

SPACE TO PROMOTE PEACE (WITH FOCUS ON RECONSTRUCTION OF AFGHANISTAN)

Executive Summary

As we see every day in the international news, the world faces many critical problems in providing for the billions of men, women, and children that inhabit planet Earth. We all require clean air, clean water, nourishing food, and secure shelter in order to survive and flourish as individuals and as societies. Unfortunately, far too many of the world's population lack sustained access to the essential elements of life. These victims of civil strife, war, and natural disasters deserve better.

This project, which was requested by UNESCO, derives from a commitment by the community of space professionals represented by the International Academy of Astronautics (IAA) to demonstrate the use of space systems in assisting the cause of peace. The IAA chose to focus on Afghanistan in the firm belief that responding quickly to the overwhelming needs of this war-torn country through the use of space systems can not only support the cause of peace in that country, but demonstrate that space systems can provide cost effective, highly efficient means to assist in rebuilding war-torn regions.

This report was prepared by a committee of Commission 5 of the IAA, composed of experts from myriad diverse disciplines and assisted by additional outside experts as needed, including individuals with recent direct experience in Afghanistan. The committee hopes that this report will serve as an inspiration for funding agencies to support the use of space systems to assist in the rapid reconstruction of Afghanistan.

The Pressing Needs of the Afghan People

Afghanistan faces nearly overwhelming needs. Torn by more than two decades of civil war and invasion, the people of Afghanistan suffer from sufficient access to most of the basic needs required to sustain them—clean water, nutritious food, transportation, and energy. They also lack adequate facilities and personnel to serve even basic health needs, let alone treating serious illness or injury. In the absence of rapid and effective assistance in building the physical infrastructure necessary for Afghanistan to regain its footing as a functioning social and economic entity that can supply most of its own basic needs, the country may once more slip back into destructive civil war. In exploring the needs of the Afghan people, the study group selected four critical infrastructure needs that can be met in part through the innovative use of space systems:

1. Health facilities enhancement and training;
2. Support for basic and advanced education and training;
3. Development of a geospatial infrastructure to support critical needs such as transportation development, water and food production, and general mapping and planning;
4. Rapid response to natural disasters.

Health Facilities Enhancement and Training. As a result of a lack of professional medical experts and facilities throughout the country, illnesses and the many war-related

physical injuries receive only minimal treatment. Afghanistan has only one practicing physician or para-medical for every 50 thousand persons. Further, 50 of Afghanistan's 330 districts have no basic health and medical facilities. The major cities have too few hospitals to serve the population (Kabul, the capital: 5; Kandahar: 3; Herat: 2). In addition, about one-quarter of the Afghan population is under 25 years old. This large group has therefore known virtually nothing but war, which has left a variety of war-related mental scars that require professional psychological treatment. Finally, the country faces a pressing need to upgrade the skills of existing medical/healthcare professionals (doctors, paramedics, pharmacists) and to increase the number of paramedical staff.

Support for Basic and Advanced Education and Training. Afghanistan once supported a robust educational system. Yet, after a long period of war and social upheaval, education and training now stands as a crucial need. Seventy-five percent of the people under the age of 25 have received little or no formal education. Hence, the literacy rate is very low. Few teachers or basic classroom facilities are available in the country. There are similarly few books, teaching aids, and other classroom materials. Hence, Afghanistan needs both rapid and cost-effective means to deliver basic and advanced educational services, not only to the cities, but also in the rural villages and towns.

Development of a Geospatial Infrastructure In order to support its planning and development activities for physical infrastructure, Afghanistan needs a broad range of accurate three dimensional maps and other detailed geospatial information. Critical needs include the basic information regarding transportation, water supply, and agricultural production. Modern geographic information systems (GISs) make possible the creation of detailed digital maps and complex geospatial databases from remotely sensed data, digital position information, and other non-spatial information.

Rapid Assessment of the Aftermath of Natural Disasters. Afghanistan is subject to damaging earthquakes and other natural disasters. It needs the basic information about damage conditions necessary to respond rapidly in the event of a natural disaster. Such information would assist not only in responding to the immediate needs of disaster victims, but also aid in planning for rebuilding damaged communities after emergency needs are met.

Space in Assistance to Afghanistan

Although space systems cannot provide the totality of needed information infrastructure development that would allow Afghan society to prosper economically and socially, they offer several advantages over traditional methods. For example, relatively inexpensive satellite telecommunication systems allow the rapid delivery of medical information, support, and training over long distances, overcoming the need to have advanced facilities throughout the country. These same capabilities can support the delivery of basic and advanced education and training to isolated communities far from the major population centers, obviating the need to develop costly land lines.

Space systems offer a cost effective means of "leaping forward" over traditional ways of doing business. For instance, imagery obtained from civil and commercial

satellite Earth observation systems, coupled with satellite-provided position information, when incorporated into a GIS, can quickly and efficiently provide the necessary geospatial information for a wide variety of infrastructure needs. Such geospatial information can assist in selecting, planning, and constructing transportation networks, supporting agricultural planning, and designing water catchment and irrigation systems.

Proposed Pilot Projects

In order to demonstrate the utility of space systems to Afghanistan's needs, the committee, in consultation with Afghani experts, has selected four pilot projects to meet part of the needs summarized above. Although these are merely first steps, they will contribute substantially to the reconstruction of Afghanistan.

- ***Pilot Tele-Health Project.*** This project envisions identifying a specialist hospital within Kabul, which would be equipped with a satellite uplink/downlink facility allowing 2-way video to rural district health centers. This system would be used for consultation between the medical staff at the central facility and the rural centers. It would also be used to train paramedical staff at the rural centers in order to create a cadre of paramedical staff. Further, because the central facility would have connectivity to the rest of the world through satellite, the expertise of external experts could be tapped upon need to assist medical staff of the central facility. This pilot project would last for one year, after which it could be expanded to other areas, if sufficient additional funding could be found, either within the country or by additional donors.
- ***Pilot Tele-Education Project.*** The tele-education pilot project would use satellite communications to link an educational facility in Kabul with portable units in a few schools elsewhere in the country. This project would provide single-point to multi-point connectivity and outreach of education and training materials, enabling Afghan officials to strengthen not only basic education in rural areas, but also professional training and even university level education. Space systems allow the flexibility of using such facilities around-the clock for a variety of purposes in a time-shared mode. In particular, such a facility could provide assistance in the following priority areas:
 - Professional training – paramedics, technicians, automobile maintenance, construction etc
 - Teacher training
 - Provision of primary/secondary school education support
 - Literacy
 - Advanced university education
- ***Pilot Project Demonstrating the Use of Space-based Geospatial Surveys for Construction of Secondary Roads.*** Assuming that the construction of the “ring” highway can be finished according to the current Afghan plan, the first priority will be to establish links among the different parts of Afghanistan, particularly in order to integrate the various populations. These secondary roads are essential to link rural communities, facilitate the movement of people, and assist the broad distribution of goods, particularly food and agricultural production. Remotely sensed imagery

acquired from space could be used to develop three-dimensional topographic maps of the region.

- ***Pilot Project on Providing Access to the International Charter on Space and Major Disasters.*** This pilot project would make use of the International Disaster Charter, which is already established and functioning to bring critical information to communities around the world struck by natural disasters. As a first action, in order to activate the Charter in case of a major disaster, the government of Afghanistan need only identify the point of contact in Afghanistan (the so-called Authorized User) and afterwards contact the United Nations Office of Outer Space Affairs or other United Nations organisations aware of the Charter. That agency can assist in activating the Charter for Afghanistan. Alternatively, Afghanistan could enter into a bilateral agreement with one of the Charter's Authorized Users, which include the space agencies or civil protection agencies in member countries. Prior to these more structured arrangements, other, less formal ones are possible. France, for example, has also developed a procedure that names a contact point in each French Embassy around the world who can be contacted in time of emergency. That point of contact will alert the French Ministry of Foreign Affairs, which will in turn alert the French Civil Protection Agency to activate the Charter on behalf of Afghanistan or any other country in critical need of disaster assessment information.

Conclusions and Implementation

As outlined in the preceding discussion, space systems can provide assistance to Afghanistan for reconstruction in a number of critical areas. The telecommunications and geospatial systems suggested for use are readily available and tested for these uses in other settings. No new development is necessary. Further, the costs of using these technologies are lower and will provide results much more quickly than through traditional means. With modest financial commitments from the developed world through space providers, the development banks and non-governmental organizations, it would be possible to begin these pilot projects very soon and complete them within a year.

It was the consensus of the IAA committee that UNESCO should move rapidly to promote the development of these pilot projects among potential funding agencies. Such a move on UNESCO's part would demonstrate more quickly than through many other means that UNESCO itself had confidence in the use of space systems in support of peace.

Further, UNESCO could show its commitment to the use of cost-effective space systems to support development, by itself taking on the creation of a pilot project for education. Such a project fits directly within the UNESCO charter and could serve as a beacon for increasing literacy and education in developing countries through space systems.