



Guam Broadband Mapping Project: Product Release White Paper

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Product Specification: October 2013 NTIA Data Model
Product/Process: NTIA—October 1, 2013 Data Deliverable
Dataset Submission QC: NTIA—SBDD_CheckSubmission.py



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OVERVIEW

This white paper highlights the **Submission Summary** for this deliverable, as well as describes the **Data Gathering**, **Data Integration**, **Data Validation and Verification** and **Quality Control** processes used to create the Broadband Mapping Project's October 1st, 2013 data submission. To support varying levels of technical and program knowledge, both a **high-level summary** and a **detailed process review** are supplied.

SUBMISSION SUMMARY

PROVIDER DETAILS

PROVIDER PARTICIPATION

- Providers Included
 - Docomo Pacific
 - GTA
 - IT&E
 - MCV
 - PDS (Pacific Data Systems) Guam

COMMUNITY ANCHOR INSTITUTION (CAI) DETAILS

OVERALL STATISTICS

Community Anchor Institution - Categories	Overall Count	CAIID Counts	Transmission Technology	Advertised Speed Down	Advertised Speed Up
Category 1 - School K through 12	57	38	4	0	0
Category 2 - Library	9	6	5	6	4
Category 3 - Medical/Healthcare	10	0	9	9	6
Category 4 - Public Safety	29	0	19	15	3
Category 5 - Universities/Colleges	6	3	1	1	1
Category 6 - Other: Government	101	0	20	17	17
Category 7 - Other: Non-Government	69	0	1	0	0
Total	281	47	59	48	31



HIGH-LEVEL SUMMARY

DATA GATHERING

BROADBAND SERVICE AREAS, MIDDLE MILE AGGREGATION POINTS AND BROADBAND SERVICE OVERVIEW

The collection of Broadband Service Areas, Middle Mile Aggregation Points and Broadband Service Overview information is handled through the following Provider Outreach Process:

- Build and maintain an inventory of Broadband providers through research and State inputs.
- The inventory and everyday interaction with providers is tracked using our Provider Catalog (PCat). Below are some examples of the web application, which has a shared access between our team and mapping partner (BroadMap).

Company Information		Source Name		Edit Clone History AAD	
Provider Name	acmetech (All)	Source Name	acmetech		
Company Address		Source Description			
Company PO Box		Layer Name	TBD		
Company House Number	12345	Source Usage Type	Tracking		
Company Street Name	Acme Avenue	Source Provider Type	BroadMap		
Company City Name	Portland	Source Content Type			
Company Suite		Source Restrictions	<input type="checkbox"/>		
Company Postal Boundary		Source Restriction Description			
Company State		TT Types	--None-- Asymmetric xDSL Symmetric xDSL Other Copper Wireline Cable Modem-DOCSIS 3.0 Cable Modem-Other Optical Carrier/Fiber to the End User Satellite		
Company Website	http://www.acmebroadband.com				
Source ID	4999				
Child Source	<input type="checkbox"/>				
Parent URL					
Parent Source ID	0				
User Name					
Password		Addr Level Data Provided	<input type="checkbox"/>		
Form 477 Interest	<input type="checkbox"/>	Preferred Contact Method			
Provider Portal Trained	<input checked="" type="checkbox"/>				

Contacts							New
Type	Name	Preferred	Phone 1	Phone 2	Email	Position	
P	Sourcing						

FRN Info		DBA		FRN Number	
Provider Name					
Name:	<input type="text"/>	DBA:	<input type="text"/>	FRN:	<input type="text"/>
<input type="button" value="Create FRN"/>					

Confidence				New
TT Type	Confidence	Last Modified	Comment	
Status Tracking				
Non Facilities Based Provider	<input type="checkbox"/>			
Business Only Provider	<input type="checkbox"/>			
Reseller	<input type="checkbox"/>			
NDA Review - Internal	<input type="checkbox"/>		Non Responsive Provider	<input type="checkbox"/>
NDA Review - External	<input type="checkbox"/>		Non Cooperative Provider	<input type="checkbox"/>
			Source Closed	<input type="checkbox"/>
Service Provider Details				
BroadMapper	--None--		BroadMap Status	Unassigned
Initial State Outreach Date			Initial Contact Vehicle	
Provider Origin			Member Association	
			Initial State Outreach	<input type="checkbox"/>
			NDA Status	--None--
			NDA Not Required	<input type="checkbox"/>
Provider Packet Exchanged	<input type="checkbox"/>		NDA Requested	<input type="checkbox"/>
Provider Packet Info Sent			NDA Exchanged	<input type="checkbox"/>
Provider Meeting Status	--None--		NDA Exchange Date	
Technical Meeting Requested	<input type="checkbox"/>		NDA Signed	<input type="checkbox"/>
Technical Meeting Scheduled	<input type="checkbox"/>		NDA Signed Date	
Number of Subscribers			Date Loaded	
			Source Closed Date	



BDIA Delivery 0412		Edit
Status	--None--	Provider Data Reviewed <input type="checkbox"/>
Outreach Date		Provider Data Reviewed Date
Initial Response		FootPrint
Meeting Date		MiddleMile
No Update Date		Subscriber
Waiting For Data Date		Provider Login <input type="checkbox"/>
Data Received Date		Provider Login Date
Data Accepted Date		
Source Ingested		Source Ingested Date
Additional Data		
Notes		
Next Steps		
Inactive <input type="checkbox"/>	Owner	briordan
Created By	briordan	2011-06-13 12:06:35
	Last Modified By	krousseau
		2012-03-16 13:41:58

- In order to encourage participation throughout the life of the program, we feel it's important to foster relationships with the providers and encourage a collaborative team effort between all parties for each data submission.
- Update provider material that describes the data requirements and logistics for data transfer.
- Update Non-Disclosure Agreement (NDA) for use in project, where applicable.
- Maintain multiple protocols for the provider to submit data, including Secure File Transfer Protocol (SFTP) technology when desired.
- Conduct one-on-one informational discussions with each provider to communicate the following:
 - Requirements of this project;
 - Broadband data required to support the product data model;
 - Submission protocols available;
 - Capability to validate how the supplied data is aggregated.
- Download/receive provider data.
- Establish a repeatable process with provider. Maintain provider communication, transaction and data handling records throughout the project (dates contacted, data received, etc.).

COMMUNITY ANCHOR INSTITUTION (CAI)

The collection of CAI information is handled through the following CAI Collection Process:

- Collect and maintain inventory of CAIs through data mining, research and State inputs.
- Maintain web-based CAI portal for institutions to add or confirm attribution, location and enter broadband-specific information.
- Upload web-based data to Core Database for standardization.
- Perform internal cleansing, such as removing duplicate records, identifying gaps in broadband attribution and verifying category.
- Geocode CAI locations.
- Translate Core Database data to deliverable-ready format.
- Continue engagement with non-responsive institutions.



DATA INTEGRATION PROCESS

The data integration and processing mechanisms currently used allow for multiple types of inputs and result in a standardized output that meets the NTIA deliverable requirements. This flexible process supports data model changes and project-requested enhancements.

- Receive inputs from providers via submission protocols; upload into Sourcing Database and catalog with provider information.
- Review provider-supplied data for completeness and for potential discrepancies that require resolution prior to processing and flag as necessary.
- Categorize input into data-type category (addresses, block lists, paper maps, etc.).
- Standardize input based on data type within Staging Database.
- Create Compact Polygons (CP)—(internal methodology for generating area-based feature for coverage in Staging Database).
- Apply broadband attribution to CP; apply metadata to CP.
- Perform quality analysis of the CP against the source supplied to identify any completeness or accuracy issues.
- Request additional information from the provider if elements of coverage are missing or contain discrepancies. This is a second manual quality check to ensure data is complete.
 - Process coverage area to build the required NTIA data model layers.

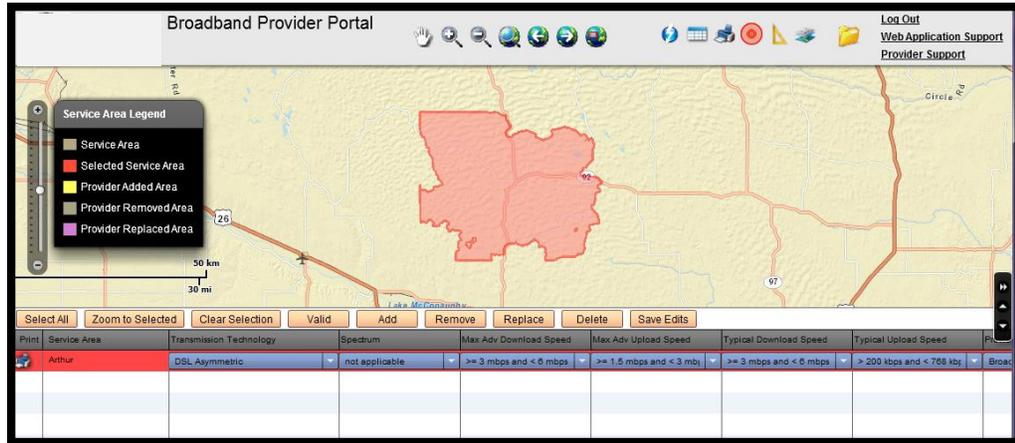
With the deployment of the Provider Portal this round, the data collection and later validation process was streamlined allowing both activities to occur within a secure web application. The majority of the providers used this methodology as it's allows them more visibility into how their data is being represented and gives them knowledge and ownership of their coverage representation. Below are some bullet points and supporting screen shots on how the portal is used.

- Each provider is assigned credentials with a strong password to ensure security measures are taken into consideration

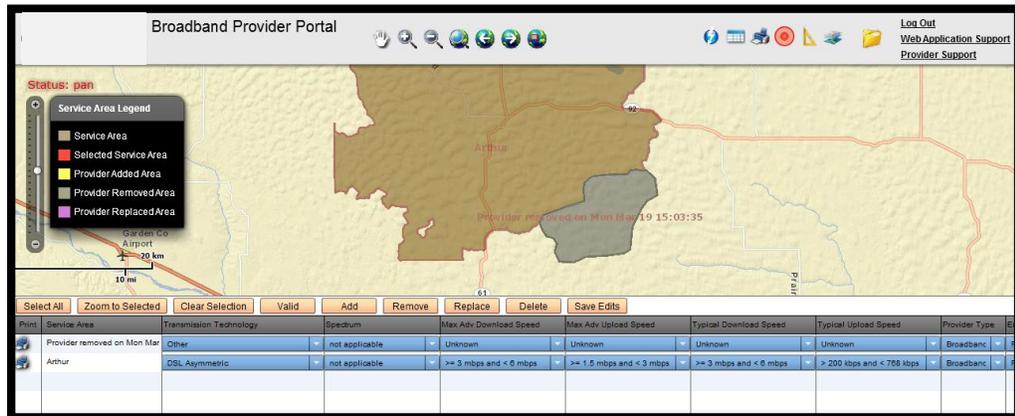
- Collection and confirmation our contact, as well as the company's DBA Name and FRN accuracy



- Capability to review and request changes to the coverage footprint

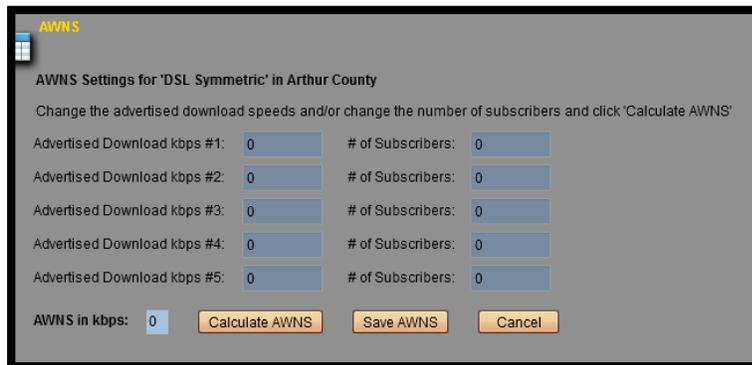
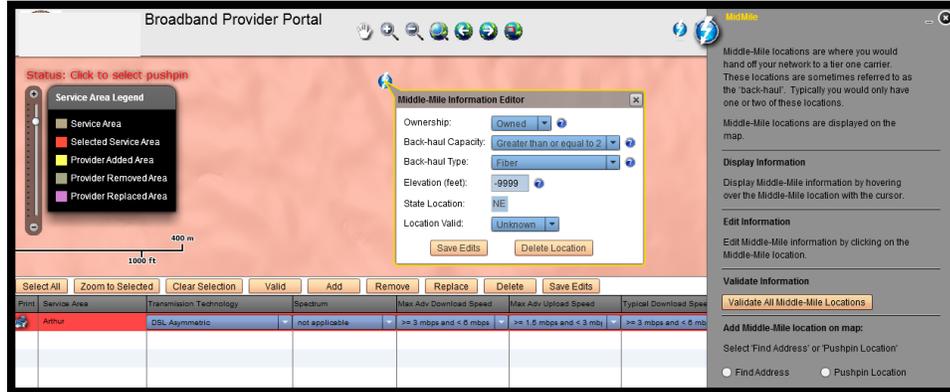


- The provider can Add/Remove portions, or all, of the footprint requesting that their footprint be increased or refined.

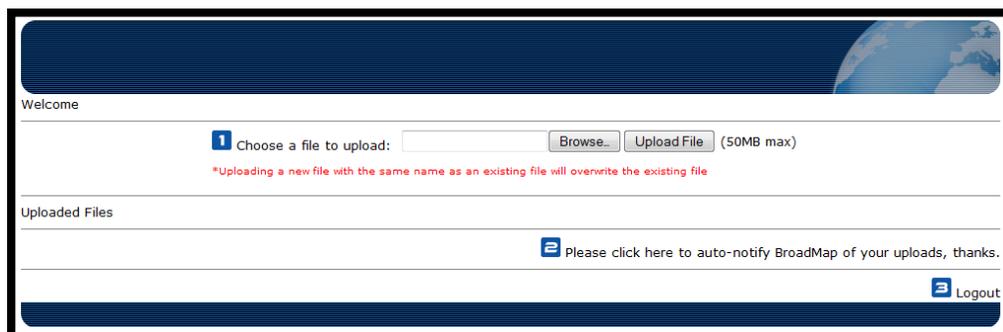
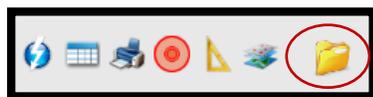




- Middle Mile and Average Weight Nominal Speed (AWNS) collection and validation



- File upload functionality to support providers that would prefer a shapefile, spreadsheet, PDF, KMZ/KML file be used to reflect changes for the data round



- Once the provider has review completed changes to their coverage, middle mile and AWNS, then can validate them all signing off that everything is accurate.



DATA VALIDATION AND VERIFICATION

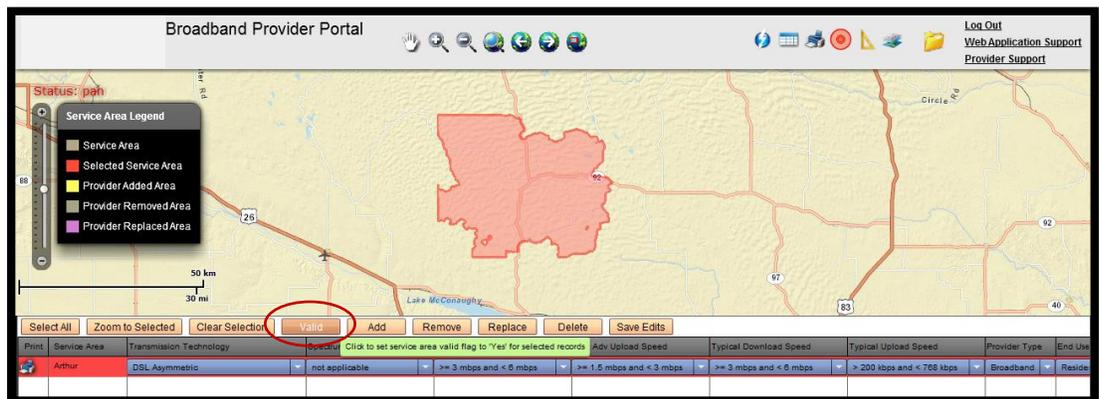
Following the creation of the product, process steps within Data Validation and Verification occur. To ensure the data collected and processed is as accurate and comprehensive as possible, provider validation and internal verification activities are employed. After the initial mapping of providers' coverage areas and serviceability claims, additional reviews are performed using the methods described in the subsections below in order of action.

BROADBAND PROVIDER VALIDATION—PROVIDER PORTAL APPLICATION

Providers are trained on and requested to use a secure interactive web application to review their current coverage area(s) and supporting broadband attribution and validate their data or submit change requests to update their data. All provider change requests go through the **Data Integration Process** and are reviewed with the provider to complete validation.

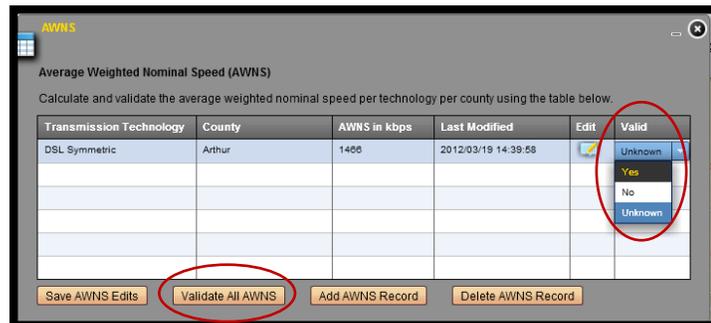
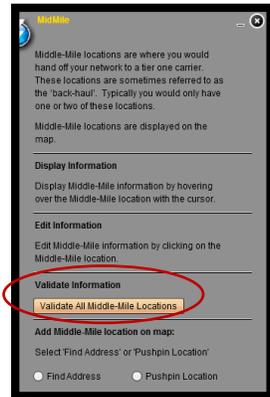
With the latest released of the Provider Portal, validation on the coverage area, middle mile and average could be completed individually. Validation examples are as follows:

- Coverage validation can be done on one record/footprint at a time or by selecting footprints and selecting the 'Valid' button. The provider could also print off their coverage for their own tracking purposes.





- Middle Mile & AWNS Validation



All validation results are tracked internally through our Validation Table, which also improves the overall **Confidence Value** as mentioned below.

PEER REVIEW

The BroadMap Team takes the time to sit down together and visually inspect the data for any abnormalities that need to be discussed.

INDUSTRY KNOWLEDGE – SUBJECT MATTER EXPERTS

Relationships and partnerships often already exist between the territory of Guam and the broadband providers, giving a first-hand look at the services offered and where they are offered. In addition, the Guam broadband team has ready access to industry experts within the fields of telecommunications and data networking. Any anomalies or questioned material is relayed to the providers for review.

PUBLIC VERIFICATION

The broadband interactive map has been released to the public, which includes functionality to collect feedback on the provider’s coverage areas, as well as running a speed test. The feedback and speed results are collected and reviewed with the providers prior to the next data submissions to identify if any map refinement is required.

The public website can be viewed at the following hyperlink:

<https://gubb.broadmap.com/PublicMap/>

CURRENCY OF OVERALL PROCESS

This is a review of providers who sent updated coverage area data to BroadMap, or were at least cooperative, reporting no updates or changes for this round of submission.



SOURCING QC GEOMETRY AND ATTRIBUTION

This is a review that providers whose coverage areas submitted through the portal or via shapefile, met standards for the following:

- Format correctness;
- Table and field structure;
- Valid values, including default values, where applicable;
- Geographic extent and topology errors.

INTERNAL QC SCRIPTS

Internal QC scripts were run to check that data input into the attribution of the coverage areas matched the data in the internal Provider Catalog. This included attributes such as FRN number, source id # and Provider Name.

NTIA SUBMISSION CHECK

Prior to data submission, another quality control script supplied by NTIA is run. This script, SBDD_CheckSubmission.py, creates an output in text form that is required to be submitted along with the final deliverable. All errors must come up clean, unless otherwise specified by NTIA.

CONFIDENCE VALUES

All verification, validation and manual quality review results are tracked by provider/technology type and stored and maintained within a Validation spreadsheet. A confidence value is assigned, based on internal assessments of the collected information, to highlight the provider coverage areas and/or attributions that would benefit from further investigation and/or enhancements.

The confidence value is calculated from the provider meeting the Quality Control checks listed below (and outlined in detail above):

- Provider Validation
- Peer Review
- State Review / Subject Matter Expert Review
- Crowd Sourcing
- Currency of Overall Process
- Sourcing QC Geometry and Attribution
- Internal QC Scripts
- NTIA Submission Check

With the continued efforts on provider validation, 3rd party verification and the release of the public interactive map with feedback collection functionality, the confidence values will be utilized further to identify specific areas in need of attention.



QUALITY CONTROL

Following collection, processing and analysis of the provider and CAI data, the product is checked manually and algorithmically against the NTIA data model. These items are outlined above in the [Sourcing QC Geometry and Attribution](#) and [Internal QC Scripts](#) and [NTIA Submission Check](#) under [Data Validation and Verification](#).

DETAILED PROCESS REVIEW

To review the detailed process, please review the attached object:



BMap_ProcessDetail
Is_2013_10_1.docx