The District of Columbia, the nation’s leading jurisdiction in 700 MHz public safety broadband deployment experience and technical expertise, proposes in this Comprehensive Community Infrastructure (CCI) grant application to create a broadband wireless network that is interoperable, public-safety grade, and economically sustainable. The Mobile Emergency Responder LTE Interoperable Network (MERLIN) will be an early deployment of the national interoperable wireless broadband network that has eluded public safety entities and federal policymakers since before September 11, 2001, when the need for interoperable public safety communications was forcefully brought to the nation’s attention. The District is a staunch advocate of a nationwide interoperable network. As the nation’s capital, the District needs coordination and interoperable communications among local, state and federal public safety entities from the District and surrounding regions. MERLIN provides that interoperability, for daily and emergency use. MERLIN will also facilitate mutual aid nationally, accelerate resource deployment, and leverage the scale and expertise of one of the nation’s commercial telecommunications providers. The District is the state/local partner for the National Institute of Standards and Technology (NIST) District of Columbia LTE test/demonstration project (see attachments 'NTIA-NIST-DC LTE Project'; 'PSCR-DC Memorandum of Understanding'; ‘PSCR 700MHz Webinar Presentation 4-20-2010,’) describing DC as an urban test location, and OCTO-PSCR collaboration on 'common test planning and coordinated testing'). MERLIN deployment will not interfere with the District’s work in the NIST-LTE Project, though MERLIN will purchase equipment will to be used to support the national test/demo effort. As required by the FCC and the NTIA in this BTOP application process, MERLIN will provide District-wide LTE wireless broadband coverage for public safety on the 700 MHz spectrum. LTE coverage will be provided to both fixed and mobile sites, providing service to public safety at all public safety sites (Metropolitan Police Department, Fire and Emergency Medical Services, Homeland Security and Emergency Management Agency, and Office of Unified Communications, and OCTO), at all District Agency headquarters locations, and at Community College of the District of Columbia. In addition, all District mobile public safety vehicles will be outfitted to support LTE operations while in transit; to ensure coverage, MERLIN is being designed to provide handoffs from LTE 4G to 3G, to ensure complete outdoor coverage. MERLIN users could easily be extended to include other District-based public safety entities, including Federal. MERLIN will leverage commercial carriers with committed cell site networks. As recommended in the FCC’s report, MERLIN will partner with a commercial carrier whose committed cell network provides complete outdoor coverage, and sufficient indoor coverage. MERLIN will provide dedicated LTE base stations at the cell sites; interoperable operation, utilizing base stations from two equipment manufacturers; and LTE user equipment of many
forms (USB dongle, mini-cards, etc). MERLIN will also provide a dedicated LTE core at the District's new secure data processing center. MERLIN will provide user applications to ensure that public safety personnel from remote jurisdictions can operate within the District on the LTE network: such as radio-over-IP (to ensure any public safety person can communicate with any other person, independent of technology used); streamed video to any public safety personnel from fixed cameras; and from first responder video feeds. MERLIN will implement Next Generation 911, permitting GPS location identification, and support other media (video, photographs, etc). MERLIN will provide a set of 802.11(n) secure wireless access points, mounted at key traffic and transportation locations, with dual access: secure, for public safety, and open, for public use. MERLIN will provide portable middle mile capability to community anchor institutions (CAIs) in the District through its Mobile Middle Mile Device (M3D). M3D combines public safety wireless broadband network with commercial services to provide portable wifi hotspots for remote use by anchor institutions as necessary. M3D broadcasts two secure SSIDs: one only for public safety traffic, and one for CAI unrestricted traffic. Traffic is backhauled to the wired network via two LTE networks; only public safety traffic may use the public safety Band 14 spectrum, and the commercial LTE network backhauls the unrestricted traffic. Public safety personnel without LTE devices will still be able to access the public safety LTE network via wifi during security incidents at CAIs, and non-public safety personnel without LTE devices will be able to access wifi during outdoor events connected with their official CAI duties. MERLIN will be implemented in three phases. Phase 1 will provide a District-wide operational LTE public safety network, to fixed and mobile locations, with handoffs to and from 3G. The cell site network will be a combination of commercial carrier and District sites, to ensure proper outdoor and indoor coverage, with District-owned base stations (eNodeB's) from at least two vendors, to ensure equipment interoperability. As LTE user equipment becomes available, different types of user equipment will be provided (USB dongles, PCI-Express mini-cards, vehicular modems, and handhelds); deployment will be appropriate to use and availability. Core and base station equipment has been sized for up to 10,000 public safety users. Phase 2 will provide a dedicated LTE core for dedicated public safety use, providing an LTE network for the entire District, which can be independent of commercial carrier operations, and provide prioritized traffic. Phase 3 will provide regional extensions of the network to neighboring National Capital Region (NCR) public safety entities, and to jurisdictions in the wider mid-Atlantic region, subject to base station existence, to demonstrate true public safety interoperability. Radio-over-IP, video and Next Generation 911 will be implemented in Phase 2, as will wireless access points at specified WMATA and DDOT locations. As host to major planned and unplanned events, the District needs rapidly deployable network capabilities, to increase capacity for events (e.g. National Mall during Inauguration), and to provide basic wireless connectivity during failure situations. MERLIN includes two Rapidly Deployable Network (RDN) units, compact portable arrangements that include both a mini-EPC and an eNB, commonly known as 'LTE-in-a-box.' MERLIN will provide six high-capacity microwave point-to-point links to backhaul to the District's fiber network. MERLIN uses purchased equipment to aid in spectrum clearing and network testing; the equipment can be used by any entity as part of the national interoperable public safety broadband network. MERLIN will provide all necessary components of a national interoperable LTE broadband wireless network: efficiencies from leveraged commercial investment, low ongoing operational costs, seamless roaming onto commercial 3G and 4G networks using a variety of multi-band/multi-mode devices, a suite of basic mobile applications, a network core capable of use by other jurisdictions, mobile
middle mile options for CAI use, rapidly-deployable LTE capabilities for emergencies, and spectrum clearing and testing equipment and services. MERLIN is a broadband wireless - terrestrial fixed, and wireless - terrestrial mobile technology project. MERLIN will cover the entire District as a single public safety service area. The District includes a population of over 580,000; over 250,000 households; over 30,000 business; and over 650 Community Anchor Institutions (including public safety locations). MERLIN will provide LTE 4G coverage on the 700 MHz spectrum to all public safety entities, and handoffs to 3G to support true mobility and roaming. MERLIN will deliver 3,000 public safety LTE users within the grant period, and OCTO is evaluating how to extend the number of MERLIN users to 10,000 over six years, providing maximum coverage and lowest unit costs. MERLIN is exempt from the NOFA’s nondiscrimination and network interconnection obligations. MERLIN is budgeted at $46,067,800. Based on the MERLIN project budget, it is estimated that approximately 501 job-years will be created or saved.