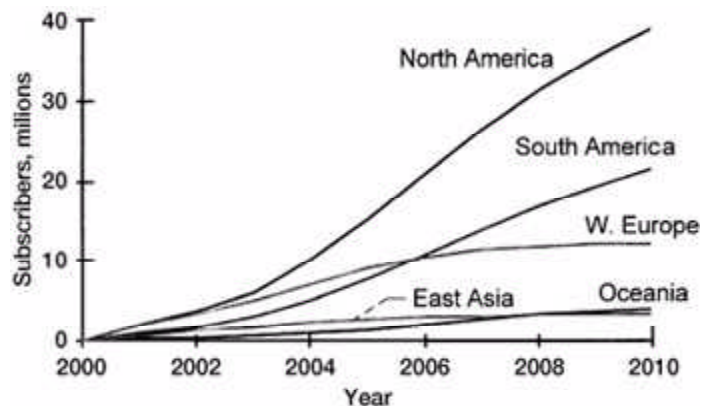
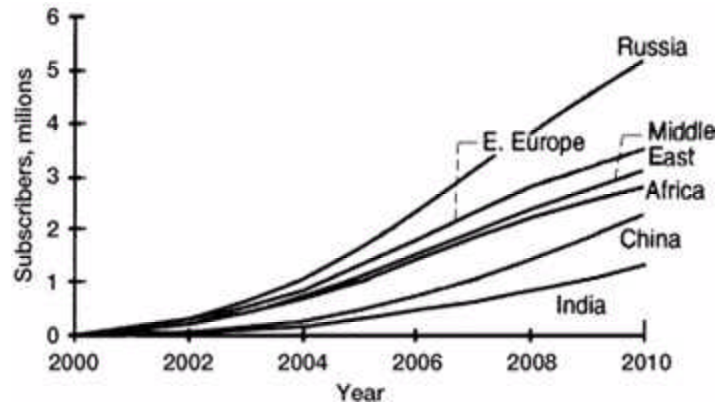


# Broadband Satellite Technologies and Markets Assessed

The current usage of broadband (data rate greater than 64 kilobits per second (kbs)) for multimedia network computer applications is increasing, and the need for network communications technologies and systems to support this use is also growing. Satellite technology will likely be an important part of the National Information Infrastructure (NII) and the Global Information Infrastructure (GII) in the next decade. Several candidate communications technologies that may be used to carry a portion of the increased data traffic have been reviewed, and estimates of the future demand for satellite capacity have been made. A study was conducted by the NASA Lewis Research Center to assess the satellite addressable markets for broadband applications. This study effort included four specific milestones: (1) assess the changing nature of broadband applications and their usage, (2) assess broadband satellite and terrestrial technologies, (3) estimate the size of the global satellite addressable market from 2000 to 2010, and (4) identify how the impact of future technology developments could increase the utility of satellite-based transport to serve this market.

Lewis' approach was to assess the requirements for satellite broadband services, which are based on an understanding of user perspectives and data needs. This research effort included interviews with leading industry players and technology experts to understand the unfolding markets for broadband services and the status of terrestrial network deployments. In addition, the suitability of available and emerging terrestrial broadband technologies to compete with the newly licensed Ka-band satellite systems in providing multimedia services to business and consumer markets was studied. The analysis was supported by an end-to-end communications services supply-and-demand model used to make quantitative assessments. It considered relevant technical, demographic, and competitive factors including application transport requirements, user preferences, changing usage levels and application mixes, affordability by user segments and geographies, investment costs and delays for upgrades, and expansion of the terrestrial infrastructure.





*Estimated penetration of broadband into top five regional satellite markets and less developed regions. (Adapted from Booz-Allen & Hamilton analysis, ref. 1.)*

We estimate that North America will have the highest number of satellite service subscribers as shown in the graph. South America is projected to be the second largest regional opportunity. In this model, the underdeveloped terrestrial networks in the region and rapidly growing gross domestic product (GDP) drive this result. Western European subscriptions could peak by 2007 and slowly decline as terrestrial buildup catches up with demand in areas not served by terrestrial technologies. In less developed regions, overall satellite service penetration is likely to be significantly lower initially than for the top five regions but to grow consistently over time. Of these, Russia is projected to be the largest single market, with over 5 million subscribers, followed by Eastern Europe, with over 3 million. We believe this result reflects the potentially underreported level of investment in terrestrial infrastructure for Russia as reported by the International Telecommunications Union (ITU). Nonetheless, Russia will most likely remain a large market for satellite services considering its large geography and low population density. A set of recommendations to improve the utility of satellite systems for delivering broadband services was developed. We expect that the methodology developed in this study will allow more quantitative assessments of specific broadband satellite technologies and markets.

## References

1. Booz-Allen & Hamilton: Assessment of Broadband Satellite Technologies and Markets, Volume 2. NASA CR-1998-206595, 1998. Available from Lewis' Satellite Networks and Architectures Branch.
2. Booz-Allen & Hamilton: Assessment of Broadband Satellite Technologies and Markets, Volume 1--Executive Summary. NASA CR-1998-206596, 1998. Available from Lewis' Satellite Networks and Architectures Branch.

**Lewis contacts:** Dr. Thomas M. Wallett, (216) 433-3673,  
Thomas.M.Wallett@grc.nasa.gov

**Authors:** Dr. Thomas M. Wallett

**Headquarters program office:** OSS

**Programs/Projects:** Space Communications, communications industry