

BTOP Comprehensive Community Infrastructure Project Plan and Build-out Timeline

Please complete the Project Plan and Build-out Timeline templates below. Note that these templates may be modified by applicants in order to provide the most effective presentation of the data for their specific project. Applicants should ensure, however, that they provide at least as much detail as the provided templates require.

For system stability reasons, it is recommended that you provide these documents in PDF format when submitting a copy of your application on an appropriate electronic medium, such as a DVD, CD-ROM, or flash drive. There is no need to provide this instruction page.

PROJECT PLAN

- Use the following table to list the major network build-out phases and milestones that can demonstrate that your entire project will be substantially complete by the end of Year 2 and fully complete by the end of Year 3. This is to be done at the aggregate level (combining all proposed funded service areas.)
- Indicated how the milestones listed below will demonstrate these completion objectives. The applicant should consider such project areas as: a) network design; b) securing all relevant licenses and agreements; c) site preparation; d) inside plant deployment; e) outside plan deployment; f) deployment of business & operational support systems; g) network testing; f) network operational. The applicant may provide any other milestones that it believes showcase progress.
- Project inception (Year 0) starts at the date when the applicant receives notice that the project has been approved for funding.
- In the table, provide any information (e.g., facts, analysis) to: a) demonstrate the reasonableness of these milestones; b) substantiate the ability to reach the milestones by the quarters indicated.

Time Period	Quarter	Milestones	Support for Reasonableness/Data Points
Year 0	-	<ul style="list-style-type: none"> • Select LTE system vendor • Finalize project plan and resource assignments • Complete FCC requirements for Public Safety waiver • Apply for any permits required for tower work and ADCOM 911 expansion • Complete required MOUs/IGAs 	<ul style="list-style-type: none"> • As we have interviewed three LTE vendors, we will be in position to move quickly in signing a contract. • FCC requires that the PSST lease be signed by August 2010
Year 1	Qtr. 1	<ul style="list-style-type: none"> • Sign contracts for LTE system equipment • Work with LTE vendor to finalize network design • Perform existing tower capacity analysis • Begin tower work at ADCOM 911 site • Begin tower work at Cherokee site • Complete equipment room expansion • Continue development of fiber network • Begin installation of initial fiber aggregation points • Identify additional ADCOM LTE access sites • Begin ADCOM 911 equipment room expansion 	<ul style="list-style-type: none"> • The primary goal will be to get all major facilities updated to handle the additional load/equipment. • As soon as an LTE vendor is selected we will work to identify all additional sites to begin site preparation work. • We plan to begin the core IP network development and deployment as soon as possible since much of it can be done without the LTE equipment. This will allow us to implement the wireless network quickly once the equipment is ready.
	Qtr. 2	<ul style="list-style-type: none"> • Complete ADCOM 911 equipment room upgrade • Perform electrical system upgrade and UPS rebalancing • Upgrade Firewall and IPS/IDS on core network • Complete IGAs/MOUs for all participating agencies • Begin Ladybird and Justice center tower work • Begin 6th avenue fiber installation • Begin West fiber installation 	<ul style="list-style-type: none"> • As most building/site improvements do not involve major construction, we anticipate quick completion of the critical sites/buildings. • The fiber installation process is expected to take the longest so our goal is to begin the construction as soon as all sites are identified.

		<ul style="list-style-type: none"> • Receive LTE hardware from vendor 	
	Qtr. 3	<ul style="list-style-type: none"> • Implement County Campus and Brighton fiber aggregation points • Complete ADCOM and Cherokee tower hardening • Begin Ladybird and Justice Center tower hardening • Begin microwave licensing • Install LTE access sites at ADCOM 911, Cherokee and Ladybird • Begin LTE Core installation (ADCOM 911 and DIA) • Begin site preparation at additional LTE access points • Finalize 6th avenue fiber run • Complete Cherokee fiber installation • Implement Cherokee fiber aggregation point 	<ul style="list-style-type: none"> • Based on initial vendor timelines, we expect equipment to be received by the 3rd quarter of the project. • We will begin microwave licensing in order to ensure all required licenses are ready once site development begins.
	Qtr. 4	<ul style="list-style-type: none"> • Complete Ladybird and Justice tower work • Begin Dorothy tower hardening • Receive microwave licensing • Begin microwave backhaul installation • Complete LTE Core installation • Install initial UE (user devices) in vehicles • Install LTE access sites at Justice Center and Hoyt sites • Begin initial LTE network testing • Begin network link between Adams County, Denver and Jefferson County and Thornton PSAPs 	<ul style="list-style-type: none"> • Based on vendor estimates, we will begin installing initial end-user devices during this quarter. We will use these initial installations to gauge initial performance and refine the network design.
	Qtr. 1	<ul style="list-style-type: none"> • Begin rolling out UEs to Adams County Sheriff and Commerce City Police • Complete new fiber build out • Complete Dorothy tower hardening • Finalize network link between Adams County, Denver and Jefferson County 	<ul style="list-style-type: none"> • We anticipate the beginning of the second year will see the first mass rollouts of end-user devices.
	Qtr. 2	<ul style="list-style-type: none"> • Begin rolling out UEs to Northglenn Police, Brighton Police • Begin rolling out UEs to South Adams Fire and North Washington Fire 	<ul style="list-style-type: none"> • ADCOM 911 plans a staged rollout of all users in order to manage and gauge initial network load.
	Qtr. 3	<ul style="list-style-type: none"> • Complete UE rollout to Adams County Sheriff and Commerce City PD • Begin UE rollout to Southwest Adams Fire, Greater Brighton Fire, Bennett Fire and North-Metro Fire 	<ul style="list-style-type: none"> • We estimate that all primary sites will be in place by this point (28-31 out of 36). An estimated 5-8 sites will remain to be developed based on initial testing.
	Qtr. 4	<ul style="list-style-type: none"> • Complete UE rollout to Brighton Police and Northglenn Police • Complete UE rollout to South Adams Fire and North 	

		Washington Fire	
Year 3	Qtr. 1	<ul style="list-style-type: none"> • Complete UE rollout to Southwest Adams Fire, Greater Brighton Fire, Bennett Fire and North-Metro Fire • Complete initial LTE access tests • Begin identification of additional LTE access site locations for required capacity or coverage 	<ul style="list-style-type: none"> • As soon as all agencies have end-user devices installed we will begin official testing to identify network deficiencies and modify network design as required.
	Qtr. 2	<ul style="list-style-type: none"> • Begin final LTE site installation 	<ul style="list-style-type: none"> • The sites identified in this installation will be those reserved for capacity planning once a baseline is determined and 'hot spots' are identified through usage.
	Qtr. 3	<ul style="list-style-type: none"> • Complete final LTE access site installation • Begin final coverage, throughput and load testing 	
	Qtr. 4	<ul style="list-style-type: none"> • Complete system coverage, throughput and load testing 	<ul style="list-style-type: none"> • Final vendor testing will take place and all required sign-offs will occur.
Year 4	Qtr. 1	<ul style="list-style-type: none"> • Hire one staff member to serve as the new grant administrator. • Release RFP for construction of Fiber Optic conduit and cabling along 120th Avenue as approved in original route modification. • Release RFP for construction of Fiber Optic lateral conduit and cabling from existing fiber on Grant Street into the City of Northglenn building. • Install application specific core switch • Procure Fiber Test equipment • Procure Spectrum Analyzer test equipment • Develop and submit Route Modification documents • Develop and submit Budget Modification documents. 	<ul style="list-style-type: none"> • New administrator will take over day to day administration of grant finances and project oversight. • 120th Avenue RFP is already written, but needs to be released for bid. • Northglenn lateral conduit RFP will be developed and released using previous RFPs as a template. • Pricing and network design is complete for new switch. Need to procure and install the equipment. • Test equipment has been initially priced. Need to procure. • Route modification documentation is already partially complete. Need to finalize. • Budget modification documentation needs to be revised and submitted in support of the route modification.
	Qtr. 2	<ul style="list-style-type: none"> • Start construction of Fiber Optic conduit and cabling along 120th Avenue as approved in original route modification. • Start construction of Fiber Optic lateral conduit and cabling from existing fiber on Grant Street into the City of Northglenn building. • Procure and install new surge suppressors at key aggregation equipment sites. • Install environmental monitors at all key aggregation sites. • Order remaining fiber SFP modules needed to provide access to the fiber network. • Order site security and access control equipment for key aggregation sites. • Order UPS device to be installed at Cherokee and Bennett Radio Tower sites. • Determine best course of action regarding LTE specific 	<ul style="list-style-type: none"> • Construction of new fiber run and lateral connection can begin immediately upon award of RFP contract. • Have already identified surge suppressors, environmental monitors, and fiber SFP modules needed. Still need to procure. • Have already received bids for site security system (materials and labor). Will place order to procure materials. • Will need to identify UPS to be used at each site, but can use specifications and bids used for previous UPS procurement. The size of the units will be the same as those previously purchased. • General Dynamics and Raytheon will continue discussions with FirstNet to possibly obtain an SMLA. If they are unsuccessful, we will enter negotiations with the

		equipment that was purchased. Whether it can still be used for LTE, or the vendor buys it back, or it will be auctioned.	vendors for a buy-back of the equipment, or auction the equipment. This should be completed by the end of Q2 Year 4.
	Qtr. 3	<ul style="list-style-type: none"> • Complete construction of Fiber Optic conduit and cabling along 120th Avenue as approved in original route modification. • Complete construction of Fiber Optic lateral conduit and cabling from existing fiber on Grant Street into the City of Northglenn building. • Install high speed microwave connections between Cherokee Tower and North Metro Fire, between Commerce City building and South Adams Fire, between Bennett Radio Tower and Bennett Fire, and upgrade existing microwave between ADCOM and North Washington Fire. • Upgrade HVAC units used in the basement network aggregation room at ADCOM. • Install site security and access control equipment for key aggregation sites. • Install UPS device to be used at Cherokee and Bennett Radio Tower sites. 	<ul style="list-style-type: none"> • We anticipate construction of 120th Ave fiber should take no more than 6 months to complete. • We anticipate construction of lateral fiber connection to the Northglenn City building should take no more than 3 months to complete. • 3 of the newly proposed microwave connections would re-use existing high speed microwaves already purchased under the grant. We only need to purchase one more to complete the work. The installation timeline includes licensing and coordination efforts, as well as physical installation at the sites. • With the installation of additional equipment, the HVAC units need to be resized to meet the increased demand. • Have already received bids for site security system (materials and labor). Will sign contract to complete the installation. • Can use existing part-time electrical contractors to complete the installation of the UPS devices.
	Qtr. 4	<ul style="list-style-type: none"> • Complete prep work to migrate an existing equipment shelter to the base of the Brighton Water tank. This includes site use agreements and pouring concrete slab to serve as foundation. • Relocate existing equipment shelter to the site at the base of the Brighton Water tank site. 	<ul style="list-style-type: none"> • Will need to modify existing site use agreement with the City of Brighton. This negotiation will start immediately in Q1, but should be completed no later than Q4. • We will solicit bids for a contractor to pour the slab and relocate the shelter during Q3, anticipating the work to be complete in Q4.
Year 5	Qtr. 1	<ul style="list-style-type: none"> • Perform necessary site work to prepare the relocated equipment shelter to house existing equipment. This includes site electrical work, modification or replacement of HVAC, and installing cabling between shelter and the base of the water tank. • Migrate equipment from inside the base of the water tank to the relocated equipment shelter. • Perform final testing of all network elements. • Verify performance metrics with all CAIs connected. • Complete all grant documentation. • Finalize and close out BTOP grant. 	<ul style="list-style-type: none"> • Will use previous bids and contracts as a template to solicit bids to complete this additional work. • Existing equipment in the base of the tank is already in use as part of the broadband network. This includes the high speed network equipment installed previously under the grant. The migration to the new shelter will provide better access and environmental controls to the equipment. • Network testing and performance is validated at the time the equipment is installed. However, since we are deploying new connections, and migrating equipment during Q1, we will need to verify the same performance metrics with the last equipment migrated or installed.

