



Budget Narrative

Applicant Name: Executive Office of the Commonwealth of PA

EasyGrants Number: 28

Organization Type (from Question 1D on BTOP application): State

Proposed Period of Performance: 2010 to 2012

Total Project Costs: \$35,980,017

Total Federal Grant Request: \$28,784,014

Total Matching Funds (Cash): \$6,196,003

Total Matching Funds (In-Kind): \$1,000,000

Total Matching Funds (Cash + In-Kind): \$7,196,003

Total Matching Funds (Cash + In-Kind) as Percentage of Total Project Costs: 20%

1. Administrative and legal expenses

- List breakout of position(s), time commitment(s) such as hours or level-of-effort, and salary information/rates with a detailed explanation, and additional information as needed.

- Provide description, calculation, and basis of evaluation for Cash Matching Funds.

- Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.

The planned budget for Administration is \$2,881,250

The budget includes Commonwealth of Pennsylvania employees to provide project governance. Exact salaries for Commonwealth of Pennsylvania employees are determined at time of hire according to Office of Human Resources procedures for classification and pay. However, the projection was made based on current budget that shows salaries and benefits for



an experienced technical project staffer (PR11) to be \$75/hour. The Office of Administration Radio believes a technical project that includes work with both vendors and federal reporting, a small staff of experienced project managers is required to interface with the administration and to make sure important issues get the appropriate high-level access. The senior staff will be responsible to make sure that multiple vendors remain coordinated, that policy and grant guidelines are adhered to, and that ongoing analysis of strategic direction is readily available.

Budgeting for project governance assumes that the proposed solution would take up to 3 years for acquisition, construction, testing, and business ramp-up. However, during that time frame, portions of the broadband solution would become available in stages. By the end of that time frame we would anticipate initial project revenues that would allow the transition from grant funded expenses to recurring revenues.

The planning is based on a vision of a 3 month ramp-up, a 2-year peak implementation period, and a 9 month implementation wind-down and business transition. At the outset of the grant award, we would look to bring on 2 employees for the project. After the first 6 months, we would initiate a 3rd position. The positions will be the technical/construction coordinator, a position for business development and customer management, and a third position for grant financials and business administration.

The technical and financial position are budgeted for two years and will use 3,915 hours each. The business development position is budgeted for 1,920 hours before transitioning to the project revenue budget. Total hours over the course of the project are 9,750 at an overall budget of **\$731,250**. The budget provides sufficient maneuver room to accomplish these goals with the Commonwealth's human resources structure. The budget can not be more precise since the exact dates of hire, the exact salary determination can not be finalized until personnel actions are completed.

Administrative expense also include an allowance for a leased project management office that can accommodate work space for project meetings, commonwealth employees, and temporary workspace for contractors. 3000 square feet was budgeted for 2 years at \$25 per square foot. Currently the Office of Public Safety Radio is in leased space. Commonwealth will not charge expenses to the budget if the project utilizes state owned property. It is expected that after two years this expense will be charged to the operating costs of the broadband systems as necessary. A budget of **\$150,000** is included for the management office.

Administrative expense includes acquisition and integration charges directly related to the customer management of the middle mile solution, including network, monitoring, network provisioning of services, and recording of services provided into a financial accounting system for invoice preparation and support. Vendors provided rough order of magnitude estimates of **\$500,000** for billing support, **\$1,000,000** for customer care, and **\$500,000** for additional business support functions. The Commonwealth expects that the final scope of work and pricing will be competitively selected within the 1st year of the project. It is expected that the recurring portions of these costs will be paid with broadband revenues after the third year.

There is no estimate for cash matching or in-kind matching in this budget category.



2. Land, structure, rights-of-way, appraisals, etc.

- Provide description of estimated costs, proposed activities, and additional information as needed.**
- Provide description, calculation, and basis of evaluation for Cash Matching Funds.**
- Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.**

The estimated budget for structures is **\$5,323,484**.

Expense is based on adding 11 telecommunication shelters to tower compounds that lack walk-in shelters. Shelters provide required space for microwave radios and switching equipment. In most of the broadband locations, the Commonwealth already has an installed shelter that can accommodate the additional equipment. Beyond space, shelters add additional security, better environmental control, and increased reliability over outdoor equipment boxes that they are replacing. The cost of a pre-fabricated shelter plus transportation, and installation is approximately \$393,044 per shelter. The total for the shelter expense is **\$4,323,484**

The Commonwealth of Pennsylvania will provide cash match. Capital construction funds for the statewide radio system will pay for \$4,128,994 million of cost for these structures and will count the cost as matching funds. The remainder of the projected expense, \$194,490 will be paid with the BTOP federal funding.

The Commonwealth provided non-cash match, is for the direct expense of using Commonwealth of Pennsylvania existing radio towers – fixed infrastructure – for hosting of microwave dishes required for the middle mile solution. OMB circular A-87 provides necessary instructions for use allowance for fixed assets. The Commonwealth of Pennsylvania has made a significant, \$500 million investment in a statewide radio system, including the construction of 114 new radio towers in the last 10 years. The towers are an extremely valuable asset in the delivery of any wireless project such as the proposed BTOP grant. The actual expense is based on a monthly depreciation allocation of \$500 per month per tower, for approximately 50 to 60 towers, over the course of the first 3 years of the broadband project. The actual depreciation expense may exceed the **\$1,000,000** estimated.

3. Relocation expenses and payment

- Provide explanation for the relocation, description of the person involved in the relocation, method used to calculate costs, and additional information as needed.**



- Provide description, calculation, and basis of evaluation for Cash Matching Funds.

- Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.

Not Applicable: Commonwealth provided zero cost estimate for relocation since we do not forecast any business or home that would need to be relocated.

4. Architectural and engineering fees

- Provide description of estimated fees, explanation of proposed services, and additional information as needed.

- Provide description, calculation, and basis of evaluation for Cash Matching Funds.

- Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.

The total estimated cost for engineering fees is **\$2,997,474**.

Each site that requires major structural change, including new shelters, requires updated sets of site drawings and documentation. Fees for this work are budgeted at \$30,000 per site for a planned quantity of 18 sites, totaling **\$540,000**. Drawings are extremely detailed to include all electronics, cabling, and antennas touched at a site.

Fees include all network engineering and design for 3.65GHz LTE microwave paths to 43 spurs off of the backbone. The engineering fees are \$5,503 per site for a total of **\$236,629**.

Fees include design and microwave engineering for the microwave radio (MDR) at 67 sites where a 150Mb path is being implemented. The fee is approximately \$15,463 per site. The Fees also include project engineering for all switching equipment, approximately 121 devices, at an planned cost of \$6,337 per site. These project engineering fees are based on vendor estimates and total **\$1,802,798**

The vendor also included a full time field project manager, to be on-site to coordinate all microwave and equipment installation for up to 30 months. This cost is based on a monthly contract rate of \$13,900 per month (approximately \$79/hr). The project manager works for the telecommunications equipment supplier and installer and is responsible to on-site for all major work at a site for the selected vendor. Cost is fully burdened to include travel and expenses. The actual months consumed will depend on the efficiency of project completion. The total cost is planned to be **\$417,000**

A small amount, **\$1,047** is included to account for duplication and postage fees related to engineering diagrams and blue print. Printing of large format documents is planned at \$4 per



page for approximately 210 documents, with the remainder and unused amounts available for postage and shipping of the documents, include purchase of storage tubes.

5. Other architectural and engineering fees

- **Provide description of estimated fees, explanation of proposed services, and additional information as needed.**
- **Provide description, calculation, and basis of evaluation for Cash Matching Funds.**
- **Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.**

The estimated budget for other engineering fees is **\$495,125**

Other engineering fees include those fees most directly related to engineering for structural improvements and infrastructure changes required to host additional microwave dishes on towers and additional equipment at sites. An independent professional engineering will provide studies and reports required before installing any new equipment on any existing tower, per standard industry practice. There is an allowance for 3 reports, a structural analysis, radio frequency study, and environmental analysis at 67 sites. The engineering vendor has quoted \$1,125 per report required. Total planned for the reports is **\$226,125**

Preliminary analysis suggests that Public Safety Radio will remove and replace six existing towers in order to provide the required structural strength and height for the 150Mb microwave equipment. The engineering fees for each new tower is \$44,883 per tower. The fee covers the engineering blueprints and the engineering quality assurance for the duration of the tower construction. The total cost for 6 towers is **\$269,000**

There is no in-kind or matching funds provided in this category.

6. Project inspection fees

- **Provide description of estimated fees, explanation of proposed services, and additional information as needed.**
- **Provide description, calculation, and basis of evaluation for Cash Matching Funds.**
- **Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.**



The estimated budget for inspection fee is **\$1,763,200**.

Project inspection fees include a telecommunications vendor estimate to keep a project management officer employed for 24 months at a \$15,500 monthly charge (approximately \$88/hr for 22 days per month at 8 hrs per day). The project management office would be coordinating the implementation and system integration for the 3 major network components – including the 43, 3.65 GHz paths, the 71 microwave paths, and all of the MPLS routing and switching, as well as the network management tools. The total cost for this position is **\$372,000**.

The Commonwealth would hire an engineering quality assurance contractor to coordinate all vendors and to integrate the process for all civil, radio, and technology engineering and design into the middle mile solution. The quality assurance contractor will also ensure that the project is in position to accept customer requests to connect to the middle mile solution and that industry standards and requirements are being met. This position would be independent of equipment suppliers and installers and would be capable of representing the Commonwealth during any and all inspections. This was estimated to be 1.75 persons over the course of two years. The lead will be fully dedicated to the project and will consume 4232 hours. The part time staff will consume 3168 hours over two years. However, it is expected the QA vendor will have limited allowance to bring in additional expertise as required to keep the project on deadline and reduce the part-time hours as needed to meet the budget. The Commonwealth currently has a similar vendor billing a fully burdened and blended rate of \$188 per hour. The Commonwealth has budgeted 7,400 hours for a total of **\$1,391,200**.

There is no in-kind or matching funds provided in this category.

7. Site work

- Provide description of estimated fees, explanation of proposed services, and additional information as needed.

- Provide description, calculation, and basis of evaluation for Cash Matching Funds.

- Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.

The budget for the site work is **\$6,628,767**.

Expense for site work includes the installation of the major microwave broadband equipment across the entire network. Installation costs are labor and services. All materials and equipment are budgeted separately. Costs are based on contract base rates for units of services and deliverables. For example, a field technician is contracted at \$1,440 per day and the contracted cost for the tower installation of an 8ft diameter microwave dish is a \$4,222 deliverable, including labor for tower climb. The total installation per site is a roll-up of numerous service fees required for the specific details of each site.



The planned budget includes installation of 3.65 GHz microwave dishes at 43 sites, for \$39,251 per site for a total of **\$1,687,793**. These radios will create spur shots off of the backbone to targeted locations requiring connections, including anchor institutions that have facilities within line of sight. The budget includes the installation of MDR radios at the 67 tower sites for \$65,191 per site totaling **\$4,367,797**. These are the installation requiring tower climbs and fixing microwave dishes onto the towers. The budget includes installation of MPLS broadband switching equipment at each tower's equipment shelter (some sites require 2 switches, some sites 1 switch) at \$4,737 per set of equipment. The total cost for switch installation is budgeted at **\$573,177**. Upon issuance of the grant award, and commencement of engineering services, the selected vendor will provide a detailed quote of installation services on a site per site basis not to exceed the budgeted amounts. This will ensure that each unit of service is quoted by contracted price and that each service can be verified as a system requirement.

There is no in-kind or matching funds provided in this category.

8. Demolition and removal

- Provide description of estimated fees, explanation of proposed services, and additional information as needed.**
- Provide description, calculation, and basis of evaluation for Cash Matching Funds.**
- Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.**

There is no cost estimate for this category on this project. Any removal of existing equipment is minimal and included with the cost of installation of replacement equipment.

9. Construction

- Provide description of estimated fees, explanation of proposed services, state whether the work is being completed by the applicant or an outside contractor, and additional information as needed.**
- Provide description, calculation, and basis of evaluation for Cash Matching Funds.**
- Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.**

The estimated budget for construction is **\$4,995,267**.

Estimates for the Broadband project includes major structural modifications to 6 existing radio towers. The changes to these towers are \$488,043 for the tower parts and tower materials for a



total of \$2,928,258, and other materials, per tower. A budget of \$344,501.50 is for labor and installation of the tower modifications, per tower, totaling to \$2,067,009. The cost for the design, engineering and inspection is stated separately. The engineering functions will determine the extent and the requirements for each modification.

Of the total \$4,995,267 cost, the commonwealth will use capital construction funds for the statewide radio system to match \$734,493 of the expenditure.

There is no in-kind match made in this category.

10. Equipment

- Provide list of equipment with description, number of units, unit cost, state whether it is being purchased or leased, and additional information as needed.

- Provide description, calculation, and basis of evaluation for Cash Matching Funds.

- Provide description, calculation, and basis of evaluation for In-Kind Matching Funds.

The estimated budget for equipment is \$10,895,450. Estimates for equipment include the electronics components for switching, routing, transport, and central server control for the 67 site microwave loop that will be the middle mile backbone.

Most of the cost is for equipment and quantities listed below:

Equipment	Per Unit Cost	Q	Budgeted Total
7705 SAR-8	\$ 19,092.00	27	\$ 515,484.00
7705 SAR F	\$8,736.00	93	\$ 812,448.00
7710 SRc-12	\$ 48,004.00	1	\$ 48,004.00
7750 MDA	\$ 28,472.00	18	\$ 512,496.00
MDR 8000	\$ 121,792.00	67	\$ 8,160,064.00
3.65 GHz WiMax Radio	\$ 10,472.00	43	\$ 450,296.00
MPLS Optics	\$1,112.00	24	\$ 26,688.00
5620 SAM	\$ 157,485.00	2	\$ 314,970.00
Total			\$10,840,450.00

The equipment budget includes 121 MPLS switches. These are the 7705 SAR-8, the 7705 SAR F, and the 7710 SRc-12. It also includes 7750 MDA routers placed along the backbone.

The equipment budget includes 67 MDR 8000 radios to be installed at each site on the middle mile solution.

The equipment budget includes 43 new tower mounted 3.65 line of sight radios that can connect the middle mile solution to additional spur sights or anchor institutions, and 24 fiber optic connectors. Budget includes 2, 5620 SAM network controllers, including server and



software. The largest expense is the MDR8000 radio, which is estimated to cost \$122 thousand each at a quantity of 67.

Because of the remoteness of tower sites, many on mountain tops, accessible via logging and other non-paved roads, the Commonwealth has budgeted for the purchase of one true 4x4 vehicle exclusively for use on the project. In most cases, personal vehicles can not be used to access sites, and although the radio project has an older fleet of small trucks, the scope of this project justifies a heavy duty vehicle at cost of **\$55,000**. The truck will remain part of broadband operation for maintenance service after construction is complete. It is anticipated that quarterly preventive maintenance checks will keep the vehicle in full use. The transfer of the vehicle to the ongoing project will be approved through the grants program office.

Of the total \$10,895,450 cost, the commonwealth will use capital equipment funds for the statewide radio system to match **\$1,332,516** of the expenditure.

There is no in-kind match made in this category.

11. Miscellaneous

- Provide additional information as needed.**
- Provide description, calculation, and basis of evaluation of Cash Matching Funds.**
- Provide description, calculation, and basis of evaluation of In-Kind Matching Funds.**

There is no cost estimate in this category.

Addendum

- If indirect costs (i.e., indirect, overhead, general and administrative, facilities and administration, etc.) and/or fringe benefits are included in the budget, please provide a copy of your existing Negotiated Indirect Cost Recovery Agreement (NICRA), if available. If the NICRA is applied accordingly in the budget, there is no need to justify the costs. If a NICRA is not available or is not consistent with the rates/calculations in the budget, please provide an explanation of how the amounts**



were calculated. Please clearly list the manner in which indirect costs are calculated in the budget.

Not Applicable: Indirect costs were not included as part of the proposed matching funds or budget.