OMB Number: 4040-0004
Expiration Date: 01/31/2009

Application for Federal Assistance SF-424	Version 02

* 1. Type of Submission:
- ☐ Preapplication
- ☒ Application
- ☐ Changed/Corrected Application

* 2. Type of Application:
- ☒ New
- ☐ Continuation
- ☐ Revision

* If Revision, select appropriate letter(s):

* Other (Specify)

* 3. Date Received:
09/01/2009

4. Applicant Identifier:

5a. Federal Entity Identifier:

* 5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: One Economy Corporation

* b. Employer/Taxpayer Identification Number (EIN/TIN): 52-2220052

* c. Organizational DUNS: 829024541

d. Address:

* Street1: 1220 19th Street NW Suite 610
Street2:
* City: Washington
County:
* State: DC: District of Columbia
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 20036

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:
* First Name: Eddie
Middle Name:
* Last Name: Choi
Suffix:

Title:

Organizational Affiliation:

* Telephone Number: 202.393.2206
Fax Number:

* Email: echoi@one-economy.com

Application for Federal Assistance SF-424   Version 02

9. Type of Applicant 1: Select Applicant Type:

M: Nonprofit with 501C3 IRS Status (Other than Institution of Higher Education)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

* 10. Name of Federal Agency:

Department of Commerce

11. Catalog of Federal Domestic Assistance Number:

CFDA Title:

* 12. Funding Opportunity Number:

0660-ZA29

* Title:

Recovery Act - State Broadband Data and Development Grant Program

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Entire Commonwealth of the Northern Mariana Islands

* 15. Descriptive Title of Applicant's Project:

Commonwealth of the Northern Mariana Islands Broadband Data Mapping Project

Attach supporting documents as specified in agency instructions.

Add Attachments   Delete Attachments   View Attachments

OMB Number: 4040-0004
Expiration Date: 01/31/2009

Application for Federal Assistance SF-424	Version 02

16. Congressional Districts Of:

* a. Applicant `DC`   * b. Program/Project `N. Mar`

Attach an additional list of Program/Project Congressional Districts if needed.

[   ]   Add Attachment   Delete Attachment   View Attachment

17. Proposed Project:

* a. Start Date: `09/15/2009`   * b. End Date: `09/15/2014`

18. Estimated Funding ($):

* a. Federal	3,099,405.00
* b. Applicant	100,000.00
* c. State	475,000.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	3,674,405.00

* 19. Is Application Subject to Review By State Under Executive Order 12372 Process?

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on [   ].

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

* 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)

☐ Yes   ☒ No   Explanation

21. *By signing this application, I certify (1) to the statements contained in the list of certifications** and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: [   ]   * First Name: `Eddie`

Middle Name: [   ]

* Last Name: `Choi`

Suffix: [   ]

* Title: `Special Assistant to the CEO | Director, BISC`

* Telephone Number: `202.393.2206`   Fax Number: [   ]

* Email: `echoi@one-economy.com`

* Signature of Authorized Representative: `Nicol Turner-Lee`   * Date Signed: `09/01/2009`

Authorized for Local Reproduction   Standard Form 424 (Revised 10/2005)
Prescribed by OMB Circular A-102

Application for Federal Assistance SF-424   Version 02

* **Applicant Federal Debt Delinquency Explanation**

The following field should contain an explanation if the Applicant organization is delinquent on any Federal Debt. Maximum number of characters that can be entered is 4,000. Try and avoid extra spaces and carriage returns to maximize the availability of space.

Project Abstract

Upon award of the NTIA grant, the Northern Mariana Islands Team will immediately begin implementation of its broadband mapping plan to create a comprehensive and continually-updated map of broadband availability and use in the Commonwealth of the Northern Mariana Islands. This process will begin by taking inventory of the current broadband service providers within the commonwealth. Concurrent with the inventory process, the Northern Mariana Islands Team will assemble a small group of Subject Matter Experts (SMEs) across all technical domains: GIS & data mapping, broadband, data inventory, systems architecture, and data security. The SME group will work with the OPUC, GEO, and the service providers to survey, analyze, properly safeguard, verify, and determine long-term solutions for housing the existing broadband data pursuant with the NOFA and NTIA grant guidelines.

Subsequently, the Data Gathering task will commence. The Northern Mariana Islands Team will request the cooperation of the service providers, utilizing NDAs as appropriate, and establishing working relationships with each provider. During this phase, the GIS experts and systems engineers will review the requirements for data automation, processing and management. This includes automated processing of the related metadata for each data set. At this time, system hardware and software licenses necessary to support the project will be acquired, installed, and configured. The Team will create a "Substantially Complete" data set by collecting and automating data from the broadband service providers; preparing other GIS data to support the processing of the broadband data; and the mapping of Community Anchor Institutions. As broadband data inventory is processed, analysis delineating unserved/underserved areas will be performed.

Quality Control processes will be employed to ensure maximum accuracy of processing and data ingestion into the GIS inventory by building in steps to verify the accuracy of the data provided by the Service Providers, especially as it relates to actual performance of their services vs. advertised capacities. This will be delivered to NTIA as identified in the NOFA. Non-proprietary and non-confidential data will be transferred to a public access server and incorporated into web-based map viewers to create the "Northern Mariana Islands Broadband Atlas" for public access and analysis. The data updates and maintenance phases will begin as soon as the baseline broadband data inventory is built. To address long-term data currency and accuracy issues, the baseline data will be updated periodically.

A web-based data access tool will be provided so that data providers may evaluate and sample their serviceability data and to ensure that their data are accurate and up-to-date. The initial and immediate priority will be to map all available carrier data and other serviceability data. A second phase of data collection can supplement and verify this data with survey data collected directly from consumers online by "crowd-sourcing" data from automated "speed tests," as well as from surveys of small businesses and residential and community anchor broadband users, which will be used to collect richer profiles of actual users' experiences and preferences.

The sustainability phase will commence after the first year of production and will continue beyond the Grant completion. The Northern Mariana Islands Team will develop the necessary documents to provide training over the course of project implementation to GEO (or designated Agency) so that the Team's work can continue at a high level of functionality beyond the Grant's completion.

Commonwealth of the Northern Mariana Islands

State Broadband Data and

Development Grant

Program Narrative

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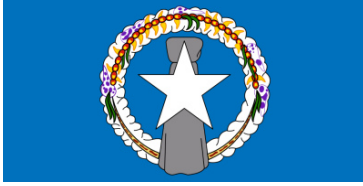
Introduction

Executive Summary

Under the administrative oversight of the One Economy as single eligible entity for the Commonwealth of the Northern Mariana Islands (CNMI), One Economy has assembled a multi-disciplinary and cross-domain task force of local and national experts to lead the implementation of the State Broadband Data and Development Program (the Program) which includes GIS specialists from CNMI's Department of Commerce, Government stakeholder agencies, and CNMI-based broadband providers and other stakeholders that may be assigned by the Governor of CNMI. Recognizing the Grant's requirements, the objectives of the effort are to gather comprehensive, island-wide broadband data on a detailed and disaggregated basis (address level), process and map the information into a GIS system, inventory the data, and provide means to aggregate the result for a comprehensive broadband map for CNMI. The effort further involves developing continual means to keep the information updated, providing effective public access to the data, and supporting data services and reports to the National Telecommunications and Information Administration (NTIA) where the data can be used to form a comprehensive nation-wide broadband mapping platform. In this effort, the task force has provisioned resources and solutions to ensure the security of sensitive data by using data-guard solutions, and providing for automated data access, maintenance, and update.

Objectives:

- Gather and map comprehensive, Territory detailed broadband data;

- Create a composite GIS inventory,

- Provide data to the NTIA for nation-wide broadband mapping;

- Identify unserved/underserved;

- Provide means for aggregate reporting and public access, considering confidentiality of the service provider data;

- Identify gaps in Emergency Service and Community Anchor's access;

- Investigate constraints impeding wider coverage;

However, beyond the island's objectives, CNMI recognizes the importance of the effort in promotion of business opportunities, public access applications for education, health, and commerce, and extending the reach of remote communities to a wider range of services. As such, other notable objectives of the Program include activities that would guide identification of gaps and constraints that are preventing wider coverage, programs to assist in determining tactical and short-term solutions to close the gaps, and efforts to form the basis for evidenced-based and data-driven strategic planning and investments in the territory's infrastructure and/or policies aimed at promoting broadband coverage and related services. These objectives include (but are not limited to):

- identifying unserved/underserved areas: it must be noted that the CNMI currently does not have accurate information regarding unserved or underserved communities. Therefore, one of the main objectives (and early targets) of the Program is to determine these areas using dasymetric (sub-census) population maps;

- identify possible gaps in Emergency Services' and Community Anchor's access to broadband, especially as it pertains to reaching wide and sparse populations; and

    - investigate constraints (policies, cost, investment gaps, etc.) impeding wider coverage.

    - evaluate the research and development infrastructure needs for CNMI's universities, colleges and businesses to compete in the new global economy

> The One Economy has vast surge capacities in GIS, broadband, data processing and automation, systems engineering, and secure public access application and data services to address all Grant requirements within the territory timelines.

Detailed resource planning will be done using the project planning process, considering work breakdown structure, identifying technical resources and equipment required to complete the tasks, and 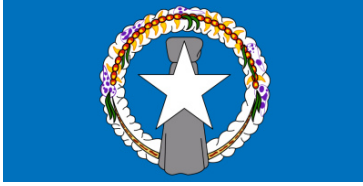analyzing the optimal number of parallel tasks that can be employed to meet the deliverable timelines. In order to ensure effective and efficient delivery of the data required by NTIA according to our timelines, about 80% of the resources were allocated within the first year of the project (with about 60% allocated within the first 3 quarters). Therefore, One Economy's full capabilities are utilized to meet the expedited timelines required by the grant. Yearly resources allocation estimates are depicted in Figure 1. Detail schedules and budget are provided in the subsequent sections.

Given this resource allocation, One Economy will be able to meet the requirements for the initial delivery of "Substantially Completed Data Sets" on November 1, 2009, followed by a more thorough broadband serviceability on or before February 1, 2010, and the "Complete Data Set by March 1, 2010. CNMI intends to use the data provided in the initial delivery to craft an application in Round 2 for infrastructure dollars. Additionally, One Economy expects to produce preliminary analyses for unserved/underserved areas, dasymetric (sub-census) analysis of the areas, and Emergency Services' and Community Anchor's access to broadband analysis in January, April, and June 2010, respectively.

Following the initial efforts, resource allocation is then balanced throughout the project to address incremental service offerings, public application access and web-based interfaces, and data updatability issues. Lastly, a slight increase of resources is provisioned toward the last 3 quarters in order to account for sustained transition of the processes and the platform.

Qualifications and Approach to Meet the Requirements

The implementation team represents a balanced public-private partnership composed of distinguished individuals, CNMI's Resources, and private industry experts and organizations with vast capabilities in broadband and telecommunications technologies, Geographic Information Systems (GIS) and data mapping, information systems engineering and

implementation, and web-based software and enterprise data management applications. The Department of Commerce also has existing relationships with, and access to, a wide range of collaborating agencies, and holds or has access to a considerable inventory of detailed island-wide data necessary to accomplish the tasks.

 In order to assure quality and comprehensive treatment of all tasks, including those involving cross-domain expertise required for the implementation, One Economy will assemble a small group of Subject Matter Experts (SMEs) across the major technical areas to advise One Economy on and work with the data providers regarding specific technical issues. The SMEs will include representatives from DOC, One Economy and other necessary CNMI governmental agencies. Initially, SMEs will customize data surveys according to the providers' inventories, will help with the data mapping, and will provide an overall gap analysis of the existing data and resources and the program objectives. During the course of the project, the SMEs will architect solutions, will provide on-going reviews of the progress, and will advise on technical implementation tasks.
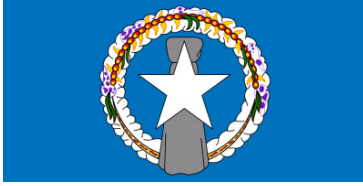
To ensure timely ***Data Gathering***, DOC will be making introductions to the service providers on behalf of the Territory Program immediately after the grant signing. SMEs, in turn, will work with the providers on data gathering arrangements and regarding any issues involving broadband-specific data mapping and data (content and format) compliance.

Equally as important, One Economy has an extensive inventory of and/or have secured access to detailed data sets relevant to the program.

To ensure information ***Accuracy and Verification***, The SME group will review "sample representative" data from each provider, and then continually will review the collected data to assure compliance and completeness. Wherever applicable, One Economy will also employ broadband technology-specific algorithms to uncover possible discrepancies, such as comparing aggregated data with the inter-connect network capacities. Finally, where possible, spot-checks will be performed manually.

Regarding data ***Accessibility***, One Economy has a variety of existing web-accessible, public facing, easy-to-use and to operate, GIS Internet applications which allow users to find, visualize and fuse a variety of layered information for viewing or printing purposes. Furthermore, One Economy has extensive experience in providing a variety of standard web-based "feature" and "map" services that enable easy access and consumption of data by other open-source or user-custom GIS applications. Finally, One Economy is already operating a large network of "meta-data" search and discovery services, data and meta-data automated ingest and production functions, and rapid but quality controlled (secured) data publication capabilities. All of these experiences will be used for supporting a variety of access, publishing, and data discovery methods.

To address data ***Security and Confidentiality***, One Economy will be using the security, access-control, authentication, and authorization services build into many of the applications described

above. Additionally, if desired, One Economy has the capabilities to utilize data guards similar to what currently is in use by various US Government agencies to protect their classified information, thus minimizing any concerns data providers may have over unauthorized access to company confidential information.

Wide spectrum of ***Applicant Capabilities*** as well as ***Capacity, Knowledge, and Experience*** are best demonstrated by (the public-private partnership composure of) One Economy's collective capabilities, depth of technical, capacities, and reach. One Economy offers an extensive cross-domain expertise and experience in related technologies and processes, as well as a wide range of affiliated collaborators, existing applications, and relevant inventory of detailed data sets to address all Program requirements.

Expedient Data Delivery requirements are addressed by One Economy's capacities, knowledge, and experience in data collection, automated processing, and existing applications and methods for data publications which are actively being used to support a number of critical services. The same experiences will be used to offer optimal data delivery options for this Program.
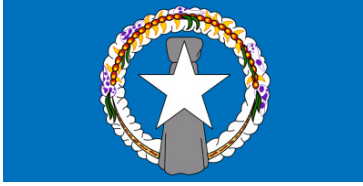
Similarly, One Economy's expertise in engineering systems and networks for automated data processing, One Economy experience involving broadband data interfaces and modules, and One Economy's distributed data network architecture, all offer optimal solutions to address ***Repeated Data Updating***.

The Team, Expertise, and Roles

One Economy will take the leadership role in implementation. To accomplish this, the One Economy has assembled a multi-disciplinary and cross-domain team of local and national experts to lead this implementation.

The implementation of the Program will be led by the One Economy. Expertise in GIS, data mapping and processing, and public applications access will be provided by One Economy. One Economy has proven and extensive capabilities in data management and GIS, and operates a vast inventory of baseline data, such as sub-census population data, parcel-level tax maps, community anchor institution, and other data sets critical to the success of the effort. One Economy also has expertise in handling large volumes of data, managing sensitive information access, and administering a wide range of web-based GIS solutions for public access to baseline and near-real-time information for user-generated product automation.

Broadband specific domain expertise will be supplied by One Economy and their national coalition. One Economy's team has extensive experience in digital mapping and Broadband Serviceability. They have over 150+ person-years of experience in the digital mapping business working for market leaders including Etak, GDT and TeleAtlas prior to joining this effort. Their capabilities are far reaching in the GIS space with expertise in geo-coding, GIS tools, mapping, spatial and relational databases and quality control. One Economy has extensive experience in the development of Territory Mapping solutions. One Economy's team was the first to launch a

national Broadband Serviceability engine in 2000 that aggregated together all of the major Broadband carriers into a single, web-based engine that was utilized by major retailers including Circuit City and CompUSA. This serviceability data included critical attribution such as availability, type of service, and speed of connection, pricing, and promotional data.

One Economy's Leadership team has held Executive positions at global digital mapping companies, global telecommunications carriers and multi-national consumer electronics firms, and offers end-to-end expertise in broadband planning at a large scale, and has access to a variety of national, inter-territory, and intra-territory broadband data that are important to the Program.

One Economy offers vast capacities in GIS, broadband domain expertise, data processing and automation, systems engineering, and secure (but open) public access application and data services expertise thereby ensuring implementation of a comprehensive solution that meets or exceeds the Grant requirements within the timelines.
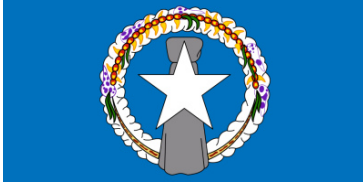
Implementation Process Overview

One Economy will rapidly begin gathering an inventory of wired/wireless broadband service providers within the commonwealth. Additionally, One Economy will start communicating the purpose of the Program and our requirements to the major service providers to secure their collaboration during the implementation phase.

Shortly after the Grant signing, One Economy will assemble a small group of Subject Matter Experts (SMEs) across the major technical domains: GIS & data mapping, broadband, data inventory, systems architecture, and data guards. The SME group will work with One Economy and the service providers to, among other tasks:

- Customize the surveys listed in Technical Appendix A of the Grant application according to the provider, and as necessary, ensure full compliance in data requests;
- Assist in the matching or "mapping" of the requested data elements to the data elements contained within the service provider's inventory;
- Assess the optimal process of obtaining the data, including any possible opportunities for automation of data mapping and inventory ingest processes;
- Assess the volume of the initial data, as well as long-term updates, and start revising the detailed system and network architectures;
- Review and assess existing data inventories available to One Economy, including baseline island-wide data, their accuracy, and any licensing/ownership rights for continual update;
- Assess data sensitivity and access requirements for proper data guard solutions; and
- Revise and customize information assurance and quality control processes to ensure fully meeting Grant requirements for submittal of the data to NTIA.

A gap analysis will then be performed in consideration of the Grant requirements, available data and resources, and the time constrains for the deliverables. Necessary adjustments to the

execution plan will be considered to ensure optimal balancing of the tasks and resources against the requirements and the deliverables to NTIA.

Next, the ***Data Gathering task*** will commence, with One Economy making requests to the service providers and ***establishing working relationships*** with each provider.

During this phase, One Economy will also review the requirements for data automation, processing and management. This will also include automated processing of the related metadata for each data set. System hardware and software licenses necessary to support the project will be acquired, installed, and configured at this time.

As the relationships with the Service Providers are solidified and the base data processing and management components are put in place, data collection steps will start in earnest. This will include ***collecting and automating data*** from the Broadband Service Providers*,* and ***preparing other GIS data*** to support both the processing of the broadband data as well as mapping the ***Community Anchor Intuitions***. Next, the ***data processing and analysis*** will start by utilizing a combination of manual and automated processing of the collected data and the related metadata towards preparation of a "Substantially Complete" data set. As broadband data inventory is processed, analysis regarding unserved/underserved areas will be performed.

Quality Control (QC) processes will be employed to ensure maximum accuracy of processing and data ingest into the GIS inventory. All data records will be geo-coded, as necessary, at this stage.
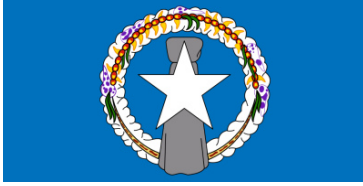
Built into the processes above will be steps to ***verify the accuracy*** of the data provided by the Service Providers and/or computed by processing steps (above), especially as it relates to actual performance of their services vs. advertised capacities.

Following the processing and validation steps, data sets will be delivered to NTIA as identified in Appendix A. Additionally, non-proprietary and non-confidential data will be transferred to a public access server and incorporated into web-based map viewers to create the "CNMI Broadband Portal" for public access and analysis.

The ***data updates and maintenance phase*** will start initially as soon as data inventory is built, but will increase as the platform ages. To address the long-term data updatability and accuracy issues, several approaches will be taken, depending on the nature of the data sets.

For baseline data, the information exchange GIS services as well as the web-based applications existing processes for periodic updates will be leveraged. Additionally, and as appropriate, One Economy will take maximum advantage of data services from the original sources (such as obtaining the transportation network from commercial mapping partners, including Navteq, DOT, demographic data from US Census, and base imagery from Yahoo!, Bing, etc.)

For the broadband data sets, to the maximum extent possible and according to predetermined specifications, One Economy will work to establish bi-lateral data exchange agreements between One Economy and the appropriate commonwealth entity. The data specifications will then be

used to periodically automate processing and ingest of data and metadata. The processing will also include error report generations that can be used to identify inaccurate or incomplete data sets.
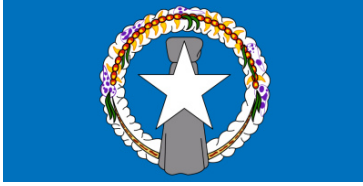
A web-based data access tool will be provided so that data providers may evaluate and sample their serviceability data and to ensure that their data are accurate and up-to-date.

While mapping all available carrier data and other serviceability data will be the initial and immediate priority, a second phase of data collection can cost-effectively supplement and verify this data with survey data collected directly from consumers. The collection and layering on of consumer experience data can be done in two basic ways: first, and most cost-effective, it can be done in volume online by "crowd-sourcing" data from automated 'speed tests' that individual users can run and receive immediate feedback for their own use as an incentive. Viral outreach efforts can encourage tens of thousands of users to 'take the test,' receive a 'report card,' and as a by product add to the automated aggregation of consumer experience data. Second, resources permitting, surveys of small business, residential and community anchor tenant broadband users can collect richer profiles of actual user experience and preferences.

Sustainability phase will commence after the first year of production and will continue beyond the Grant completion. During this phase, One Economy will develop the necessary documents describing the processes, data processing, technical specifications of applications, system architecture, system maintenance, and the like and ensure that technology infrastructure will conform with standard hardware and software. These documents will be used to provide training over the course of the project implementation to One Economy.

Collaboration phase will require a group effort from all involved CNMI agencies and private partnerships with participation from all stakeholders. The Program Management team from One Economy will deploy a traditional approach to project planning and collaboration. Five components will be followed in this Broadband Mapping project planning: a) Project Initiation Stage; b) Project Planning Stage; c) Project Execution Stage; d) Project Monitoring and Controlling Systems; and e) Project Completion Stage.

Planning Phase requires a well-designed and well-executed broadband adoption program for CNMI to make significant progress in realizing the economic, educational, and personal benefit of universal broadband adoption by all segments of the population. The planning program will have an emphasis on the following goals: (a) developing a baseline assessment on Broadband deployment; (b) identifying and tracking areas of low Broadband penetration and identifying suppliers who could assist the team in increasing adoption; (c) identifying barriers of adoption for Broadband; (d) creating regional and local Digital Connector programs to manage One Economy's planning efforts; (e) establishing Internet and computer ownership programs; (f) collecting Broadband market data to incorporate into our core Broadband mapping database; (g) facilitating exchange of information between private and public sector partners and (h) creating tools to be able to automatically input data into the core Broadband Map.

Commonwealth of the Northern Mariana Islands

Technical Narrative and Approach

Data Gathering, Verification, Processing, Access, and Security

One Economy is committed to implementing systems, processes and applications which will efficiently and repeatedly produce the requested data for NTIA. The narrative that follows illustrates the Company's experienced-based approach to satisfy the requirements as outlined in the NOFA.

Data Gathering

Data gathering involves an interrelated series of steps, or *tasks*, which collectively result in preparation of a comprehensive and high-quality datasets required by NTIA, meeting the four major areas outlined in Appendix A of the solicitation, including:
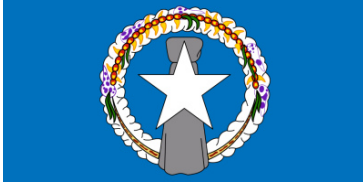
1. Broadband Service Availability in Provider's Service Area, for each Provider
   a. Service availability by Census Block
   b. GIS-based (for wireless service)
2. Residential Broadband Service Pricing in Provider's Service Area, for each Provider
3. Broadband Service Infrastructure, for each Provider
   a. Middle mile and backbone interconnection points
4. Community Anchor Institutions

Each of the *data gathering tasks*, detailed below, are organized to support both the expedient initial delivery and the semi-annual updates required by NTIA, as well as to support efficient public access to service area maps. The tasks also consider security and confidentiality for data access as described in the *Accessibility* and *Security and Confidentiality* sections, respectively. These tasks include establishing a working relationship with CNMI's Broadband Service Providers, establishing the data processing and management environment, collecting and automating data from the Service Providers, preparing other GIS data, and processing these data to a unified schema in order to support necessary updates and reports for NTIA and the public.

Mapping Development to Produce an Up-To-Date Detailed Street Map

Before the aggregation and conflation of broadband data, it is important to start with a current and complete detailed street map of the territory to ensure accurate results and correct association of information to address level. CNMI has produced a GIS map data base consisting of detailed street map and other land use data layers. The development of this data is not current or complete. A Mapping Update Program shall embark immediately following contract award to complete the digital mapping of detailed street network and relevant attributes to ensure that the CNMI has a high quality, complete and current base map to proceed with the broadband mapping effort.

Below outlines the high level tasks of the Mapping Update Program:

- Source aggregation (from satellite imagery to local tax maps)
- Manual digitization of street network, highways, postal and geo-political boundaries, land use, anchor points and other points of interests
- If required, differential GPS shall be used to collect the required geometry (streets and highways)
- Attribution of data (street names, addresses, parcel info, census info, other points and polygons, meta data)
- Topological and integrity checks
- QA - Random sampling including infield verification of features and attributes

Establishing a Working Relationship with CNMI's Broadband Service Providers

Even before this grant application has been approved, One Economy will begin talking with the key broadband providers in CNMI in an effort to help them understand this program, our approach, our information needs, and the opportunities and associated benefit of a successful program. In anticipation of a favorable review by NTIA, One Economy will continue our engagement with these organizations to expedite timely, accurate and comprehensive data collection from each of them. These steps will also help to accelerate and optimize the deployment of the data processing environment and the development of an appropriate data model. The first two tasks will be initiated following contract award (described later).
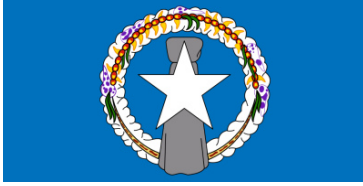
Establishing the Data Processing and Managing Environment

To support the eventual processing and management of the data collected under this activity, appropriate system hardware and software licenses will be acquired, installed, and configured. The hardware platform will be sized to assure sufficient storage and optimal performance given the volume of data and usage, as well as maximizing up-time. The software applications include a host of enterprise and scalable solutions, such as SQL Server or other similar Relational Databases extendible for GIS, ESRI server products (e.g., ArcGIS, ArcIMS, ArcCatalyst for metadata, etc.), and a variety of other (mostly open-source) Internet and Application Server (stock) products.

The system and the platform will be housed and hosted by One Economy, leveraging existing capabilities, for the period of performance (up to 5 years), and then will be transferred to the CNMI DOC(or designated Agency), as described in the sustainability section.

Initially, a fully configured GIS system will be deployed, and associated data models will be implemented to provide the baseline inventory system for the collected data. Incrementally, other services will be built on the system to address:

- data and metadata automation processing that may require systems engineering and software development;

- definition and implementation of GIS data services (and data standards), based on standard industry services (e.g., WFS, WMS, KML, XML, etc.), required for data exchange and information sharing and distribution; and

- Automated broadband data update processes and ingest (as feasible).

Over time, and as standard services are defined and deployed, the One Economy will develop, deploy, and release the following services:

- automated applications and/or processes employed by One Economy (or designated Agency) that would generate reports required by NTIA and according to the specifications provided in the Grant Solicitation Appendix A, from the GIS inventory;

- web-based standard compliant metadata search, discovery, and download (as applicable according to licensing agreements and confidentiality governing the data);

- web-accessible standard data exchange services, such as WFS, WMS, KML, XLM, etc. (constrained by the licensing agreements and confidentiality governing particular); and

- web-based accessible, password-protected as well as open access GIS viewer application(s) to allow public user access and product generation. The application will include printing capabilities of generated products; place-name gazetteers and address lookup search, thereby allowing for fusion of other baseline GIS data sets.

As noted, some of the components and processes are already in place within One Economy's data processing facility and can be used without any modifications. These include significant hardware, GIS software, applications, and data as well as other network and Internet servers and services. Other components – equipment and processes – will be acquired and developed under this grant to specifically receive, process, safeguard, and deliver required datasets to NTIA and to the public.

Collecting and Automating Data from Broadband Service Providers

This task will begin immediately upon award notification with One Economy making requests to the service providers for subscriber, service area and infrastructure data. One Economy will utilize a representative sample of these data to develop a data model to efficiently store data from each provider and create a database schema accordingly.

It is anticipated that each Service Provider will provide the requested information in different formats and schemas. One Economy will not attempt to harmonize all sources into a single unified data model/schema at this point, but will perform some pre-processing to standardize storage of common elements across all provider schemas (e.g., names, addresses, etc.). The resulting data tables can be considered a "staging area" designed to both effectively accommodate future inputs (i.e., updates) and outputs (further described below).

To populate the Staging Area database, automated scripts will be developed to Extract, Transform and Load (ETL) data from each provider into appropriate database tables. Depending upon available data transfer mechanisms and anticipated data update procedures a unique
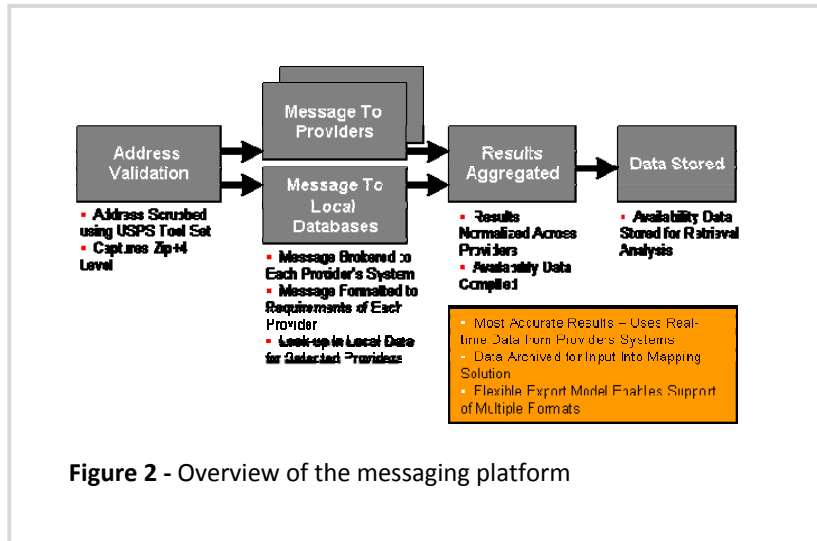
script/process is likely required for each data type (1 – 3 above) from each service provider. These ETL processes will be automated based on Data Processing and Publishing (DPP) service extracts, key parameters from the original source documents / data services, transforms them into geospatially-referenced data sets, and loads the resulting records into One Economy's Geospatial Database (GDb). Metadata (information which describes the underlying data) is also captured and/or updated at this point in the processing sequence. DPP is designed to process dynamic data from a wide range of data types from multiple sources using a diverse set of protocols and methods.

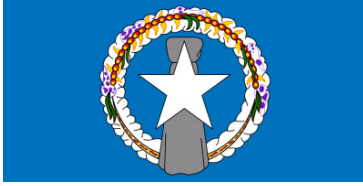**Figure 2 -** Overview of the messaging platform

In addition to automated parsing using DPP. One Economy will aggressively work with every small to mid-tier provider to integrate open Application Programming Interfaces (API) into their billing and/or serviceability engine. Specifically, One Economy has extensive experience undertaking similar integration efforts using the messaging platform (depicted in Figure 2). There will be some cases where carriers do not have the core expertise or infrastructure to build these interfaces. In those cases, the One Economy will determine whether integration of open APIs is feasible, and if not, will provide additional options based upon their situation. These options include:

- Secured FTP site – Allows carriers to send their data to One Economy in a standardized format

- Email Interface – For carriers that are less sophisticated, One Economy has a conflation tool that converts various file formats and integrates the data into a pre-production engine; and

- Fax Interface – To serve the lowest common denominator.

One Economy has used the above options in projects involving major broadband service providers, and have negotiated national agreements to provide serviceability data collected using these options to consumers through protective terminals and online. This experience includes the development of integrated tools to provide for dynamic display of serviceability data including attributes such as speed (upload and download), price, plan detail, promotions and bundled offerings. Their efforts produced the first ever nationwide assemblage of carrier serviceability. This experience will be used to gather serviceability information from these core providers.

Whether the ETL scripts or any combination of the above options are used, One Economy follows a formal testing process that includes establishment of test case scenarios and documentation of all required inputs and anticipated outputs.
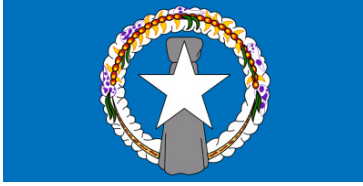
In other words, the testing step will ensure that the data contained within the Staging Area database are consistent with what was originally obtained from each Provider, i.e., that the ETL process did not introduce errors. Additionally, as the data is compiled from each service provider it will be verified for consistency and completeness (i.e., One Economy will review the data to assure that they are correct representations of the service that is actually provided). This second mode of verification/validation will include utilizing broadband technology-specific algorithms to uncover possible discrepancies, such as comparing aggregated data with the inter-connect network capacities. Spot-checks will be performed manually as well. At the conclusion of this task, One Economy will have:

- established data sharing relationships with all key Broadband Service Providers;
- implemented mechanisms to automate receipt of necessary service area, service pricing and infrastructure data; and
- populated a Staging Area database with an initial snapshot of data sufficient to address the NTIA requirements for items 1 - 3 as outlined in Appendix A.

Preparing other GIS Data

Data Gathering also involves collection and processing of additional GIS "framework" and community anchor institution data to fulfill the NTIA requirements (i.e., item 4 in Appendix A). These data are also needed to effectively fulfill the public-accessibility / Territory Map requirement. Presently, One Economy holds a significant number of these necessary datasets, many of which have been provided by strategic partners. The table below highlights key framework and anchor institution data, their source and main attributes:

GIS Framework Layers*		
Name	**Source(s)**	**Key Features / Characteristics**
Demography	US Census, Navteq	Cities, Place Names, Populated Places, CensusSF1 and SF3, Population Density
Transportation	Navteq, BroadMap	Airports, Seaports, Heliports, Roads, Bridges
Hydrography	USGS,	Streams, Wetlands, Dams, Rivers, Reservoirs
Cadastral	BroadMap	Land Parcels
Business Loc	InfoUSA & GOVCNMI	Hotels, Financial Institutions, Ice Production Facilities, Fuel Supply
Boundaries	Navteq & CNMI DOC	Coastlines, ZIP codes, Census Tracts and Blocks
Land Use/Land Cover	USGS, BroadMap	Landcover, Landuse, Fed Lands, Parks, Reserves, Zoning
Terrain	USGS	Digital Elevation Model (DEM), contours, Radar-derived DEM (IfSAR), shaded relief, LIDAR, topographical maps (DRG's)

Imagery	USGS, Digital Globe	Satellite (Landsat, SPOT, IKONS, QuickBird), air photos
Community Anchor Institution Layers		
Emergency Services	Navteq	Police & Fire Stations, Fire Response Zones, Emergency Shelters, Emergency Operations Centers, Siren Locations
Health Care Svc	InfoUSA, Schools, Health and Libraries Coalition	Hospitals, Health Clinics, Assisted Living, Skilled Nursing Fac
Public Facilities	InfoUSA & BroadMap	Public schools, Government buildings
Other	InfoUSA	Cemeteries, Places of Worship, Corrections Institutions

Table 1 – Sample of Existing Data Inventory

These datasets will be processed and quality controlled for high accuracy according to One Economy's "Best Practices" procedures. Key components of this process include establishment of defined staff roles and responsibilities including: (i) Processing Manager, responsible for prioritizing, scheduling, resourcing and tracking data automation processing; (ii) Geospatial Data Manager, responsible for overall data content and quality for GDb resources; (iii) Metadata Manager, responsible for ensuring quality and integrity of metadata describing the contents within GDb; and (iv) Analysts, who create (and utilize) data according the diagram below. Each is assigned specific database roles and permissions commensurate with their duties. Other components of the GDb processes described in the Practices document include acquisition planning, processing, validation, metadata authoring, data and metadata loading, and symbology file creation. A versioned geospatial database is used to support multi-user editing and review of new/revised data prior to them being committed to a production service.
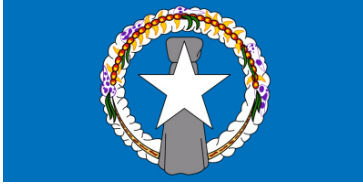
Data Processing and Analysis

The next step in the Data Gathering process involves additional processing of data within the Staging Area and GDb to populate the Broadband Production Database. In a sense, this moves, transforms and conditions all necessary data from assorted data providers, including Broadband Service Providers, into a unified and controlled data environment. It also captures data processing steps and other information required to update metadata. These steps will be automated to the extent possible, especially for re-occurring steps such "mapping"

Priority processing will be given to "*Substantially Complete*" data set.

Priority Analysis will be given to the Territory's "*unserved/*"*underserved*"

provider data to the data model developed by One Economy during the previous step. Other data loading, populating community anchor institution tables from One Economy's GDb, for example, may be done manually as updates are not expected to be frequent nor regular.

Initially, during this phase, the greatest emphasis will be placed on:

- Meeting the broadband mapping requirements for the "Substantially Complete" data set. All possible capacities at the disposal of One Economy will be utilized here to ensure the most realistic delivery of the data sets for the Grant's deliverable timelines;

- Aggregation of the broadband data to determine the Territory's "unserved" and "underserved" areas. These data sets are not currently available with sufficient accuracy.
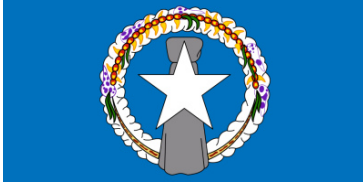
Priority will also be given to an initial analysis of the information above in correlation to the identification of possible unserved/underserved vulnerable / disadvantage population and emergency services. Among other benefit, this will help identify important "hot spots" for the broadband planning process.

Data Processing and Analysis tasks will include a combination of automated and manual (or manually assisted) steps to harmonize and insure quality and integrity of data required to address all items in Appendix A. These steps will include combinations of:

- **geo-coding** - providing address-based records with spatial coordinates;

- **reverse geo-coding** - assigning an address to data containing geospatial coordinates,

- **conflation** - combining and aggregating different sources of information for the same feature – e.g., two street maps – to provide a single representation of the feature by using the best available information from all sources – e.g. street geometry from one source and address ranges from another source;

- **feature editing/clean-up** - manual editing to resolve errors or discrepancies associated with automated processing steps – e.g., polygon "sliver" and "dangling nodes" removal to construct valid topology;

- **spatial overlay** - mathematically compositing information from two or more feature categories to into a single data source – e.g., assigning available broadband service levels from one GIS layer to addresses in a parcel database layer or combining individual wireless service area maps into a composite map;

- **spatial analysis** - implementing spatial algorithms to derive new/additional information – e.g., validating or estimating service availability by modeling wireless propagation over terrain or estimating wireline service boundary from infrastructure data layers.

Specifically, under this task, data will be processed and transferred from the Staging Area Database and from GDb into the Broadband Production Database such that:

- all addressed-based provider data (1a) are geocoded and loaded into the same geodatabase schema;

- all shape-based provider data (1b) are composited into the same geodata schema;

- all broadband service infrastructure data (3a, b) are reverse geo-coded (if/as necessary) and loaded into the same schema; and

- all community anchor institution data are geocoded (as necessary) and loaded into the same geodatabase schema. (As noted above, many of the required community anchor data are already available and geocoded.)

Quality Control (QC) and metadata preparation processes described above will be utilized in this phase as well to ensure consistently high-quality data standards.

One Economy has significant experiences and resources to accomplish these tasks. Highlights include:

Geocoding/Reverse Geocoding

One Economy has multiple means available for geocoding addresses within CNMI. The ESRI StreetMap which is a national dataset with 85 – 90 percent accuracy is often used as the starting point. Through the use of custom address locators, other datasets within One Economy's GDb which contain address range information can then be used to complete the geocoding process. These include national databases such as the National Transportation Atlas Database, NAVTEQ, and TIGER, as well as local data resources, such as county centerline datasets and parcel datasets.
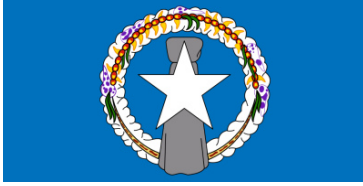
Dasymetric Mapping **-** One Economy has refined and applied methods to disaggregate census data to estimate the distribution of population and socio-economic characteristics. In CNMI the Census geography, even at the most detailed Census block level, varies significantly in both area and population size. This deviation in the Census geography is especially important in rural areas where census unit are large and population density is not homogeneous. Ancillary data sets, such as land use/land cover, can be used to more accurately distribute the population, and thus the demographic data associated with the population, to better identify segments of the population requiring specific services, be they emergency management services or broadband telecommunications services.

Spatial Modeling and Analysis

Spatial modeling and analysis techniques will be used to transform information provided by service providers into informative and easy-to-interpret coverage area maps. The underlying spatial data used to create this map will in turn be used to populate the publicly-accessible CNMI Broadband Portal and associated map services as well as combined with parcel and master address files to produce address-based broadband availability data required by NTIA.

Accuracy and Verification

To ensure information *Accuracy and Verification*, One Economy will review "sample representative" data from each provider, and then will continually review the collected data to assure compliance and completeness. Wherever applicable, One Economy will also employ broadband technology-specific algorithms to uncover possible discrepancies, such as comparing aggregated data with the inter-connect network capacities. Finally, where possible, spot-checks

will be performed manually. One Economy and our partners utilize multiple methods to determine data accuracy and validation. These methods include the following components.

Data Comparison – One Economy's approach is to develop a dynamic and updateable map database based on the capability of multiple technologies that allow for conflation of data from multiple sources. With over 20 layers of data in the list above, the mapping solution is capable of being both a data accuracy tool as well as a data verification tool. The data platform evaluates all the data that is contained in the database and produces exception reports based upon the anomalies from the data. One Economy's digital mapping technicians evaluate all the exceptions produced by the platform and make determinations based upon data that is available to them. If the digital map technician cannot make a thorough determination, they will refer the exception to Quality Control to do the following:
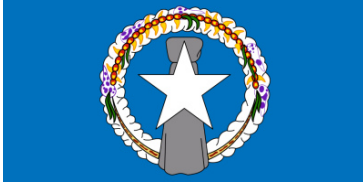
- Call Service Provider(s) in the specified area for verification;
- Dispatch Digital Connectors to visit the area and survey users;
- Contact territory resource partners for further verification of data;
- Contact data partners to ask for verification;
- Employ conference center partner to call businesses and consumers in the surrounding area to inquire about their Broadband service options.

Surveying: In order to validate provider information on coverage and to create a baseline for assessing broadband access demand, One Economy will initiate and manage several survey/sampling efforts in the Territory. First, One Economy will initiate a Preliminary Survey/Sampling effort to assess demand for and access to – both territory-wide (as baseline) and in unserved or underserved areas – broadband connectivity. This process is as follows:

- Create Territory-specific poll to ask consumers to identify their current broadband status:
    - connectivity offerings (if known)
    - pricing options (if known)
    - interest in broadband service
    - willingness to pay for broadband service
    - is Broadband a luxury, nice-to-have, or a needed service
    - where does the consumer access the Internet
    - are consumers properly trained and comfortable using the Internet
    - is Broadband content relevant to consumers

- Poll 300-1000 (statistically significant sample) in areas where anomalies exist territory-wide to establish baseline of consumer knowledge and territory-wide broadband availability.
- Poll 300-1000 rural citizens to quantify consumer knowledge and rural broadband availability as a baseline.

Additionally, One Economy will utilize Data Verification Specialists, who will be assigned to regions throughout CNMI to establish relationships with carriers, to work with regional and municipal data providers and to spot check serviceability in areas where we find anomalies.

Provider Verification – One Economy's web-based data access tool provides the capability to Service Providers to evaluate and sample their serviceability data and to ensure accuracy.

Speed Testing - While mapping all available carrier data and other serviceability data will be an initial and immediate priority, a second phase of data collection can cost-effectively supplement and verify this data with survey data collected directly from consumers. Data on consumers' actual online user experience can serve a number of important policy objectives, including the verification of carrier-provided data (such as "advertised" speeds) and the identification of bottlenecks due to under-provisioning. Concerning the speeds (throughput) provisioned to the territory's residences, businesses and community anchor institutions, the Commerce Department's NOFA requires not only the mapping of the "maximum advertised downstream (and upstream) speeds," but also the "typical downstream (and upstream) speeds" experienced in practice by consumers. While the accurate collection of actual consumer experience data requires additional collection efforts, it provides an opportunity to simultaneously survey consumers concerning other aspects of the service they receive.
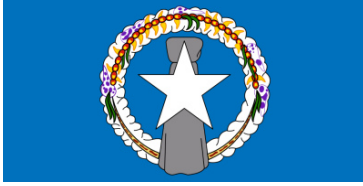
The collection and layering on of consumer experience data can be done in two basic ways: First, and most cost-effectively, it can be done in volume online by "crowd-sourcing" data from automated 'speed tests' that individual users can run in a minute or two – and receive immediate feedback for their own use as an incentive. Viral outreach efforts can encourage tens of thousands of users to 'take the test,' receive a 'report card,' and as a by-product add to the automated aggregation of consumer experience data. Second, resources permitting, surveys of small business, residential and community anchor tenant broadband users can collect richer profiles of actual user experience and preferences.

Crowd-sourcing – One Economy will be deploying tools online that consumers will use to measure and report actual measurements of the speeds (upstream and downstream), as well as (simultaneously) other diagnostic data on the quality of their broadband connections and actual user experience, including latency (packet delay), jitter (variability in latency), and routing or packet degradation discrepancies. As large numbers of broadband users access these tools for their own benefit, their data will be 'crowd sourced' (aggregated) into the territory map, improving overall quality at extremely low cost.

Through One Economy's platform, consumers and researchers will be provided with real-time feedback on the speed and quality of their Internet connections through the partnership with M-Lab.[1] M-Lab was founded by New America's Open Technology Institute (OTI), Google Inc., the PlanetLab Consortium at Princeton University, and other academic researchers to enhance Internet transparency and to sustain a healthy, innovative Internet.

M-Lab provides the consumer with immediate feedback, provides Internet researchers with aggregate data to discern patterns and, in the context of broadband mapping, M-Lab can add

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[1] *See* http://measurementlab.net OTI, in collaboration with the Knight Center on Digital Excellence, conducts community needs assessments and advises on strategies to address the needs of unserved / under-served areas.

geographically specific queries in order to generate views and reports that reveal the actual user experience in discrete local areas. The national scope of M-Lab's data on broadband connection speed and quality will promote the comparability CNMI's data with data gathered from other territories. Google and other companies contribute data hosting capacity. All data collected via M-Lab is openly available to the academic researchers.

Accessibility

One Economy has developed and operates several easy-to-use, web-based GIS applications, allowing public users to find, visualize and assess geospatial information. Additionally, One Economy has extensive experience in serving geospatial data to OUR users and clients via standards-based web services, including the Open Geospatial Consortium's (OGC) Web Map Service (WMS) and Web Feature Service (WFS) widely-adopted standards. The WMS and WFS services can be easily "consumed" within open-source and commercial-off-the-shelf GIS applications such as ArcGIS and MapInfo. Finally, One Economy hosts and operates a large network of distributed data and data services, supported by "metadata" search and discovery services, all aimed at supporting a variety of access, publishing, and data discovery methods.
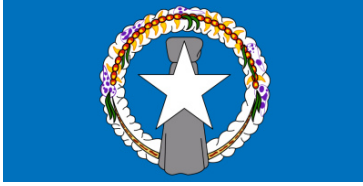
These capabilities can be easily customized to support the information access requirements of this project. The Broadband Portal web application would allow public citizens, agencies and businesses to view the availability of wireline and wireless broadband services for their place of residence, business, education, etc. via simple-to-navigate tools.

We will be the launching of the Broadband Stimulus Mapping Portal for CNMI. This portal will contain key content for the Territory including:

- ❖ A Message From The CNMI DOC
- ❖ Key Web Links
- ❖ Related News Item Links
- ❖ A Broadband Blog
- ❖ Broadband Project Portal
- ❖ Broadband Serviceability Search
- ❖ Maps and Reports
- ❖ Contact Us Feature including an online form, 800 Number and contact email

The Broadband Serviceability User interface is intuitive and very easy for the user to navigate. Utilizing mapping display technology from Google, the consumer, business or lawmaker will find their experience to be fast and complete. The tool will have advanced functionality built-in to the solution including:

- Address Look-up Tool to identify location and options for service
- Full zoom and pan
- Up to date digital mapping of the CNMI
- Full incorporation of Anchor Institution and Points of Interest Data
- Satellite and Aerial Imagery
- Elevation and Topographical Mapping

The web portal functionality also includes functionality that will assist CNMI with it BTOP and BIP initiatives. The Broadband Project Portal includes functionality that creates a means to solicit, receive and evaluate proposals focused on the following areas:

❖ Build-out of the Broadband Infrastructure in Unserved and Underserved Areas.
❖ Development of Programs To Increase Adoption of Broadband Services
❖ Development of Applications and Programs Aimed At Key Areas of Interest (Community Centers, Law Enforcement Agencies etc)

The Broadband Project Portal section within the Broadband Stimulus Mapping Portal will require registration. This will allow CNMI and One Economy to monitor and approved entries but it also allows us to build a database of potential partners who have interest in soliciting NTIA Broadband Grants. We believe that this tool will be incredibly beneficial in helping the Territory of CNMI accumulate, vet and process Broadband providers.
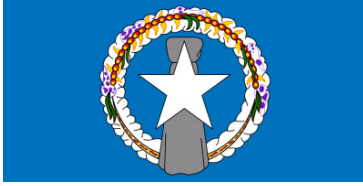
Security and Confidentiality

To address data *Security and Confidentiality*, One Economy will be using the security, access-control, authentication, and authorization services built into many of the applications described above. Further, public access will be provided via a map and data server hosted outside of the One Economy firewall. The data accessed by the public, either from the Atlas or one of the public web services (i.e., WMS or WFS); will be stored within the Public Access database. This database will be populated via an automated process, including appropriate filters, to prevent any company proprietary data from being transferred from the Production data base to the Public Access database. Thus, even if security were breached on the public access server, it would not contain any of the proprietary data.

In order to support flexible and secured information exchange to and from the non-public data repositories that will constitute the backbone of the system, One Economy will deploy data guard appliances comparable to what currently is in use by various US Government agencies to protect classified information. These guards will provide the data streams' obfuscation, conditioning, and pedigree labeling mechanisms to ensure data control policies compliance between and among data domains. The guards will include a graphical user interface to enable the implementation of data control policies into business rules to be applied on the data streams, thus providing a way for non-technical users to easily configure the data-level modifications required to ensure security, confidentiality, and information pedigree.

During this phase, and before any data services are released, requirements for data security and confidentiality (as stated by the service providers) will undergo a detailed review in order to develop the architecture and deploy the necessary data guards.

All data found within One Economy's processing environment falls into one of the following categories:

Commonwealth of the Northern Mariana Islands

Public Company Data – Public company data is defined as data that any entity, either internal or external to our company, can access. The disclosure, use or destruction of Public company data will have limited or no adverse affects on our company nor carry any significant liability. Proprietary Company Data – Proprietary company data is any information that derives IT'S economic value from not being publicly disclosed. It includes information that our company is under legal or contractual obligation to protect. The value of proprietary company information to our company would be destroyed or diminished if such information were disclosed to others. Most our company sensitive information should fall into this category. Proprietary company information may be copied and distributed within our company only to authorized users. Proprietary company information disclosed to authorized external users must be done so under a non-disclosure agreement.

Confidential Company Data – Confidential Company Data is information that is not to be publicly disclosed, regardless of IT'S economic value. The disclosure, use, or destruction of Confidential Company Data can have adverse affects on our company and possibly carry significant civil, fiscal, or criminal liability. This designation is used much less frequently. It is used for highly sensitive information whose access is restricted to selected, authorized employees. The recipients of confidential information have an obligation not to reveal the contents to another individual unless that person has a valid need to know for the information. Company confidential information must not be copied without authorization from the identified owner.

Confidential Customer Data – Confidential customer data is defined as data that only authorized internal our company entities or specific authorized external entities can access. The disclosure, use, or destruction of confidential customer data can have adverse affects on our company and their relationship with their customers, and possibly carry significant liability for both. Confidential customer data is entrusted to, may transit, or is stored by our company (and others) over which they have custodial responsibility but do not have ownership.

Project Feasibility

To ensure feasibility, the Team prepared a budget based on a detailed analysis of the resources required to accomplish the tasks over the performance period, considering timeline delivery requirements, and the 20 percent non-federal matching contributions. A summary of the budget is presented here. This section also provides an overview of the budgeting process, explanation of how the financial figures were determined, and how the allocation of resources were provisioned to assure project feasibility.

This project requires additional personnel to support the digital mapping requirements for CNMI. One Economy will be dispatching a core digital mapping staff and digital mapping vans to assist CNMI on creating a digital mapping dataset that will meet the requirements of the State Broadband Data and Development Program Technical Requirements. One Economy will utilize local personnel within CNMI under the oversight of One Economy to complete this work.

Commonwealth of the Northern Mariana Islands

Category	Year 1	Years 2 thru 5	Total	Match*
Personnel	0	0	0	$ 0
Fringe	0	0	0	-
Contractual	1,354,090	1,011,225		-
Travel	8250	22,000	30,250	-
Equipment	205,380	0	205,380	-
Other	-	-	-	775,000
Sub-total Direct	$ 1,567,720	$ 1,033,225	$ 2,600,945	$ 775,000
Indirect	0	0	0	-
Mapping Budget	**$ 1,567,720**	**$ 886,070**	**$2,600,945**	**-**
Planning Budget	**-**	**-**	**$ 498,460**	**-**
Total	**-**	**-**	**$ 3,099,404**	**$ 575,000 ***
Match %			80%	20% *

Table 1 - Budget Summary

* Territories are exempted from funding the first $200,000 of matching funds per the State Broadband Data and Development Grant Program NOFA

Applicant's Capabilities, Capacities, Knowledge, and Experience were described in terms of the One Economy's collective capabilities, reach, and the depth of the technical bench in partnering institutions. Additionally, to assure feasibility, One Economy prepared the budget based on detail analysis of the resources required to accomplish the tasks over the performance period, considering timeline delivery requirements, and the 20 percent non-federal matching contributions. To ensure meeting timelines for the deliverables, significant resources will be allocated during the first four quarters of this project.

Budgeting Process and Narrative

Budget determination was done using a detailed resource planning process. A detailed spreadsheet accompanying this application supports how the overall estimates were derived. This section provides a summary of the process and the overall structure of the budget.

Human Resources Cost: To begin with, technical requirements to accomplish each task were examined by One Economy. Each expert then provided a detailed Cost Structure necessary to accomplish the tasks (details provided under the Personnel section) and any inter-dependencies among the tasks.

Next, the information from all experts were compiled into a comprehensive plan, and cross referenced again for inter-dependencies. As a result, a detailed comprehensive Cost Structure was developed.
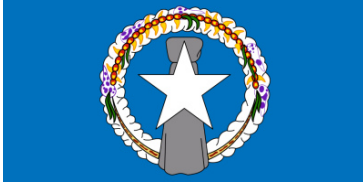
The comprehensive Cost Structure was then checked against the timeline constraints imposed on the deliverables to identify the optimal number of parallel resources required to meet the deadlines. As a result, an overall Project Plan was developed to identify the project's *Critical Path* and derive concurrent human resources needed to meet the project milestones. These resources where then mapped to the level of skills required for each task and to the cost for each skill set (including sub-contract personnel cost) to devise the budget for the human resources. A Fringe Benefit rate of 30% was used, where applicable, to include healthcare, social security, workers' compensation, vacation, and retirement.

Hardware and Software Cost: Estimating computer hardware and software cost was performed using skilled and experienced GIS experts, and Network and Security Engineers. One Economy examined the data requirements (expected volume, update frequency, etc.), public access and reporting requirements, and the security and access control mechanisms, and estimated a platform that can accommodate tactical needs but that can also scale up in the future. Based on these, One Economy proceeded to estimate the hardware and software cost for the platform using the manufacturers' published costs. All equipment will be compliant with hardware and software standards.

For this project, one database server with Direct Attached Storage disk array, one ArcIMS map server, one Application Server, and one Web Server were provisioned. Software licenses for RDBMS and ArcIMS software were estimated based on the hardware. Detail is provided below.

	Server	Qty	Price	Total
Database Server		1	$ 28,000.00	$ 28,000.00
	8 Core / 64 Threads @1.4 GHz Sparc T2			
Accessories	HBA	2	$ 1,000.00	$ 2,000.00
	300GB F 10K Hard Drive	4	$ 625.00	$ 2,500.00
	9733A-Z Optical Cables	4	$ 45.00	$ 180.00
Storage	**Dell Disk Array**	1	$ 16,850.00	$ 16,850.00
	3.6 Terabytes 12 x 300GB 15K SAS	12	incl	
Map & App Server		2	$ 15,000.00	$ 30,000.00
	4 Core / 32 Threads			
Web Server		1	$3,200.00	$ 3,200.00
	500 GB SATA Drive	2	$300.00	$ 600.00
Shipping for Above				$ 450.00
	Hardware Subtotal			**$ 83,330.00**
	Software	**Qty**	**Price**	**Total**
DRBMS	**SQL ServerLicensing (**multiplier .25 x cores)	2	$40,000	$ 80,000.00
Map Server	ArcIMS	1	15000	$ 15,000.00
	Software Subtotal			**$ 95,000.00**
	Digital Mapping Hardware	**Qty**	**Price**	**Total**
	Trimble GPS Pathfinder ProXT Receiver	1	$2500	$2500

	ArcGIS Editor	**1**	$7500	$7500
	Trimble Terra Sync GPS Analyst Extension	**1**	$3000	$3000
	Dell Latitude E6400 laptop	**1**	$2800	$2800
	External HD	**1**	$500	$500
	Power converter / back up	**1**	$1000	$1000
	Trimble GeoXM Handheld GPS	**3**	$2000	$6000
	Misc cables	**1**	$3000	$3000
Hardware and Software Cost				**$ 205,380.00**

Travel Cost: Similarly, number and frequency for travel estimated based on the Project Plan were used to derive the cost based on the federal government's published rules and regulations.

Intra-Territory

Monthly partner meetings are planned during the 1st quarter after project initiation. Trips will be taken on a quarterly basis for the 2nd through 4th quarters and once every 2 quarters for the balance of the project. Estimated number of trips for partner meetings: 11 trips @ $250 per tip = $2,750
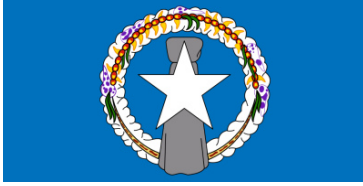
Domestic

Monthly partner meetings are planned during the 1st quarter after project initiation. Trips from Washington D.C. to CNMI will be taken on a quarterly basis for the 2nd through 4th quarters and once every 2 quarters for the remaining duration of the project. Estimated number of trips for partner meetings: 11 trips @ $2,500 per tip = $27,500

Indirect Costs: Were calculated at a federally negotiated rate of 19% of Modified Total Direct Costs (MTDC). MTDC consists of all salaries and wages, fringe benefit, materials and supplies, services, travel, and the first $25,000 of each sub-grant or subcontract.

Matching Contributions: Finally, three separate methods were used to determine the true and accurate value of the non-federal matching contributions. First and most straightforward, One Economy secured funding allocations from non-governmental foundations. Secondly, One Economy provided a list of tangible data set, imagery, and hardware and software that will be donated to the Program. Data set values and other costs were estimated based on the current market value. Finally, Territory employees' time involved with the project were estimated to complete calculations for the required matching funds. As stated above, the figure below of $575,000 represents the amount required for the Territory to provide along with the $200,000 allowance that is provided to the Territories per the NOFA (Section V).

Map, Imagery, Business and 3D Data, Software, …	Descriptions	Five Year Costs
Google	3D Building Data, Imagery , Servers, Co-location and personnel	$575,000

Total Funding	$575,000
Total In-Kind Funding	**$575,000**

Planning Budget Narrative

Project Management: Management of the deployment of team members, data analysis, and report delivery. Managed by the Regional Director - $75,000

Digital Connectors Training and Deployment Costs: The Digital Connectors will be chosen, trained, and focused on gathering data. Equipped with laptops and a custom application they will have the most efficient means to aggregate and transmit data. Their training will involve the necessary knowledge and skills to conduct these surveys, but more important, it will prepare participants to provide leadership and inspire interest in the project. The costs associated include the costs for their training sessions, as well as for their "supplies" which are netbook/portable data aggregation devices, and a Digital Connector t-shirt. The Digital Connectors also receive a cash stipend in addition to their free hardware that they use during the program. The program is specified for 200 Digital Connectors, but can be scaled down a smaller number with each Connector receiving a greater stipend, but this can be reassessed at the identification of the initial map highlighting need areas. - $200,000
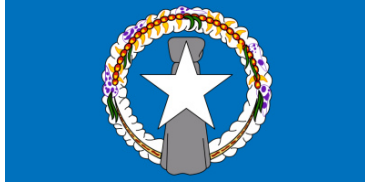
Regional Staff for Community Outreach and Hardware Acquisition: Staff member will be deployed to work with the Broadband Opportunities Coalition and community organizations to setup town hall meetings, meet with community stakeholders and aggregate data. In addition, this staff member will coordinate the affordable hardware acquisition program. - $56,374

Digital Connector On the Ground Support and Supplemental Training: Mid-level staff members will be working with Digital Connectors in the field to ensure that the program is being run effectively and properly. - $25,000

Report Development and Creation: This effort will focus intensely on ensuring that the data collected is efficiently ingested into the core Broadband Mapping dataset and that specific outputs are generated to provide data analysis, to create strategies and develop recommendations, and to track success. In additional to the writers, this includes Senior One Economy Staff time. - $40,000

Operating Expenses and Travel Costs: These costs are to facilitate the general operating expenses for the One Economy regional staff members full and part time to be able to travel among the islands, and within an island, with the youth, and cover the expense to take the data from the portable devices and upload those sets to the BroadMap/One Economy server. – $21,500

Indirect Rate: One Economy has a federally negotiated and agreed rate of 19% of activities, calculates the costs of services above and multiplies by .19 to achieve an indirect cost of $TBD.

Commonwealth of the Northern Mariana Islands
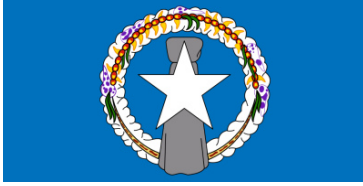**Planning Budget Spreadsheet**

Category	Total
Personnel	$ 152,874
Fringe	31,000
Contractual	40,400
Travel	8,000
Equipment	0
Other	125,000
Sub-total Direct	$ 417,874
Indirect	80,586
Planning Budget	**$ 498,460**

Applicant and the One Economy Capacities

One Economy's expertise and roles are described in detail in the previous sections. However, beyond what is described, One Economy will be working with team members from CNMI whose experience can greatly enhance project feasibility. This section summarizes the team member's composure and reach.

Core Personnel and Skill Categories

o **Special Assistant to the CEO of One Economy** will be responsible for Broadband Planning project management, creation of user experiences, & external partner coordination.

o **CNMI Project Manager** will be responsible for evaluating the project on an ongoing basis. Will serve as the interface between DOC and One Economy.

o **Program Manager** will focus on oversight of project management application, development and implementation of methodology, guides, best practices and metrics.

o **Technical Project Manager** will focus on assisting with managing the day-to-day details of the technical execution and is also specifically tasked with ensuring high quality standards are met.

o **Database and Requirements Engineer** will create and design RDBMS database model to store Broadband maps, demographic data, broadband assets and services. This position is also responsible for the creation of collection requirements and specifications for all databases.

o **Database Administrator** will manage and coordinate project database services.

o **GIS Systems and Mapping Engineer** will be responsible for deploying the selected GIS suite of tools for production. This position will also write required production scripts and tools to interact with or to incorporate other 3rd party sources.

o **Applications and Tool Engineer** will work with Google KML and Microsoft.net / Bing environments to integrate 3rd party data and applications on top of Google Earth or Microsoft Virtual Earth.

o **Geo-coding and Conflation Engineer** will develop algorithms and tools to perform geo-coding and reverse geo-coding to assist with geo-coding functionality. This position will also manage geopolitical and postal structures.

o **Sr. Quality Control Manager** will be responsible for the overall quality metrics which includes measurement criteria, definition of quality requirements, development of quality tools, and quality & certification processes. This position is also responsible for conducting and executing quality control / assurance programs to ensure that all input data sources and generated map data meet quality control specifications and requirements.

o **Senior Web Designer** will be responsible for Broadband Portal development; integration with Google maps or MS Virtual Earth and One Economy content to render broadband availability and serviceability result.

o **Cartographic Specialist** will be responsible for the production aspects of street map data manipulation, X boundary generation, creation and aggregation, geo-referencing 3rd party data, such as demographic data and serviceability data, to highly accurate street map data. This position is also responsible for the formatting and preprocessing of 3rd party input sources to meet preproduction specifications and requirements.

Extended Team

One Economy plays a major role in the supply and demand-side "Planning" phase for this Program by bringing resources of 90 full-time employees at 10 offices worldwide. One Economy uses innovative approaches to deliver the power of technology and information to rural and low-income people. In these efforts, One Economy has worked with a wide range of partners including CTIA, NCTA, Microsoft, Google, Cisco, and the Ford Foundation, and others.

In addition to involvement in broadband access programs, One Economy has a track record of delivering programs that result in broadband adoption. The resulting effort will be a comprehensive supply and demand side solution that contains the most comprehensive and verifiable broadband data set and map available for CNMI.

One Economy will be working with a selection of interest group stakeholders that represent a wide range of interests. The stakeholders include:

- *The New America Foundation* is a nonprofit, nonpartisan public policy institute. Through the Wireless Future Program and Open Technology Initiative, New America pursues a mission of ubiquitous and affordable broadband connectivity for all.

- *Broadband Opportunities Coalition* – Major national civil rights organizations have come together with One Economy to focus on addressing policy barriers that have slowed
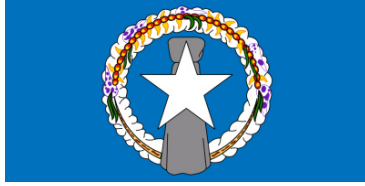
broadband growth, and promote the need to increase the adoption and use of related technologies to create greater wealth and new job opportunities.

- *Schools, Health and Libraries Coalition* – The coalition promotes connecting anchor institutions with high-capacity broadband to provide the greatest benefit to the disadvantaged and other unserved and underserved segments of the population.

- *BroadMap L3C* is a digital mapping and data aggregation company based out of Michigan. They have extensive experience in digital mapping. Their team has spent over 150+ years working for and with companies in the space including eTak, Geospatial Data Corporation and TeleAtlas. They have extensive work in the Broadband serviceability area, assisting in the creation of a nationwide Broadband serviceability tool in 2000.
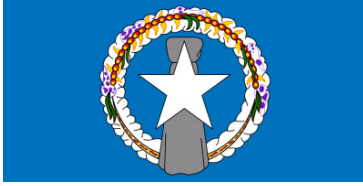
Expedited Data Delivery

Expedient Data Delivery requirements are addressed by One Economy's capacities, knowledge, and experience in data collection, automated processing, and existing applications and methods for data publications which are currently in use supporting a number of critical and emergency services. Similarly, One Economy's expertise in engineering automated processing of data, broadband data interface modules, and distributed data architecture, all offer optimal solutions to address the *Process for Repeated Data Updating*.

One Economy has the ability to reach all the timelines set forth by the NTIA. The plan is to utilize a three stage process to launch multiple versions of the solution, as summarized in the Table below. In order to meet the timelines, One Economy has allocated considerable resources within the first two quarters of the project. These resources can assist with data collection, processing, and automation, as applicable.

Project Timeline	
Tasks	Time frame
Acquisition of hardware, software and data sources	20 Days
Initial configuration, integration, implementation, data ETL, output definition	30 Days
Generation of initial analysis and results	45 Days
Refinement of analysis and results, plus integration of additional sources & capabilities	4 Months
Completion of the development of dynamic mapping platform. Full integration of all carrier serviceability data and third party source data.	6 Months

Table 2 - Project Timeline for Substantially Completed Data

Additionally, One Economy has extensive experience in digital mapping and serviceability experience, including development of core platforms that allows for automatic and manual conflation of data from over 50,000 sources nationwide. These sources of data include large

Commonwealth of the Northern Mariana Islands

imports from the Department of Transportation and InfoUSA (Geo-referenced Points of Interest Data) and others to individual user street geometry corrections. The ability to manage such diverse input mechanisms (including other diverse sources of data explained earlier) attest to the strength of One Economy's solution. We will manage the Broadband serviceability in the same manner.

Substantially Complete Set of Data By November 1, 2009

In order to meet this deadline, while the acquisition of hardware and software are taking place, One Economy's existing and extensive GIS environment may be used to acquire and process licensable data. The initial configuration, integration, implementation, data ETL and output definition will be completed in 30 days. Within a 45-day period, One Economy will generate the results of the initial survey. The key to this first release is:

- The Ingestion of the Raw Form 477 Data
- All Licensable Data Sources
- Integration of Core Digital Mapping
- Ingestion of Demographic Data
- Core Points of Interest and Anchor Institution Data

One Economy will then be able to assist CNMI in developing IT'S initial assessment of unserved and underserved Broadband areas and their ranking based upon agreeable demographical attributes. During this period, One Economy will also begin to dynamically integrate into the carrier systems.

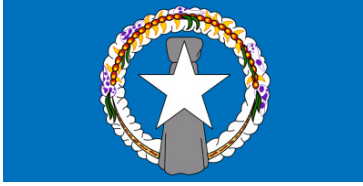## Substantially Complete Set of Data By February 1, 2010

The secondary release will be a more thorough perspective of broadband serviceability. Along with the data that was ingested and conflated in the first release, additional data sources will be incorporated into this release. These sources include:

- First Generation of Real-time Broadband Provider Data
- Quality Control Release of Initial Anomaly Batch of Data
- Digital Connector Survey Data Ingestion
- Broadband Data Sampling interface will be launched to allow Carriers data sampling
- Ingestion of first release of wireless spectrum data
- Speed Test Ingestions
- Release of 1st Generation of Territory, Regional and Municipal Data Ingestion

Substantially Complete Set of Data By March 1, 2010

The Broadband Serviceability final release will include all of the elements mentioned above in a fully automated solution. This is the official launch of the ConnectMap Live solution. All ingestion will be done in an automated or semi-automated process with the exception of the following:

- Anomaly Data Management

- Small Provider Data Ingestion – Some of these providers will still require One Economy to accept their data via facsimile, excel spreadsheet, email and ftp.

The final launch will include the completion of the following areas of development:

- Launch of All Broadband Provider Data
- Finalization of Development of Ingestion Process To Manage All Territory, Regional and Municipal Data.
- Full Automation of Wireless Spectrum and Serviceability Data
- Crowd Sourcing Ingestion Tool Completed

Access Applications Going Forward

Finally, One Economy's experience in automated processing, ingest, and publishing of data will be used during the course of the project to ensure timely access to accurate and updated information for various constituents (and according to the security guidelines). Activities here will include:

- Continual fine-tuning of the automated data processing and ingest;
- Developing web-enabled and web-accessible applications based on existing models;
- Defining and releasing standard web-enabled "feature" and "map" services; and
- Developing automated processes for data export and reporting, including those required to meet the "updatability" (and associated periodic reporting) requirements by NTIA.
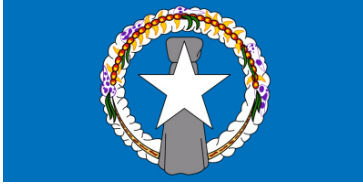
Process for Repeated Data Updating

The production and updating process of the database is an ongoing process that provides the latest and freshest content. The frequency of map/content updates varies depending on the type of source. For example, the detailed street network shall be updated on a monthly basis. Broadband coverage and serviceability updates can range from daily for user-generated content to semi-annual for FCC Form 477 data.

Our dynamic map database architecture allows for a "LIVE" product server to be utilized for product generation and on-demand query access by any entity at anytime producing results and user experience similar Google Maps and/or Microsoft BING. The product server will be refreshed on a daily basis from content updates made to the core database.

To the extent possible, the procedures developed for initially populating the Broadband database will be automated and scripted such that they can be run repeatedly throughout the 5-year grant period and beyond. The update process will involve:

- Obtaining updates from the service provider (including secured service-based processes);
- Using XTL processes to transform Service Provider data into the Staging Area Database, performing basis pre-processing data consistency checks, basic data normalization, etc.;
- Periodically updating data layers associated with Community Anchor Institutions, a task which is already part of One Economy's standard DGb processes;

- Processing and transforming Staging Area and GDb-stored data into the Broadband Production database, performing necessary geocoding, conflation, spatial editing and spatial overlay/analysis tasks as outlined above;

- Running scripts to prepare updated reports and datasets for NTIA; and,

- Running scripts to prepare public access data, passed through appropriate filtering steps to strip-off proprietary and confidential data

Furthermore, One Economy will ensure updateability by including the elements below:

- All data licenses are annual licenses and will be renewed each year.

- Through data sourcing and quality control, One Economy will continue to work to expand core data sourcing list to include newly licensable data as it becomes available.

- Agreements will be made to supply the Company with relevant data updates on a monthly or quarterly basis

- Key demographic information will be ingested as additions and deletions to provide a simple format to update anchor institutions, small, medium and large-sized businesses, health care facilities and educational institutions.

- Budgets for ongoing surveying have been developed to allow for verification of data throughout the five years.

- All non-disclosure agreements with the service providers will extend for the period of the grant.

A dedicated One Economy Specialist, an Account Manager, multiple technical support reps, and an Executive sponsor will manage this effort for the duration of this agreement.
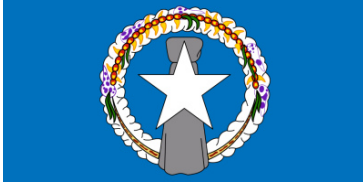
Planning and Collaboration

Effective outreach to collaborators and key stakeholders, "best practices" for project management, and Key Performance Indicator (PKI) evaluations will all be used to ensure success in this effort. Reporting will also be utilized to assure transparency. Each of these approaches is described below.

Collaborators and Key Stakeholders

One Economy has already established a very wide reach to and existing relationships with important stakeholders and collaborators across the Territory. It will be critically important to build consensus for the initiative. One Economy will include the following stakeholders within and outside of CNMI:

- CNMI Office of the Governor
- CNMI Office of the Chief Information Officer
- CNMI Department of Information Technology
- BroadMap, Google and New America – Broadband Experts and Implementation;

- Other key stakeholders and collaborators include:
  - Service Provider Member(s)
  - Navteq;
  - Schools, Health and Libraries Coalition Representative;
- Other Territory Officials and stakeholders, as appropriate, include:
  - CNMI Development Authority ;
  - CNMI Territory Department of Education;
  - CNMI Department of Health
  - CNMI Department of Transportation
  - CNMI Territory Tax Commission

As previously noted, One Economy already will be working on relationships with the Broadband Service Providers, will communicate the Program objectives to the major providers, and will work to obtain their commitment to the process. Similarly, One Economy will have existing data sharing agreements with many of the CNMI agencies named above. And finally, One Economy has access to a wide range of national resources that can augment One Economy's capacities and collaborative circle. One Economy will also be extending and formalizing new partnerships with the service providers and other key stakeholders, as appropriate.

Project Planning and Management

From the implementation perspective, the following is an overview of One Economy's Project Management Processes, utilizing best practices approach to project planning and collaboration. This process recognizes the following five major stages during the course of a project: a) Project Initiation Stage; b) Project Planning Stage; c) Project Execution Stage; d) Project Monitoring and Controlling Systems; e) Project Completion Stage.

The relationships among the components are depicted here.

Project Initiation Stage

Project initiation involves finalizing contractual agreements, gathering of the Subject Matter Experts (SME) for a detailed review, determining the scope and nature of the broadband mapping effort, and detailing tactical and strategic planning. Focus elements of this stage are:

Figure 5 - Project Planning & Management Stages

- Study analyzing the business needs in measurable goals.
- Conceptual design of the operation of the final products.
- Equipment and contracting requirements including an assessment of 'long-lead' items.
- Financial analysis.
- Stakeholder analysis, including Territory Departments, Broadband Providers, and support personnel for the project.
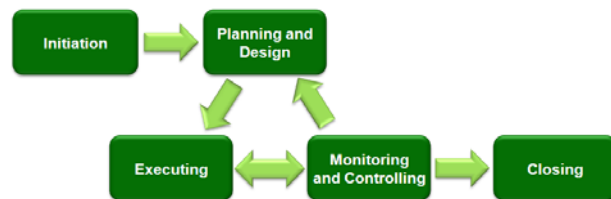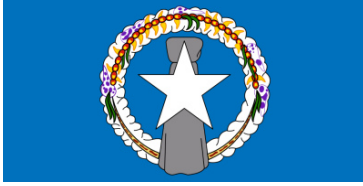- Project charter including costs, tasks, deliverables, and schedule.

Planning and Design Stage

During this stage, the system design is completed; prototype system is built and configured; the data model is established; and the initial database with licensed data and a control Broadband Provider dataset is tested. Controls are created to ensure that the final product will meet the specifications of the NTIA Technical Appendix. The results of the design stage should include a product design that:

- Satisfies the CNMI, NTIA, Broadband Providers and the end users
- Functions as it was intended.
- Produced within quality standards.
- Produced within time and budget constraints

Project Execution Stage

This stage involves development of the processes used to complete the work defined in the project management plan to accomplish the project's requirements. One Economy will coordinate people and resources from the Consortium, data partners and CNMI, as well as integrate and perform the activities of the project in accordance with the project management plan. The deliverables are produced as outputs from the processes performed as defined in the project management plan.

Project Monitoring and Controlling

Monitoring and Controlling consists of processes performed to observe project execution so that potential problems can be identified in a timely manner and corrective action can be taken, when necessary. The Broadband Mapping performance will be observed and measured regularly to identify variances from the project management plan:

- Measuring the ongoing project activities (where we are);
- Monitoring the project variables (cost, effort, etc.) against the project plan and the project performance baseline (where we should be);
- Identify corrective actions to properly address issues and risks (How can we get on track); and
- Influencing the factors that could circumvent integrated change control so only approved changes are implemented

Project Completion Stage

One Economy will close after each stage of the project by denoting the formal acceptance of the deliverables by the constituents. Administrative activities include the archiving of the files and documenting lessons learned. The Broadband Mapping closing phase consists of two parts:

Figure 6 - Project Monitoring

- Close project: to finalize all activities across all of the process groups to formally close the project or a project phase.
- Contract closure: necessary for completing and settling each contract, including the resolution of any open items, and final reporting and acceptance.
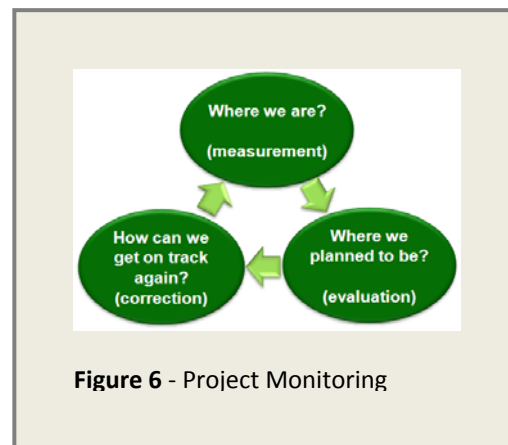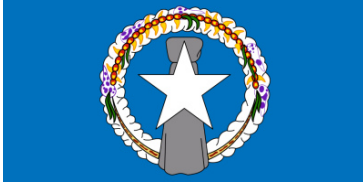
Key Performance Indicators (KPIs)

Beyond the Project Plan, One Economy will utilize Key Performance Indicators to assure focus on the tangible and measurable results and gauge the project's real world impact on policy making and the success of the Broadband mapping initiative. These KPIs will ensure that the company keeps a focus on the key areas of performance. Here are some PKIs to be considered for this project.
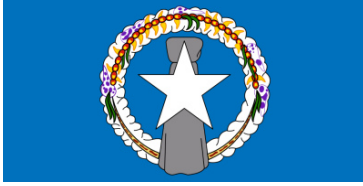
Key Performance Indicator	Description & Notes
Government Relevance	To be defined within the policy context by real value and impact measured in fact or as perceived by various Territory of CNMI regional government agencies, communities, and end users.
Business Relevance	To be defined within the business context primarily for telecom providers who participate in the One Economy program by real value and impact measured in fact or as perceived by end users.
Stakeholder Engagement	Complementing the Government Relevance and Stakeholder Engagement KPIs, gauge the quality of interaction and level of engagement with all the various stakeholder groups and participants on an ongoing basis.
Data Accuracy and Improvement Processes	The use of a blended approach will allow the cross check of various data elements and comparison of source data quality, however all anticipated data sources have limitations and shortcomings that a set of quality metrics and process improvement measurements can and should address.
Reportability	The measurement of whether the project, IT'S standard deliverables, and ad hoc use deliver the right level of information to the end user as needed.
Governance and Compliance	The project will utilize an array of varied data sources each with their own rights and obligations defined by agency policies, license terms and conditions, contributors' proprietary concerns, and privacy concerns which should be codified in project policy, tracked in real time, re-mediated when necessary, and reported on periodically.
Performance to Budget and Schedule	Though grant and commercialization opportunities will affect long term opportunities and direction, the initial budget and schedule will be defined and should be readily measurable by standard agency accounting and management practices.

Table 3 - Key Performance Indicators

Planning

One Economy's Broadband Planning program creates a solution for bridging the gap between the broadband map and the subsequent policy and consumer-focused decisions that are needed to ensure island-wide broadband adoption. Broadband adoption helps people as well as businesses enter the economic mainstream and be active participants in the Digital space.

Well designed and well-executed broadband adoption programs are vital for CNMI to make significant progress in realizing the economic, educational, and personal benefit of universal broadband adoption by all segments of the population. One Economy's planning program will have an emphasis on the following goals; (a) developing a baseline assessment on Broadband deployment, (b) identifying and tracking areas of low Broadband penetration and implementing

suppliers who could assist the Territory in increasing adoption, (c) identifying barriers of adoption for Broadband, (d) creating regional and local Digital Connector programs to manage planning One Economy's and efforts, (e) establishing Internet and computer ownership programs, (f) collect Broadband market data to incorporate into One Economy's core Broadband mapping database, (g) facilitating exchange of information between private and public sector partners and (h) creating tools to be able to automatically input data into the core Broadband Map.

One Economy has demonstrated that well-executed broadband adoption leads to knowledge and action in health, entrepreneurship, financial literacy, and education. One Economy is proposing to make best use of the Broadband Planning funds available through combining macro level data with on the ground demand-side data to achieve the goals.

One Economy has developed a customized Digital Connector program for CNMI. Digital Connectors are a task force of youth ages 14-21, who live in underserved areas and are exposed to the benefit of information technology through a comprehensive curriculum. They are trained to be technology ambassadors in their communities. Their primary role is to aggregate survey data at the street level, conduct and gather data through town hall meetings, and to manage and promote the affordable hardware acquisition program. The Digital Connectors provide a community with a passion for technology and a commitment to train and assist underserved populations on the benefit of Broadband and technology.
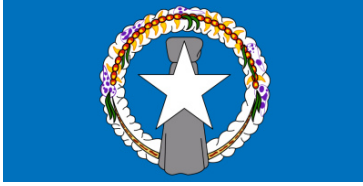
The Digital Connectors program is One Economy's planning solution designed to provide a process for accomplishing One Economy's goals. The proposed solution includes:

Broadband Availability Determination - The project will utilize the supply-side data collected from the overall mapping project to identify highly undeserved/unserved areas and focus on those communities with the most need.

Identification of Barriers to Broadband Adoption - The Broadband Planning efforts will focus on collecting demand-side data and insight from the unserved and underserved communities to identify and understand the barriers to broadband adoption. A comprehensive Broadband Planning report will include highly localized short, medium, and long-term recommendations for increasing Broadband adoption and utilization throughout the territory. Based upon that report, an action plan will be developed and implemented and will be continuously monitored and adjusted as necessary.

Increased Computer Ownership and Access Programs - One Economy has extensive experience in creating programs to increase broadband adoption and computer access among unserved and disadvantaged communities. With the assistance of One Economy's hardware OEM partners, the Company will establish an affordable hardware acquisition program for the underseved and unserved communities in CNMI.

Increased Community Anchor Institutions Broadband Availability – One Economy's Broadband Mapping program will assist the company in identifying the Anchor Institutions

that do not have ubiquitous broadband service. Once identified, the Company will create a plan to deliver Broadband hardware and service to those locations.

Promotion of Local Community Engagement – Through the Company's working with community stakeholders and by enlisting the support of the Broadband Opportunities Coalition which consists of the National Association for the Advancement of Colored People, League of United Latin American Citizens, National Urban League, National Council of La Raza, and the Asian American Justice Center, One Economy will coordinate resources and planning efforts to promote Broadband awareness and adoption..

The primary outcome of the Planning initiative will be to:
- Lower the price of broadband via public/private partnerships that further offset the cost;
- Increase the awareness of the benefit of broadband;
- Promote digital literacy to increase the ability to utilize broadband;
- Provide relevant content;
- Facilitate the acquisition of affordable hardware

Reporting

As the Applicant and administrator, One Economy recognizes that pursuant to OMB Memorandum M-09-21, it is responsible for the reporting of all data required. The sub-awardees and contractors also acknowledge and will comply with the guidelines and requirements set forth by the Federal Funding Accountability and Transparency Act of 2006 and OMB Requirements for Implementing Sections 1512, 1605 and 1606 of the Recovery Act, and provisions regarding "Buy American," wage rate, and separate identification of funds requirements.

One Economy shall complete reporting functions per the NOFA requirements.