft Report for general formatting, grammar, spelling, and other technical edits. Once complete, the QC Lead sends the draft *SAV Findings & Determination Report* to the Desktop Advisor to review the report for completion and technical accuracy.

5.1.1 Decision Point—Draft Report Sufficiently Complete?

If the Desktop Advisor believes the draft *SAV Findings & Determination Report* is sufficiently complete for final reviews the Desktop Advisor proceeds to step **5.2**. Alternatively, if the report contains errors or there are incomplete sections, the Desktop Advisor proceeds to step **5.1.2**.

5.1.2 Locate Application Records and Availability of Missing Information

If information is determined to be missing from the report or analysis, the Desktop Advisor sends the report to the SAV Coordinator highlighting the errors or areas with missing information. The SAV Coordinator conducts due diligence to locate the missing information in the SAV Document Library and *SAV Execution Tool* saved on SharePoint. The SAV Coordinator may solicit the help of the Desktop Research Team as needed. Once this process is completed, the SAV Coordinator sends the updated draft *SAV Findings & Determination Report* to the Desktop Advisor for review.

5.2 Archive Draft SAV Report in SharePoint and Route to Regional Lead

Before routing the draft *SAV Findings & Determination Report* to the Regional Lead, the Desktop Advisor archives the report on SharePoint and updates the *SAV Checklist*. Once archived, the Desktop Advisor notifies the SAV Coordinator that the draft report for the SAV is sufficiently complete and ready for final review and routes the draft report to the Regional Lead.

5.3 Update SAV Status Tracker

Upon notification from the Desktop Advisor, the SAV Coordinator updates the SAV Status Tracker to “Under Review” for the application on SharePoint.

6.0 SAV Report Review and Submission

To ensure the final *SAV Findings & Determination Report* is thoroughly reviewed and the Team arrives at an eligibility determination aligned with the PFSA eligibility criteria described SAV Purpose (**Document Overview**), the SAV Review Team routes the *SAV Findings & Determination Report* through senior project reviewers before submitting to the Application Review Team. This process requires concurrence on eligibility, clear channels of authority and communication, and a thorough reading of the report for accuracy of the eligibility determination. The procedure begins with an initial review of the draft *SAV Findings & Determination Report* performed by the Regional Lead and culminates in the delivery of the final *SAV Findings & Determination Report* to the Application Case Manager.

SAV Report and Submission Procedure

6.1 Review Report and Confirm Eligibility Determination

After reviewing the report, the Regional Lead confirms the eligibility determination as provided on the summary page of the draft *SAV Findings & Determination Report*. The determination is based on the review of the report and the perceived confidence and quality of data collected.

6.2 Concur on Eligibility Determination

Upon confirming the eligibility determination, the Regional Lead forwards the report to the Regional Leads who were not assigned the application for concurrence. For example, if a SAV takes place in the Western region, the other Regional Leads consist of the Central and Eastern Regional Leads. After receiving the report from the designated Regional Lead, the other Regional Leads collaborate and determine whether they agree with the eligibility determination issued by the Field Research Team. Should the Regional Leads *agree* on the determination, the process proceeds to step 6.4. Should the Regional Leads *disagree* on the eligibility determination, the report is escalated to the Broadband SME per step 6.3.

6.3 Render Final Determination

If the Regional Leads do not reach concurrence on the final eligibility determination, the report is routed to the Broadband SME for review. The Broadband SME relies on technical knowledge and interpretation of the data in the report to issue guidance and any next steps to clarify outstanding questions. The Broadband SME authors a memo and includes the details provided in **Table 29**. This report is sent back to the Regional Team for final determination. If 6.3 is executed, this memo becomes a component of the final *SAV Findings & Determination Report*.

Table 29: Broadband SME Memo Contents

Output Item	Required?	Description
Next Steps and Guidance	Yes	If additional Field Research is required to clarify the justification for the eligibility determination issued by the Field Research Team, the Broadband SME will draft these instructions, detailing key activities and outputs thereof to be included in the Field Research Report before submission.
Justification	Yes	The Broadband SME details the reasoning behind the guidance and next steps issued, explaining what actions and data points should be collected to clarify the eligibility determination.

6.4 Conduct Quality Assurance on Final Report

After the report is archived on the SharePoint site, the SAV Review Lead conducts a final quality assurance review, making any adjustments to the report as needed.

6.5 Archive SAV Findings & Determination Report to SharePoint

After the final report and eligibility determination is confirmed by the Regional Leads or the Broadband SME, the SAV Coordinator archives the report on SharePoint. To maintain version control, the final report is labeled with unique identifiers in the following format: “AppID_SAV Report_Date”) and is saved in PDF format in the SAV Document Library.

6.6 Route SAV Report to Application Case Manager

Upon archiving the report, the SAV Review Lead sends the final *SAV Findings & Determination Report* to the Application Case Manager. The SAV Coordinator formally closes-out the report, notifying the SAV Review Team that the SAV is complete and updates the *SAV Checklist* to indicate that the *SAV Findings & Determination Report* has been submitted to the Application Case Manager.