



DEPARTMENT OF TECHNOLOGY SERVICES

Isiah Leggett
County Executive

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MEMORANDUM

October 3, 2012

TO: Jennifer Hughes, Director, Office of Management and Budget

FROM: Harash "Sonny" Segal, Director, Department of Technology Services *Harash Segal*

SUBJECT: FiberNet FY13-18 CIP – FY14 Mid-Cycle CIP Increase Request

EXECUTIVE SUMMARY

Summary. The FY13-18 FiberNet CIP budget is funded entirely by restricted capital revenues in the non-tax supported Cable Fund. A mid-cycle CIP increase of \$1.860 million in FY14 and \$1.635 million in FY15 is hereby requested to address unanticipated costs associated with the implementation of the American Recovery and Reinvestment Act (ARRA) and provision of a College Fiber Network. A mid-cycle FY14 CIP increase is vital and essential to enable FiberNet to support planned expansion in FY14-16, including the Public Safety System Modernization project. Failure to fund the mid-cycle increase may result in a 25 percent increase in fiber termination costs (\$758,000) and a 200 percent increase in pole attachment safety corrections (\$929,000), *i.e., a \$1.687 million increase beginning in FY15 if the FY14 mid-cycle increase is not approved. An additional \$3 million over 3 years may also be required to provide commercial broadband services to support PSSM and the College will continue to pay for leased services.* The Cable Fund can be used to fund the requested increase¹ or the FY13 General

¹ The current Comcast franchise expires at the end of FY13. An anticipated renewal will affect the allocation of funding between capital funds, which may only be used for construction and equipment purchases, and operational funds. In addition, the County is preparing to renegotiate franchise revenue sharing agreements with municipalities. While the negotiation outcomes may vary, under every scenario, the Cable Fund will have sufficient funding to fund the requested FY14 mid-cycle FiberNet FY13-18 CIP adjustment. The majority, if not all, of the funding increase will be provided by allocating Cable Fund capital funds that may only be used for the purpose of constructing FiberNet or television production facilities and equipment. Cable fund expenditures, by law, may only be spent pursuant to the Cable Communications Plan.

Operating Budget appropriation of \$3,093,200 in FiberNet chargebacks, intended to be used to support upgrades of FiberNet hub sites and electronics, could also be used to fund the request. FY12 ARRA Grant sub-recipient funding was reprioritized to support the following unanticipated ARRA grant implementation item:

- *\$1 million of ICBN ARRA funding (1.3 percent of ICBN budget) was provided in FY12 to fund unbudgeted State completion of necessary environmental reviews, thus reducing available funding for future unanticipated budget items.*

FY13 FiberNet CIP funding was reprioritized to support the following unanticipated ARRA grant implementation items:

- *\$52,307 of the FY13 FiberNet CIP must be provided as an unanticipated ARRA grant match contribution to pay City of Rockville permit fees.*
- *\$200,000 of FY13 FiberNet CIP funds must be provided as an unanticipated ARRA grant match contribution to pay pole attachment fees and costs to permit overlashing to existing FiberNet fiber.*

Additional FY14-15 FiberNet CIP funding will be needed to support the following unanticipated ARRA grant implementation and FiberNet budget items:

- *\$464,285 is needed in FY14 to fund unanticipated fees and costs to correct outstanding FiberNet pole attachment issues. If unfunded, utility companies may increase fees beyond this amount.*
- *\$1.14 million is needed in FY14 to perform half of the necessary FiberNet hub fiber terminations to ensure the viability and sustainable growth of the network.*
- *\$255,512 is needed in FY14 to complete engineering and construction for three Montgomery College connections to FiberNet and engineering for a College Fiber Network as outlined in the draft memorandum of understanding between the County and the College.*
- *\$1.14 million is needed in FY15 to complete the remaining half of the necessary FiberNet hub fiber terminations to ensure the viability and sustainable growth of the network.*
- *\$495,224 is needed in FY15 to complete construction of a College Fiber Network as outlined in the draft memorandum of understanding between the County and the College.*

See the attached current FY13-18 FiberNet CIP, chart of FY14 Mid-Cycle CIP Increases and proposed amendments to the FiberNet CIP.

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BACKGROUND

ARRA Background. Montgomery County is part of a coalition of nine central Maryland counties and cities (collectively, the Inter-County Broadband Network or ICBN) and the State of Maryland (collectively with the ICBN, the One Maryland Broadband Network or OMBN). In Montgomery County, the ARRA grant will be used to expand and enhance FiberNet, the County's fiber optic communications network. The ARRA grant is funding construction of 140 miles of new fiber capacity between FiberNet hub sites and to expand FiberNet to 89 elementary schools, 19 Housing Opportunities locations and 1 public safety location.

In September 2010, OMBN was awarded a \$115 million ARRA grant to expand broadband statewide.² Projects were required to be substantially complete, meaning 2/3 complete, by August 30, 2012, and to have expended all ARRA funds by August 30, 2013. Any funds not spent by August 2013 will be returned to the U.S. Treasury. To process vendor payments by August 2013, all ARRA grant work must be completed by June 30, 2012.

FY13-18 FiberNet CIP Background. At the end of FY13, FiberNet consisted of 350 miles of aerial fiber attached to approximately 7,000 utility poles and 50 miles of underground fiber.³ FiberNet provides voice, video and data communications to 326 locations and also serves as the communications *backbone for the public safety radio communications networks and the traffic management networks. The additional fiber construction between FiberNet hubs being funded by the ARRA grant is a critical upgrade.* The FY13-18 FiberNet CIP anticipates that FiberNet will expand to 510 locations by FY17 and will support future public safety radio technology. Without the ARRA grant construction, there is not enough spare fiber capacity within FiberNet to support the additional 109 ARRA sites, nor the 75 additional County, MCPS, M-NCPPC, and WSSC sites. Of these 75 additional sites, 59 are planned to be built between FY14 and FY16 and an additional 25 traffic cameras will added as well during this period. More importantly, the ARRA grant will provide the fiber capacity necessary to support the Public Safety System Modernization (PSSM) project which is presently being constructed.

ARRA Grant Budget Development. The ARRA grant required "shovel ready" projects that were ready to be built, but which could not have been built but for the provision of federal

² The \$76 million ICBN portion of the ARRA grant is being managed by Howard County. Montgomery County receives the benefit of \$14 to \$17 million in construction, but the funds are received and expended by Howard County so there is no recorded increase in the FiberNet CIP budget as a result of the ARRA grant. Montgomery County was required to contribute \$2.6 million total in matching cash and in-kind labor between FY11 and FY13.

³ In addition to FiberNet fiber, the County also has fiber and copper wiring attached to utility poles to support the traffic management systems. The original FiberNet design was cost-effective because it leveraged, and was simultaneously constructed as part of, a planned expansion of traffic management system wiring.

funding. In a perfect world, the OMBN, ICBN, and FiberNet engineering would have been performed prior to the submission of the ARRA grant, but there was neither time nor funding to perform the necessary engineering work prior to the grant submission (nor are local governments likely to have spent millions to engineer projects that have no identified funding source). Therefore, best estimates were developed based on cost averaging and key assumptions. Relevant FiberNet assumptions were:

- (a) Federal and State governments would be prepared to proceed with rapid implementation of the ARRA grants;
- (b) No County or municipal permitting fees would be required to expand a County communications network to schools and public housing;
- (c) Pole attachment costs assumptions were as follows:
 - (1) Pole licenses (*i.e.*, permission to attach to utility poles) were held for the majority of utility poles on which FiberNet fibers are already attached;
 - (2) New ARRA grant-funded fiber could be overlashed to existing FiberNet fiber attached to 2,700 poles at no additional cost to use these poles;
 - (3) Costs to construct new aerial fiber and attach to utility poles would be reasonable;
 - (4) Ensuring that utility companies to complete work necessary to make poles ready for new attachments (“make ready” work) within a reasonable time period would be a challenge.
- (d) Terminating the new ARRA fiber into existing hub sites would require minimal equipment and labor; and
- (e) Montgomery College did not have any additional fiber requests to be included in the ARRA grant.

MID-CYCLE COST INCREASE FACTORS

(a) Maryland Environmental Assessment Costs. The federal and Maryland State governments were not prepared to implement the ARRA grant. Specifically, federal construction grants require an environmental assessment plan (EAP) to ensure compliance with environmental protection statutes and regulations. Congress did not anticipate this review process, which typically takes 12 months, when establishing a 24-36 month grant funding period. The federal government relies on states to certify environmental compliance. The Maryland government did not have sufficient staff, nor funding to hire temporary staff, to review EAPs. Additional funding from ICBN was needed to enable the State to process ICBN EAPs within six months. Until the EAP certification was complete, federal funding for construction would not be available.

- *\$1 million of ICBN ARRA funding (1.3 percent of ICBN budget) was provided in FY12 to fund unbudgeted State completion of necessary environmental reviews, thus reducing available funding for future unanticipated budget items.*

(b) Rockville Permit Fees. Throughout the ICBN area, municipalities waived permitting fees as the majority of construction was designed to expand government networks to government facilities, police and fire stations, and to public schools, libraries and community centers. In Montgomery County, the County and Gaithersburg waived permit fees and Takoma Park did not require permit applications. Rockville, however, in response to recent County actions to require additional fees for County services provided to the City, opted not to waive permitting fees. Although the County could have responded by opting not to provide broadband service to the MCPS elementary schools located in Rockville to reduce permit fees, there are key FiberNet hubs located within the City and FiberNet cannot be upgraded without permits from Rockville.

- *\$52,307 of the FY13 FiberNet CIP must be provided as an unanticipated ARRA grant match contribution to pay City of Rockville permit fees.*

(c) PEPCO Pole Attachment Fees and Costs.

New Fiber Routes. The County has a written pole attachment agreement with Verizon and a verbal pole attachment with PEPCO. Following EAP approval, in March 2011, the County began submitting applications to construct new pole attachments on utility poles where no existing FiberNet fiber was presently attached. PEPCO and Verizon requested that the County limit the number applications to 5 per week over a 15 week period. These applications required significant engineering drawings, planned ride outs by utility company inspectors along proposed routes, engineering estimates from the utility companies, and construction work performed by the utility companies. In the past, PEPCO and Verizon typically took 18 months to complete this type of make ready work. Verizon agreed to complete the ARRA application review and make ready work within two months. PEPCO agreed to use best efforts to expedite make ready work. Eventually, PEPCO agreed to complete all make ready work by September 2012. This would enable the County to complete all outside fiber construction by December 2012 and to subsequently complete fiber termination, internal building wiring, and testing by June 30, 2013. During these months of discussion, no issue was raised by PEPCO about overlashing new fiber to FiberNet fiber already attached to utility poles.

Written PEPCO Pole Attachment Agreement Request and Impact on Overlashing Along Existing FiberNet Routes. The FY13-18 FiberNet CIP request was submitted in the fall of 2012. After approval of the FiberNet CIP, in approximately May 2013, some 14 months after the County first submitted PEPCO pole attachment applications, PEPCO contacted the County to request that the County not continue to overlash to existing FiberNet fiber attached to PEPCO utility poles until a written pole attachment agreement was executed. Upon inspection of the new ARRA grant-funded overlash, PEPCO determined that it preferred to have some of the pre-existing FiberNet pole attachments relocated to other areas of the pole. Thus, PEPCO did not

want additional new ARRA attachments to be overlashed and complicate the relocation process.⁴ Upon further discussions and investigations by PEPCO and the County, it was determined that because of the verbal agreement and informal nature of the County and PEPCO's past working relationship, PEPCO had not always required pole attachment applications to permit the County to attach to PEPCO poles and that the County and PEPCO could only provide formal pole licenses for 10 percent of the poles on which FiberNet was attached.⁵

Process to Correct Existing Routes. To address the need to complete the outside ARRA grant construction by December 2012, PEPCO and County agreed in July 2012 to perform expedited joint ride out inspections of the proposed ARRA routes. Where no pole attachment issues were found, PEPCO would permit overlashing and the parties would, at minimum, document the pole numbers and PEPCO approval of the County's pole attachment. Where relocation work was necessary, the County would pay fees to enable PEPCO to perform the necessary make ready work (sometimes this means that the facilities of other parties attached to the pole need to be moved).⁶ This resulted in approximately \$200,000 in unanticipated ARRA construction costs which will be funded using the current FY13 FiberNet CIP.

Cost to Correct Existing Routes. As part of the ARRA grant, the County will have inspected between 2,400 and 2,700 of the 7,000 poles on which FiberNet and other County facilities are attached. Based on this sample, the County estimates that 30 percent of FiberNet pole attachments not being leveraged for the ARRA grant will need repairs to the pole

⁴ Regulations require that communications wires be placed a minimum distance below the electrical lines attached to the top of the poles and that all wires be attached on poles at a minimum distance above the ground level. By practice, when an applicant requests to add new wires to a pole, the new applicant is responsible for paying all fees necessary to make the pole ready, either by rearranging the wires or by replacing an existing pole with a taller pole to ensure minimum distances are met. New poles typically cost \$20,000 to \$40,000 to replace. Routes are often reengineered underground or over alternative routes to avoid the cost of having to replace poles.

⁵ Because of the absence of written pole licenses stating the original height of the County attachment and the absence of engineering stick drawings (showing the height of every existing pole attachment) that would have been included with formal pole attachment applications, it is difficult to determine whether relocation issues were caused by the County or a subsequent attacher.

⁶ The ARRA project created a dilemma for the County. In planning new construction, if there are additional make ready costs to correct existing FiberNet attachments to permit overlashing to existing FiberNet fiber, the ARRA project can opt to: (1) make the corrections; (2) use an alternative route to reduce make ready costs; or (3) build underground and avoid make ready costs. The ARRA project has no obligation to perform the FiberNet pole attachment repairs, but once the County is made aware of a the repair issue, the County has an obligation to correct it. New routes require submission of new pole attachment applications, fees, and make ready costs, which make new routes more expensive than overlashing, and underground construction costs 30 to 60 percent more than new aerial construction. These decisions are cost-based and made on a case-by-case basis. However, if a new route or underground construction option is used by the ARRA project, the County still has to pay to correct the FiberNet repair issue that was discovered. Thus, in most cases, it was determined that using ARRA fund to pay for work to correct the repair issue and to permit overlashing was more cost effective than building a new route or constructing underground.

attachments. If the County and PEPCO continue using the expedited ride out inspection process, the estimated cost for these repairs will be \$464,285. The County intends to negotiate a reasonable period of time to enable a clean-up and review of existing pole attachments as part of the new written pole attachment agreement PEPCO requested in May 2012.

- *\$200,000 of FY13 FiberNet CIP funds must be provided as an unanticipated ARRA grant match contribution to pay pole attachment fees and costs to permit overlash to existing FiberNet fiber.*
- *\$464,285 is needed in FY14 to fund unanticipated fees and costs to correct outstanding FiberNet pole attachment issues. If unfunded, utility companies may increase fees beyond this amount.*

(d) FiberNet Hub Fiber Termination. The ARRA grant fiber will fund construction of vital additional fiber capacity between FiberNet hubs. Fiber-backbone capacity between FiberNet hubs is used to carry all communications network traffic. In addition, FiberNet fiber-backbone capacity between hubs is used to segregate and carry Public Safety Radio and Public Safety Mobile Data Systems communications traffic separate from all other communications traffic. The Public Safety System Modernization Internet Protocol (IP or IP-based) radio network is being built with the expectation that diversely routed FiberNet fiber-backbone capacity will be ready to support PSSM IP radio traffic.

FiberNet has 12 hub sites strategically placed throughout the County. FiberNet leverages state-of-the-art IP technologies to maximize its transport capacity over high-speed links by creating a backbone network connecting each hub to multiple hubs in a mesh. When a new site is added to FiberNet, it only needs to be connected to the nearest hub. Once communications traffic reaches the closest hub site, it will be forwarded to its final destination via the shortest path through the FiberNet hub-mesh. Thus, if part of the network becomes congested or inoperable, traffic can be dynamically routed via other hubs in the backbone network. Operating FiberNet in this manner minimizes the route distances for new sites and thus minimizes the per foot and total cost of adding additional sites to FiberNet.

Specific FiberNet Fiber Termination Requirements. As part of the ARRA grant implementation, engineering was performed at two hubs to determine the level of work necessary to terminate new ARRA fibers in FiberNet hubs. As a result, it was determined that the costs for termination of ARRA fiber in FiberNet hubs were unexpectedly and significantly higher than the remaining available ARRA grant funds.

ARRA fiber pulled into a hub site typically consists of 216 fibers enclosed in a bundle 1-inch in diameter. A connector is attached to each fiber and then the other end of the connector

is plugged into a port. A cabinet about 2.5' wide and 5' tall contains room for 400 or so fiber connection ports. Different sections of the cabinet are reserved for specific uses. For example, fibers to public safety locations, interconnections with other networks, education sites, community sites, *etc.* Space is left to add new connections in each section. A splicing matrix or diagram noting what location each fiber connects to and which port it is connected to is also created. After termination, each fiber is tested by shooting light at one end and confirming that the light is visible at the other end.

For FiberNet, this process is complicated by the existence of the current FiberNet infrastructure in each hub.⁷ The existing FiberNet hub infrastructure is twelve years old and its optical connectors are too large to accommodate the density required to terminate more than three times the number of connections originally anticipated. Thus, all the old and new fiber entering every hub must be reterminated to completely integrate the ARRA construction into, and to leverage the benefit for, FiberNet. The existing and new terminations have to be uniformly built and configured so that all the same type of connections (e.g., public safety, schools, government sites, *etc.*) are terminated in the same patterns within the equipment cabinets at each hub site so that FiberNet is maintainable. In and of itself, reterminating FiberNet fiber in the hubs is a large project that requires a tremendous effort on the part of everyone participating in the project. DoT and DTS have performed this activity previously and the effort required weeks of prestaging equipment and still resulted in two weekends of network outages at affected hub locations. This activity needs to be scheduled so that all FiberNet sites served by a hub, including public safety services, can be without network services for a 12 to 24 hour window.

Fiber Termination Temporary Solution. The problem the County Government faces in integrating the ARRA fiber into FiberNet has two distinct parts. The first and most welcome task is integrating the ARRA fiber into FiberNet. At least two large bundles of fibers providing 432 fibers need to be terminated in each hub. The second task is caused by the first, infrastructure space needs to be created in each hub to triple the number of optical connections. This can only be accomplished by removing all of the current optical hardware and replacing it with more dense optics with smaller form-factor connectors. Taken together, these two tasks completely rebuild the fiber termination infrastructure in each hub.

⁷ Imagine a home stereo receiver connected to a television, DVD player, and DVR set top box recorder. Now imagine the labor to replace one piece of this equipment and add a game console. The FiberNet termination project is similar to connecting 432 new pieces of equipment and keeping the 150 pieces of current equipment still functioning, all within the current space used for home electronics. Except that instead of connecting home electronics, FiberNet equipment terminations enable police and fire communications, broadband to schools and operation of all County systems.

Based on engineering estimates performed at two separate hub sites, the fiber termination will likely cost \$285,000 *for each hub site*. The remaining ICBN budget would provide approximately \$300,000 to complete the fiber termination at all 12 FiberNet hubs. Rebuilding the fiber termination infrastructure is not possible based on the current funding available from ARRA and the FiberNet CIP.

The challenge for the ICBN project and Montgomery County Government was how to ensure that the grant project is completed by the June 30, 2013 grant deadline. The following would have had to occur to meet the grant deadline:

- *PEPCO must meet its original deadline to complete all make ready work on new fiber routes work by the end of September and would have to complete new make ready work on existing FiberNet routes within 4 to 8 weeks;*
- *All the remaining ARRA fiber construction would need to be completed by the target date of December 30, 2012;*
- *Several million in additional funding would need to be available in FY13;*
- *The FiberNet staff and contractors would have to complete a complex hub termination every two weeks; and*
- *No other unanticipated factors could emerge, such a PEPCO strike, major storm, etc., that would delay construction and potentially put millions of ARRA grant funding at risk.*

For these reasons, the FiberNet team designed an alternate temporary solution.

Rather than terminating fibers in the closest hub site, all new ARRA fibers will be terminated in Hub Site A. This will enable all of the ARRA sites to be made operational and satisfy the requirements of the ARRA grant. During FY14 and FY15, the FiberNet teams will then integrate the ARRA fiber into FiberNet. Four hub site terminations will be completed in each year. The remaining hub sites are in locations scheduled to be moved as part of larger County redevelopment projects (e.g., Shady Grove SmartGrowth) and the cost of terminating those hub sites will be built into the redevelopment project budget. Until the hub termination work is completed, the new 59 FiberNet sites and 25 cameras planned to be added in FY14-16 as part of the current FiberNet CIP will be delayed until FY17 or later. More importantly, new fiber needed to support the PSSM will not be available until FY17, after the hub termination work is completed in FY16 (if funded in the FY15-20 FiberNet CIP). *Delay of the provision of fiber for PSSM will require the County to fund additional, very expensive 24x7x365 commercial broadband service with 99.999 percent reliability to support transport of public safety IP radio traffic.*

- ***\$1.14 million is needed in FY14 to perform half of the necessary FiberNet hub fiber terminations to ensure the viability and sustainable growth of the network.***

- ***\$1.14 million is needed in FY15 to complete the remaining half of the necessary FiberNet hub fiber terminations to ensure the viability and sustainable growth of the network.***

In addition, the ARRA grant imposes an open access requirement for all newly constructed fiber. To meet this condition, the ICBN will be make 24 strands of fiber available for lease (dark fiber leasing). No member of the ICBN has experience with this type of public-private partnership. But the dark fiber leasing has the potential to generate income for the County to offset maintenance and operational costs. *Dark fiber leasing, and this potential revenue stream, is not possible until the FiberNet hub site fiber termination is completed.*

(e) Montgomery College FiberNet Use and College Fiber Network. The College and the County are working together to find a cost-effective means to leverage FiberNet to support the College's current and future communications network needs. Previous College leadership preferred to seek funding to build a separate network.⁸ Current College leadership remains interested in a College Fiber Network but is recommitted to leveraging the benefits of FiberNet and working cooperatively with the County. FiberNet is connected to five of the College's eight locations but no College communications network traffic is currently routed by the College over FiberNet. The College and the County have agreed in principle to the following:

- (1) Phase 1. The College will beginning running some communications services over FiberNet, likely beginning in October 2012. This will enable the parties to see what works well and what issues arise in running College communications services over FiberNet. To complete this, new fiber connections need to be engineered and built to the three College locations not presently connected to FiberNet.
- (2) Phase 2. For technical reasons, the County would like to segregate College communications traffic and transport it similar to the way public safety communications and traffic management network communications are transported separately from other FiberNet communications services. To accomplish this, an additional 8.3 miles of fiber must be constructed to create additional fiber capacity between a few college locations and FiberNet hubs. Space fiber capacity from the

⁸ In FY12, a proposal was submitted to the College Board of Trustees to fund a \$10 million network to support eight college locations. In FY13, additional funding was requested by College as part of the FY13-18 CIP process to construct a separate fiber network. Within the Montgomery College FY13-18 CIP and the FY13 Cable Fund, funding was not provided for a separate College Fiber Network, but the County Council inserted a provision into both budgets requiring that the College and County execute a FiberNet MOU by August 2012 and create an implementation plan by October 2013 to use spare budget and fiber capacity within the ARRA grant to build a College Fiber Network. Failure to do so would enable the College to come back to the Council to request funding for a separate network. When it became evident that there would be no spare ARRA grant funding, the College and the County met to create an alternative plan and drafted a revised MOU. See attached draft MOU, which is presently under review and discussion by the College and the County.

ARRA build, after the hub site terminations are completed, can be used to provide the College with a separate fiber allocation.

The College presently leases communications services from Comcast at a cost of approximately \$1 million annually. Establishing FiberNet connections to all College locations and provision of a College Fiber Network will enable the College to reduce its purchase of leased services over time.

- *\$255,512 is needed in FY14 to complete Phase 1 engineering and construction for three Montgomery College connections to FiberNet and Phase 2 engineering for a College Fiber Network as outlined in the draft memorandum of understanding between the County and the College.⁹*
- *\$495,224 is needed in FY15 to complete Phase 2 construction of a College Fiber Network as outlined in the draft memorandum of understanding between the County and the College.¹⁰*

JUSTIFICATION FOR MID-CYCLE CIP ADJUSTMENT

- Project offers the opportunity to achieve significant savings or cost avoidance or to generate significant additional revenue.**

The County's contractors have recently completed initial engineering work to complete the hub terminations and College fiber connections. If funding is approved for FY14-15, staff and contractor familiarity with current hub designs, FiberNet configuration, and College fiber routing, as well as the ability to bridge and obtain ARRA grant contract materials and labor pricing, will be leveraged to reduce construction costs. If the termination work and College fiber splicing and fiber construction is delayed until FY15 or later, the construction costs will likely increase by 25 percent. *Continuing the fiber termination work in FY14 and FY15 may save the County \$758,000 in construction costs.*

Moreover, if the hub termination work is not completed by FY15, fiber will not be available to support the PSSM project. The County would likely need to lease highly reliable commercial broadband service, *i.e.*, very expensive leased services, for public safety radio IP communications services for three years while the fiber termination is completed in FY15-16. *Thus, the County may have to spend an additional \$3 million over three years to purchase*

⁹ Preliminary cost estimates. These estimates as based on best available information and may change over time as new information becomes available.

¹⁰ Preliminary cost estimates. These estimates as based on best available information and may change over time as new information becomes available.

highly reliability public safety IP radio communications until the fiber termination work is completed.

Completing FiberNet connections to Montgomery College and completing the College Fiber Network will potentially enable the College to reduce its use of leased commercial services, providing operational savings for the College after the College construction is completed.

Completion of the College Fiber Network may significantly reduce the College's \$1 million annual expenditure for leased communications services.

Project offers a significant opportunity, which will be lost if not taken at this time.

The County has a very small window to complete negotiation of the PEPCO pole attachment agreement and to cost effectively correct existing pole attachment safety violations. If the informal ARRA grant expedited ride-out inspection process is not funded and continued into FY14, the County will likely need to submit formal pole attachment applications to obtain pole licenses and the right to attach to the utility poles. The cost of formal applications is likely three times as much as the informal inspection process, largely because of the cost of submitting detailed engineering drawings and paying engineering reviewing costs.

Continuing the pole attachment correction work in FY14 may save the County \$929,000 in pole attachment costs.

Project must be amended for technical reasons.

The FiberNet project must be amended to properly terminate new ARRA fibers into the closest hub sites, instead of into Hub A. This work must be completed to enable provision of fiber for the PSSM project and to enable on-time construction of the 59 new sites and 25 traffic cameras planned to be added to FiberNet between FY14 and FY16.

Project leverages significant non-County sources of funds.

The need to temporarily terminate FiberNet fiber in Hub A is necessitated by the need to complete the ARRA grant by the grant deadline. The County would have to forfeit any construction funds not spent by the grant deadline if the County had failed to design a temporary Hub A solution. But to ensure that the ARRA grant-fund fiber can be leveraged as designed, the County must fund the additional costs to properly complete the FiberNet hub terminations.

Project is needed to address an urgent health or safety concern.

Repairing FiberNet pole attachments is necessary to protect the public health and safety. Montgomery County experiences major storms every 18 months. Failure to correct these safety violations may have potentially life-threatening consequences. In addition, the delay of

FiberNet connections to traffic cameras reduces the possibility of adding speed cameras to promote safer driving.

Project supports significant economic development initiatives, which in turn will strengthen the fiscal capacity of the County government.

Dark fiber leasing of the ARRA grant fiber will provide an opportunity for the County to generate additional revenue. This leasing cannot be offered until the hub termination work is completed. In addition, providing high speed broadband services to the community centers may enable other economic development opportunities which will be delayed until the hub terminations are completed.

SUPPLEMENTAL FUNDING

FiberNet technology uses electronic equipment to move data in the form light through glass fibers. Technology evolution occurs in the electronic equipment located in the hubs and at end site locations. Equipment becomes more efficient at moving light. Thus, by upgrading the electronic equipment, more capacity and speed can be achieved without having to replace the hundreds of miles of fiber between sites and hubs. If the equipment is not regularly upgraded, FiberNet becomes an inefficient and stranded asset. Therefore, FiberNet planners designed a means to fund replacement of this equipment by having each site pay a small chargeback of \$75 each month which would then be set aside to fund the equipment replacement. For administrative simplicity, rather than allocating funds to each entity from the General Fund, and then having each entity pay the chargeback back to the General Fund, the County determined that the General Fund should annually designate the FiberNet chargeback. In this way, the cost to replace FiberNet electronics would be a very minor month charge for every agency benefiting from FiberNet, and every three to five years the FiberNet equipment could be replaced without having to find new funding to support a multi-million dollar equipment allocation.

Beginning in or before FY06, the County Operating Budget stated: “The Director of Finance must designate \$1,219,300 of FY06 General Fund to fulfill the FiberNet chargeback requirement of the County Government.” In FY09, \$1,940,370 was designated to fulfill the chargeback requirement. However, in FY10, to address the County’s budget issues, the budget resolution language was changed. The requirement for the Director of Finance to designate a specific amount was eliminated and replaced with a simple statement: “For FY10, the FiberNet chargeback requirement of the County Government is estimated to be \$3,093,200.” See Attachment, page 16.

The County has built the FiberNet chargeback funding over seven years. The FiberNet hub termination project is consistent the purpose of the FiberNet chargeback. Now is the time when the chargeback funding is needed and it should be allocated to support this mid-cycle CIP request. Capital and operational funding within the Cable Fund are also available to support this request, but the Cable Fund need not be the only source of support for the vital and critical FiberNet asset.

For additional information, please contact John Castner or Mitsuko Herrera.

Cc: John Castner, FiberNet Manager, DTS
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Gary Thomas, ITPCC Staff, DTS
Mary Beck, CIP Manager, OMB
Naeem Mia, Cable Fund and DTS Budget Analyst, OMB
Erika Lopez Finn, Montgomery College Budget Analyst, OMB

The County has built the FiberNet chargeback funding over seven years. The FiberNet hub termination project is consistent the purpose of the FiberNet chargeback. Now is the time when the chargeback funding is needed and it should be allocated to support this mid-cycle CIP request. Capital and operational funding within the Cable Fund are also available to support this request, but the Cable Fund need not be the only source of support for the vital and critical FiberNet asset.

For additional information, please contact John Castner or Mitsuko Herrera.

Cc: John Castner, FiberNet Manager, DTS
Mitsuko Herrera, Cable & Broadband Administrator, DTS
Dieter Klinger, System and Operations Division Chief, DTS
Gary Thomas, ITPCC Staff, DTS
Mary Beck, CIP Manager, OMB
Naeem Mia, Cable Fund and DTS Budget Analyst, OMB
Erika Lopez Finn, Montgomery College Budget Analyst, OMB

Fibernet -- No. 509651

Category
Subcategory
Administering Agency
Planning Area

**General Government
Technology Services
Technology Services
Countywide**

Date Last Modified
Required Adequate Public Facility
Relocation Impact
Status

**March 28, 2012
No
None.
On-going**

EXPENDITURE SCHEDULE (\$000)

Cost Element	Total	Thru FY11	Est. FY12	Total 6 Years	FY13	FY14	FY15	FY16	FY17	FY18	Beyond 6 Years
Planning, Design, and Supervision	3,046	2,220	200	626	606	20	0	0	0	0	0
Land	4	4	0	0	0	0	0	0	0	0	0
Site Improvements and Utilities	13,106	12,441	65	600	250	175	175	0	0	0	0
Construction	14,544	1,169	1,875	11,500	875	2,175	2,175	2,175	2,175	1,925	0
Other	24,773	21,173	0	3,600	100	100	100	1,600	1,600	100	0
Total	55,473	37,007	2,140	16,326	1,831	2,470	2,450	3,775	3,775	2,025	0

FUNDING SCHEDULE (\$000)

	Total	FY11	FY12	Total 6 Years	FY13	FY14	FY15	FY16	FY17	FY18	Beyond 6 Years
Cable TV	44,387	25,921	2,140	16,326	1,831	2,470	2,450	3,775	3,775	2,025	0
Contributions	86	86	0	0	0	0	0	0	0	0	0
G.O. Bonds	8,900	8,900	0	0	0	0	0	0	0	0	0
PAYGO	2,100	2,100	0	0	0	0	0	0	0	0	0
Total	55,473	37,007	2,140	16,326	1,831	2,470	2,450	3,775	3,775	2,025	0

OPERATING BUDGET IMPACT (\$000)

	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18
Maintenance			1,459	1,097	153	101	13	37
Net Impact			1,459	1,097	153	101	13	37

DESCRIPTION

This project provides for the planning, design, and installation of a County wide fiber optic cable-based communication network with the capacity to support voice, data, and video transmissions among Montgomery County Government (MCG), Montgomery County Public Schools (MCPS), Montgomery College (MC), Maryland National Capital Park and Planning Commission (M-NCPPC), Housing Opportunities Commission (HOC) and Washington Suburban Sanitary Commission (WSSC) facilities. FiberNet is also the communications backbone for the Public Safety Radio and Public Safety Mobile Data Systems (collectively, Public Safety Communications System PSCS), and future technology implementations. Fibernet has an estimated useful life of at least 20 years. Upgrades and replacements to electronic components in the core and at user sites will be required periodically throughout the service life.

CAPACITY

As of September 1, 2011, there are 316 sites on FiberNet. The number of sites scheduled for completion by September 1, 2014 is 465. By September 1, 2017, that number is expected to be 510.

ESTIMATED SCHEDULE

FiberNet anticipates 134 sites will be brought on-net by 2014. In the prior FY11-16 CIP, the estimated time frame would have extended into 2017.

COST CHANGE

Cost increase is due to an expansion of the project scope primarily related to the increasing MCPS FiberNet sites, as well as providing FiberNet support to the Advanced Traffic Management System.

JUSTIFICATION

FiberNet is a critical infrastructure asset serving every agency in Montgomery County. As of September 1, 2011, 316 user sites are on-net and receiving critical services from FiberNet. In FY07, the Department of Technology Services (DTS) completed the re-engineering of FiberNet (now referred to as FiberNet II) to directly support Ethernet connections. This provides a core network that is technologically newer, faster and less expensive to operate on a per-site basis.

The Interagency Technology Policy Coordination Committee (ITPCC) focus during the first two years of this CIP will be constructing the ARRA Grant-funded sites. MCG, MCPS, MC, M-NCPPC, HOC and WSSC require substantially increased communication services and bandwidth among their facilities. The County will provide fiber optic services to those facilities for which leased telecommunications services cannot meet current or projected demand as cost effectively as FiberNet. Studies include: Fibernet Master Plan; RAM Comm. Mar 1995; Fibernet Eval. Rpt., TRW, Sept 1997; Fibernet Proj. Cost Est., ARINC, Apr 1998; Fibernet Proj. Cost-Benefit Analysis, ARINC, Oct 1998; Fibernet Strategic Plan, PrimeNet, June 2002; Fibernet Strategic Direction, Interagency Telecommunications Advisory Group (ITAG), Nov 2003; and the Fibernet service level agreement, Jan 2005.

OTHER

DTS is responsible for project management, network operations, and maintenance of electronics, while the Department of Transportation (DOT) is responsible for installation and maintenance of the fiber optic cable. Comcast, at DTS's direction, also provides fiber used in Fibernet. Sites installed to date include MCG

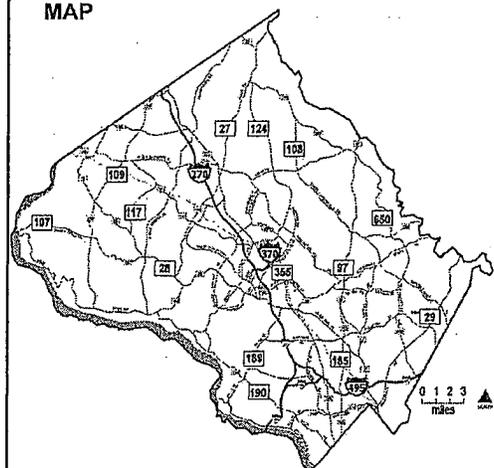
APPROPRIATION AND EXPENDITURE DATA

Date First Appropriation	FY96	(\$000)
First Cost Estimate		
Current Scope	FY13	55,473
Last FY's Cost Estimate		39,147
Appropriation Request	FY13	1,831
Appropriation Request Est.	FY14	2,470
Supplemental Appropriation Request		0
Transfer		0
Cumulative Appropriation		39,148
Expenditures / Encumbrances		37,045
Unencumbered Balance		2,103
Partial Closeout Thru	FY10	0
New Partial Closeout	FY11	0
Total Partial Closeout		0

COORDINATION

Department of Technology Services
Department of Transportation
Advanced Transportation Management System Project
Montgomery County Public Schools
M-NCPPC
Montgomery College
HOC
WSSC
Comcast
Public Safety Radio System
Information Technology Policy Coordination Committee (ITPCC)
ITPCC CIO Subcommittee
Interagency Technology Advisory Group (ITAG)
CIO Howard County
Inter-County Broadband Network Program
Office

MAP



Fibernet -- No. 509651 (continued)

departments/offices, PSCS sites, MC campuses, MCPS high schools/middle schools/administrative facilities and several elementary schools, M-NCPPC sites, HOC sites and WSSC sites including the headquarters building in Prince Georges County. The municipalities of Takoma Park, Gaithersburg and Rockville are on FiberNet as well as several cultural centers including American Film Institute (AFI), Strathmore, the Convention Center and Black Rock. Currently FiberNet is focused on building out the approved ARRA Grant-funded sites, which includes all remaining MCPS elementary schools, 8 MC sites, and 21 HOC properties. Approximately \$3 million is necessary to build out the cable plant to support Advanced Traffic Management System field devices. Funding for this project is included in the FY13-FY18 CIP.

ITPCC will undertake an approval action on a recommended 'Fiber Sub-Allocation Policy and Decision Process' in FY13. This proposed policy will govern future special fiber resource sub-allocation decisions for FiberNet for all participating ITPCC agencies.

ITPCC will be requested to approve a special sub-allocation request by Montgomery College for the installation and maintenance of fiber to 8 MC sites. Agency FiberNet Memorandum of Understanding (MOU) and Service Level Agreements (SLAs) will be updated and revised to reflect the ongoing FiberNet operating network. A separate MOU will be developed for a special sub-allocation of dark fiber for the 8 Montgomery College sites, installed as part of the current ARRA Grant-funded Fibernet expansion.

FISCAL NOTE

The ARRA Grant represents a tremendous cost savings to Montgomery County. The County will receive the benefit of over \$17 million dollars in construction for a matching contribution of \$2.6 million. The matching contribution is funded as part of the FY12 and FY13 FiberNet CIP.

Fibernet maintenance is supported by a grant from the franchise agreement with the County's cable service provider, Comcast. The original grant amount of \$1.2 million/yr is increased by the CPI each year. The FiberNet operating grant will expire at the end FY13 when the current Comcast cable franchise agreement expires. The County is planning to request a similar level of funding during the Comcast franchise renewal negotiations.

FY13-18 FIBERNET CIP - FY14 MID-CYCLE SUPPLEMENT REQUEST

APPROVED FY13-18		EXPENDITURE SCHEDULE (\$000)				
Cost Estimate	Total	Total 6 Years	FY14	FY15		
Planning, Design & Supervision	3,046	626	20	-		
Land	4	-	-	-		
Site Improvements & Utilities	13,106	600	175	175		
Construction	14,544	11,500	2,175	2,175		
Other	24,773	3,600	100	100		
Total	55,473	16,326	2,470	2,450		
FUNDING SCHEDULE (\$000)						
Cable TV	44,387	16,326				2,450
Contributions	86	-				-
G.O.Bonds	8,900	-				-
PAYGO	2,100	-				-
Total	55,473	16,326	-	2,450		
OPERATING BUDGET IMPACT (\$000)						
Maintenance		1,459	153			101
Net Impact		1,459	153			101

FY14 MID-CYCLE ADJUSTMENT		EXPENDITURE SCHEDULE (\$000)						
Cost Estimate	Revised Total	Increase	Revised Total 6 Years	Increase	Revised FY14	Increase	Revised FY15	Increase
Planning, Design & Supervision	3,123	77	703	77	97	77	-	
Land	4	-	-		-		-	
Site Improvements & Utilities	13,570	464	1,064	464	639	464	175	
Construction	17,498	2,954	14,454	2,954	3,493	1,318	3,810	1,635
Other	24,773	-	3,600		100		100	
Total	58,968	3,495	19,821	3,495	4,330	1,860	4,085	1,635
FUNDING SCHEDULE (\$000)								
Cable TV	47,882	3,495	19,821	3,495	4,330	1,860	4,085	1,635
Contributions	86		-				-	
G.O.Bonds	8,900		-				-	
PAYGO	2,100		-				-	
Total	58,968	3,495	19,821	3,495	4,330	1,860	4,085	1,635
OPERATING BUDGET IMPACT (\$000)								
Maintenance			1,459		153		101	
Net Impact			1,459		153		101	

FIBERNET FY13-18 CIP REVISIONS

DESCRIPTION – Amend 2nd sentence

FiberNet is also the communications backbone for the Public Safety Radio and Public Safety Mobile Data Systems, and will be the backbone for the Public Safety System Modernization (PSSM) IP-based radio network, and future technology implementations.

Deleted: (collectively, Public Safety Communications System PSCS),

COST CHANGE – Amend

Cost change is due to an expansion of the project scope primarily related to completing the American Reinvestment & Recovery Act grant project by terminating fibers in hubs sites, increasing fiber capacity, and expanding FiberNet to all Montgomery College and MCPS sites, as well as correcting FiberNet pole attachment safety violations and providing FiberNet support to the Advanced Traffic Management System.

Deleted: the increasing

Deleted: FiberNet

JUSTIFICATION – Add new sentence to end

Failure to terminate fibers in hubs critically jeopardizes the PSSM project and ability to connect 85 new sites and traffic cameras (including the Police Academy and Woodlawn Park Police Substation) because fiber capacity will not be available. Additional leased services costs would be incurred. Delaying fiber termination to FY15 or later may increase construction costs by 25 percent. Delaying pole attachment repairs will increase costs by 300 percent.

OTHER – Add to end of first paragraph

Approximately \$2.3 million is necessary complete the ARRA grant fiber termination, \$ 500,000 is needed to correct FiberNet pole attachment safety violation s, and \$ 750,000 is needed to provide FiberNet connections and routing to all Montgomery College locations. The ARRA grant budget assumed all current FiberNet pole attachment were licensed, that there would be no additional costs to overlap to existing attachments, and that hub termination costs would be minimal. FiberNet hubs are too small to permit additional fiber termination unless existing fibers are reterminated. Approximately 90 percent of current FiberNet pole attachments need written pole license documentation licensed and 30 percent require repairs to pole attachments. Montgomery College was not included in initial scope of ARRA grant project.

OTHER – Amend first sentence of second paragraph

ITPCC adopted a 'Fiber Allocation Policy and Decision Process' in FY12,

Deleted: will undertake an approval action on a recommended

Deleted: Sub-

Deleted: 13

FISCAL NOTE – Add to end of first paragraph

Restricted capital grants in the Cable Fund are available in FY14 an FY15 to support additional funding for ARRA grant completion and FiberNet pole attachment work.

FIBERNET FY13-18 CIP: PLANNED FY14-16 ADDITIONS TO FIBERNET
Construction of these sites will be delayed until FY17 or later if FY14 CIP is not funded

AGENCY	LOCATION NAME	Total
MCG	Aquatic Center	
	ATMS Camera	
	Children's Resource Ctr.	
	Clara Barton	
	East County Gov't Center	
	East County Rec	
	Good Hope	
	Gwendolyn Coffield CC	
	Leland Comm. Center	
	Long Brch. Comm. Ctr.	
	Longwood Comm. Ctr.	
	MLK Swim Center	
	Olney Swim Center	
	Olney W&L	
	Ross Boddy	
	Schweinhart Sr. Center	
	Scotland	
Western County Outdoor Pool		
Wheaton Rec Center		
Wheaton/Glenmont Outdoor Pool		
MCG Total		44
MCPS	CTI	
	Emory Grove Center	
	Ewing Center	
	Fairland Holding Center	
	Grosvenor Holding Center	
	Muddy Branch - Festival	
	North Lake Holding Center	
	Print Shop	
	Radnor Center	
	Randolph Depot	
	RICA	
	Rock Terrace School	
Smith Center		
West Farm Depot		
MCPS Total		14
M-NCPPC	Black Hill Headquarters	
	Black Hill Northern Region Headquarters & Park Police Office	
	Brookside Nature Center	
	Dedrick Annex	
	Little Bennett Campgrounds	
	Little Bennett Maintenance Yard	
	Meadowside Nature Center	
	Needwood Mansion	
	Pope Farm Nursery	
	Waters House	
	Wheaton Ice Arena	
Wheaton Regional Park Maintenance Yard		
Woodlawn Park Police Substation		
M-NCPPC Total		13
WSSC	Brighton Dam	
	Colesville Tank	
	Consolidated Laboratory	
	Damascus Elevated Tank	
	Damascus Wastewater Treatment Plant	
	Falls Road Standpipe	
	Gaithersburg Depot	
	Glenmont Elevated Tank	
	Hampshire Greens Tanks	
	Lyttonsville Depot	
	North Woodside Standpipe	
	Seneca Wastewater Treatment Plant	
Shady Grove Standpipe		
WSSC Total		13
TOTAL AFFECTED FY14-16 FIBERNET SITES		84

ITPCC Policy Guideline for Special Allocation of FiberNet Resources

Background

By August 2013 Montgomery County will assume ownership and operational responsibility for an additional 140 miles of very high capacity fiber optic infrastructure provided through the Federal ARRA Grant and Maryland ICBN project. This is a shared County resource that will provide low cost, high speed broadband resources for the use of all agencies. Upon completion, the total FiberNet network will be a large, but finite, resource for benefit of the County. Therefore, it is important for the ITPCC to establish and agree on a framework for future allocation and use of fibers from this very valuable resource. FiberNet governance falls under the FiberNet Governance Charter which suggests that proactive review and approval should be required for future allocations of FiberNet fibers for special or separate network requirements over FiberNet. Without some governance oversight, use of this finite resource could be misdirected and squandered. The FiberNet Governance framework exists in order to achieve the highest and best use of finite FiberNet resources for the benefit of all agencies.

Existing precedents for separate networks operating over FiberNet include, the Public Safety Radio System, Advanced Traffic Management System, and Traffic Signal System Modernization. This network traffic is not co-mingled with other FiberNet traffic, and some of this traffic is carried using specifically allocated fibers. Most future network buildout decisions should continue to fall under the existing processes defined within the FiberNet Governance Charter framework. This is the normal process that results in the annual FiberNet plan review and the biennial FiberNet CIP project. This process typically consists of the following steps:

- ITPCC agencies determine their FiberNet requirements and provide them to MCG DTS Network Services where they are incorporated into the annual FiberNet planning and budget request processes as appropriate
- Interagency review through the FiberNet ITAG technical review process results in recommendations to the CIO Subcommittee. If the approved biennial CIP project does not require amendment, no further action is needed
- CIO Subcommittee reviews, approves, and makes recommendations to the ITPCC Principals
- ITPCC reviews and makes final approval decisions
- Appropriation actions by Council conclude the process

Action

Provision of FiberNet fibers for special or separate network requirements that do not fall under typical FiberNet network services presents a special case where explicit review and approvals are suggested. ITPCC review and approval of recommendations for special allocation of FiberNet resources should occur after complete technical review and business justifications for the special allocation have been recommended by the FiberNet ITAG and the CIO Subcommittee.

Special allocation reviews requiring ITPCC approval shall include:

1. When fiber is allocated for agencies to operate separate networks to meet broadband or other technical requirements that cannot be provided by FiberNet
2. When fiber is allocated to provide services to leased facilities and leased bandwidth is not a recommended alternative
3. Other uses where FiberNet is determined by ITAG, CIO Subcommittee, and ITPCC to be a non-viable option, but the special case exemption is consistent with achieving the highest and best use of FiberNet.

Approved by ITPCC on June 26, 2012

PHASE ONE - FIBERNET ACTIVATION

Montgomery College FiberNet Connection Cost Estimates

This cost estimate outlines fiber optic construction costs necessary to provide FiberNet service to all seven designated Montgomery College sites.

Notes:

FiberNet already has connectivity at Takoma Park, Germantown, Mannakee, and Calhoun. No additional fiber optic construction is necessary to provide FiberNet service.

FiberNet will provide connectivity to King Street through the use of two existing Montgomery College dark fiber strands between Takoma Park and King Street. No additional fiber optic construction is necessary.

Comcast has previously agreed to construct fiber from the Comcast headend to 40 W. Gude Street for FiberNet. This fiber construction is included in this cost estimate.

Cost estimates assume that Montgomery College can secure any building access agreements for all Montgomery College locations.

Construction and engineering costs are estimated based on ICBN fiber construction costs.

Mileage

Description	New Build	Overlash
S Summit Ave to Snake Route	0.2	1.9
40 W Gude to Comcast HE	0.2	0
Wheaton to Snake Route	0.3	0.8
Total	0.7	2.7

Engineering Budgetary Cost	
Footage to be Engineered	17952
Cost per Foot	\$ 1.25
Engineering Cost	\$ 22,440

PHASE ONE - FIBERNET ACTIVATION

Montgomery College FiberNet Connection Cost Estimates

Overlash Construction

Description	Per Foot	
Materials	\$	3.00
Make Ready	\$	1.25
Overlash	\$	3.00
Total	\$	7.25
Footage		14,256
Overlash Cost	\$	103,356

Underground Construction

Description	Per Foot	
Materials	\$	3.00
Underground	\$	13.00
Total	\$	16.00
Footage		3,696
Underground Cost	\$	59,136

Total Cost

Overlash Costs	\$	103,356
Underground Costs	\$	59,136
Splicing/Termination Materials	\$	3,800
Splicing	\$	12,000
Construction Estimate	\$	178,292

PHASE TWO - MC FIBER NETWORK

Montgomery College FiberNet Connection Cost Estimates

This cost estimate outlines fiber optic construction costs necessary to provide the College with a dark fiber solution to all seven designated Montgomery College sites.

Notes:

To provide the number of dark fibers that the College is requesting, FiberNet must construct new fibers to the closest hub or back to the ICBN backbone fiber, "the snake route."

Cost estimates assume that Montgomery College can secure any building access agreements for all Montgomery College locations.

Construction and engineering costs are estimated based on ICBN fiber construction costs.

Mileage

Description	New Build	Overlash
Calhoun to Hub A	1.5	2
40 W Gude to New Fiber Build	0.3	0
Mannakee to New Fiber Build	0	0.8
Gaithersburg to Snake Route	0.2	1.5
King St to Snake Route	1.1	0
Takoma Park to King St	0.4	0.5
Total	3.5	4.8

Engineering Budgetary Cost	
Footage to be Engineered	43,824
Cost per Foot	\$ 1.25
Engineering Cost	\$ 54,780

PHASE TWO - MC FIBER NETWORK

Montgomery College FiberNet Connection Cost Estimates

Overlash Construction

Description	Per Foot	
Materials	\$	3.00
Make Ready		\$1.25
Overlash	\$	3.00
Total	\$	7.25
Footage		25,344
Overlash Cost	\$	183,744

Underground Construction

Description	Per Foot	
Materials	\$	3.00
Underground	\$	13.00
Total	\$	16.00
Footage		18,480
Underground Cost	\$	295,680

Total Cost

Overlash Costs	\$	183,744
Underground Costs	\$	295,680
Splicing/Termination Materials	\$	3,800
Splicing	\$	12,000
Construction Estimate	\$	495,224

DRAFT

**FIBERNET MEMORANDUM OF UNDERSTANDING
BETWEEN MONTGOMERY COUNTY, MARYLAND
AND MONTGOMERY COLLEGE**

This Memorandum of Understanding (“MOU”) is entered into by Montgomery County, Maryland (the “County”) and Montgomery College (“Montgomery College” or the “College”), known collectively as the “Parties.” The purpose of this MOU is to further the cooperative relationship between the Parties regarding the use and expansion of FiberNet. FiberNet is the fiber optic communications network owned and operated by the County. FiberNet is used to provide voice, video, data, and public safety communications to the County, County-funded entities, and other governmental agencies and entities.

Whereas, the users of FiberNet and the residents of Montgomery County benefit from the inter-agency collaborative approach of using FiberNet as a cost-effective shared resource thereby reducing design, engineering, procurement, pole attachment, construction, maintenance, and operating costs for each individual agency and, whereas, the Montgomery County Council has legislated that user agencies must notify the Council before paying any fee to or entering into any agreement with any private provider so that the Council may consider if adjustments to the funded FiberNet buildout schedule are warranted to avoid paying excessive fees to private providers for telecommunications service to any specific facility;

Whereas, the construction and operation of FiberNet and the ability of Montgomery College to provide communications network services is contingent upon fiscal appropriations by the Montgomery County Council and the encumbrance of such funding;

Whereas, FiberNet is governed by the Interagency Technology Policy Coordinating Committee (“ITPCC”), the County and Montgomery College are both members of the ITPCC, and the ITPCC receives advice from the ITPCC members’ Chief Information Officers (“CIOs”);

Whereas, the CIOs are responsible for recommending, and the ITPCC is responsible for approving, memorandums of understanding and service level agreements amongst ITPCC members regarding current network operation and maintenance of FiberNet as well as future construction, operational and maintenance needs of FiberNet as technologies mature and change over time and the need to expand FiberNet evolves;

Whereas, the ITPCC has a Policy Guideline for Special Allocations of FiberNet Resources (Attachment 1), and there is precedent for separate network operation, as the Public Safety Radio, Advanced Traffic Management, and Traffic Signal System Modernization network traffic is not co-mingled with other FiberNet traffic and some of this traffic is carried using specifically allocated fibers;

Whereas, the current and future academic, administrative and technical needs of and planning for Montgomery College need to be supported by a robust communications network, and whereas the College has a One-Campus vision to efficiently and seamlessly provide equivalent communications network services at its many locations; and

Whereas, Montgomery College operates at eight locations within the County, of which four have direct fiber connections to FiberNet.

**Now therefore, in consideration of these Recitals, the Parties agree to the following
FIBERNET MEMORANDUM OF UNDERSTANDING:**

- 1. Expand Montgomery College Use of FiberNet.** The Parties will engineer Montgomery College's fiber connections to FiberNet, as well as any future College FiberNet connections, to operate at 10 Gbps. As the College requires, the College will route traffic over these FiberNet links to perform the College's network functions. FiberNet will provide an OSI (open systems interconnect) Layer Three Ethernet hand-off at its point-of-presence at each College FiberNet location. The Parties will meet regularly to review the College's use of FiberNet and address ways to expand and enhance the benefit of FiberNet to the College and to address the College's need to have reliable communications services.
- 2. Plan and Implement a Future Montgomery College FiberNet Network by Leveraging FiberNet Facilities.** The Parties will work together to enable the eventual migration of the College communications network to a "College Fiber Network" such that the College's communications traffic can be carried over FiberNet fiber without passing through any FiberNet electronic equipment. A College Fiber Network would operate over College owned, operated and maintained electronics. FiberNet fiber maintenance would be provided by Montgomery County Government. The Parties believe that an independent College Fiber Network could be efficiently developed by having FiberNet carry the College's communications network traffic segregated from other FiberNet traffic and the ITPCC has a policy in place to permit such special allocations. Such a College Fiber Network represents an effective use of FiberNet resources because it provides the optical network infrastructure necessary to support the College's One-Campus vision while leveraging the County's investment in over 500 miles of FiberNet optical network infrastructure at no additional cost to the College.
- 3. Cooperatively Expand FiberNet to Other College Locations.** The College has main distribution frames (MDF) at the following locations:
 - 930 King Street, Silver Spring, MD 20910 – Network Operations Center ("Silver Spring")
 - 51 Mannakee Drive, Rockville, MD 20850 – Computer Science Building ("Rockville Campus")
 - 15400 Calhoun Place, Rockville, MD 20850 – College MDF ("OITB")
 - 20200 Observation Drive, Germantown, MD 20876 – Goldenrod Building ("Germantown Campus")
 - 12 S. Summit Avenue, Gaithersburg, MD 20877 – Fourth Floor MDF ("Gaithersburg")
 - 40 W. Gude Drive, Rockville, MD 20850 – Second Floor MDF ("Gude")
 - 11002 Veirs Mill Road, Wheaton, MD 20902 – WDCE MDF ("Wheaton")
 - 7600 Takoma Avenue, Takoma Park, MD 20912 – Commons Building ("Takoma Park Campus")

- a. The Parties will work together to secure funding to expand FiberNet to all of the College's eight locations and to build a redundant western route to the King Street MDF. At the present time the Rockville Campus, OITB, Germantown Campus, and Takoma Park Campus have direct fiber connections to FiberNet. Montgomery College agrees to be responsible for obtaining right of entry and access for the County to all buildings and necessary easements to reach building entrances if funding is secured to expand FiberNet to additional College locations. The College cannot guarantee right of entry or access but will use best efforts to obtain rights of entry to buildings that are not owned by the College. If the College cannot obtain a right of entry to a building, the Parties are not obligated to expand FiberNet fiber to the MFD within that building.
 - b. The College will assist the County in identifying and permitting use of the existing fiber path between the Takoma Park Campus and the Silver Spring location for FiberNet use.
 - c. The Parties acknowledge that while existing FiberNet fiber is located nearby the Germantown Campus and Gaithersburg and Wheaton locations, there is very little spare fiber capacity from these locations to the nearest FiberNet hub sites, and there is an additional shortage of fiber capacity amongst the Rockville Campus, Gude and OITB locations and to the closest FiberNet hub sites. Adding additional fiber capacity near these locations would be a benefit to the College and to FiberNet. Therefore, the Parties agree to work with ITPCC to develop future recommendations to expand FiberNet fiber capacity to meet the needs of the College and FiberNet.
- 4. Share Information and Collaborate on Technical Issues.** The Parties agree to cooperate with and work together to resolve any and all technical, administrative or regulatory challenges which may present themselves during the term of this agreement. Montgomery College will provide network operations and management information as reasonably requested by the County so as to facilitate current and future efficient FiberNet construction and network operation. Such information may include, but is not limited, to:
- a. Current network services that Montgomery College plans as necessary to be operated over FiberNet fiber;
 - b. Future network services to be implemented in the next two to three years; and
 - c. Current equipment in use or planned to be in use in the next two to three years in the operation of Montgomery College services over FiberNet fiber.
- 5. Seek ITPCC Review and Cooperation.** ITPCC approval is required to permit allocation of FiberNet fibers to operate separate networks over FiberNet and has a policy in place to permit such allocation. The Parties will work cooperatively to obtain ITPCC approval for development of a College Fiber Network at such time as the College is ready to proceed with creation of such a network and funding becomes available. The Parties will also work within the ITPCC CIO Subcommittee to make recommendations to regarding improvements to FiberNet network monitoring, maintenance and service level agreements.

GENERAL TERMS AND CONDITIONS:

6. **Fiscal Appropriation.** No additional budget allocation is being provided by the Parties to complete work described herein. The Parties' ability to meet the terms of this MOU is contingent upon fiscal appropriations by the Montgomery County Council and the encumbrance of such funding.
7. **Ownership and Governance.** Montgomery College acknowledges that the County would own all current and future FiberNet fiber and that ITPCC approval is required to permit allocation of FiberNet fibers to operate separate networks over FiberNet.
8. **Waiver.** Nothing in this MOU, nor any action taken by any Party pursuant to this MOU, nor any document that arises out of this MOU shall constitute or be construed as a waiver of either the sovereign immunity or governmental immunity of the Parties.
9. **Dispute Resolution.** Any dispute regarding or arising out of this MOU shall be governed by rules and procedures established by the ITPCC so long as they comport with County and Maryland law. In the event that the Parties are unable to resolve the dispute, the Parties may submit the dispute to a mediator, acceptable to both Parties, for the purpose of facilitating discussion and receiving new perspectives on the issues and new proposals for compromise. The Parties shall share the cost of the mediation equally. Such mediation shall not be binding on any Party.
10. **Governing Law and Venue.** This MOU must be construed and enforced in accordance with the laws of the State of Maryland. The Parties agree that all disputes arising hereunder that cannot be resolved through other means must be brought in the Circuit Court for Montgomery County, Maryland, or in the U.S. District Court for the District of Maryland, Greenbelt Division.
11. **Term.** This Agreement is effective as to each Party upon the date of signature by that Party ("Effective Date"). This Agreement will remain in effect until notice is given in writing by either party requesting termination of the MOU. Party must provide at least 90 days notice of termination.
12. **Entire Agreement.** This MOU embodies the entire agreement of the Parties. No representations, inducements, or agreements, oral or otherwise, between the Parties not contained herein shall be of any force and effect. This MOU may not be amended or modified in any manner other than by an agreement in writing approved by the Parties and duly signed by authorized persons on behalf of the Parties.

THIS SECTION INTENTIONALLY LEFT BLANK

MONTGOMERY COUNTY, MARYLAND and MONTGOMERY COLLEGE, through their respective authorized representatives, have executed this **FIBERNET MEMORANDUM OF UNDERSTANDING** on the dates indicated below.

MONTGOMERY COUNTY

_____ Date: _____
Timothy L. Firestine
Chief Administrative Officer

APPROVED as to form and legality
this ____ day of _____, 2012
OFFICE OF THE COUNTY ATTORNEY

By: _____ (signature)
Name: _____ (print name)
Office of the County Attorney

MONTGOMERY COLLEGE

_____ Date: _____
Dr. DeRionne P. Pollard
President

APPROVED as to form and legality
this ____ day of _____, 2012

By: _____ (signature)
Name: _____ (print name)
Montgomery College

**Approval and Appropriation of the Operating Budgets
of Montgomery County Government
Excerpts of Council Budget Resolutions – FY06-FY13**

The County Council for Montgomery County, Maryland approved the following resolution:

FY06

31. The Director of Finance must designate \$1,219,300 of FY 2006 General Fund funds to fulfill the FiberNet chargeback requirement of the County Government.

FY07

33. The Director of Finance must designate \$1,424,670 (DPWT and DTS operational support) of General Fund funds at the beginning of FY 2007 to fulfill the FiberNet chargeback requirement of the County Government.

FY08

34. The Director of Finance must designate \$1,658,670 (DPWT and DTS operational support) of General Fund funds at the beginning of FY 2008 to fulfill the FiberNet chargeback requirement of the County Government.

FY09

38. The Director of Finance must designate \$1,940,370 of General Fund funds at the beginning of FY 2009 to fulfill the FiberNet chargeback requirement of the County Government.

FY10

31. For FY10, the FiberNet chargeback requirement of the County Government is estimated to be \$2,183,370.

FY11

34. For FY 2011, the FiberNet chargeback requirement of the County Government is estimated to be \$2,454,270.

FY12

34. For FY 2012, the FiberNet chargeback requirement of the County Government is estimated to be \$2,747,670.

FY13

36. For FY 2013, the FiberNet chargeback requirement of the County Government is estimated to be \$3,093,200.