MAINGATE BAA08-21 Q&A

Questions 1-16 were posted Jun 13, 2008 with amendment 0001. Solicitation questions (17 through 73) and answers are attached.

Q17: The TRLs specified in the BAA appear to be different from those in the Proposers' Day briefing. Please clarify

A17: The BAA presents the TRLs as "approximate" - e.g. "~TRL 5" or "~TRL 6". The briefing presents them as "TRL 4/5" or "TRL 5/6". Both are considered to be equivalent.

Q18: Which aspect of the MAINGATE capability is more important? For example, if a company were to choose to do one, which one is preferred?

A18: Both the gateway and MANET capabilities are required for the MAINGATE Program.

Q19: Are the NCRS deliverables (e.g., information on designs, capabilities, and demonstrations) available to potential proposers?

A19: Yes. Technical information from the NCRS Program is available to qualified proposers per the BAA. See BAA08-21 and posted amendments for qualification criteria and data request procedures.

Q20: The BAA provides 21 legacy radio types but does not provide specific GSA designators. Please clarify the specific radio designators and how they can be acquired.

A20: The 21 radios listed in the BAA represent fundamental types to be considered for the MAINGATE effort. The Government recognizes that some specific models and types may be unavailable for use in the program due to ongoing operations. Specific models are negotiable based on availability following contract award.

Q21: Please clarify what is meant by "end-to-end" testing: is it between MAINGATE nodes or between legacy radios?

A21: End-to-end testing involves the ability to access or send application data from any user (legacy or gateway) to any other user (legacy or gateway). That capability includes transferring data between legacy networks (comprised of the same or different radio types) connected to a common gateway and transferring data between legacy networks connected to different gateways, which are reachable via the wireless IP MANET.

Q22: Are steerable or tracking antennas expected for the long-range links?

A22: Proposers may use steerable, tracking, or any other antenna type or technology to achieve the metrics specified in the BAA.

Q23: Are antennas part of the $60k/unit price goal?

A23: Antennas for the Gateway are part of the price goal if they are required for achieving the metrics specified in the BAA. Antennas which are part of a legacy radio system are not counted towards the price goal.

Q24: What is the scalability requirement for the MANET?

A24: No specific scalability metric is established for the program. Specific scalability limits will be a function of the scenario in question (e.g. mix of ground and airborne nodes as well as their density and transmission powers). The MANET, however, should be shown to scale according to proven limits, e.g. on the order of (n-1)^-1.

Q25: What are the gateway QOS metrics?

A25: See the BAA for specific QOS metrics.

Q26: Please clarify the site visit process.

A26: See the revised section 1.1.8 entitled Oral Presentation and Demonstration Expectations in solicitation amendment 2.

Q27: Is there a downselect planned for the program?

A27: No. MAINGATE is a single phase program with the potential for multiple awards. The selected proposer(s) is (are) expected to be contracted for the entire length of the base program.

Q28: Can a proposer use existing software for bridging networks?

A28: Yes, proposers can use existing software for network bridging provided it meets the needs and metrics of the program.

Q29: What is meant by the use of the term "default IP network" in the BAA?

A29: The embedded wireless IP network (WIPN) is considered to the “default IP network”. Other IP networks can be used via the gateway and/or the WAN and LAN connections.

Q30: Is there a JTRS compliance requirement for the MAINGATE unit?

A30: No JTRS compliance requirement exists for the MAINGATE unit. The Government is open, however, to compatibility with JTRS-specific waveforms (e.g. WNW, SRW, etc.).

Q31: Is a full-rate production of the MAINGATE units expected? If so, then what are projected cost and quantities?

A31: DARPA is not anticipating full rate production of the MAINGATE units within the DARPA program.

Q32: Can a proposer plan to augment the MANET with (non-MAINGATE) radios to attain long ranges?

A32: Proposers may offer intermediate radios as relays to achieve range metrics. Such a solution must provide for the capability and performance specified in the BAA as part of the MAINGATE system offered to the Government and at the specified price. Proposers are encouraged make every attempt to provide for the capabilities and performance metrics specified in the BAA using only MAINGATE units.

Q33: What is seen to be the biggest challenge in the MAINGATE program?

A33: The biggest challenge is believed to be attaining the requisite performance and capabilities at the specified per unit cost.

Q34: What are the GPR and licensing guidelines for the XG capability?

A34: XG information can be provided to proposers as GFE. A tutorial used by the program is to be posted on the password-protected BAA website. The core of the XG dynamic spectrum access (DSA) capabilities are GPR and any source code provided will be unwarranted as it was not the intention of the XG Program to produce portable code. It should be noted that all XG performers have IP rights that may affect applicability to MAINGATE. Proposers may further investigate a range of DSA considerations in published literature such as the IEEE Dynamic Spectrum Access Networking (DySPAN) conference publications.

Q35: If the bandwidth and architecture are sufficient to support the required latency for 20 video streams at 384 kbps, is a multicast protocol required?

A35: The BAA states that multicast protocols must be supported.

Q36: With the extensive amount of preparation required for the site visit orals and

demonstrations, can the due date be extended by 60-90 days? This is especially important due to ITAR delays.

A36: See the revised section 1.1.8 entitled Oral Presentation and Demonstration Expectations in solicitation amendment 2. The Government believes that sufficient time is provided for preparation of proposals and oral presentations and plans to hold to the current proposal due date of 28 July.

Q37: Is the 50W transmit power a hard requirement or can a design use a lower transmit power if the required link margins can be established in real-world operations with less than a 50W transmit power?

A37: The proposed design can use less than a 50W transmit power provided it can provably and reliably establish and maintain the required link margins under high attenuation conditions (e.g. dense foliage). Proposals using such alternative approaches must provide an analysis showing reliable connectivity under the range of deployments (e.g. node quantities and communications ranges) and environments for groups of MAINGATE nodes in the proposal. The 50W transmit power was derived based on NCRS field-test experience at locations with dense foliage such as Ft. Benning, GA.

Q38: Is the MAINGATE high band capability included in the $60k/unit cost?

A38: Yes, the MAINGATE high band capability is included in the $60k/unit cost.

Q39: How large of a field test would be required for the LUT?

A39: The base program includes a requirement for 13 units including two (2) airborne units. The fully-priced options are viewed to be similar to a Cobra Gold exercise.

Q40: How much funding is available to get to the MAINGATE demo?

A40: The appropriate amount of funding required for the proposed base program including the final demo is to be determined by the proposer. No target funding amount is defined by the Government under the BAA.

Q41: What is the expected duration of the base program?

A41: The appropriate duration required for the proposed base program including the final demo is to be determined by the proposer. No target duration is defined by the Government under the BAA.

Q42: How important is dynamic spectrum access (DSA) capability to the MAINGATE program?

A42: The ability to reliably access sufficient spectrum for the MAINGATE networks is vital. While DSA is not a requirement, it is viewed as a viable technology to provide reliable spectrum access. The specific spectrum access mechanism proposed – whether DSA, traditional manual planning, or other means – needs to consider the challenges of obtaining wideband spectrum assignments in CONUS and eventual overseas deployments of MAINGATE by the Services.

Q43: Does MAINGATE need to use the same high and low band frequencies used by NCRS? Are there specific frequency considerations beyond availability of necessary bandwidth to support program objectives?

A43: The frequency use of the MAINGATE units must be compliant with US and host nation regulations and allocations.

Q44: With respect to the networking software, what is meant by the BAA statement, "only components and subsystems at an approximate maturity of TRL-6 will be considered for entry into this effort," with respect to the nomenclature "TRL 5/6" provided in the MAINGATE Proposers' Day briefing?

A44: The BAA presents the TRLs as "approximate" - e.g. "~TRL 5" or "~TRL 6". The presentation presents them as "TRL 4/5" or "TRL 5/6". Both are considered to be equivalent.

Q45: Will the Government provide all NCRS CDRLs, system specifications, ICD, design documents, test documents, and test results to proposers?

A45: The Government has made all NCRS technical data available to all qualified proposers. See the BAA for details and the process of obtaining the data.

Q46: Is the Chat capability limited to the MAINGATE gateway? What about text messages between cell phone users connected to the MAINGATE network?

A46: The Chat capability is not limited to the MAINGATE gateway. Any capability provided by a radio/device and network should be supported by the MAINGATE gateway and network.

Q47: Will DARPA contract for the 1000 Limited Rate Initial Production MAINGATE units for the Costed Options?

A47: See solicitation section 1.1.7. The 1000 MAINGATE nodes will are to be negotiated as part of the initial MAINGATE contract award.

Q48: Does the MANET gateway include the satellite communications terminal? If so, who provides the satellite bandwidth during the MAINGATE demonstrations and how much bandwidth will be required (e.g. 384 kbps x 20 streams)?

A48: The SATCOM terminal is part of the MANET gateway. The MAINGATE developer is responsible for obtaining the appropriate SATCOM bandwidth to support the demonstrations. The required bandwidth will not exceed the capability of SATCOM providers.

Q49: Who are the manufacturers of the WAVE and RIOS MANETs discussed during the MAINGATE Proposers' Day?

A49: Information on existing MANET systems can be found via the internet or other sources. The MAINGATE program does not promote existing proprietary or non-proprietary solutions as they do not meet the needs of the MAINGATE program.

Q50: Is open source software (OSS) acceptable for use in the MAINGATE program? If so, can the proposal include the required Representations and Certifications as needed for the OSS?

A50: Yes, OSS can be proposed and used in the MAINGATE program where appropriate. The required Representations and Certifications should be included in the proposal.

Q51: Are contract performance rewards possible if the contractor finishes early and/or exceeds performance or TRL requirements?

A51: See section 4.3.2.2 (10). Contractors are to propose the desired award instrument that will result in reasonable contractor risk and provide the contractor with the greatest incentive for efficient and economical performance.

Q52: What are the Go/No-Go criteria for the MAINGATE program.

A52: MAINGATE is a single phase program and does not have any Go/No-Go criteria typically used in multi-phase DARPA programs.

Q53: What incentive (target goal) exists for the larger potential MAINGATE prime contractors to utilize small businesses as subcontractors?

A53: See solicitation section 6.9 entitled Subcontracting. MAINGATE proposers will be required to provide a small business plan per the BAA.

Q54: Will DARPA, Raytheon, or CenGen sell NCRS radios and/or software to any

qualified bidders?

A54: The purchase of NCRS radios and/or software is a matter to be discussed between interested parties and Raytheon or CenGen as DARPA has no ongoing contractual interests in the NCRS

Q55: What is the minimum IP network that will be demonstrated in the MAINGATE program (e.g. VHL LOS at ranges up to 60km; BGAN SATCOM for over-the-horizon networking)?

A55: The IP networking to be demonstrated in the MAINGATE program includes all components specified in the BAA: ground mobile units, airborne units, and SATCOM to provide for communications across all tiers (local/regional tactical communications and worldwide reachback).

Q56: How was the MAINGATE unit cost goal of $60k/unit derived?

A56: The MAINGATE unit cost goal of $60k/unit is derived from informal surveys of existing components and affordability needs expressed by the operational community.

Q57: Will the government establish an XG requirement? Will they resource additional demonstrations or capability enhancements?

A57: The MAINGATE program does not establish the use of XG technologies/capabilities as program requirement. Demonstrations and capability enhancements of XG technologies specific to the MAINGATE effort may be proposed as part of the development and experimentation plan.

Q58: How many channels were demonstrated in the DIMA video presented at the MAINGATE Proposer's Day?

A58: One channel was demonstrated in the DIMA video

Q59: What was the DIMA channel radio data rate, video resolution in pixels, frames per second per video, and latency per video stream in the DIMA video presented at the MAINGATE Proposer's Day??

A59: The channel Data Rate = 260 kbps, Application Layer Data Rate per user = 100 kbps, Video Resolution = 192 x 140, Frame Rate = 30 fps, Latency ~ 40ms for the DIMA demonstration.

Q60: What was the DIMA compression approach?

A60: The DIMA demonstration used MS-MPEG4 V2

Q61: BAA08-21 Page 7, Figure 1 indicates that 2 analog and 2 digital radios are required. Page 41 paragraph 4 Gateway, Ports (bidirectional) lists three (3) Voice Radios and Three (3) Data Radios. Can you please clarify? Is it 2+2 or 3+3?

A61: Figure 1 is for illustration purposes only and is not a system specification. The entry in Appendix A (page 41, Item 4 Gateway, Ports) provides the gateway specification to be met; i.e., the gateway must be able to support 3 digital and 3 voice radios/networks simultaneously and provide interoperability among all of them.

Q62: Can we assume that voice radios and analog radios are the same? Please clarify.

A62: No, the gateway must (at a minimum) be able to provide interoperability among all of the required legacy radio types provided in Appendix A (plus the WAN, LAN, and MANET IP radio). It must provide simultaneous interoperability for all combinations of up to 6 different legacy radio types.

Q63: The MAINGATE program is intended to provide "interoperability" to the military and to public safety agencies (e.g., police and fire). Will the LUT provide radio connections to public safety agencies? If not, it is strongly encouraged that the LUT require a connection to public safety agencies in the VHF, UHF and 800 MHz trunking frequency bands.

A63: The LUT may include participation by public safety agencies. The ability to establish a gateway interface with the 800 MHz public safety radio (voice) is called out in Appendix A pg 41. Gateway interfaces to other types of public safety radios (voice and data) other than those called out in the BAA are possible and may be proposed along with a discussion of the design challenges and system/user benefits.

Q64: BAA08-21 Page 42 Environmental Testing, Temperature Range: Is 100 degrees to be F vice C?

A64: The temperature range is -56.5 C to 100 C to account for the range of operating conditions.

Q65: BAA08-21 Page 15 para 1.1.7 Option 1 and Option 2 MAINGATE Limited User Testing: With respect to the "sell price to the government" of $60K per recurring production unit; is this to be exclusive of the non-recurring expense of final product

design, testing, documentation, certification, etc.?

A65: No. The above unit price should reflect ALL non-recurring and recurring costs. DARPA does not plan to change the product design for the options, nor does it plan to provide resources for certification efforts. All MAINGATE documentation should be provided in the base program, not in the options. Expenses for pre-LUT equipment checkout, operator training, and on-site maintenance and fixes, are exclusive of the unit selling price in each option. The contractor may include pricing for A- and B-Kit installations in these options, but this is NOT a requirement

Q66: BAA08-21 Page 15 para 1.1.7 Option 1 and Option 2 MAINGATE Limited User Testing: If the $60K "sell price to the government" of $60K per recurring production unit is exclusive of the non-recurring expense, do you require an estimate for this non-recurring expense.

A66: No, the unit price is not exclusive of non-recurring expenses. It should reflect ALL non-recurring and recurring costs. DARPA does not plan to change the product design for the options, nor does it plan to provide resources for certification efforts. All MAINGATE documentation should be provided in the base program, not in the options. Expenses for pre-LUT equipment checkout, operator training, and on-site maintenance and fixes, are exclusive of the unit selling price in each option. The contractor may include pricing for A- and B-Kit installations in these options, but this is NOT a requirement

Q67: BAA08-21 para 1.1.1 page 7 Technical Description, page 10 Wireless IP Network, and page 12 MAINGATE Node cost:
Background: Page 7 Technical Description states "The physical configuration will include a minimum of six (6) slots to support interfaces to legacy radios and networks, as well as a WIPN radio for default MANET connectivity among the MAINGATE nodes. Page 10 Wireless IP Network states, "It also is envisioned that the higher frequency bands can exploit directional antennas and thus the goal is to increase the information rate to 100 Mbps using a gateway slot or WAN/LAN ports, and a high data rate disk data link system like Common Data Link (CDL) or Tactical Common Data Link (TCDL). Page 12 MAINGATE Node cost states, "The goal for the cost to the government of the MAINGATE node is $60,000 (FY08$) per unit for a volume purchase of 1,000 units at program completion. A MAINGATE node consists of the gateway, MANET IP radio, WAN port, LAN port, and operator console. This does not include the cost of the individual external radios (except for the default WIPN that is an integral part of the gateway) or the cost of legacy radio kits.

Question: During the MAINGATE Proposers Day 24 June, Dr Stotts stated that the cost is to include the cost of the highband radio and its directional antenna if used. The production MAINGATE node does not appear to include any radio other than "a WIPN

radio for default MANET connectivity". Please confirm that the cost of the production MAINGATE node (target <$60K at quantity 1000) is to include the highband radio system connected via a gateway slot or WAN/LAN ports, and a high data rate disk data link system like Common Data Link (CDL) or Tactical Common Data Link (TCDL). "

A67: The MAINGATE internal unit is expected to meet the BAA requirements, which reflect both low band and highband data rates. It consists of the gateway, MANET IP radio, WAN port, LAN port, and operator console. This does not include the individual external radios or the legacy radio kits. The contractor can use any antenna structure, e.g., omni-directional, directional, to achieve these requirements using the internal MANET IP radio. Because of the number of existing high data rate relays used by the services today, e.g., ROVER, TCDL, CDL, MAINGATE also must be able to interface with these relays through one of the six WAN ports. The BAA language "…information rate to 100 Mbps using a gateway slot or WAN/LAN ports, and…" should have read "…information rate to 100 Mbps using a gateway, and…." . See solicitation amendment 2 which reflects this revision.

As noted during industry day, as well as the BAA, the MAINGATE unit price is exclusive of any external radios, e.g., SINCGARS, TCDL, PRC-150.

Q68: Would DARPA consider a multi-phased programmatic concept that would support multiple Phase 1 awards to two (or more) primes to allow DARPA to better assess the viability of alternative approaches through an initial criteria-gated concept-development milestone?

A68: No, Multiple awards are possible, but MAINGATE is a single phase program with no provisions for go/no-go assessments or downselects.

Q69: Assuming that there are multiple WIPN waveforms that meet all the requirements of the BAA, would the use of a WIPN radio standard that is planned for mass production and deployment within all branches of the arm forces be evaluated as superior to other compliant WIPM waveform(s) that are not currently in DoD plans for mass deployment? In other words, will credit be given for proposing a WIPN radio/waveform that the DoD plans to extensively deploy?

A69: The selected waveform and any other aspect of the proposed design will be evaluated in accordance with its contribution to the evaluation criteria presented in the BAA section 5.1.

Q70: Will offers be considered that are at variance to the stated form factor in terms of dimension?

A70: All submitted proposals will be reviewed according to the stated evaluation criteria,

which include the size and packaging of the system. The form factor listed in Appendix A is to ensure MAINGATE unit compatibility with the targeted ground and air platforms. Deviations from the proposed SWAP would affect utility and transition of MAINGATE to the Services.

Q71: Is a more precise definition of the frequency bands of interest available?

A71: No. At a minimum, the MANET radio should be adaptable to frequency bands traditionally used by DoD in CONUS. While DARPA only plans to conduct experiments and demonstration in CONUS, designs should also consider the ability to access other bands to facilitate potential future uses of MAINGATE beyond the DARPA-funded effort.

Q72: BAA Page 10 states: "It also is envisioned that the higher frequency bands can exploit directional antennas and thus the goal is to increase the information rate to 100 Mbps using a gateway slot or WAN/LAN ports, and a high data rate disk data link system like Common Data Link (CDL) or Tactical Common Data Link (TCDL)." Industry Day discussions appeared to drive the capability into the WIPN radio. Please clarify whether a high frequency solution that uses a gateway slot or WAN/LAN ports and an external radio is compliant.

A72: The MAINGATE internal unit is expected to meet the BAA requirements, which reflect both low band and highband data rates. It consists of the gateway, MANET IP radio, WAN port, LAN port, and operator console. This does not include the individual external radios or the legacy radio kits. The contractor can use any antenna structure, e.g., omni-directional, directional, to achieve these requirements using the internal MANET IP radio. Because of the number of existing high data rate relays used by the services today, e.g., ROVER, TCDL, CDL, MAINGATE also must be able to interface with these relays through one of the six WAN ports. The BAA language "…information rate to 100 Mbps using a gateway slot or WAN/LAN ports, and…" should have read "…information rate to 100 Mbps using a gateway, and….". See solicitation amendment 2 which reflects this revision.

Q73: What is the anticipated contract type envisioned for the base award and options?

A73: See section 4.3.2.2 (10), contractors are to propose the desired award instrument that will result in reasonable contractor risk and provide the contractor with the greatest incentive for efficient and economical performance.