## Application for Federal Assistance SF-424

Version 02

**\* 1. Type of Submission:**
- [ ] Preapplication
- [X] Application
- [ ] Changed/Corrected Application

**\* 2. Type of Application:**
- [X] New
- [ ] Continuation
- [ ] Revision

**\* If Revision, select appropriate letter(s):**

**\* Other (Specify)**

**\* 3. Date Received:**
08/26/2009

**4. Applicant Identifier:**

**5a. Federal Entity Identifier:**
Department of Commerce

**\* 5b. Federal Award Identifier:**
RIN: 0660-ZA29

**State Use Only:**

**6. Date Received by State:**

**7. State Application Identifier:**

**8. APPLICANT INFORMATION:**

**\* a. Legal Name:** Center for Innovative Technology

**\* b. Employer/Taxpayer Identification Number (EIN/TIN):**
54-1282820

**\* c. Organizational DUNS:**
120835756

**d. Address:**

| | |
|---|---|
| **\* Street1:** | 2214 Rock Hill Road |
| Street2: | Suite 600 |
| **\* City:** | Herndon |
| County: | Fairfax |
| **\* State:** | VA: Virginia |
| Province: | |
| **\* Country:** | USA: UNITED STATES |
| **\* Zip / Postal Code:** | 20170-4228 |

**e. Organizational Unit:**

Department Name:

Division Name:

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

Prefix: Ms.

**\* First Name:** Patricia

Middle Name:

**\* Last Name:** Inman

Suffix:

Title: Contracts and Grants Manager

Organizational Affiliation:
Center for Innovative Technology

**\* Telephone Number:** 703-689-3044

Fax Number: 703-689-3001

**\* Email:** pinman@cit.org

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**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.):**

All areas of the Commonwealth of Virginia

**\* 15. Descriptive Title of Applicant's Project:**

Virginia proposes to develop an advanced architecture, model, and comprehensive data library to underpin Virginia's "next generation" broadband map.

Attach supporting documents as specified in agency instructions.

Add Attachments    Delete Attachments    View Attachments

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

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**16. Congressional Districts Of:**

| * a. Applicant | 10 | * b. Program/Project | All VA |
|---|---|---|---|

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

|  | Add Attachment | Delete Attachment | View Attachment |
|---|---|---|---|

**17. Proposed Project:**

| * a. Start Date: | 10/01/2009 | * b. End Date: | 09/30/2014 |
|---|---|---|---|

**18. Estimated Funding ($):**

| * a. Federal | 4,772,404.00 |
|---|---|
| * b. Applicant | 8,500.00 |
| * c. State | 3,945,000.00 |
| * d. Local | 0.00 |
| * e. Other | 482,781.00 |
| * f. Program Income | 0.00 |
| * g. TOTAL | 9,208,685.00 |

**\* 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: | Mr. | * First Name: | Peter |
|---|---|---|---|
| Middle Name: | | | |
| * Last Name: | Jobse | | |
| Suffix: | | | |

| * Title: | President and CEO |
|---|---|

| * Telephone Number: | 703-689-3040 | Fax Number: | 703-689-3001 |
|---|---|---|---|

| * Email: | pjobse@cit.org |
|---|---|

| * Signature of Authorized Representative: | Patricia Inman | * Date Signed: | 08/26/2009 |
|---|---|---|---|

Authorized for Local Reproduction

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

**Application for Federal Assistance SF-424**                                           Version 02

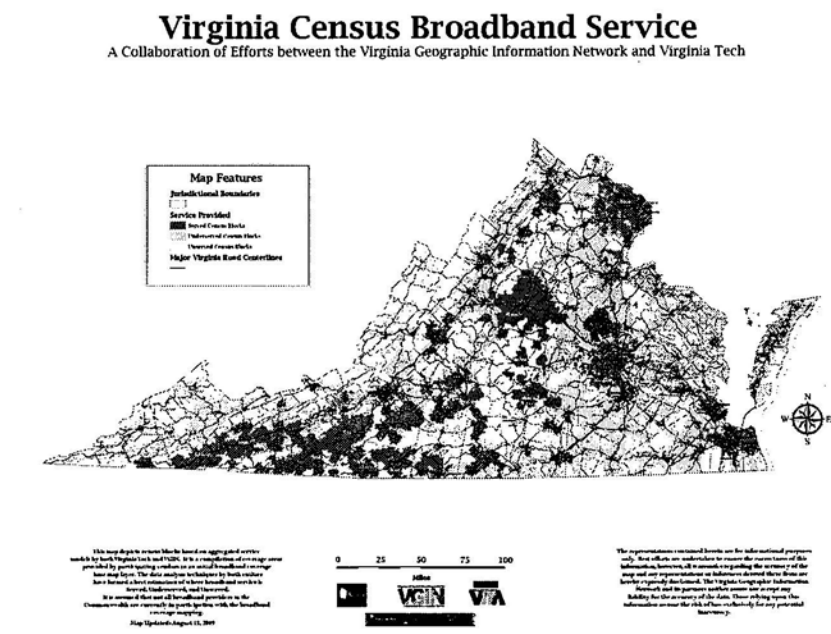**\* Applicant Federal Debt Delinquency Explanation**

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.

The CIT Team includes two primary partners - Virginia Tech's eCorridors Program through the University's Center for Geospatial Information Technology (Virginia Tech) and the Virginia Geographic Information Network of the Virginia Information Technologies Agency (VGIN/VITA) to develop and maintain a comprehensive statewide data library through the use of existing data/base maps, supplemental data from private/public sector providers, third-party (independent) data collection and verification, survey research methods, self-reporting Internet speed testing and mapping tools, a multi-platform framework and publicly-available online interface for the dissemination of Virginia broadband data. Additionally, the Commonwealth proposes to develop an advanced architecture and model for a "next generation" inventory of broadband-related data, consistent with the ongoing developments in the NTIA and FCC broadband plans and extending the NTIA specification to include a number of other elements of interest to broadband stakeholders in Virginia in a way that is scalable to the national level.

In addition to the mandated elements collected under this application, the Commonwealth proposes to collect additional data sets (e-commerce/electronic medical record usage, location of state-managed transportation projects, location of vertical assets) to augment Virginia's state map/data library and provide a means of obtaining baseline and progress measurement data (through prescribed updates) for ARRA-supported initiatives and programs of national significance (such as those through the Office of the National Coordinator related to electronic medical records).

*Unserved/Underserved Areas*



**Virginia Census Broadband Service**
A Collaboration of Efforts between the Virginia Geographic Information Network and Virginia Tech

Between the release of the NOFA and the submission of this application, the Commonwealth, in conjunction with our partners, Virginia Tech and VGIN/VITA, produced a preliminary map (http://gismaps.virginia.gov/broadband_census ) to assist communities with the identification of un/under/served and rural areas (by census block) as defined by RUS/NTIA. The map shown above is derived from data collected for Virginia's original pre-NOFA broadband map at http://gismaps.virginia.gov/BroadbandMappingFinal/, and derived estimates of un/under/served census blocks by combining our service provider data with statistical and mapping methodologies developed by Virginia Tech and VITA. CIT presented this map to those providers currently under non-disclosure agreements for review prior to its release. Providers' updates to the original model are reflected in the map shown above.

### *Prioritization*

Projects presented to the Commonwealth (by NTIA) for prioritization will be reviewed by a cross-secretariat team identified by the Governor. Those projects meeting the following criteria will be given the highest priority:

- Those with the ability to affordably serve un-served areas
- Those projects that have a high probability of positively impacting areas that suffer from ongoing and documented negative socio-economic conditions such as high-levels of unemployment, above average eligibility in free/reduced lunch programs, above average poverty, etc.

The priority list as defined by the "team" will be provided to the Governor for his review. Final prioritization of the projects will be at the discretion of the Governor.

## 1. DATA

### A. Data Gathering
The Center for Innovative Technology (CIT), along with its primary partners – Virginia Tech's eCorridors Program through the University's Center for Geospatial Information Technology (Virginia Tech) and the Virginia Geographic Information Network of the Virginia Information Technologies Agency (VGIN/VITA) will develop:

- An advanced architecture and model for a "next generation" inventory of broadband-related data, consistent with the ongoing developments in the NTIA and FCC broadband plans and extending the NTIA specification to include a number of other elements of interest to broadband stakeholders in Virginia in a way that is scalable to the national level.
- A comprehensive statewide broadband data library to be developed and maintained through:
    - use of existing data/base maps
    - supplemental data from private/public sector providers
    - third-party (independent) data collection
    - survey research methods
    - self-reporting Internet speed testing and mapping tools

A multi-platform framework and publicly-available online interface for the dissemination of Virginia broadband data

The Team will be augmented by four private sector partners to assist in the data collection and verification process:

- Apex CoVantage – Independent end-use data collection and verification
- AfterImage, LLC – Data conversion for providers unable to provide data in NTIA compatible format
- Broad Axe Technology Partners – Telehealth/Electronic Medical Record connectivity and benchmarking
- Strategic Networks Group – Electronic Commerce connectivity and benchmarking

### *Spatial Data Creation, Verification and Maintenance*

The Technical Appendix of the NOFA states "awardees shall provide NTIA with a list of all addresses at which broadband service is available to end users in the provider's service area, along with the associated service characteristics identified below" (Section 1.a.). Because accurate address location information is a critical component to data verification and cross-checking, Virginia is proposing as a part of this effort that a statewide address point data collection and verification effort be undertaken. In addition to an accurate address point base map, this will provide spatial integrity in subsequent broadband validation, maintenance and update efforts. It is estimated that approximately 45% of jurisdictions have quality geospatial address point data, providing a starting point for 100% statewide coverage. Address point data will be cross-referenced with Virginia Base Mapping Program's high resolution orthophotography and street centerline datasets as a means of spatial validation. Updates to address point location information will be tied back into the statewide 911/road centerline data maintenance efforts already in place in the Virginia Geographic Information Network/VITA. At completion, statewide address point data will become public domain data.

### *Methodology*

If awarded, a portion of the Broadband Mapping funds would be used to hire additional contract support personnel to collect and verify address point data. Existing local data would be gathered from 911 addressing databases and used to generate approximate address range information. Working with local knowledge experts, these contract personnel would use GIS tools and technologies to accurately position the address point on the primary residential structure on top of existing high resolution orthophotography.

- All address point outputs will be cross-referenced with existing Broadband service provider data for quality control.
- Final output will be a master address point record database that includes the base attribution required for NOFA reporting

*Project Timeline: Address Points*

Address point development and verification is expected to occur within 6 months of grant award. Major milestones include:

- Survey and quality review of currently-available address point data.
- Develop work plan, define processes for statewide completion, and identify QA/QC steps
- Complete data development, compare to existing broadband addresses, and update location information as necessary

*Data Model Development*

One of the deliverables for this project – one that has relevance and utility well beyond its scope – is a comprehensive data model for broadband. By "data model," we envision a formal documentation of the data architecture, representation and accessibility to guide our efforts which will define the:

- Kinds of information that need to be collected for a thorough understanding of broadband availability, affordability and quality, including structured and unstructured data
- Relationships between individual data elements in a detailed schema
- process itself that is employed to collect the data and turn it into actionable spatial information
- Strategies for representation of the data elements as a spatial data model
- Standards and metadata for documentation of the above

This data model would be developed in the early stages of the project and used as a reference in subsequent stages of the process. It is envisioned that a model such as this could have relevance to other state and national interests; therefore, it would be designed to be as scalable as possible and then made freely available. It is intended that the model be vetted by outside domain experts for completeness and accuracy.

*Process for developing the data model*

- Conduct an environmental scan of existing data structures and representations for broadband infrastructure, services, coverage, availability, etc. See what others have done and what, if anything is coalescing as a standard. Adopt and comply with all emerging standards, should they exist.
- Model specification – enumerate the various data elements that would be included in a "broadband data library" that represent the complete picture of broadband availability, affordability and quality in a community. For example, these might include (but would not be limited to):
  - (i) Physical availability
    - a. Telecommunications Infrastructure
      - i. Fiber routes
      - ii. Central office locations
      - iii. Points of Presence
    - b. Wireless service areas

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      i. Propagation models for RF in relevant areas of the spectrum
     ii. Terrain/surface models and atmospheric conditions
  c. Vertical Assets
      i. Functional availability
  d. User speed test points
  e. Service Quality
  f. Gaps in service

The next stage in model specification is the enumeration of the necessary attributes for each identified data element. The data type, length and format should be considered at this stage and here again, all open standards should be considered. For example:

    (ii) Fiber routes
       i. Fiber count
      ii. Fiber type (SMF/MMF)
     iii. Owner

Relationships between data elements will then need to be formalized within the model framework; for example, service areas *are served by* a network *consisting of* fiber routes *which contain* cables *which contain* fibers… etc.

It should be noted that the NTIA data specification from the NOFA is a good starting point for the attribute and data format specification in our proposed data model. However, we suggest that it can be taken further to include a broader array of data elements beyond provider service areas; and, thereby, increase its flexibility and usefulness as a means to guide this and other broadband mapping efforts.

- Model vetting and verification with key public and private stakeholders – in this stage it will be necessary to solicit comment and critique from government, private sector and academic experts on both broadband and geospatial data model development to determine if the model meets the standards of generality and scalability to be a useful guide for this and possibly other broadband projects.

- Model implementation as GDB and other formats – translation of the model from the conceptual to its digital representation as a collection of spatial database tables and the associated relationship classes and metadata. At this stage we re-iterate our commitment to vendor and platform neutrality; while we fully intend to support the NTIA-mandated ESRI shapefile format, we also recognize the utility in a model representation accessible to users of other GIS, database and web mapping platforms.

- Model dissemination – we intend to make any data model produced under this effort publicly available, with the goal of improving standardization across broadband mapping projects and possibly achieving acceptance as a standard by the general GIS user community outside of the scope of the ARRA projects.

*Data Elements*
1. **Broadband Service Availability in Provider's Service Area**
   a) *Availability by Service Address –Services associated with Specific Addresses*
      The Commonwealth currently has an initial data set of broadband availability data from 30 providers operating in Virginia that will serve as the basis for our data collection effort and submission to the National Broadband Map as well as the parallel development of a "next-generation" data inventory and Virginia broadband maps/library. Additional data (as outlined by NTIA) will be collected and derived from data sets provided by the initial 30 vendors plus additional broadband service providers in the Commonwealth – including those receiving funds through the ARRA BTOP infrastructure program. To the extent that data is unavailable from private providers in the area, independent data collection methodologies will be applied to obtain the requisite data. Cross-checking and verification of all data will be performed via several methodologies by the Virginia mapping team partners and survey teams.

      In addition to the tab-delimited text file provided to NTIA, point locations for all addresses collected in section 1. (a) of the NOFA will be provided. Point locations shall:

      - include the x,y locations of each address
      - be in Environmental Systems Research Institute (ESRI) file geodatabase format
      - be consistent with applicable portions of the Federal Geographic Data Committee (FGDC) Street Address Data Standard (http://www.fgdc.gov/standards/projects/FGDC-standards-projects/street-address/)
      - have the NOFA-required records (attributes) attached or linked to each point

      Data sets for those end-users served by state managed or municipal networks will be obtained directly from existing data sources including the Virginia Department of Emergency Management, the Virginia Information Technologies Agency, as well as source data from individual municipal network administrators. **Note:** For providers willing to participate, but lacking sufficient capacity to produce data files in the appropriate manner, the Commonwealth will provide assistance (under this initiative) to convert existing data into an NTIA-compatible format. Non-disclosure agreements consistent with the requirements outlined in the NOFA will be utilized, upon request by the provider, to ensure cooperation and mutual agreement on data usage terms and conditions throughout the performance period of this proposed project.

      In addition to the supply side (information on service areas is obtained directly from service providers) approach to data collection outlined above, The Virginia Tech eCorridors program will implement a demand-side data collection and assessment, in part by leveraging an updated and enhanced version of its Community Broadband Map tool

(http://ecorridors.vt.edu/maps/broadbandmap.php) that has been collecting broadband data in Virginia since September 2006 to collect input from Virginians on the speed, type and quality of their broadband service. This free, online resource enables broadband subscribers in Virginia to run an easy to use open-source speed test and add the results to a dedicated Google mashup map of user-generated broadband data. An associated targeted outreach program (in concert with the initiatives proposed in the CIT submission under the BTOP building-sustainable demand program) will encourage Virginia citizens to visit the online resource, test their speeds (upload/download), and provide optional information related to other factors of broadband service and adoption.

The CBM is an interactive web-based Google Maps application. Users click on a zoomable map to mark their location, and then initiate a speed test on their Internet connection using the Network Diagnostic Tool (NDT) developed and maintained as an open-source project by Internet2 (http://www.internet2.edu/performance/ndt/). Once the speed test has run, the results are saved along with the user's latitude and longitude, as marked interactively by the user on the map. At this point, the user has the option of entering additional connection data, such as the price paid, the service type (Residential, business, etc.), the access technology (cable modem, DSL, etc.), the service provider, and a subjective assessment of connection adequacy. No personally-identifiable information is collected during this process, and tests are anonymous. Over time, the system has the potential to collect a sufficiently-large sample of data points to allow researchers to analytically "connect the dots" and infer the location of broadband service areas, or if the service areas are known, use the measured speeds as a verification tool against the self-reported or advertised speeds of providers in the area.

In the context of this mapping proposal, we propose to augment the service provider data described in the "Data Gathering" section with speed test data collected through eCorridors' interactive Community Broadband Map (CBM). This can be done in a variety of ways, as a function of sample size:

- If sample size is sufficiently large and captures the underlying spatial variability of broadband access in Virginia, the data can be used in its own right to develop an entirely citizen-generated map of broadband, which could complement the service-provider-data-based map.
- If only a few points are available, they can still be used individually for verification of the service-provider-data-based map as ground truth "spot checks." Furthermore, since the NDT tool captures more data than simply speed – such as network latency, congestion problems, and bottlenecks – we can use this ancillary data to troubleshoot *why* network problems may exist or areas may be underserved.

We propose to make a concerted effort to increase the sample size and drive traffic to the speed test site. By conducting a targeted outreach (in concert with

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the efforts proposed under the broadband planning and demand building campaigns), we hope to raise awareness of the site and get Virginians interested in the affordability and quality, as well as the price, of their broadband.

In parallel to the efforts to drive traffic to the eCorridors map, we propose to refine our analytical methods to better translate the raw user-generated speed test points into meaningful, accurate maps. We propose to develop repeatable, effective methods for the integration of this data with the service providers' data, as well as the creation of standalone statistically-derived maps such as the first iteration of the map offered to the localities as a planning tool and reference for ARRA proposal development (described in more detail below).

Because the eCorridors broadband map is constantly online and users can test their speed at any time, it functions as an ideal vehicle for updates. At the semiannual interval mandated by the NOFA, or sooner if sufficient data points are collected during a given time interval, we propose to collect the data from the database that drives the eCorridors broadband map and generate statewide maps; which, given sufficient sample size, could then be integrated with the service-provider data that forms the backbone of our primary "Virginia Broadband Map." Other data elements collected by the eCorridors broadband map may also be useful in their own right, *given sufficient sample size,* as standalone components of the proposed "broadband data library," such as end user-generated maps of speed, upload speed, price, service type, and access technology, or web-based data exploration and report generation tools that would enable users to summarize and group variables such as average download speed by access technology or average cost per megabit per second.

The extent to which the eCorridors broadband map data will be able to inform the main Virginia Broadband Map and produce value-added derived products will greatly depend on the sample size achieved. However, we believe this tool has significant potential to add an additional dimension of depth and perspective to our statewide mapping efforts.

The eCorridors program will perform a series of analyses using the data points created by end-users, and at the agreed-upon update intervals will use the results of these analyses to verify the service provider data collected in parallel by CIT and VGIN/VITA. The Virginia mapping team will perform a verification process to determine accuracy and if there are discrepancies with the provider data that need to be addressed, CIT will work to resolve the conflicts and determine the appropriate resolution. The eCorridors program also intends to create additional mapping products from all broadband data collected under this initiative (with exception for data covered under existing NDA's prior to the start of the performance period) to complement the primary state map, reflecting Virginia's commitment to the concept that the state-level map resulting from this project should be a "broadband data library" and inventory consisting of multiple digital resources for consumers and providers of advanced telecommunications, not just

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a single, monolithic map. Given sufficient response and valid data points, end-user input will help to verify the accuracy of service providers' claimed coverage areas and introduce an important - and ongoing - element of public participation and citizen education/ awareness to the broadband mapping process.

b) *Availability by Shape File – Wireless Services not provided to a specific address*
To the fullest extent possible, shape files obtained during the previous mapping initiative will be refined (updated) and used in the NTIA-funded mapping initiative. As noted in the previous section, for those providers willing to participate but lacking sufficient capacity to produce data files in the appropriate manner, the Commonwealth will provide assistance under this initiative to convert the data into the NTIA-mandated ESRI shapefile or address format as outlined in the NOFA clarification dated 8/12/2009.

  – All spatial data shall be provided in ESRI file geodatabase format
  – For fixed location wireless providers this dataset shall be terrain and building corrected, using the best available sources, to indicate those areas blocked by obstacles and thus unable to receive service.

Using 2000 census block data and 2008 census block group data, methods will be used to delineate household locations within census block boundaries. These data will be correlated with wireless service provider customer address data. In making the link between the service provider data and the census block data, Virginia will be able to cross reference comprehensive spending pattern and income information held by the company's existing customer base classified by quality of service; i.e., uplink and downlink speeds, provided by wireless companies that are determined as part of the survey.

  – Given transmission point locations and hardware specs, computer models can be applied to generate spatial delineations of wireless internet provider service areas, and associated household counts/approximations, for those areas where precise address/customer information is unable to be gathered.
  – With wireless service coverage mapped, the un-served by wireless geography can then be delineated. Drawing upon comprehensive existing tower data held by the partner company AfterImagesGIS, transmission locations will be selected and their service areas projected to show where and to what extent service can be extended throughout the state. This can be applied for varying levels of technology, whether it is licensed or unlicensed frequencies.

## 2. Residential Broadband Service Pricing in Providers Service Area

a) *Average Revenue per End User (ARPU) and Weighted Average Speed* – no longer applicable *(per NOFA clarification dated 8/12/2009)*

## 3. Broadband Service Infrastructure in Providers Service Area

a) ***Last-Mile Connection Points*** – no longer applicable *(per NOFA clarification dated 8/12/2009)*

b) ***Middle-mile and Backbone Interconnection Points*** – **at the time of this application, the ability of mapping personnel to obtain Interconnection data points remains in question.** Spatial location of these items (as available) will be collected and verified using address points where appropriate. Using the existing state basemapping data (orthophotography and/or street centerline data) the proposed creation of a complete map will contain 100% coverage of address point's accessible middle-mile and backbone interconnection points.
   - Point locations for these facilities will be in ESRI file geodatabase format
   - Link or attach the NOFA required records (attributes) to each point.
   - For community anchor institutions: Point locations for these facilities will be in ESRI file geodatabase format - Link or attach the NOFA required records (attributes) to each point.

4. **Community Anchor Institutions (schools, libraries, medical and healthcare providers, public safety entities, community colleges and other institutions of higher learning, and other community support organizations and entities)**
The Virginia mapping team will draw upon existing data sets to serve as the primary data source for service availability at the anchor institutions as specified. Data sources to be leveraged include, but are not limited to:

   - Virginia Tech has upstream/downstream, type, technology data for 64.83% of K12 schools and 86.72% of Virginia libraries based on 1) surveys taken by the Virginia Department of Education and the Gates Foundation, respectively, and 2) self-reported data from speed tests taken at http://www.ecorridors.vt.edu/maps/k12broadband/ and http://www.ecorridors.vt.edu/maps/libbroadband/.
   - Data currently held and/or accessible by VGIN/VITA including the Virginia Base Mapping Program which contains geospatial data for the location of community anchor institutions.
   - Broadband connectivity data for healthcare institutions not otherwise captured by VGIN/VITA and/or Virginia Tech will be collected by Broad Axe Technology Partners and provided to VITA/Virginia Tech for integration into the state/national maps

Additionally, for all spatial data deliverables:

   - Spatial metadata shall comply with FGDC metadata standards
   - Metadata shall include a comprehensive description of the methodology used to create each dataset including: Methods used to determine x,y location of addresses; Terrain and building correction and point location determination

## B. Accuracy and Verification

The Commonwealth proposes to use several methods of data verification: self-reporting and survey methodology along with statistical modeling to ensure the validity and accuracy of the data provided to NTIA

- **Independent verification and data collection** - APEX CoVantage LLC will provide field data collection services that augment and validate existing provider data; drive test major roads and communities for wireless coverage information: use independent data collection methods such as direct mail, online and telephone surveys, and mobile field inspection; and focus on rural areas and service territory boundaries.
- **Self–reported speeds, pricing and service type** collected directly from end users through the Community Broadband Map (CBM), an interactive web-based map based on the map currently in use by Virginia Tech's eCorridors Program
- **Survey research** will consist of a comprehensive survey of consumer broadband adoption and satisfaction. It will be coordinated through the Virginia Tech Center for Survey Research, participating in this project as a subcontractor of the Virginia Tech eCorridors program and Center for Geospatial Information Technology.

The Center for Survey Research at Virginia Tech will:

- Consult with the core project team to fully develop scope and approach to surveying broadband availability and related factors in Virginia.
- Work with mapping team to determine sampling strategy based on Virginia 911 PSAP. Database will be utilized to determine valid sampling ratios and to deliver the survey. The survey will be stratified to include representative samples of subgroups as appropriate.
- Develop survey instruments in consultation with project workgroup.
- Conduct comprehensive telephone survey.
- Conduct analysis of survey results; prepare analysis and summary report and present survey results to project workgroup.

Once data are received from the Center for Survey Research, the Virginia Tech eCorridors Program and the Virginia Geographic Information Network will compare claimed service areas and speeds from the service providers to survey results for each geographic area of interest, using statistical models to be developed during the course of the project in consultation with both the survey research domain experts and the GIS analysts on the core project team. Discrepancies between claimed and surveyed data may necessitate follow-up contacts with service providers, which would be handled by CIT.

- **Cross-referencing with existing and locally-collected data sets** VGIN/VITA is hosting the vendor-provided source data that was obtained through multiple Non Disclosure Agreements during the first half of 2009. New data that is collected from vendors or from field methods described in this proposal will be verified and cross referenced against previously-obtained data. Standard data quality control

and assurance methods will be utilized within the SQL Server source database using database tools and routines. Additionally, spatial analysis and comparisons will be run using ESRI GIS software tools to ensure that data integrity is observed and that proper data maintenance procedures are utilized.

## C. Accessibility

The Commonwealth of Virginia and its partners consider the effective dissemination of Virginia broadband availability, performance and usage data to be an equally important consideration to the collection of the data itself. To that end, we propose the creation of multiple mapping products and a variety of delivery formats to accommodate the needs of broadband stakeholders.

- Maps and information on this and other NTIA BTOP programs will be served from multiple secure locations, including the Commonwealth's Broadband Site (http://www.wired.virginia.gov), the Virginia Information Technologies website (http://www.vita.virginia.gov), and the Virginia Tech eCorridors website (http://www.ecorridors.vt.edu).

- VITA will act as the primary hosting provider for the physical data collected under this program, and proposes to employ a services-oriented architecture to maximize flexibility in the choice of application platforms.

Our general approach to data hosting and dissemination is as follows:

- VITA, through its VGIN subsidiary, will be the primary hosting provider for any geospatial data protected by nondisclosure agreements that is collected and stored during the course of this project. Virginia Tech may host non-sensitive data elements such as citizen speed test results, vertical asset locations and other elements of the comprehensive broadband data library, but all distributed hosting will be done in a coordinated manner.
- A separate consideration from hosting is the dissemination of the data. We propose first and foremost that the centerpiece of our dissemination strategy is the protection of any confidential data elements protected by nondisclosure; however, as we uphold this imperative, we must also find ways to make *representations* of the data available to the public in a manner complying with all agreements to which the core project team becomes a party.
- One way in which we hope to achieve such a balance is through the migration away from traditional methods of data dissemination that rely on transmission of the physical data files to the end user and towards a *service-oriented architecture (SOA)* in which we make representations of the data available as web services. These web services can be consumed by a variety of clients, including web mapping applications, desktop GIS applications, and custom end-user applications. This provides us with a flexible architecture that should scale and age well through the anticipated 5-year duration of this project, and beyond, because web services offer a number of key advantages over traditional static data sharing strategies.

- Services can be tuned for optimal display performance on the server-side through techniques such as caching.
- Updates occur server-side, and clients consuming the services will see them immediately. Since the clients store no data on their end, concerns about end-users storing outdated copies of the data are lessened. With a project such as this one that requires at least semiannual updates, it is especially important that updates are rolled out to the user base efficiently.
- Multiple services can be created from the same base dataset to support specific clients or platforms; each can be tuned to optimize performance for a specific need.
- Access to services can be controlled effectively.
- We envision using web services as the centerpiece of our hosting and dissemination strategy; however, to the extent allowable – and required – by the NOFA and any nondisclosure agreements we will also make permitted data elements, or subsets thereof, available to end-users for download.
- In addition to web services, which by their nature have no user interface and are consumed by either web-based or desktop software applications that act as an intermediary between the data and the user, we also plan to deploy web mapping applications that will support viewing, querying and analysis of the data. These applications may be hosted by either VITA or Virginia Tech, depending on the source data and the confidentiality restrictions placed upon it. We envision the development of a number of applications working together to deliver the information in the broadband data library to the public in an efficient manner.
- To the extent required by the NOFA, we will also make all appropriate datasets available to NTIA for the purposes of integration into a national broadband map, along with the requisite documentation and metadata. We will fully support the mandated ESRI data format, as well as others, detailed below in the multi-platform support section.
- Data libraries constructed under this grant and the data they contain will be configured to be compatible with multiple GIS platforms and applications (Google Earth, ESRI, etc). We believe that the accessibility of the broadband data library and its effective use by the public will be maximized if we support multiple geospatial platforms for data dissemination. The ESRI shapefile format specified in the NOFA will be the native format for all data collected, and this representation of the data will be stored by VITA, as detailed in the previous section. However, we envision the creation of both static and dynamic parallel representations of the core dataset in other formats, which could include, but would not necessarily be limited to:
  - Google Earth .kml
  - XML for Google Maps – and web-based mapping applications to serve this data
  - Open Geospatial Consortium Web Feature Service (WFS) and Web Map Service (WMS)
  - ESRI Map and Geodata Services
  - Geography Markup Language (GML)

- Multi-platform and interoperability systems development and integration efforts will be led by the Virginia Tech eCorridors Program, the Virginia Tech Enterprise GIS, in coordination with VGIN and VITA. The development of the web services will consist of the specification of the services' capabilities and target client platforms, the programming of the services, and the physical provisioning of the services. The latter will be done as a collaborative effort between VITA and eCorridors, with due consideration given to issues of redundancy, load balancing, security and the protection of confidential data.
- The overarching objective of these efforts, as stated previously, will be to provide multiple "views" of the data to meet the needs of a diverse and technically-sophisticated user base, while at the same time providing straightforward, web-based interfaces to the data for users that do not require sophisticated mapping and analytical functionality.
- Derivative, complementary maps and data tools will be maintained by Virginia Tech's eCorridors Program, consistent with Virginia Tech's data security protocols and within its highly secure data storage facility with 24/7 monitoring and oversight.
- All websites containing NTIA-funded data will be constructed to be compliant with industry standards for handicap use and access following Section 508 of the Rehabilitation Act of 1973. All Commonwealth of Virginia websites currently comply with this standard as required by executive order mandate.

## D. Security and Confidentiality

Having successfully completed a baseline broadband availability map that required the protection of, handling, use, and display of address level data, CIT and its partners have successfully demonstrated the ability to define and meet security and confidentiality requirements to the satisfaction of private sector providers, the Commonwealth, and the user community. Additionally CIT holds a top secret facility security clearance.

**VGIN/VITA** provides information about "Commonwealth Security" through its website at http://www.vita.virginia.gov/services/default.aspx?id=111. The Commonwealth Security & Risk Management Directorate of VGIN/VITA protects data and provides a safe, secure technology environment that enables state agencies to accomplish their respective missions. Tools and processes utilized are:

- Development and maintenance of Standards, Policies and Procedures
- Secure Infrastructure & Technical Support
- Critical Infrastructure Protection & Business Continuity
- Risk Management
- Information Security Training and Awareness
- Incident Management

The Commonwealth Information Security Standard (ITRM Std SEC501-01) was designed to protect the following types of data:

- Personally Identifiable Information, including information that describes, locates or indexes anything about an individual including financial transactions,

- Social Security numbers, medical history, ancestry, religion, political ideology, criminal or employment record and photographs

- Proprietary research data

- Certain confidential proprietary data Network diagrams and IP addresses

- Server names and configurations

- Contract cost estimates

With existing and appropriate safeguards already in place, along with standard operating procedures for security best practices, VGIN/VITA already is protecting sensitive data on behalf of the Commonwealth and is well positioned to protect sensitive data for this proposal.

**Virginia Tech** has considerable experience in the management and protection of sensitive and confidential data in both its research mission and its administrative operations, which often require the secure storage of data with strong intellectual property, commercial, copyright, privacy or national security significance. The protection of sensitive data is governed at the institutional level by policy 7105 on Sensitive Data (http://www.policies.vt.edu/7105.pdf). Authority to implement this policy is assigned to the university's Vice President for Information Technology by resolution of the Board of Visitors (http://www.bov.vt.edu/minutes/07-06-04minutes/attach_v_070604.pdf). In accordance with this directive, the IT organization adopted and abides by the "Standard for Protecting Sensitive University Information in Digital Form" (http://www.it.vt.edu/publications/pdf/2_SensitiveDataStandardFinal5June-signed.pdf). This internal regulatory framework prescribes and enforces general guidelines for securing sensitive data, irrespective of format.

Data collected during the course of the development of the Virginia Broadband Map will be primarily geospatial in nature. Therefore, any data hosting activity conducted by Virginia Tech for the proposed project would fall under the Enterprise GIS division of IT, which provides hosting and systems development support to the eCorridors program and the Center for Geospatial Information Technology (CGIT). In order to comply with the institutional policies set forth in the previous section, Enterprise GIS has developed a number of technical solutions for the protection of confidential and sensitive information.

Hosting of data collected under the proposed project would be jointly managed by VGIN/VITA and Virginia Tech. Because many of the datasets that would go into the creation of the Virginia Broadband Map come from service providers under nondisclosure agreements to which VGIN/VITA and CIT are signatories but Virginia Tech is not, it is likely that Virginia Tech will have a small role to play in the *physical hosting and storage* of the data that drives the map. However, Virginia Tech may host web applications for dissemination of the map, and may also host alternative representations of the NOFA-mandated ESRI data format. Because VGIN/VITA proposes to adopt a services-oriented architecture for the sharing of the Virginia Broadband Map, Virginia Tech and its Enterprise GIS may consume map services from VITA, conduct processing or translation of the data into another format, and re-deploy the service from its own IT infrastructure. Under such an arrangement no physical data would be housed at Virginia Tech, but the secure authentication and authorization procedures detailed above would be used to full effect, in an effort to ensure that the chain of confidentiality from the service providers contributing data to the end-users of the map is preserved end-to-end.

## 2. PROJECT FEASIBILITY

### A. Applicant Capabilities
**Detailed Budget Narrative**

The matching funds committed to this project are **50.64%** of total program dollars. All matching funds are certified to be from non-federal sources. Letters of commitment from partner organizations are included.

Center for Innovative Technology
**Project Budget**
**Broadband Mapping/Planning**

Period of Performance - 10/1/2009 to 9/30/2014

| Cost Element | Total Federal Request | Total Match | Total Budget |
|---|---|---|---|
| Personnel | | | |
| Subtotal Personnel | $234,859 | $0 | $234,859 |
| Fringe Benefits | $164,941 | | $164,941 |
| Subtotal Direct Labor | $399,801 | $0 | $399,801 |
| Equipment | $0 | | $0 |
| Travel | $6,669 | | $6,669 |
| Supplies | $5,000 | | $5,000 |
| Contractual | $100,000 | | $100,000 |
| Contractual over $25k cap | $3,485,903 | $4,436,281 | $7,922,184 |
| Other | $0 | | $0 |
| Subtotal Other Costs | $3,597,572 | $4,436,281 | $8,033,853 |
| Total Direct Costs | $3,997,373 | $4,436,281 | $8,433,654 |
| Indirect Costs | | | |
| Overhead | $130,652 | | $130,652 |
| G&A | $196,169 | | $196,169 |
| TOTAL PROJECT COST | $4,324,193 | $4,436,281 | $8,760,474 |

**Personnel $234,859.**

[redacted]

**Fringe Benefit $164,941**

[redacted]

**Travel $6,669** is based on GSA per diem rates and will cover the following:
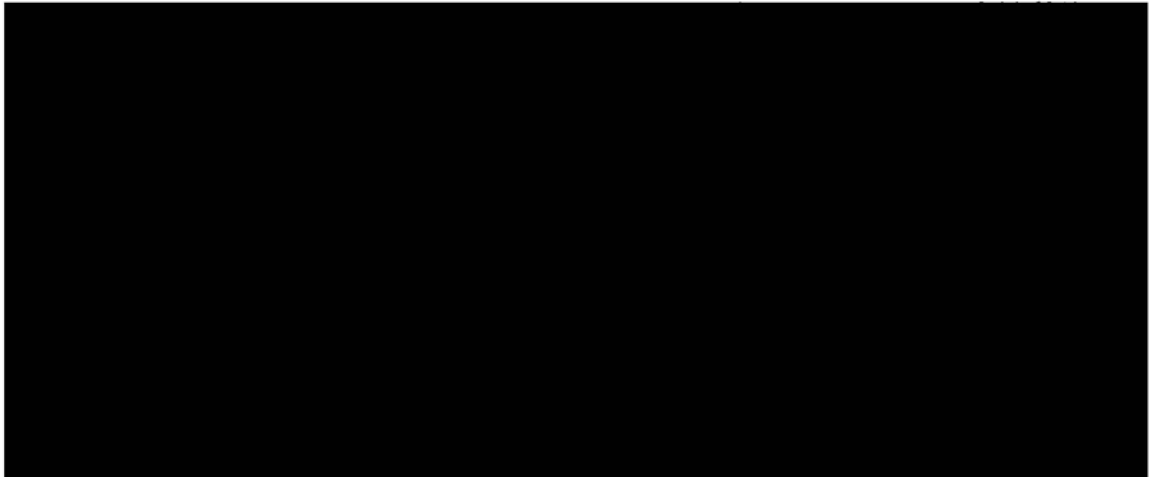
Center for Innovative Technology
Supplement to Budget - Travel Cost Worksheet
Broadband Mapping/Planning

Period of Performance - 10/1/2009 to 9/30/2014

| Location Car Travel | Purpose | Number Trips | Number People | Number Days | Number Nights | RT miles | Mileage costs @ .55/mile (per trip) | Hotel (per night) | Total Hotel Costs (per trip) | Per Diem (per day) | Per Diem Costs (per trip) | Parking (per day) | Parrking (per trip) | Total Cost per Trip | Total Cost for all trips |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
| Grand Total | | | | | | | | | | | | | | | $ 6,669 |

Hotel and Per Diem rates are from the following website:
http://www.gsa.gov/perdiam

**Equipment $0.** There are no anticipated prime expenditures on equipment unique to this effort. Subcontractor equipment is listed within individual subcontractor proposals.

**Supplies $5,000** includes print materials for the program.

**Contractual $3,585,903** costs and **Matching Funds $4,436,281 – Total $8,022,184**

[redacted]

Center for Innovative Technology
Commonwealth of Virginia

Contractor costs are in line with current and historical costs associated with each specialized program areas and supporting quotes. Each contractor has provided a detailed Statement of Work and Budget. Budgets are either consistent with prior years' efforts on CIT projects or considered reasonable based upon CIT's experience. Each contractor's budget has been reviewed and questioned by two levels of management at CIT.

**Other $0**. There are no anticipated prime expenditures on other expenses unique to this effort.

**Total Indirect Charges $326,821**

(redacted)

Total Mapping Federal Request: $4,324,193
Total Matching Funds: $4,436,281
**Total Mapping Project Cost: $8,760,474**

Center for Innovative Technology
**Project Budget**
**Broadband Mapping/Planning**

Period of Performance - 10/1/2009 to 9/30/2011

| Cost Element | Total Federal Request | Total Match | Total Budget |
|---|---|---|---|
| Personnel | | | |
| | | | |
| **Subtotal Personnel** | $144,874 | $0 | $144,874 |
| Fringe Benefits | $101,745 | | $101,745 |
| **Subtotal Direct Labor** | $246,619 | $0 | $246,619 |
| Equipment | $0 | | $0 |
| Travel | $6,113 | | $6,113 |
| Supplies | $10,000 | | $10,000 |
| Contractual | $0 | | $0 |
| Contractual over $25k cap | $0 | $0 | $0 |
| Other | $0 | | $0 |
| **Subtotal Other Costs** | $16,113 | $0 | $16,113 |
| **Total Direct Costs** | $262,732 | $0 | $262,732 |
| Indirect Costs | | | |
| Overhead | $80,593 | | $80,593 |
| G&A | $104,886 | | $104,886 |
| **TOTAL PROJECT COST** | $448,211 | $0 | $448,211 |

Center for Innovative Technology
Commonwealth of Virginia

**Personnel $144,874.**

[redacted]

**Fringe Benefit $101,745**

[redacted]

**Travel $6,113** is based on GSA per diem rates and will cover the following:

Center for Innovative Technology
Supplement to Budget - Travel Cost Worksheet
**TOTAL PROJECT COST**

Period of Performance - 10/1/2009 to 9/30/2011

| Location Car Travel | Purpose | Number Trips | Number People | Number Days | Number Nights | RT miles | Mileage costs @ .55/mile (per trip) | Hotel (per night) | Total Hotel Costs (per trip) | Per Diem (per day) | Per Diem Costs (per trip) | Parking (per day) | Parking (per trip) | Total Cost per Trip | Total Cost for all trips |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
| **Grand Total** | | | | | | | | | | | | | | | **$ 6,113** |

Hotel and Per Diem rates are from the following website:
http://www.gsa.gov/perdiem

**Equipment $0.** There are no anticipated prime expenditures on equipment unique to this effort. Subcontractor equipment is listed within individual subcontractor proposals.

**Supplies $10,000** include print materials for the program.

**Contractual $0.** There are no anticipated expenditures for contractual costs unique to this effort.

**Other $0.** There are no anticipated prime expenditures on other expenses unique to this effort.

**Total Indirect Charges $185,479**

████████████████████████████████████████████████

**Total Planning Portion:    $448,211**

**Grand Total Mapping and Planning:    $9,208,685**


**B. Applicant Capacity, Knowledge, and Experience**

The Center for Innovative Technology, having recently served as the cornerstone of the Commonwealth of Virginia's inaugural broadband mapping initiatives, is uniquely positioned and qualified to serve as Virginia's mapping oversight and coordination entity.

Since 2008, CIT in partnership with the Commonwealth Office Telework Promotion and Broadband Assistance (OTPBA) has served as the lead organization for broadband mapping strategy and implementation initiatives in the Commonwealth.    As a 501(c)3 FOIA-exempt organization, CIT was chosen by the then Secretary of Technology Aneesh Chopra and then OTPBA Director (now Deputy Secretary of Technology) Karen Jackson to serve as the coalescing point for the Commonwealth's initial mapping activities including:

- Building relationships with members of the Virginia broadband provider community (as well as statewide telecommunications, cable, and wireless industry organizations) to build participation and consensus on the initiative – including the need to obtain address-level availability data from the carriers
- Determining parameters of data to be collected and mapped
- Defining and enlisting a team of existing (public sector) organizations, including VGIN/VITA and Virginia Tech to assist in the endeavor and produce physical and virtual representations of the final product - at *no incremental cost to Commonwealth taxpayers*
- Defining overall project goals, desired outcomes. and determining parameters for data submission, protection and dissemination
- Developing and executing provider non-disclosure agreements
- Managing  the overall map development, approval, and delivery process

The resulting map, currently available at http://www.wired.virginia.gov, along with the provider and mapping partner relationships developed by CIT, will serve as a strong foundation for future mapping initiatives and provide the Commonwealth and NTIA with the ability to leverage and draw upon CIT's knowledge base and relationships as a means of successfully developing next generation broadband maps.

## Key Personnel

### *Center for Innovative Technology*
Karen Jackson, Deputy Secretary of Technology for the Commonwealth of Virginia, a CIT staff member, will continue in her role as the senior staff member for the Commonwealth's broadband mapping initiatives. Ms. Jackson has successfully managed the Commonwealth's broadband programs since 2000, including serving as senior staff for Governor Kaine's Commonwealth Broadband Roundtable and producing the Commonwealth's "online community broadband toolkit" and broadband map in 2009.

### Karen Jackson
*Deputy Secretary of Technology for the Commonwealth of Virginia and Vice President of Broadband Programs for the Center for Innovative Technology*
- Appointed by Governor Kaine to serve as senior advisor for broadband and telework-related issues and policy and senior staff for the Commonwealth Broadband Council
- Serve as primary contact and application architect for technology-related applications under the 2009 American Recovery and Reinvestment Act including broadband mapping and building sustainable broadband demand.
- Interface with broadband providers, funding sources, members of the Administration and local leaders to carry out broadband-related initiatives, pilot projects and public-private partnerships
- Advocate for, and facilitate the development and deployment of applications, programs, and services to bolster the usage of and demand for broadband level telecommunications
- Responsible for evaluating and implementing broadband and telework policy in the Commonwealth, making recommendations regarding strategy and legislative issues and working with legislative bodies (Federal and State) to craft language and policy remedies to remove barriers and encourage deployment and adoption.
- Credited with benchmarking address-level broadband service availability in the Commonwealth at no incremental cost to Commonwealth taxpayers
- Develop resources to aid state agencies and communities in the adoption of telework and broadband - including the online "Community Broadband Toolkit" - an interactive resource developed to support and expedite the deployment of community-driven broadband initiatives
- Represent the Kaine Administration in matters pertaining to broadband and telework initiatives in the Commonwealth, including the Rural Telecommunications Congress and National Governor's Association broadband web-cast
- Collaborated with members of the Virginia General Assembly and the Kaine Administration to insure adoption of HB1329/SB206, companion bills requiring access to state-owned telecommunication towers (including first responder towers) by

qualified wireless broadband service providers in un-served areas of the Commonwealth. (2008)

- Developed regionally-based programs targeted toward solving the "digital" needs of small and medium sized businesses and rural/underserved communities.
- Acted as a catalyst for the formation of partnerships between educational institutions, industry, and the public sector to facilitate rural broadband service delivery and training.
- Performed in-depth analyses at the community level and devise affordable broadband solutions based on current service availability, constituent needs, and regional economic and demographic trends.
- Acted as an advocate for rural communities seeking to develop and deploy broadband solutions.

### *Virginia Tech eCorridors*

Virginia Tech's eCorridors Program at Virginia Tech has over 10 years in researching broadband issues including wireless technologies, optical fiber architecture and design, policy and business models, and over 3 years of experience in measuring and mapping broadband speeds. The program is an information technology outreach effort, aimed at facilitating and promoting the ability for every person, organization, and community in Virginia and beyond to have the capability, at a reasonable cost, to produce and access high volume information and services in the networked world. eCorridors has a national reputation as a reliable guide in the development, planning, and optimization of advanced telecommunications systems. The eCorridors team has worked with the general public; state and national policymakers, and communities in rural regions, on a variety of projects, including:

- The eCorridors Community Broadband Access Map (CBAM) – The CBAM has been collecting consumer-volunteered connectivity data - location of telecommunications infrastructure and services, as well as connection speeds, and local level pricing since August 2006.
- K-12 and Public Libraries Broadband Map -- Conceptualized by Virginia's then-Secretary of Technology, Aneesh Chopra (now Chief Technology Officer in the Obama administration), the application allows school administrators to test their school's Internet speed capabilities and easily report findings to the Secretary of Technology's office.
- Virginia Tobacco Indemnification and Community Revitalization Commission – eCorridors, working alongside the Tobacco Commission and business and community officials, developed an RFP which was released and resulted in Mid Atlantic Broadband MBC building a fiber network based on eCorridors' architecture recommendation.
- Alaska Broadband Speed Test -- The eCorridors program was selected by the Northwest Arctic Broadband Task Force to conduct a weeklong broadband mapping experiment in an effort to provide a 'snapshot' baseline assessment of broadband conditions in Alaska.

*Virginia Tech Center for Geospatial Information Technology*
The Center for Geospatial Information Technology (CGIT) is an interdisciplinary university-wide center at Virginia Tech that focuses on applied research in geographic information systems (GIS), global positioning systems (GPS) and Computer-Aided Design (CAD). The Center works to bring discipline-specific researchers and clients together with geospatial experts to develop new ways to collect and analyze data, perform simulations and present results in visual contexts in the Commonwealth and the nation. Our staff, students, and affiliated faculty are involved in innovative applications-based tasks that are oriented specifically toward client needs, such as: Web-enabled decision support system, GPS-based automated data collection, Sensor-enhanced information systems integration, Programming and systems integration for client or client/server geospatial applications, Complex spatial analysis, Needs analysis, Database development in GIS, Geospatial data layer conversions, and Digital image processing and remote sensing.

The center's clients have included: Alexandria Archaeology Museum, Va., National Geospatial Intelligence Agency, State Corporation Commission, Town of Blacksburg, Virginia, Virginia Department of Conservation and Recreation, Virginia Department of Emergency Management, Virginia Department of Transportation, and Virginia Tech - Site & Infrastructure Development.
CGIT has received more than $4.4 million dollars in research funding over the past five years in the following areas: Transportation & Infrastructure, Environmental Management, Hazard Mitigation Planning, Flood Map Modernization, Wireless Communications, Homeland Security, Smart Growth, and Public Health. Selected projects include:

- 2010 Hazard Mitigation Plan for Virginia – CGIT is performing data development and analysis for the hazard assessment and vulnerability analysis, and developing mitigation strategies.
- Buried Asset Management Infrastructure – Buried Assets investigated include sewer systems and water distribution systems. CGIT researched and proposed a new national data model to facilitate improved condition assessment tracking and prediction.
- Decision Support Database for Virginia's Bikeways – This project facilitates the information retrieval and decision-making efforts for VDOT, DCR and other stakeholders with regards to bicycle and pedestrian infrastructure.

**Brenda van Gelder**
*Director, Strategic Partnership Initiatives, Office of the VP for IT, Virginia Tech*
During her 20 years of employment with the University, Brenda van Gelder has participated as a member of a number of national working groups focused on broadband policy issues, and has directed a number of special research efforts focused on policy and regulatory issues associated with advanced telecommunications networks. Ms. van Gelder has made numerous presentations to key legislators, FCC officials, and community leaders regarding the policy issues associated with advanced network infrastructure leveraging various technologies. She has served on multi-university projects to assess resiliency and vulnerabilities of critical infrastructure for regions of

Virginia in the context of disaster recovery or emergencies. Her most recent activities involve policy and implementation issues related to the convergence of physical security and logical security, as well as public safety initiatives involving information technologies at Virginia Tech. Ms. van Gelder has a Masters degree from Virginia Tech in Marketing/Business Administration.

## Peter Sforza
*Co-Director, Center for Geospatial Information Technology, Blacksburg Campus*
Peter Sforza, Research Associate in the Department of Geography and co-director for the Center for Geospatial Information Technology, provides leadership for the center's research and sponsored projects, management and operations. Initiatives include a broad range of geospatial research and applications for safety and security, health IT, 3-D, context-neutral data mining and visualization techniques.

Since 2004, Mr. Sforza continues to serve as coordinator for the VirginiaView, a statewide consortium for remote sensing education, research, and geospatial applications. Mr. Sforza brings a wealth of interdisciplinary experience in the geospatial research arena across multiple units at Virginia Tech, including: Virginia Tech Information Technology Strategic Initiatives, Center for Geospatial Information Technology, Center for Environmental Applications of Remote Sensing, and the Department of Geography. He has enjoyed success by bringing together interdisciplinary teams around complex problems of a geospatial nature that leverage geographic information systems capabilities and academic strengths.

Mr. Sforza holds a B.S. in biology (1997) and a M.S. in Life Science (2004) with a concentration in Plant Pathology, Physiology, and Weed Science at Virginia Tech. His academic work has focused on developing integrative and systems approaches to real world problems in epidemiology, biotic and a biotic interactions, and landscape ecology using scientific visualizations, informatics, geospatial technologies and remote sensing.

## Jean Plymale
*Operations System Analyst, eCorridors, Virginia Tech Geospatial Information Sciences*
Jean Plymale has over 30 years of experience working in diverse areas of information technology. In her current role as a member of Virginia Tech's eCorridors, E-GIS and the CGIT teams, she is responsible for managing projects focused on the development of analytic tools used in the assessment of physical and information security as well broadband deployment. Jean serves on local and national level committees and interacts with community, state and the private sector to promote the advancement and understanding of broadband technologies in underserved regions. Prior to joining the eCorridors program, Ms. Plymale worked at the Virginia Tech Computing Center as a Senior System Engineer where she managed UNIX and mainframe systems and applications. She holds a B.A. and M.A. from Virginia Tech as well as a graduate certificate in politics and policy of Science and Technology from Virginia Tech.

## Seth Peery
*Senior GIS Architect, Enterprise GIS, Virginia Tech Geospatial Information Sciences*
Seth Peery is Senior GIS Architect with the Enterprise GIS division of Virginia Tech Geospatial Information Sciences, and also serves as a technical advisor to the eCorridors

program. He specializes in GIS systems architecture, geospatial application server administration, GIS web application development, and the integration of GIS technologies with other computing systems. Mr. Peery founded the Enterprise GIS organization and created the first Enterprise GIS system at Virginia Tech, building on prototype systems he had created as a Master's and PhD graduate student in the eCorridors program. He is the technical lead on Enterprise GIS projects. He has been at Virginia Tech since 2003, and prior to developing the Enterprise GIS, he provided technical and research support to the eCorridors program. Mr. Peery is currently completing a PhD in the Environmental Design and Planning program at Virginia Tech, with a research focus on the mapping and spatial analysis of broadband Internet access in rural areas and its impact on economic development. He holds a Master's Degree (2005) from the Urban Affairs and Planning program at Virginia Tech, with his thesis work focusing on the ability of next-generation broadband networks to enable economic development through the "Producer Network" concept that originated at Virginia Tech. He holds Bachelor's degrees in Computer Science and in Political Science (2003) from Radford University.

**David Kramar**
*Graduate Research Assistant, Center for Geospatial Information Technology, Blacksburg Campus*
David Kramar provides assistance for the center's research and sponsored projects. He is currently completing a PhD focusing in Geospatial and Environmental Analysis with a focus on Analytical and Statistical Modeling. Mr. Kramar's academic interests include: wildlife toxicology, geographic information systems, quantitative methods, and advanced spatial and numerical analysis as it relates to environmental phenomena. Mr. Kramar's involvement with GIS dates back to 1996, and was one of the first to use ArcGIS during its early development. He went on to work as a consultant in the GIS industry for several years and acted both as a GIS senior analyst and as a project manager. Mr. Kramar holds a Master's Degree in Geography from Virginia Tech, with his thesis work focusing on estimating mercury risk to the common loon in the Rangeley Lakes region of western Maine, involving a regression-based GIS model. He holds a Bachelor's degree in Geography with an emphasis on Geographic Information Systems and Statistical Modeling.

*Virginia Geographic Information Network (VGIN/VITA)*
VGIN/VITA was established in 1997 to foster the creative utilization of geospatial information by the Commonwealth of Virginia and to achieve economies of scale for commonly-used basemapping datasets primarily by state and local government. This is achieved through coordination of local and state government stakeholders, such as state agency user groups, regional user groups, and specialty Community of Interest user groups. Some of the core functions of VGIN/VITA include:

- Develop & recommend policies & guidelines required to support state and local government exchange, acquisition, storage, use, sharing and distribution of geographic or base map data and related technologies

- Compile a data catalog consisting of descriptions of GIS datasets maintained by individual state and local government agencies
- Set priorities for the development of state digital geographic data and base maps that meet the needs of state agencies, institutions of higher education, and local governments
- Provide services, geographic data products, and access to the repository

VGIN/VITA currently oversees the development and maintenance of enterprise basemapping for statewide high resolution aerial photography, statewide road centerline sourced from 911 and the state DOT, and the National Hydrography Data Set. VGIN delivers a suite of products, projects and programs to constituents in local, state and federal government, academia, private and non-profit sectors through activities such as the development of web map services, application and data hosting, geospatial project management and needs assessment, and geospatial metadata portal management.

Projects of note that the Virginia Geographic Information Network has completed or is currently working on include:

- Virginia Base Mapping Program Orthophotography: Since 2002, VGIN has overseen the initiation, procurement and delivery of statewide high resolution orthophotography on a four year cycle, with the third cycle currently underway. A total of $18 million dollars since 2002 has been managed by VGIN to acquire and provide these products for the Commonwealth.
- Virginia Base Mapping Program Road Centerline development and maintenance: VGIN initiated, procured and delivered statewide road centerline GIS data, consisting of local 911 addressing and Department of Transportation road data. The initial project cost $2.1 million dollars, with ongoing annual maintenance cost averaging $300,000.

**Dan Widner**, *Coordinator of the Virginia Geographic Information Network) within the Virginia Information Technologies Agency (VGIN/VITA)*. Mr. Widner has twenty-nine years experience in the fields of mapping and Geographic Information Systems. Dan's work experience includes fourteen years as a cartographer for the Defense Mapping Agency, four years with Intergraph Corporation supporting geospatial needs of defense and state transportation organizations; eight years as GIS Manager/Assistant IT Director for the Virginia Department of Transportation, and three years serving as the Coordinator of the Virginia Geographic Information Network within the Virginia Information Technologies Agency. His current duties include the facilitation and coordination of Commonwealth and enterprise-wide geographic information systems and data for state and local governments, the fulfillment of the Code of Virginia mandates for GIS, and serves as the Coordinator for the VGIN Advisory Board. Dan currently serves on the Board of Directors of the National States Geographic Information Council (NSGIC) as the co-chair of NSGIC's Transportation For The Nation workgroup. Dan has a Bachelor's degree in Geography from Indiana University.

**John Owens**, *Geospatial Technical Services Manager for the Virginia Geographic Information Network* Mr. Owen manages the Geospatial Enterprise Platform for VGIN/VITA as the Geospatial Technical Services Manager for the Virginia Geographic Information Network. He previously worked for the University of Virginia, University of Maryland, Virginia Tech and Virginia Commonwealth University. Highlights of his previous work include development of the NASA MODIS Rapid Response System and extensive work with development and management of complex processing systems and Internet GIS mapping applications. He holds a Bachelor's of Science in Biology from Virginia Tech as well as a Master's of Science in Information Systems from Virginia Commonwealth University. He is a Microsoft-Certified Systems Engineer.

**Michael Vojta** has over a decade of experience in Geospatial information systems, data analysis, programming and application development, and program management. His GIS administrative duties have included appointments as GIS Manager for the Allegheny County Health Department, Virginia Department of Emergency Management, Chesapeake Bay Local Assistance Department, and as a data modeler and project data analyst for the Virginia Department of Transportation and currently with Virginia Geographic Information Network. Michael's academic achievements include a Masters of Urban Planning, Certificate of Environmental Management, and a Bachelors of Science in Geology. He has frequently guest lectured on geospatial topics before university students, industry and government professionals and has technical articles published in industry news journals.

**Stuart "Stu" Blankenship** is currently employed by VGIN/VITA in the Virginia Geographic Information Network (VGIN) as a Geospatial Projects Manager. His primary responsibility is the management of the collection and distribution of the orthophotography and elevation data products that are part of the Virginia Base Mapping Program (VBMP). Prior to his employment with VGIN/VITA, Stu worked for the Virginia Economic Development Partnership for 9 years where he was the GIS Manager from 2004 through 2007. Stu received a B.S. in Geography from James Madison University and a Masters in Urban and Regional Planning from Virginia Commonwealth University.

**Stephen Barbie** is a certified GIS Professional (GISP). In his current position of two years at VGIN/VITA, Stephen is responsible for administering and maintaining the agency's sixteen GIS servers. This entails installing and configuring software, loading spatial data for GIS applications, providing technical support for public and private-sector users of GIS data, and performing ongoing server maintenance. Stephen has a thorough knowledge of ArcGIS Server, ArcSDE, ArcIMS, and ArcGIS Desktop software applications, as well as experience in Oracle, SQL Server, HTML, and JavaScript. Stephen began his career in GIS at the Virginia Department of Transportation, where he served as a GIS Programmer Analyst for six years.

## 3. EXPEDIENT DATA DELIVERY

The ultimate arbiters of whether or not the Commonwealth (or any other state) can adhere to, and deliver on the schedule published by NTIA are the broadband providers themselves. The Commonwealth has excellent relationships with the providers and industry associations across the state; however, our ability to expediently build on our existing data is dependent on the providers' willingness and ability to provide the required data in the NTIA-prescribed format(s). At the time of application, it is anticipated that the Commonwealth will be able to reasonably provide the following data:

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**Type of Data Requested**

**Broadband Service Availability – by Provider**
- Street Address
- End user type (residential, business, governmental, small business, medium or large enterprise)
- Technology (e.g., DSL, fiber, cable, wireless, etc.)
- Speed Tier
  - maximum advertised downstream and upstream speeds available at the address
  - data transfer rate that subscribers can achieve consistently during heavy network usage periods (downstream and upstream)

**Wireless Services – Not Associated With Specific Address**
- Availability Area  (GIS compatible map)
- Technology of Transmission
- Spectrum Used
- Speed Tier
  - maximum advertised downstream and upstream speeds available at the address
  - data transfer rate that subscribers can achieve consistently during heavy network usage periods (downstream and upstream)
    - Community Anchor Institutions (schools, libraries, medical and healthcare providers, public safety entities, community colleges and other institutions of higher education, and other community support organizations and entities).
  - Latitude
  - Longitude
  - Broadband service technology
  - Advertised upstream and downstream speeds

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**Broadband Service Pricing**
  - By County
  - Technology
  - Subscriber -Weighted Nominal Speed
    - Sum of the products of a provider's advertised maximum speed times the number of subscribers for each of those speeds divided by the total number of subscribers.

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**Broadband Infrastructure**
  - Middle Mile and Backbone Interconnection Points (interconnection points of facilities between (a) a service provider's network elements or segments and (b) between a provider's network and another provider's network, including the Internet backbone).
    - Serving capacity of transport facility (mbps or gbps)
    - Facility backhaul type
    - Latitude
    - Longitude
    - Elevation

Assuming that it will take (an unpredictable amount) of time for the providers to conform existing (company) data sets with those specified by NTIA and to respond to the rush of requests participating in this initiative, it is (conservatively) proposed that the Commonwealth will deliver a modified data set by November 1, 2009 as follows:

25% of broadband providers in the state
50% of households in the state
50% of households in rural areas
95% of public community Anchor institutions

Should data collection proceed at a more rapid pace than anticipated, a more aggressive timeline will be pursued and achieved. The Commonwealth will target having a substantially complete data set (as defined in the NOFA) by February 2010.

*Note*: between the release of the NOFA and the submission of this application, the Commonwealth, in conjunction with our partners, Virginia Tech and VITA, produced a preliminary map ( http://gismaps.virginia.gov/broadband_census ) to assist communities with the identification of un/under/served and rural areas (by census block) as defined by RUS/NTIA. The map is derived from data collected for Virginia's original pre-NOFA broadband map at http://gismaps.virginia.gov/BroadbandMappingFinal/, and derived estimates of un/under/served census blocks by combining our service provider data with statistical and mapping methodologies developed by Virginia Tech and VITA. This map was required by the Commonwealth Governor's Office to be reviewed and sanctioned by providers in the Commonwealth prior to its release. The providers requested modifications to the original model, which were incorporated in order to ensure cooperation and future assistance with obtaining the necessary data. The second generation un/under/served map was created using the following procedure:

- On May 14, 2009, CIT and the Virginia Office of Telework Promotion and Broadband Assistance released a map of fixed and wireless broadband service areas in Virginia based on various data obtained from 30 Virginia broadband providers under nondisclosure agreements. The map generalized the service areas and de-identified carriers so that it, as a derived product, would remain compliant with the NDA's. This "first-generation" map represented the best available broadband service area data in Virginia at the time of the NOFA release.

- The NOFA specifies that applicants for BIP and BTOP broadband infrastructure development programs identify, down to the census block level, served, unserved, and underserved areas. The operational definitions of "unserved" and "underserved" are spelled out in the NOFA, but the terms are defined in terms of metrics like take-rate, % of households served, and highest advertised connection speed. The Virginia service area data could not address take-rate or advertised speeds as it only identified the estimated footprint of fixed and wireless broadband service, although it could, albeit imperfectly, address the share of the population theoretically served by broadband.

- Because the data held by the state did not address the issue of speed, Virginia Tech eCorridors collaborated with VGIN to incorporate additional data elements. As mentioned above, eCorridors has developed an interactive web-based map in which users can click on the map to mark their location and then run a free open-source speed testing utility. The results of the speed test are associated with the marker, and over time a collection of test data points builds up. These data points were used to create a spatial statistical model that predicted broadband speeds in each census block. Predicted speeds <= 200Kbps were classified as unserved; 200Kbps< predicted speeds <768Kbps were classified as underserved, and predicted speeds >=768Kbps were classified as served.

- After receiving the block data from Virginia Tech for the areas that were identified as unserved, underserved, and served, VGIN performed a quality assurance check against the service data provided by the broadband vendors.

- The data provided by the vendors varied in spatial accuracy, so VGIN chose to use only the most accurate data during the verification process. The most accurate data was provided by vendors as latitude/longitude coordinates which were then converted to point locations in a geodatabase. VGIN performed a spatial join between these point locations and the underserved block polygons provided to us by Virginia Tech. The result of the spatial join was a new polygon geodatabase feature class that contained a summary of the number of vendor points within each polygon.

- The block polygons from Virginia Tech contained an attribute for the population from the 2000 census. From the result of the spatial join process described above, VGIN was able to estimate the population served by broadband within each block by multiplying the number of vendor points by the average household size of 2.54 individuals per household (average household size obtained from Census Bureau website). With the population served by broadband within each block now available, an estimate of the percent served could be calculated using the census population attribute within each polygon.

- VGIN then created a new attribute that indicates which polygons within the blocks provided by Virginia Tech would be considered served or underserved using the QA methodology. Blocks with an estimate of 50% or more of the population served by broadband (NOFA Definition) are coded as "served" in this new attribute.

- A new field, "VGIN_QA" was added to keep track of revisions that were made to the original Virginia Tech dataset and coded by the data's separation. (1 = Untouched by VGIN, 2 = Coded as Served by definition above)

- The new map containing VGIN's recoded blocks was then presented to the service providers for review. Only two providers expressed concern over the accuracy of the map. VGIN revisited the original data underlying the "first generation" map, and when geocoded address point data was taken into consideration along with the latitude/longitude data that was used in the first round of QA/QC, a representation of

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broadband served/unserved/underserved areas emerged that was met with approval from all stakeholders.

⚓ This "second-generation" map was released on August 5, 2009 as an ArcGIS Server web application. It provides a map of all Virginia census blocks, identified as either "served," "unserved" or "underserved" based on the above methodology. The final map combines elements of statistical prediction and ground truth verification against service provider data to present Virginia localities with the best estimate of the served/unserved/underserved areas that can currently be made, given the constraints of existing data.

⚓ This map is intended only as a temporary solution to be used by localities as a reference for ARRA-proposal development, and will be superseded by the maps proposed in this document.

In addition to the mandated elements collected under this application, the Commonwealth proposes to collect the following data sets to augment the Commonwealth's state map/data library and provide a means of obtaining baseline and progress measurement data (through prescribed updates) for ARRA-supported initiatives and programs of national significance (such as those through the Office of the National Coordinator related to electronic medical records) programs. Specifically, the following data elements provide invaluable data that the Commonwealth can use (near term) to further target the delivery, and measure the effectiveness of, programs/applications proposed in the CIT –BTOP building sustainable demand submission (0660-ZA28). Additionally, the Commonwealth plans to utilize the data collected regarding the use of electronic medical/health records as a platform for applications to programs forthcoming through the Office of the National Coordinator to serve as a national model to follow. By collecting these data elements now, as part of this initiative, Virginia will be positioned to not only contribute to the national broadband mapping initiative, but also have the data sets needed to demonstrate (and quantify the results from) the inter-dependent relationships between the NTIA mapping and demand building activities and programs related to other national initiatives and provide quality measures.

⚓ **EMR/Telehealth usage** – to provide a baseline of health-related broadband connectivity and Health IT-related broadband application usage. Results will provide data needed to effectively and efficiently deploy broadband-related assistance to stimulate application usage and build sustainable broadband demand. Subsequent data updates will be utilized to measure the impact of proposed telemedicine-oriented-building-sustainable-broadband-demand programs and will be used for reporting and program adjustment to assure positive outcomes and maximize effectiveness.

⚓ **E-commerce usage information** - to provide a usage baseline of e-commerce applications and broadband services. Results will provide data needed to effectively and efficiently deploy broadband-related assistance to stimulate e-commerce (economic development) and build sustainable broadband demand. Subsequent data updates will be utilized to measure the impact of proposed e-commerce- oriented-

building-sustainable-broadband-demand programs and will be used for reporting and program adjustment to assure positive outcomes and maximize effectiveness.

⊥ **Location of transportation projects** (no funding requested for this layer) – to support and identify "dig once" opportunities. Available geospatial data for ARRA-funded transportation projects will be included in Virginia's Broadband mapping efforts.

⊥ **Location/status of ARRA funded projects** (no funding requested for this layer)

⊥ **Vertical assets locations and capabilities** – to provide information to potential providers of wireless Internet access regarding strategically-positioned candidate locations for the installation of transmission equipment, with the intended effect of shortening the lead time and reducing costs for deployment. A proof-of-concept Vertical Assets Inventory has already been completed in a set of central Virginia counties by the same project team that seeks funding under this proposal, and the software tools, data models and processes are available and well-documented. To extend this concept to a statewide-scale would provide additional value-added information complementing the map of provider-service areas and broadening the content available in the broadband data library.

⊥ **Address-level locations of Virginia businesses,** to support economic impact assessment of ARRA-funded broadband infrastructure projects. As the coordinating entity for broadband projects in the Commonwealth, CIT has a significant interest in demonstrating how funded projects in the telecommunications space translate into tangible job creation and business expansion benefits. As a research center, eCorridors seeks to understand and quantify the mechanisms and models underlying and explaining the relationship between broadband and economic development. As the ARRA broadband programs continue into future rounds of funding, a better understanding of the interplay between broadband and economic development could result in more targeted, effective use of resources. In addition, the collection of accurate address point basemap data for the Commonwealth will further the effort to accurately map the locations of Virginia businesses, thus enabling the research and assessment of ARRA-funded broadband infrastructure projects.

*Proposed timeline (based on September 15, 2009 award)*

⊥ September 15, 2009 – receive approval for grant – initiate:
- Conduct first semiannual meeting of the entire Virginia mapping team (these meetings will occur semiannually throughout the project period to reinforce partner relationships and provide performance checkpoints)
- Assessment of data availability from the providers and align resources accordingly.
- Update process for providers who participated in initial mapping initiative
- Independent verification of data collected in first round, continue collection of missing data elements
- Mapping of available data – community institutions, schools, transportation projects, etc.
- Launch self-reporting sites – speed, price, etc.

- Begin to develop a comprehensive data model for broadband, using the NTIA data specification as a point of departure. Conduct an environmental scan of existing data definitions and extend them to a higher level of generality

- October 1, 2009 – Assess data collection process and mapping process
  - Add layer for broadband demand/other ARRA-funded activities
  - Refine analytical approaches for the use of citizen speed tests as a verification tool to facilitate accuracy of the provider and other data.
  - Refine data model for broadband.
  - Perform analyses of citizen speed test results with service-provider data.
  - Validate state broadband map in preparation for November release; develop methodology documentation.
  - Begin e-commerce/Telehealth and EMR data collection modules

- November 1, 2009
  - (National Map - required) - deliver proposed data ( substitute list of data attributes and percentages)
  - (State map) – deliver elements necessary for determining priority areas for funding )

- January 1, 2010 – launch multi-platform compatible web-based mapping capability, continue data updates and refinements

- February 1, 2010 – Deliver full set of data required under NOFA to NTIA

- March, 2010 - Conduct semiannual meeting of the entire Virginia mapping team

- June, 2010 – Deliver fully functional, complete state map

- September 1, 2010 – initial update due to NTIA
  o Conduct semiannual meeting of the entire Virginia mapping team

- March/September, 2011 – Update national/state maps – including usage data, completeness of VA ARRA-funded projects, data verification, etc
  - Conduct semiannual meeting of the entire Virginia mapping team

- March/September 2012 - Update national/state maps – including usage data, completeness of VA ARRA-funded projects,data verification, etc
  - Conduct semiannual meeting of the entire Virginia mapping team

- March/September 2013 - Update national/state maps – including usage data, completeness of VA ARRA-funded projects, data verification, etc
  - Conduct semiannual meeting of the entire Virginia mapping team

- March /September 2014 - Update national/state maps – including usage data, completeness of VA ARRA-funded projects, data verification etc
  - Conduct semiannual meeting of the entire Virginia mapping team

# 4. PROCESS FOR REPEATED DATA UPDATING

The Virginia Broadband Map will be updated at the intervals mandated in the NOFA. The process for accomplishing each semiannual update will consist of

- an update of key source data components of the map
- re-running of the methodology used to construct the map from its components
- re-deploying the map on VITA/Virginia Tech's web and database servers
- submitting the updated map to NTIA per the guidelines in the NOFA.

Of the data components identified in Section 2: Data Gathering of this proposal, the following table describes how each will contribute to the update process:

| Data Component | Update status |
|---|---|
| existing data/base maps | Updated periodically by various data providers external to the Virginia mapping team; incorporated into the semiannnual updates on an as-needed basis. |
| collection from private/public sector providers | Semiannual updates will be requested from providers. |
| third-party (independent) data collection and verification | Ongoing, with verification process occurring prior and in conjunction with each subsequent new release of updated maps and data |
| survey research methods | Statewide random telephone survey to be completed annually |
| self-reporting Internet speed testing and mapping tools | Data update is inherently ongoing as users add new data points. Model reviewing the results with the service provider data, and verifying the accuracy of it, will be run semiannually. |

# 5. PLANNING AND COLLABORATION

## A. Collaboration

Building on the success of the format of the Commonwealth's Broadband Roundtable, CIT proposes to facilitate the creation of regional technology planning teams; to collaborate with broadband service providers and information technology companies to encourage deployment and user adoption; and to facilitate information exchange regarding use and demand for broadband services between public and private sector users.

In order to foster greater collaboration, we propose to do the following:

- Build on our existing relationships with more than 30 broadband service providers in the Commonwealth as a means of bridging the gaps (perceived and real) between service providers and those in un/underserved locations, hosting individual and/or small group meetings with stakeholders as deemed appropriate. Letters of support from the Virginia Association of Counties, Virginia Municipal League, Virginia Telecom Industry Association, Virginia Wireless Association, Virginia Tech, Virginia Information Technologies Agency, Bristol Virginia Utilities, ESRI, Senator Mark Warner, Congressman Rob Whittman, Congressman Tom Perriello attached.

- Collect requisite data through the formation of 7 regional broadband leadership teams and facilitate 14 regional meetings (over 2 years) to be held throughout Virginia (regions for this purpose are the homeland security planning regions as outlined by the Office of Commonwealth Preparedness (http://www.ocp.virginia.gov/Governance/RPAC.cfm) which will allow for alignment with ongoing and emerging next generation first responder initiatives and coordination with the members of the Commonwealth's Broadband Advisory Council (an 11 member body created by legislation passed and signed in 2009).

- Evaluate progress on existing and planned deployments, and facilitate conversations between public sector leaders and private sector providers to further the goals of the Commonwealth and insure the success of NTIA funded initiatives

- Work with service providers, IT companies, and leadership (within and across regional leadership teams) from all levels of government to identify emerging opportunities and challenges, identify broadband related training and education needs.

- Utilize the regional and topical meetings as a means of strategically targeting programs proposed under CIT's BTOP – building sustainable demand application *(RIN* 0660-ZA28) as a means of insuring meaningful and successful outcomes.

## B. Planning

### *BDIA related purpose*

- To identify and track the areas with low levels of deployment, the rate at which residential and business users adopt broadband service and other related information technology services and possible suppliers of such services
- To identify barriers to the adoption of broadband service and information technology services
- To create and facilitate by county or region in a state, local technology planning teams
- Collaborate with broadband service providers and information technology companies to encourage deployment and use

- To collect and analyze detailed market data concerning use and demand for broadband service
- Facilitate information exchange regarding use and demand for broadband services between public and private sector users

### *The Problem(s) to be Addressed*

From 2008 – 2009, the Commonwealth of Virginia's Broadband Roundtable traversed the Commonwealth, meeting with local and regional leaders and collecting information about ongoing and emerging broadband activities and documenting community needs and barriers to the deployment process.

During these sessions it became abundantly clear that community leaders continue to search for assistance with making informed decisions regarding broadband technologies, funding and legal options, and creating long term sustainability.

As part of their final report, Roundtable leader cited that "Growing sentiment in the Commonwealth that universal access to affordable broadband is a prerequisite for economic growth, educational excellence, healthcare reform, and job creation; crux of concern is the growing geographically imposed digital divide as many rural communities continue to lack access to affordable broadband infrastructure.

What became apparent through the work of the Roundtable is that despite our best efforts to align resources and policies into a cohesive "package" for communities to leverage, holes remain, leaving leaders in the Commonwealth without a complete "slate" of policies and resources to build upon when crafting a broadband initiative…and consequently communities remain without hope of ever attaining broadband independence.

### *The Proposed Solution*

Funding is requested under the broadband planning portion of this proposal to further investigate, validate, update and develop the findings of the Roundtable (as enumerated below), identify new and emerging issues/barriers/opportunities and to build an overall plan - policy, promotion (and education), and practice – as a means of expanding the "broadband friendly" environment in the Commonwealth. Areas of concentration for this initiative as outlined by the Commonwealth's Broadband Roundtable are:

- **Removing barriers to investment:** Identify and develop plans for eliminating unnecessary regulation and policies that inhibit or slow private sector investment such as access to rights-of-way, tower site regulation, access to municipally-owned towers and structures, permitting and licensing, and asymmetric regulations (that treat one class of providers differently from another).

- **Leveraging existing assets:** Evaluate the impact/effectiveness of creating incentives for state and local governments to allow placement of additional antennae on existing government-owned towers and other structures (e.g. buildings,

water towers, etc.). Examine expenditures of public dollars in construction of towers and other broadband related infrastructure and evaluate the possible impact of requiring state and local agencies to coordinate on government tower construction to facilitate efficient use of resources.

- **Creating incentives to investment:** Evaluate the budget impact and overall effectiveness of implementing statewide incentive programs (exemptions, deductions, tax credits, application-centric grant programs) to help attract private infrastructure investment and leverage potential federal investments. Priority would be given to un-served areas of the Commonwealth.

- **Strengthening the Commonwealth's focus on broadband:** Review and revise existing support program and outreach elements/configuration to ensure that state government programs are properly organized, coordinated and applying the appropriate resources and policies to close Virginia's broadband gap.

- **Defining educational gaps and the need for educational campaigns:** Topics to examine include, but are not limited to: 1) Identifying aspects of broadband deployment activities that could benefit from additional focus/education as a means of creating a "safety net" for decision makers. 2) Determining the need for an improved understanding of emerging wired, wireless and 4G broadband technologies, and applications 3) increasing the use of public-private partnerships; and 4) Determining the need for additional online (or other format) resources as a means of accelerating broadband deployments.

- **Evaluating and documenting broadband related ordinances:** Developing a comprehensive mechanism for documenting "broadband friendly" (in Virginia and nationally) ordinances, permitting processes, and Comprehensive Plan elements as a means of developing a resource bank of information designed to aid communities with the adoption of "broadband friendly" ordinances and fast-track permitting policies for broadband construction projects.

*Anticipated Outcomes*
Upon completion, the Commonwealth will have:

- Completed an analysis of the Commonwealth's broadband related - strengths, weaknesses, opportunities and threats and developed an actionable list of recommendations to take Virginia's broadband efforts to the "next level"
- A thorough roadmap linking our mapping efforts (and the resulting identification of un/underserved areas and broadband usage statistics) with our extended deployment plans for broadband applications proposed under the BTOP program for purposes of ongoing evaluation
- Information necessary to develop a "broadband friendly" legislative slate to further remove barriers and expedite deployments

- Developed a robust web-based resource (next generation wired.virginia.gov) upon which communities (in Virginia as well as nationally) can rely for broadband planning and implementation assistance.
- The ability (based on mapping data and information collected regionally) to effectively foster partnerships for deployment beyond areas eligible/approved for funding under the BIP and BTOP programs.

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## BUDGET INFORMATION - Non-Construction Programs

### SECTION A - BUDGET SUMMARY

| Grant Program Function or Activity (a) | Catalog of Federal Domestic Assistance Number (b) | Estimated Unobligated Funds | | New or Revised Budget | | |
|---|---|---|---|---|---|---|
| | | Federal (c) | Non-Federal (d) | Federal (e) | Non-Federal (f) | Total (g) |
| 1. Mapping | 11.558 | $ | $ | $ 4,324,193.00 | $ 4,436,281.00 | $ 8,760,474.00 |
| 2. Planning | 11.558 | | | 448,211.00 | 0.00 | 448,211.00 |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. Totals | | $ | $ | $ 4,772,404.00 | $ 4,436,281.00 | $ 9,208,685.00 |

## SECTION B - BUDGET CATEGORIES

| 6. Object Class Categories | GRANT PROGRAM, FUNCTION OR ACTIVITY | | | | Total (5) |
|---|---|---|---|---|---|
| | (1) Mapping | (2) Planning | (3) | (4) | |
| a. Personnel | $ 234,859.00 | $ 144,874.00 | $ | $ | $ 379,733.00 |
| b. Fringe Benefits | 164,941.00 | 101,745.00 | | | 266,686.00 |
| c. Travel | 6,669.00 | 6,113.00 | | | 12,782.00 |
| d. Equipment | | | | | |
| e. Supplies | 5,000.00 | 10,000.00 | | | 15,000.00 |
| f. Contractual | 8,022,184.00 | | | | 8,022,184.00 |
| g. Construction | | | | | |
| h. Other | | | | | |
| i. Total Direct Charges (sum of 6a-6h) | 8,433,653.00 | 262,732.00 | | | $ 8,696,385.00 |
| j. Indirect Charges | 326,821.00 | 185,479.00 | | | $ 512,300.00 |
| k. TOTALS (sum of 6i and 6j) | $ 8,760,474.00 | $ 448,211.00 | $ | $ | $ 9,208,685.00 |
| 7. Program Income | $ | $ | $ | $ | $ |

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## SECTION C - NON-FEDERAL RESOURCES

| | (a) Grant Program | (b) Applicant | (c) State | (d) Other Sources | (e)TOTALS |
|---|---|---|---|---|---|
| 8. | Mapping | $ 8,500.00 | $ 3,945,000.00 | $ 482,781.00 | $ 4,436,281.00 |
| 9. | Planning | | | | |
| 10. | | | | | |
| 11. | | | | | |
| 12. | TOTAL (sum of lines 8-11) | $ 8,500.00 | $ 3,945,000.00 | $ 482,781.00 | $ 4,436,281.00 |

## SECTION D - FORECASTED CASH NEEDS

| | Total for 1st Year | 1st Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter |
|---|---|---|---|---|---|
| 13. Federal | $ 1,324,694.00 | $ 344,747.00 | $ 329,472.00 | $ 325,126.00 | $ 325,349.00 |
| 14. Non-Federal | $ 887,256.00 | 221,814.00 | 221,814.00 | 221,814.00 | 221,814.00 |
| 15. TOTAL (sum of lines 13 and 14) | $ 2,211,950.00 | $ 566,561.00 | $ 551,286.00 | $ 546,940.00 | $ 547,163.00 |

## SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

| | (a) Grant Program | FUTURE FUNDING PERIODS (YEARS) | | | |
|---|---|---|---|---|---|
| | | (b)First | (c) Second | (d) Third | (e) Fourth |
| 16. | Mapping | $ 1,007,757.00 | $ 848,777.00 | $ 708,999.00 | $ 726,981.00 |
| 17. | Planning | 155,195.00 | | | |
| 18. | | | | | |
| 19. | | | | | |
| 20. | TOTAL (sum of lines 16 - 19) | $ 1,162,952.00 | $ 848,777.00 | $ 708,999.00 | $ 726,981.00 |

## SECTION F - OTHER BUDGET INFORMATION

| 21. Direct Charges: | 22. Indirect Charges: Rates approved by Department of Commerce 3/2009 |
|---|---|

| 23. Remarks: | Section D above include both Mapping and Planning dollars for Year 1 forecasted cash needs. |
|---|---|

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# Detailed Budget Narrative
## Center for Innovative Technology

# MAPPING BUDGET

The matching funds committed to this project are **50.64%** of total program dollars. All matching funds are certified to be from non-federal sources. Letters of commitment from partner organizations are included in the application.

Center for Innovative Technology
**Project Budget**
**Broadband Mapping/Planning**

Period of Performance - 10/1/2009 to 9/30/2014

| Cost Element | Total Federal Request | Total Match | Total Budget |
|---|---|---|---|
| Personnel | | | |
| | | | |
| **Subtotal Personnel** | $234,859 | $0 | $234,859 |
| Fringe Benefits | $164,941 | | $164,941 |
| **Subtotal Direct Labor** | $399,801 | $0 | $399,801 |
| Equipment | $0 | | $0 |
| Travel | $6,669 | | $6,669 |
| Supplies | $5,000 | | $5,000 |
| Contractual | $100,000 | | $100,000 |
| Contractual over $25k cap | $3,485,903 | $4,436,281 | $7,922,184 |
| Other | $0 | | $0 |
| **Subtotal Other Costs** | $3,597,572 | $4,436,281 | $8,033,853 |
| **Total Direct Costs** | $3,997,373 | $4,436,281 | $8,433,654 |
| Indirect Costs | | | |
| Overhead | $130,652 | | $130,652 |
| G&A | $196,169 | | $196,169 |
| **TOTAL PROJECT COST** | $4,324,193 | $4,436,281 | $8,760,474 |

**Personnel $234,859**

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**Fringe Benefit $164,941** ████████████████████████████

████████████████████████████████

**Travel $6,669** is based on GSA per diem rates and will cover the following:

| Grand Total | $ 6,669 |
|---|---|

Hotel and Per Diem rates are from the following website:
http://www.gsa.gov/perdiem

**Equipment $0.** There are no anticipated prime expenditures on equipment unique to this effort. Subcontractor equipment is listed within individual subcontractor proposals.

**Supplies $5,000** include print materials for the program.

**Contractual $3,585,903** costs and **Matching Funds $4,436,281 – Total $8,022,184**

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# PLANNING BUDGET

Center for Innovative Technology
**Project Budget**
**Broadband Mapping/Planning**

Period of Performance - 10/1/2009 to 9/30/2011

| Cost Element | Total Federal Request | Total Match | Total Budget |
|---|---|---|---|
| Personnel | | | |
| **Subtotal Personnel** | $144,874 | $0 | $144,874 |
| Fringe Benefits | $101,745 | | $101,745 |
| **Subtotal Direct Labor** | $246,619 | $0 | $246,619 |
| Equipment | $0 | | $0 |
| Travel | $6,113 | | $6,113 |
| Supplies | $10,000 | | $10,000 |
| Contractual | $0 | | $0 |
| Contractual over $25k cap | $0 | $0 | $0 |
| Other | $0 | | $0 |
| **Subtotal Other Costs** | $16,113 | $0 | $16,113 |
| **Total Direct Costs** | $262,732 | $0 | $262,732 |
| Indirect Costs | | | |
| Overhead | $80,593 | | $80,593 |
| G&A | $104,886 | | $104,886 |
| **TOTAL PROJECT COST** | $448,211 | $0 | $448,211 |

**Personnel $144,874**

**Fringe Benefit $101,745**

**Travel $6,113** is based on GSA per diem rates and will cover the following:

Center for Innovative Technology
Supplement to Budget - Travel Cost Worksheet
TOTAL PROJECT COST

| Location Car Travel | Purpose | Number Trips | Number People | Number Days | Number Nights | RT miles | Mileage costs @ .55/mile (per trip) | Hotel (per night) | Total Hotel Costs | Per Diem (per day) | Per Diem Costs (per trip) | Parking (per day) | Parking (per trip) | Total Cost per Trip | Total Cost for all trips |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Period of Performance - 10/1/2009 to 9/30/2011 | | | | | | | | | | | | | | | |
| Grand Total | | | | | | | | | | | | | | | $ 6,113 |

Hotel and Per Diem rates are from the following website:
http://www.gsa.gov/perdiem

**Equipment $0.** There are no anticipated prime expenditures on equipment unique to this effort. Subcontractor equipment is listed within individual subcontractor proposals.

**Supplies $10,000** include print materials for the program.

**Contractual $0.** There are no anticipated expenditures for contractual costs unique to this effort.

**Other $0.** There are no anticipated prime expenditures on other expenses unique to this effort.

**Total Indirect Charges $185,479**

**Total Planning Portion:** $448,211

**Grand Total Mapping and Planning:** $9,208,685

Center for Innovative Technology
Commonwealth of Virginia

# SF424 Forecasted Cash Needs

**SECTION D – 13. Federal and 14. Non-Federal**

**Forecast is based on milestones to be achieved**
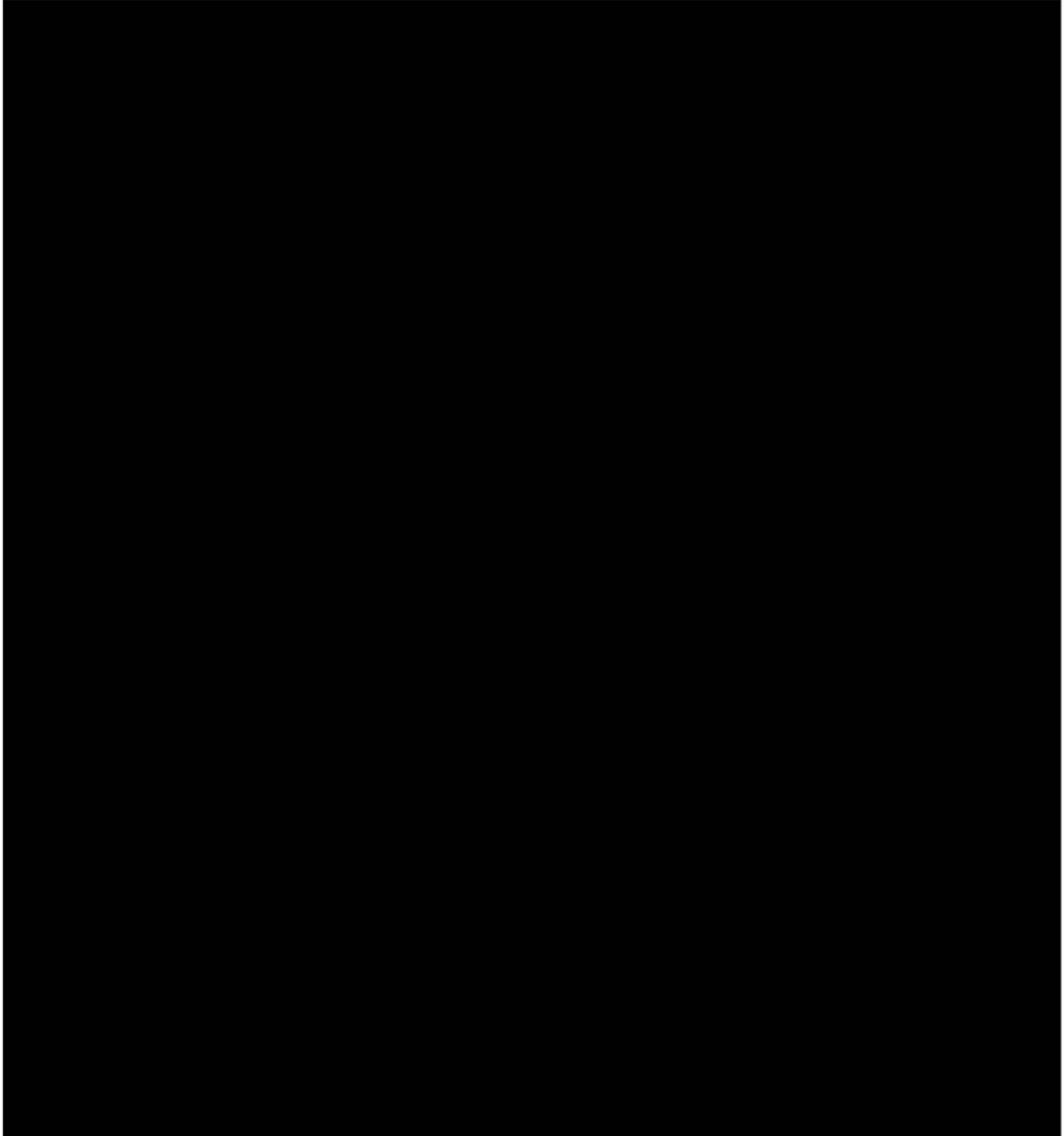
**SECTION E – 16 Mapping and 17 Planning – Budget Estimates of Federal Funds Needed for Project**

Center for Innovative Technology
Commonwealth of Virginia

Center for Innovative Technology
Commonwealth of Virginia
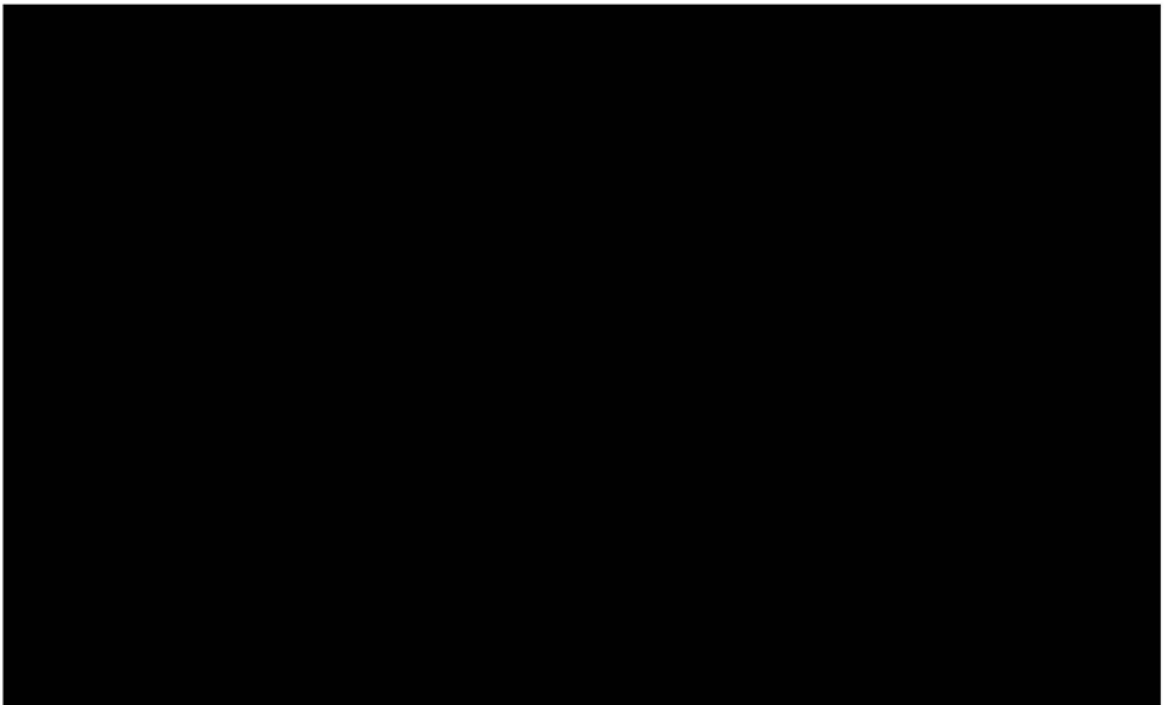
# VirginiaTech

eCorridors Program
VP for Information Technologies Office (0169)
Blacksburg, Virginia 24061
540/231-1853  Fax: 540/231-5843
E-mail: bvgelder@vt.edu
www.ecorridors.vt.edu

August 20, 2009

Karen Jackson
Deputy Secretary of Technology
Office of the Governor
Patrick Henry Building, 3rd Floor
1111 East Broad Street
Richmond, Virginia 23219

Dear Karen,

Virginia Tech, through its eCorridors Program and Center for Geospatial Information Technology, is pleased to accept the invitation to participate on Virginia's statewide broadband mapping initiative, and provide assistance on this initiative as outlined in the attached proposal.  As such, the University commits to this 5-year effort a cost share total of ▉▉▉▉ The funding amount provided to the University over the 5-year period will be a total of ▉▉▉▉ for eCorridors and CGIT tasks related to the collection, verification, and dissemination of broadband data as well as the development of an architecture and model for an ongoing data inventory consistent with the NTIA and FCC specifications and those of the mapping team under your direction.

The eCorridors Program has been performing research on broadband policy, deployment, adoption, and its impact on economic development for the past 10 years.  The past three years have included the development of a publicly available broadband mapping and speed-testing application for collection and dissemination of end-user data on speed, pricing, technology, provider, and location.  The attached proposal leverages those developments and expertise in ways that are consistent with the Secretary of Technology's Office objectives and strategy for broadband mapping under the NTIA program.  As a member of the statewide team, Virginia Tech will be guided by the leadership of the Commonwealth Secretary of Technology and Deputy Secretary, as well as the other team partners in carrying out the initiative proposed herein.

The eCorridors group looks forward to participating on this important endeavor with the ultimate goal of increasing and improving the availability of high quality broadband to all communities, citizens and businesses in Virginia.

Sincerely,

Brenda H van Gelder

Brenda van Gelder
Director, eCorridors Program
Virginia Polytechnic Institute and State University

*Invent the Future*

**Virginia Wireless Association**

www.vawireless.org

August 13, 2009

Karen Jackson
Deputy Secretary of Technology and
Vice President, Broadband Programs
Center for Innovative Technology
2214 Rock Hill Road, Suite 600
Herndon, Virginia 20170

Dear Ms. Jackson,

I am writing to support the Center for Innovative Technology's application (on behalf of the Commonwealth of Virginia) under the National Telecommunications and Information Administration's State Broadband Data and Development Grant Program.

As President of The Virginia Wireless Association (www.vawireless.org), a nonprofit professional association comprised of wireless industry and wireless telecommunication professionals in Virginia, we support the call for increased deployments of infrastructure necessary to provide broadband capabilities. The Virginia Wireless Association was formed to promote an understanding of both the benefits and the necessity of wireless service in and for the Commonwealth of Virginia.

In order for any wireless service to exist, including broadband service, infrastructure is required. We believe that the wireless industry can play a prominent role in developing Virginia's broadband capabilities, particularly in those areas identified as rural and unserved, through the development of wireless infrastructure. To this end, we are pleased to support Governor Kaine's Broadband Roundtable and the Center for Innovative Technology's efforts to increase broadband infrastructure in the Commonwealth.

The Center has assembled an outstanding team to accomplish the tasks as outlined by NTIA and we are happy to lend our future support to the development of wireless broadband in Virginia.

Sincerely,

Ed Roach
President
Virginia Wireless Association

Cc:  Sheila Garrison, Legislative Committee Co-Chairman
     John Clark, Legislative Committee Co-Chairman

ER/krj

Leading the Way!

August 17, 2009

Ms. Karen Jackson
VP Broadband Programs
Deputy Secretary of Technology
2214 Rock Hill Road
Herndon, Virginia 20170

Dear Karen:

This letter is to state that Bristol Virginia Utilities (BVU) is partnering with CIT/the Commonwealth in the State Broadband Data and Development Program and will be providing ███████████ from Bristol Economic Development and ███████ from BVU) in match.

Sincerely,

Wes Rosenbalm
President and CEO

August 13, 2009

Karen Jackson
Deputy Secretary of Technology and
Vice President, Broadband Programs
Center for Innovative Technology
2214 Rock Hill Road, Suite 600
Herndon, Virginia 20170

Dear Ms. Jackson:

I am writing to support the Center for Innovative Technology's application (on behalf of the Commonwealth of Virginia) under the National Telecommunications and Information Administration's State Broadband Data and Development Grant Program.

As the Manager for the ESRI Charlotte Regional Office, I wholeheartedly endorse the application and pledge my commitment to help make the overall effort a successful and sustainable endeavor.

The availability of accurate, accessible broadband service mapping data plays a critical role in the ability of the Commonwealth and the nation to focus efforts on areas that remain unserved and underserved and make strategic planning and investment decisions…a process now driven (all too often) by anecdotal information and localized data.

ESRI's GIS technology was used to help support Governor Kaine's Broadband Roundtable with the Center for Innovative Technology during the production of the Commonwealth's initial broadband service availability map, and we look forward to continuing our support and involvement.

I believe that the Center has assembled an outstanding team to accomplish the tasks as outlined by NTIA and I am happy to lend my support to your proposal and future mapping activities.

Sincerely,

Christian Carlson
Director, State and Local Government Sales

# COMMONWEALTH of VIRGINIA

## MEMORANDUM

**TO:**       All Interested Parties

**FROM:**   Leonard M. Pomata

**DATE:**    August 11, 2009

**SUBJECT:**   Letter of In-Kind Contributions for Virginia Response to Broadband Mapping
NOFA Grant Application to the National Telecommunications and Information
Administration (NTIA)

The Virginia Information Technologies Agency affirms that this agency entered into contract in
2008 to acquire an update to the state's high resolution orthoimagery through the Virginia Base
Mapping Program at a cost of ███████████ Fifty percent of this product will be used as an "in
kind" contribution, for a total of ███████████ to support Virginia's grant application in August
2009 submitted by the Governor's lead, Deputy Secretary of Technology Karen Jackson.

In addition, it is estimated that a large portion of the Virginia Base Mapping Program's
2006/2007 orthoimagery, at a cost of approximately ███████████ will be utilized for
Virginia's Broadband Mapping efforts.

The total in-kind contribution of Virginia Base Mapping Program Orthoimagery for Virginia's
Broadband Mapping grant application is ███████████

# VTIA

VIRGINIA TELECOMMUNICATIONS
INDUSTRY ASSOCIATION

1108 E. Main Street, Suite 1000
Richmond, Virginia 23219-3551

August 7, 2009

**Duront A. Walton, Jr**
*Executive Director*

804-643-7429
804-212-6589 CELL
804-643-6156 FAX

vtiadwalton@aol.com

Karen Jackson
Deputy Secretary of Technology and
Vice President, Broadband Programs
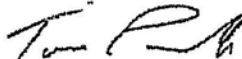Center for Innovative Technology
2214 Rock Hill Road, Suite 600
Herndon, Virginia 20170

Dear Ms. Jackson,

The purpose of this letter is to formally lend support to the Center for Innovative Technology's application (on behalf of the Commonwealth of Virginia) under the National Telecommunications and Information Administration's State Broadband Data and Development Grant Program.

As Executive Director for the Virginia Telecommunications Industry Association (VTIA), I whole heartedly endorse the application and pledge my full commitment to making the overall effort a successful and sustainable endeavor.

The availability of accurate, accessible broadband service mapping data plays a critical role in the ability of the Commonwealth (and the nation) to focus efforts on areas that remain unserved and underserved and make strategic planning and investment decisions.

The VTIA and its member companies were pleased to participate with Governor Kaine's Broadband Roundtable and to partner with the Center for Innovative Technology during the production of the Commonwealth's initial broadband service availability map, and we look forward to continuing that support and our involvement.

I believe that the Center has assembled an outstanding team to accomplish the tasks as outlined by NTIA and I am happy to lend my support to your proposal and future mapping activities.

Sincerely,

Duront A. Walton, Jr.
VTIA Executive Director

TOM PERRIELLO
5TH DISTRICT, VIRGINIA

1520 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-4711
(202) 225-5681 FAX

COMMITTEE ON TRANSPORTATION
AND INFRASTRUCTURE

COMMITTEE ON VETERANS' AFFAIRS

DISTRICT OFFICES:

313 2ND STREET SE, SUITE 112
CHARLOTTESVILLE, VA 22902
(434) 293-9631
(434) 293-9632 FAX

308 CRAGHEAD STREET, SUITE 102
DANVILLE, VA 24541
(434) 791-2596
(434) 791-2598 FAX

515 SOUTH MAIN STREET
FARMVILLE, VA 23901
(434) 392-1997
(434) 392-3254 FAX

## Congress of the United States
### House of Representatives
#### Washington, DC 20515-4605

August 6, 2009

Ms. Karen Jackson
Deputy Secretary of Technology and
Vice President, Broadband Programs
Center for Innovative Technology
2214 Rock Hill Road, Suite 600
Herndon, VA 20170

Dear Ms. Jackson,

I am writing to support the Center for Innovative Technology's application on behalf of the Commonwealth of Virginia to the State Broadband Data and Development Grant Program administered by the National Telecommunications and Information Administration.

As Representative of Virginia's 5th congressional district, I have been working hard to facilitate the deployment of broadband service to my constituents in unserved and underserved areas. One of my major interests in supporting H. R. 1, The American Recovery and Reinvestment Act was its investment in last mile broadband deployment. My office has organized district-wide roundtables to encourage and facilitate sustainable solutions to broadband deployment in the region.

The availability of accurate, accessible broadband service mapping data plays a critical role in the ability deployment projects to focus efforts on areas that remain unserved and underserved. Accurate mapping data is also crucial for making strategic planning and investment decisions that will lead to sustainable results. I applaud the commitment of the Center to provide accurate mapping data and to address the needs of those communities throughout the Commonwealth that lack adequate broadband access.

Respectfully,

Tom Perriello
Member of Congress

TP: bj

MARK R. WARNER
VIRGINIA

# United States Senate

WASHINGTON, DC 20510-4606

August 5, 2009

Karen Jackson
Deputy Secretary of Technology and
Vice President, Broadband Programs
Center for Innovative Technology
2214 Rock Hill Road, Suite 600
Herndon, Virginia 20170

Dear Ms. Jackson:

I am writing to support the Center for Innovative Technology's (CIT) application, submitted on behalf of the Commonwealth of Virginia, to the National Telecommunications and Information Administration's State Broadband Data and Development Grant Program. I whole heartedly endorse the application, which I know will be a successful and sustainable endeavor.

As the former co-chair of the Virginia Broadband Roundtable, I understand the challenges of statewide broadband deployment planning. As the result of your dedicated work and leadership, the Roundtable created a Community Broadband Toolkit that gave Virginia localities practical advice on how to provide or expand broadband access. The Roundtable also created a statewide broadband availability map.

CIT's application to the State Broadband Data and Development Grant Program would take Virginia's broadband mapping capabilities to the next level. As you know, the availability of accurate, accessible broadband service mapping data plays a critical role in enabling the Commonwealth to focus efforts on areas that remain unserved and underserved. Accurate data and mapping information also increases the ease by which state governments can make strategic planning and investment decisions, a process that is all too often driven by anectdotal information and localized data.

I believe that the Center has assembled an outstanding team to accomplish the tasks as outlined by NTIA. I am happy to lend my support to your proposal and future mapping activities.

Sincerely,

MARK R. WARNER
United States Senator

ROBERT J. WITTMAN
1ST DISTRICT, VIRGINIA

HOUSE ARMED SERVICES COMMITTEE
READINESS SUBCOMMITTEE
SEAPOWER AND EXPEDITIONARY FORCES
SUBCOMMITTEE

COMMITTEE ON NATURAL RESOURCES
FISHERIES, WILDLIFE, AND OCEANS SUBCOMMITTEE
NATIONAL PARKS, FORESTS,
AND PUBLIC LANDS SUBCOMMITTEE

CO-CHAIR, CONGRESSIONAL
SHIPBUILDING CAUCUS

WWW.WITTMAN.HOUSE.GOV

**Congress of the United States**

**House of Representatives**

**Washington, DC 20515—4601**

August 5, 2009

WASHINGTON OFFICE
1318 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-4261

DISTRICT OFFICES:

FREDERICKSBURG OFFICE
3504 PLANK ROAD, SUITE 203
FREDERICKSBURG, VA 22407
(540) 548-1080

PENINSULA OFFICE
4904-B GEORGE WASHINGTON
MEMORIAL HIGHWAY
YORKTOWN, VA 23692
(757) 874-6687

MIDDLE PENINSULA OFFICE
508 CHURCH LANE
TAPPAHANNOCK, VA 22560
(804) 443-0560

Honorable Lawrence E. Strickling
Assistant Secretary for Communications and Information
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Ave., NW
Washington, DC 20230

Dear Mr. Strickling:

I am writing to express my interest in the State Broadband Data and Development Grant Program application submitted by the Center for Innovative Technology on behalf of the Commonwealth of Virginia.

The Center for Innovative Technology is overseeing the Commonwealth's broadband mapping initiative to increase the availability of accurate, accessible broadband service mapping data. This program will develop state-specific data on the deployment levels and adoption rates of broadband services in the Commonwealth of Virginia allowing the state to focus efforts on providing services to the underserved and unserved communities in Virginia.

Please give all possible consideration to the grant applications submitted by the Center for Innovative Technology and do not hesitate to contact my office at (540) 548-1086 or 3504 Plank Road, Suite 203, Fredericksburg, VA 22407 with any questions you may have.

With kind regards, I remain

Sincerely,

Robert J. Wittman
Member of Congress

RJW: hjy

# COMMONWEALTH of VIRGINIA
### Office of the Governor

Timothy M. Kaine
Governor

August 5, 2009

The Honorable Lawrence E. Strickling
Assistant Secretary for Communications and Information and Administrator
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Avenue, NW, Room 4898
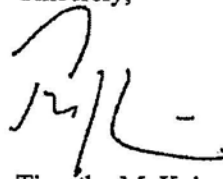Washington, DC 20230

Dear Mr. Strickling:

The Center for Innovative Technology, located in Herndon, Virginia, has played a crucial leadership role in Virginia's broadband mapping efforts to date. The providers and other participating organizations have developed a trusting relationship with the Center for Innovative Technology and look forward to working with them as we continue Virginia's mapping efforts.

Thus, based on their key role and participation in Virginia's broadband mapping initiatives to date, the Center for Innovative Technology is the single eligible entity in the Commonwealth of Virginia and has been designated by the state to receive a grant under the National Telecommunications and Information Administration's State Broadband Data and Development Grant Program.

Thank you for your continued efforts in regards to funding through American Recovery and Reinvestment Act, and we look forward to working with your agency on this and other broadband initiatives.

Sincerely,

Timothy M. Kaine

TMK:tp
c: Ms. Karen Jackson, Deputy Secretary of Technology
Mr. Peter Jobse, President, Center for Innovative Technology

# COMMONWEALTH of VIRGINIA

## Office of the Governor

Timothy M. Kaine
Governor

August 5, 2009

The Honorable Lawrence E. Strickling
Assistant Secretary for Communications and Information and Administrator
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Avenue, NW, Room 4898
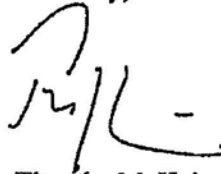Washington, DC 20230

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Thank you for your continued efforts in regards to funding through American Recovery and Reinvestment Act, and we look forward to working with your agency on this and other broadband initiatives.

Sincerely,

Timothy M. Kaine

TMK:tp
c: Ms. Karen Jackson, Deputy Secretary of Technology
Mr. Peter Jobse, President, Center for Innovative Technology

FORM **CD-511**
(REV 1-05)

CERTIFICATION REGARDING LOBBYING

U.S. DEPARTMENT OF COMMERCE

Applicants should also review the instructions for certification included in the regulations before completing this form. Signature on this form provides for compliance with certification requirements under 15 CFR Part 28, 'New Restrictions on Lobbying.' The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of Commerce determines to award the covered transaction, grant, or cooperative agreement.

**LOBBYING**

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 15 CFR Part 28, for persons entering into a grant, cooperative agreement or contract over $100,000 or a loan or loan guarantee over $150,000 as defined at 15 CFR Part 28, Sections 28.105 and 28.110, the applicant certifies that to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying.' in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

**Statement for Loan Guarantees and Loan Insurance**

The undersigned states, to the best of his or her knowledge and belief, that:

In any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying,' in accordance with its instructions.

Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure occurring on or before October 23, 1996, and of not less than $11,000 and not more than $110,000 for each such failure occurring after October 23, 1996.

**As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above applicable certification.**

**\* NAME OF APPLICANT**
Center for Innovative Technology

**\* AWARD NUMBER**

**\* PROJECT NAME**
State Broadband Data and Development Grant Program

Prefix: Mr.

**\* First Name:** Peter

Middle Name:

**\* Last Name:** Jobse

Suffix:

**\* Title:** President and CEO

**\* SIGNATURE:** Patricia Inman

**\* DATE:** 08/26/2009

# DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

**1. * Type of Federal Action:**
- [ ] a. contract
- [x] b. grant
- [ ] c. cooperative agreement
- [ ] d. loan
- [ ] e. loan guarantee
- [ ] f. loan insurance

**2. * Status of Federal Action:**
- [ ] a. bid/offer/application
- [x] b. initial award
- [ ] c. post-award

**3. * Report Type:**
- [x] a. initial filing
- [ ] b. material change

**4. Name and Address of Reporting Entity:**

[x] Prime   [ ] SubAwardee

*Name: Center for Innovative Technology

*Street 1: 2214 Rock Hill Road    Street 2: Suite 600

*City: Herndon    State: VA: Virginia    Zip: 20170

Congressional District, if known: 10

**5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:**

**6. * Federal Department/Agency:**

Department of Commerce

**7. * Federal Program Name/Description:**

CFDA Number, if applicable:

**8. Federal Action Number, if known:**

RIN: 0660-ZA29

**9. Award Amount, if known:**

$

**10. a. Name and Address of Lobbying Registrant:**

Prefix:    *First Name: N/A    Middle Name:

*Last Name: N/A    Suffix:

*Street 1: N/A    Street 2:

*City: N/A    State: VA: Virginia    Zip: 20170

**b. Individual Performing Services** (including address if different from No. 10a)

Prefix:    *First Name: N/A    Middle Name:

*Last Name: N/A    Suffix:

*Street 1:    Street 2:

*City:    State:    Zip:

**11.** Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

*Signature: Patricia Inman

*Name: Prefix:    *First Name: Peter    Middle Name:

*Last Name: Jobse    Suffix:

Title: President and CEO    Telephone No.: 7036893040    Date: 08/26/2009

## ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET.  SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

NOTE:   Certain of these assurances may not be applicable to your project or program. If you have questions, please contact  the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1.  Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2.  Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3.  Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4.  Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5.  Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6.  Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C.§§1681- 1683,  and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation

Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U. S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended,  relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7.  Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8.  Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

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9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

| * SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL | * TITLE |
|---|---|
| Patricia Inman | President and CEO |
| * APPLICANT ORGANIZATION | * DATE SUBMITTED |
| Center for Innovative Technology | 08/26/2009 |

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