3. INTERNETWORK PERFORMANCE

3.1 General

a. The object of this section is to model and predict the required minimum bandwidth per some number of average users and the impact of wide area network communication delays on transaction oriented applications (i.e.. remote terminal or remote client server). The prediction will bound the magnitude of bandwidth required to support information transfer or store and forward oriented applications (i.e.. e-mail) and indicate possible problematic application performance due to communications delays between terminals and remote hosts or between clients and remote servers. Note that communication delays in general consist of physical propagation delays, due to distance and available bandwidth, and communications path utilization due to information transfers, multiple simultaneous remote terminal or client server sessions, and network management related information communications.

b. It is imperative that application loads be actually modeled and tested within the SIM Centre. The SIM Centre internetwork will be modeled after the target SIGNET internetwork including HQ, regional, and mission components and therefore enable a higher degree of confidence to be obtained regarding application performance.

c. The throughput and response capability of the local area subnetworks will exceed the requirements of all existing corporate applications / services. Furthermore, any pressures on increasing local bandwidth can be readily addressed with proper network tailoring techniques and/or utilizing higher throughput network elements or local subnetwork technologies.

d. The wide area subnetwork poses the greatest challenge to supporting communications due to the limited bandwidth and relatively long propagation delays characteristic within the wide area subnetwork. Therefore, the focus within this section is on the wide area subnetwork.

e. The approach to implementing the optimum solution will have to take into consideration the specifics of delay, expected traffic volumes, and availability on at least a per region basis, and perhaps on a per mission basis where experience has shown unreliable and poor quality service in "the last mile". In general, a hybrid approach will lead to the optimum balance between quality service perception from the end users and maintainability of centralized information and human resources.

3.2 Wide Area Subnetwork Performance

3.2.1 Throughput Considerations

a. The available low aggregate bandwidth provisioned to the missions for SIGNET may inhibit the use of regionalized general client/server and terminal/host implementations. The following analysis indicates that 19.2 kbit/s links should be adequate to support the typical mission in terms of information transfer. Delay sensitive applications may be problematic depending upon the required performance as expected by the application users. It is recommended that wide