Q: What is the definition of Goodput?
A: Goodput is defined as the sum of all application layer payload bits sent by all nodes during the defined processing time window divided by the time span of the window. The Go/No-Go score will be based on the end to end results as seen by the application layer, not on a per node basis for traffic that happens to use multiple hops.

Q: How is bandwidth measured?
A: Bandwidth is measured at the 3 dB point (e.g. 802.11b has a 22 MHz bandwidth). Due to the difficulty of verifying instantaneous operating bandwidth, the performer must stay within the continuous bandwidth associated with each test, either 1, 10, or 25 MHz, respectively.

Q: How are LPD and AJ measured?
A: LPD is measured in terms of the post-detector power margin in decibels available to the intended receiver versus a detector using a band matched wideband radiometer. AJ is measured in terms of the jamming margin of the intended receiver from a band-matched Gaussian noise jammer. For the purposes of this calculation, forward error correction (FEC), direct sequence processing gain, and null depth are counted toward these measures. Frequency hopping is an important technique in the real world, but does not count toward these measures since the available spectrum is artificially limited. Note that there is no LPD or AJ testing involved in Phase 1 of the MNM program.

A: How is processing gain measured?
Q: By dividing the occupied spectral bandwidth by the information bit rate on a per stream basis.

Q: Will the Bidder's have access to information from the government GPS?
A: No.

Q. Can Bidder's use GPS?
A: Yes.

Q. Will the government provide the drivers for the Go/No-Go test?
A. The government will provide drivers for the formal test periods but not for informal link testing.

Q. Are 20 nodes required for the Go/No-Go test?
A. 20 nodes are required for the Go/No-Go test and it would be prudent to have a spare node(s) on site.

Q. Is the government providing the high data rate and multicast generators?
A. A government test application will reside in each of the 20 nodes. A portion of the 20 nodes will be the high date rate and multicast generating nodes.

Q: Will any nodes be airborne in Phase 1?
A: The Phase 1 Go/No Go test will be ground vehicles only. No airborne or advantaged nodes will be used.

Q. Is the Command Center node part of the network?
A. The Command Center node is part of the network and can also serve as an E-F pair in addition to routing for other nodes. For the purposes of the Go/No-Go test the Command Center is one of the 20 performer supplied mobile nodes. The government will extend the (Gigabit) Ethernet from the performer SUV into a government supplied trailer that will serve as the Command Center. The government will supply the (Gigabit) Ethernet cable.

Q: The Phase 1 Go/No Go is based on a 20 node network. It is allowable for a proposer to indicate that their design is scaleable beyond 20 nodes?

A: Yes.

Q. What is the maximum vehicle speed during the Go/No-Go test?
A. 35 mph is the base speed limit at Lakehurst Naval Air Engineering Station (NAES). Node speeds during the test range from 5-10 mph up to 35 mph.

Q: Clarify whether the high data rate nodes are full-duplex or half-duplex.
A: In the case of the paired (A/B) high data rate nodes, the test application will send 125 Mbps from Node A to Node B and 125 Mbps from Node B to Node A for a total of 250 Mbps. Whether this is implemented at the lower layers as full-duplex or half-duplex is up to the discretion of the performer.

Q. Is a simultaneous multicast and unicast capability?
A. Simultaneous transmission and reception of unicast high data rate and reception of multicast data is an integral part of the Go/No-Go test.

Q. Does every competitor have the same E-F pair sequence?
A. Not necessarily. The selection of E-F pairs is random over the course of a Go/No-Go test and from Go/No-Go test to Go/No-Go test. All performers will experience the same average effects over the course of the Go/No-Go test.

Q. Are the high data rate and multicast generating nodes eligible to be E/F pairs?
A: No.

Q. When will the test tools be capable of supporting TCP instead of just UDP?
A: The MNM program may support an upgrade of the test tools to support TCP although higher layer protocols are not the subject of this effort. In Phase 1, only UDP (unicast and multicast) will be utilized. See http://nettion.pf.itd.nrl.navy.mil/ for more jnformation on the test tools.

Q: Three distinct Go/No-Go tests are planned – Can the performer manually change modes between Go/No-Go tests?
A: The performer may manually change modes between Go/No-Go tests.

Q. What is meant by ‘average system load’ in the Go/No-Go matrix?
A. For the Phase 2 Go/No-Go test each type of traffic will be a percentage of the average system load (e.g. – Type 1 traffic will constitute 10% of the average system load for the Phase 2 Go/No-Go).

Q. Why is there a limit on the number of retransmissions for Type 3 traffic in Phase 2?
A. The number of retransmits is limited to prevent congestion associated with nodes that may be intentionally unreachable as part of the Go/No-Go test. However, these retransmissions are application layer retransmission and are not meant to imply a PHY/MAC layer design approach which could use re-transmits based on design trade-offs.

Q: Clarify the frequency band of operation for Phase 1.
A: At MNM Bidder’s Day it was stated that the government is assuming operation in the 2.4 GHz ISM band based on availability and cost of equipment and past spectrum availability at Lakehurst NAES. This does not preclude bidders from using a different frequency. The government requested comments from Bidder’s on alternative bands that may be used in order to begin the frequency request process. DARPA requests bidders to avoid frequency bands that are difficult to obtain access to such as FAA, Cellular, broadcast TV, and other assigned or common use frequencies, since there will be no guarantee of spectrum availability. The government will obtain the necessary permissions to radiate.

Q. Is performance in a single frequency band acceptable for Phase1?
A. Yes.

Q. Is there a power limitation for operation in the 2.4 GHz ISM band?
A. There will be a 25 dBW EIRP (power per antenna, dB + gain per antenna, dB + number of antennas, dB) per platform limitation for operation in the 2.4 GHz ISM band. Bidder's planning to use other frequency bands will be scaled in EIRP to maintain a level playing field among performers within the limitations available from the Lakehurst NAES spectrum manager.

Q. What Lakehurst NAES multipath modeling results are available?
A. Measurements taken by Lucent as part of the Future Combat System-Coummunications (FCS-C) program have shown capacities in excess of 10 bps/Hz in the 2.4 GHz ISM band in the Lakehurst NAES environment due to multipath from trees (foliage) and buildings. The raw data measurements taken by Lucent are not a deliverable to the government.

Q. Is propagation data on Lakehurst NAES available?
A. At MNM Bidder's day it was stated that CPRT can compute point-to-point bulk propagation loss accounting for the impact of buildings and foliage.

Q. Is DTED data on Lakehurst NAES available?
A. Yes.

Q. Why is DARPA stipulating the use of OLSR?
A. The intent is to not give an advantage to any proposer based on the routing layer. Stipulating a common routing layer provides the government more visibility into performance at the MAC and PHY layers, reduces cost, and reduces overall program risk.

Q. Once packet routes are selected will they change?
A. OLSR changes packet routes as necessary at intervals on the order of seconds, and packet routes will change during the conduct of the Go/No-Go test.

Q: What will the interface be between the GFE network layer and the performer provided MAC layer?
A: At MNM Bidder's Day it was stated that (Gigabit) Ethernet bridging will be used with an RJ-45 Ethernet cable. The government expects the performer to support an (Gigabit) Ethernet bridge and to give head-of-queue priority to network control packets over data packets based on packet header information to be provided by the government to the awardees. Specific methods of implementing the (Gigabit) Ethernet bridge and priority queuing are left up to the performer.

Q: The current IETF implementation of OLSR does not provided a means to pass link layer information up to the network layer – is it the government's intent to provide this interface?
A: Currently, the government does not plan to burden the awardees with the necessity of having to pass lower layer information up to the network layer. DARPA agree this is a useful capability and one likely required for future systems. However, with regards to Phase 1, the demonstration will be constructed so as to not require this capability. If all awardees desire this capability then it could be discussed and potentially implemented. Bidder's should state in their proposal if they desire this capability.

Q: Does DARPA need to have a currently funded JTRS program to justify a roadmap or path through Phase 2?
A: No.

Q: Will DARPA provide funding support with the JTRS JPO for the MNM PHY/MAC/NET for insertion into the JPO plans and funding?
A: The MNM program does not currently have plans to provide funding support beyond the Phase 2 technology development or to pursue JTRS/SCA compliance. Clearly any system design will need to be

traceable to eventual JTRS/SCA compliance and that should be part of the performer's transition plan. As an example, the Phase 2 final form factor should fit on JTRS Cluster 1 size card

Q: Why is the Phase 1 demonstration planned for the 9th month when Phase 1 is planned to be 12 months long?
A. The Phase 1 demonstration is planned for the 9th month to allow sufficient time to analyze and document the Phase 1 results and for the necessary administrative actions to prepare for Phase 2.

Q: Clarify what is expected in the proposal regarding Phase 2 technical and cost information.
A: Please see the BAA03-31 modification at http://www2.eps.gov/spg/ODA/DARPA/CMO/BAA03-31/Modification%2001.html. Note that this modification also changes the proposal due date to Noon EST on Wednesday, 23 July 03.

Q: When will the MNM Phase 2 BAA be released?
A. The release of the MNM Phase 2 BAA is planned for January 2004.

Q. Tim Krout's viewgraphs presented at MNM Bidder's Day are not on the web site – how can I get a copy?
A. Please send a request to Vic Jaroch at vjaroch@snap.org to receive a copy of Tim Krout's viewgraphs.

Q. Can non-US citizens work on the MNM program?
A. Yes. However, access to Lakehurst NAES for non-US citizens requires substantial paperwork and approximately 5 months advance notice. Bidders should be aware that depending on the force protection status at Lakehurst NAES, non-US citizens may require escorts. Bidder's should not plan to be able to have non-US citizens access Lakehurst NAES until 1 March 04 at the earliest. Bidders that will require a significant number of non-US citizens to access Lakehurst NAES should state this in their proposal.

Q. How many awards are planned?
A. According to the BAA, one to four awards are planned. The Government reserves the right to adjust the number of awards as it sees fit in order to fulfill the best interests of the Government.

Q: The BAA stated that $20M is available for Phase 1 and that up to four awards may be made - does this mean that an individual Phase 1 proposal must not exceed $5M?
A: No. Bidders should not assume a budget limit of $5M or less. Bidders should base their cost proposal on what is required to meet the Go/No-Go metrics and program objectives.