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Beyond The Boundaries



Commonwealth of the Northern Mariana Islands

Broadband Mapping Project:

Product Release White Paper

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Product Specification: Fall 2012 NTIA Data Model
Product/Process: NTIA—October 1, 2012 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, 2012 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
 - IT&E
 - MCV
- Non-Responsive/Non-Cooperative Providers
 - None
- Other Provider Comments
 - iConnect
 - Currently not a broadband service provider; however they are researching further on entering the Terrestrial Fixed Wireless market
 - GTA
 - Working towards becoming a reseller provider in this area
 - Docomo Pacific
 - Provided data required for mapping their wireless footprint; however it was removed as it does not meet the NOFA standards of broadband speeds
 - Just acquired MCV and we should update accordingly in the subsequent data submission

COVERAGE AREA CHANGES

- Coverage Footprint Reductions/Map Refinement –
 - IT&E has updated their speeds for this data submission, including their AWNS
- Coverage Footprint Expansion –
 - No expansion for this data submission round



DATA CORRECTIONS

- There were no data corrections required for this data submission
- There was also no NTIA 3rd Party data review results posted on the Broadband State Data Management Tool that could lead to potential data corrections.

COMMUNITY ANCHOR INSTITUTION (CAI) DETAILS

OVERALL STATISTICS

Community Anchor Institution - Categories	Overall Count	CAIID Count	Transmission Technology	Advertised Speed Down	Advertised Speed Up
Category 1 - School K through 12	19	17	0	0	0
Category 2 - Library	3	2	0	0	0
Category 3 - Medical/Healthcare	3	0	0	0	0
Category 4 - Public Safety	0	0	0	0	0
Category 5 - Universities/Colleges	1	1	0	0	0
Category 6 - Other: Government	7	0	0	0	0
Category 7 - Other: Non-Government	11	0	0	0	0
Total	44	20	0	0	0

CAI CHANGES

- The CAI's within the following categories were reviewed again against the below-mentioned databases to identify if any CAIID's need to be updated or added.
 - For K-12 institutions (CAI type 1) please add the NCES ID CCD ID value found here:
<http://nces.ed.gov/ccd/bat/>
 - For Higher Education (CAI type 5) please add the NCES IPEDS ID value found here:
<http://nces.ed.gov/ipeds/datacenter/>
 - For Libraries (CAI type 2) please. Combine (do not add) "FSCSKey" and "FSCs_SEQ" from the "puout08av2000" file and place them here:
<http://harvester.census.gov/imls/data/pls/index.asp> (FYI the LIBID is your state's unique ID for libraries)



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SUBMISSION RECEIPT

SUBMISSION RECEIPT RESULTS

- Attached are the results from the NTIA data submission receipt quality script.



MP_2012_9_17.txt

- Error Report

The only items detected were for the TT-10 service coverage areas that have a maximum advertised download speed of 7 and the Middle Mile elevation check.

The technology and speeds were validated by the provider and are within the ranges communicated in the NTIA data model.

All items are included within the accompanying ReadMe file.

Update: There was an update made to the submission receipt on 09/20/12 that introduced the longitude issue for Middle Mile layer.



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1Economy
Corporation

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		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	<div>--None-- Asymmetric xDSL Symmetric xDSL Other Copper Wireline Cable Modem-DOCSIS 3.0 Cable Modem-Other Optical Carrier/Fiber to the End User Satellite</div>		
Company Website	http://www.acmebroadband.com				
Source ID	4999				
Child Source	<input type="checkbox"/>				
Parent URL					
Parent Source ID	0				
User Name					
Password					
Form 477 Interest	<input type="checkbox"/>	Addr Level Data Provided	<input type="checkbox"/>		
Provider Portal Trained	<input checked="" type="checkbox"/>	Preferred Contact Method			

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

FRN Info		
Provider Name	DBA	FRN Number
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
Status Tracking		Comment
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--
Initial State Outreach Date	BroadMap Status
Provider Origin	Unassigned
	Initial Contact Vehicle
	Member Association
	Initial State Outreach <input type="checkbox"/>
	NDA Status
	--None--
	NDA Not Required <input type="checkbox"/>
	NDA Requested <input type="checkbox"/>
	NDA Exchanged <input type="checkbox"/>
	NDA Exchange Date
	NDA Signed <input type="checkbox"/>
	NDA Signed Date
	Date Loaded
	Source Closed Date

Provider Packet Exchanged	<input type="checkbox"/>
Provider Packet Info Sent	
Provider Meeting Status	--None--
Technical Meeting Requested	<input type="checkbox"/>
Technical Meeting Scheduled	<input type="checkbox"/>
Number of Subscribers	



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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		
<div>Notes</div>		
<div>Next Steps</div>		
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.



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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

A screenshot of a web form titled "Login". It contains two input fields: "Username" and "Password". Below the "Password" field is a "Login" button.

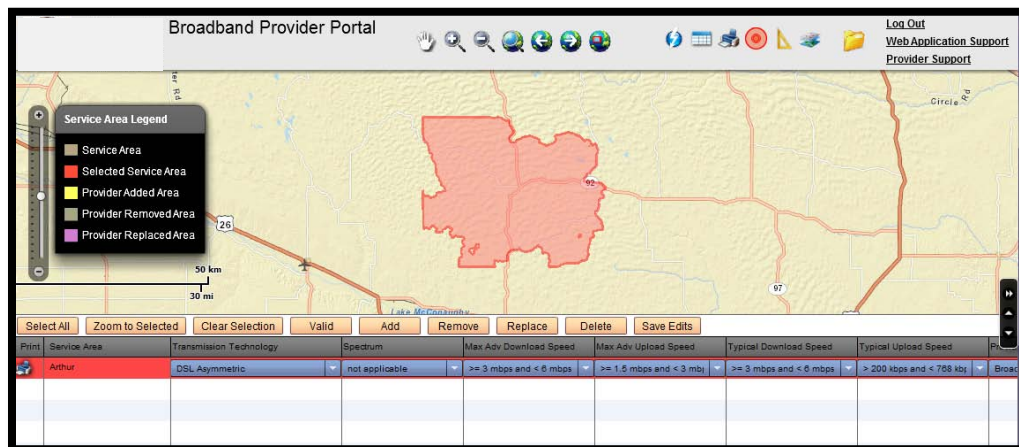
- Collection and confirmation our contact, as well as the company's DBA Name and FRN accuracy

A screenshot of a web form titled "Contact and Provider Information". It contains the following fields and controls:

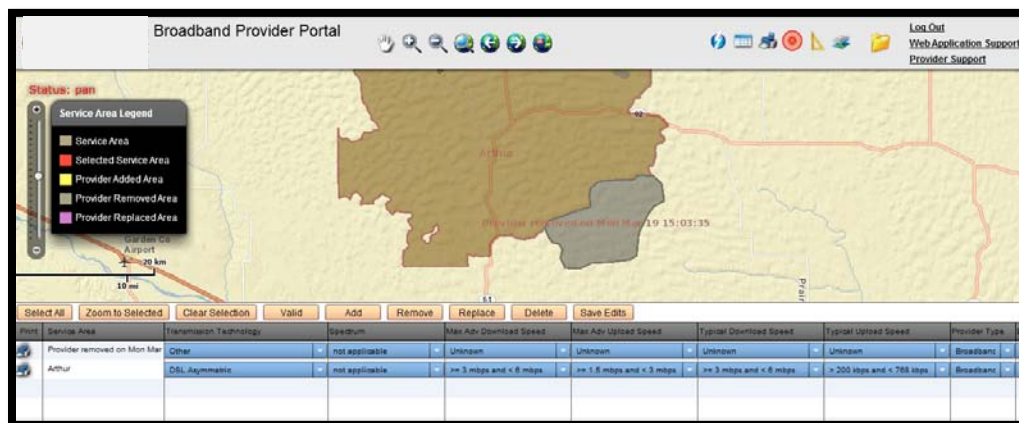
- Text: "Please enter contact information and change provider information if incorrect:"
- Form fields: "Contact name:" (filled with "Kristin Rousseau"), "Contact E-mail:" (filled with "kris.rousseau@broadmap.com"), "Contact Phone:" (filled with "603-448-4475"), "Doing Business As (DBA) Name:" (filled with "acmetech"), and "FCC Registration Number (FRN):" (filled with "2222222").
- Buttons: "Add DBA" (next to the DBA field) and "Submit" (at the bottom).
- Text: "Please note the following:"
- Bulleted list:
 - Contact info will only be stored when a record is saved
 - Provider info will be applied to all service areas



- 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

Broadband Provider Portal

Status: Click to select pushpin

Service Area Legend

- Service Area
- Selected Service Area
- Provider Added Area
- Provider Removed Area
- Provider Replaced Area

Middle Mile Information Editor

Ownership:
Back-haul Capacity:
Back-haul Type:
Elevation (feet):
State Location:
Location Valid:

Display Information

Display Middle-Mile information by hovering over the Middle-Mile location with the cursor.

Edit Information

Edit Middle-Mile information by clicking on the Middle-Mile location.

Validate Information

Add Middle-Mile location on map:

Select 'Find Address' or 'Pushpin Location'

☐ Find Address ☐ Pushpin Location

Point	Service Area	Transmission Technology	Spectrum	Max Ads Download Speed	Max Ads Upload Speed	Typical Download Speed
1	Arthur	DSL Asymmetric	not applicable	>= 3 mbps and < 6 mbps	>= 1.5 mbps and < 3 mbps	>= 3 mbps and < 6 mbps

AWNS

AWNS Settings for 'DSL Symmetric' in Arthur County

Change the advertised download speeds and/or change the number of subscribers and click 'Calculate AWNS'

Advertised Download kbps #1: # of Subscribers:
Advertised Download kbps #2: # of Subscribers:
Advertised Download kbps #3: # of Subscribers:
Advertised Download kbps #4: # of Subscribers:
Advertised Download kbps #5: # of Subscribers:

AWNS in kbps:

- 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



Welcome

1 Choose a file to upload: (50MB max)

*Uploading a new file with the same name as an existing file will overwrite the existing file

Uploaded Files

2 Please click here to auto-notify BroadMap of your uploads, thanks.

- 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

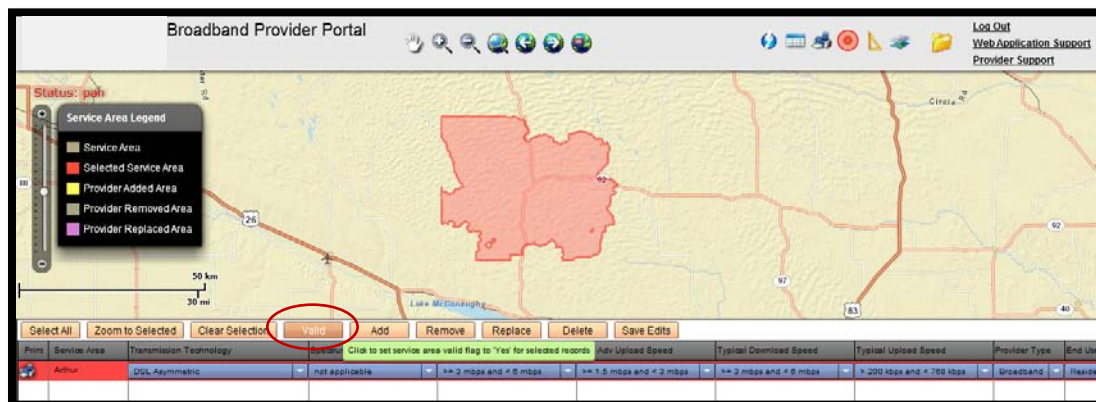
Following the creation of the product, process steps within Data Validation and Verification occur. To ensure the data collected and processed is as accurate and comprehensive as possible, provider validation and internal verification activities are employed. After the initial mapping of providers' coverage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

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.

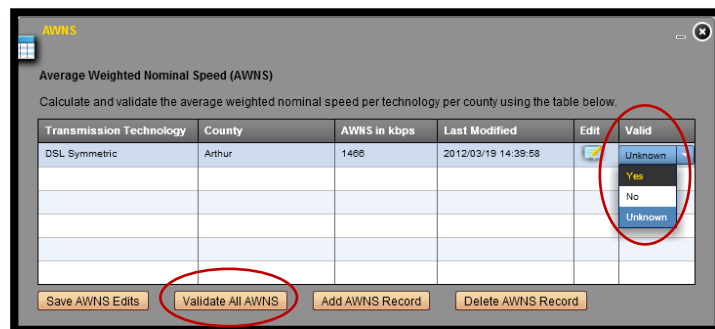
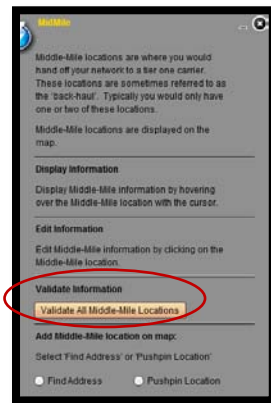
With the latest released of the Provider Portal, validation on the coverage area, middle mile and average could be completed individually. Validation examples are as follows:

- 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.

THIRD-PARTY DATA VERIFICATION

For this submission, the NTIA 3rd Party Data summary was reviewed again to ensure any corrections required were represented in the final product and the supporting documentation. This includes additional feedback received directly from NTIA, prior to this data submission.

This submission was also compared to the previous data submission, April 2012, as a quality check to identify and resolve any potential erroneous discrepancies between the two products.

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 continue to be collected and reviewed with the providers prior to the next data submission to identify if any map refinement is required.

The public website can be viewed at the following hyperlink:

<http://cnmi-bb.broadmap.com/PublicMap/>

CONFIDENCE VALUES

All verification, validation and manual quality review results are tracked by provider/technology type and stored and maintained within a **Validation table**. 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.



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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. Some of the items included within these checks are:

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

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.

DETAILED PROCESS REVIEW

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



BMap_ProcessDetails
_2012_10_01.docx