Some more examples: The entire civilian transport field including the air transport system, is quickly moving into the area of Intelligent Transportation Systems, including "smart vehicles," electronically monitored vehicle tracking systems, and "smart cards" to facilitate customer processing. This is another area where easy retrieval of noncommercial knowledge databases can facilitate airport systems development.

The feasibility of conversion and public use of future military base closings can be more quickly assessed with "prepackaged" knowledge databases relating to environmental conditions and other local and/or topical situations being provided in advance by the military. Further, it is possible that even the schedules for decommissioning military equipment, including ground vehicles, might be useful to civilian transportation authorities if information databases were readily available to transport operators. The importance of technology transfer from military and noncommercial research centers to the public domain is evidenced by the advance bulletin for the 1998 International Air Transportation Conference, where military-to-civilian airfield conversion, the military's role in assisting civilian airport sponsors, and university centers for airport research are prominent among the suggested topics.

The knowledge databases that I am describing can be disseminated and shared through conventional conferences such as the University of California Institute of Transportation Studies' Technology Transfer Program, "1997 Noise Program," in San Diego; interactive CD-ROMs such as the CD-ROM that the Volpe Transportation Center is planning to use for distribution of airport layout plans; satellite transmission such as that currently used by the American Association of Airport Executives' (AAAE) Airport Training & Safety Institute for its Airport News & Technology Network (ANTN) programming; and the Internet, making full use of 24-hour bulletin boards monitored at regular intervals, rescheduled chat room sessions, and "push" technologies wherein information changes at specific Web sites automatically trigger E-mail notifications to interested parties.

# Technology Transfer from the Air Force (D. Merrill)

General Ronald Fogleman, then Air Force Chief of Staff, stated his views in his *Global Engagement* report published in November 1996. Based on the Joint Chief of Staff Chairman's *Joint Vision 2010*, a roadmap was drawn for DOD military operations into the 21st century. The Air Force defines global engagement as four areas of importance and six core competencies.

### Four Areas of Importance

The four emphases from the Air Force leadership are

To take care of people within the community (first priority);

• To enhance reliability and modernize Air Force equipment;

To recognize and plan for global infrastructure need; and

• To focus internal Air Force operations on mission and core competencies.

#### Six Core Competencies

The strength of the U.S. Air Force resides in the following:

 Preservation of air and space superiority through control of air and space;

• A capacity for global attack and power projection that gives adversaries anywhere on earth reason to reconsider hostile actions against U.S. allies;

Precision engagement to minimize damage and lives lost and maximize effectiveness;

Information superiority: the United States always knows more than its adversary and knows it faster;

Agile combat support: the United States is prepared to operate anywhere in the world; and

Rapid global mobility-gets forces to the fight quickly and reliably.

Air Mobility Command (AMC) plays a key role in all six core competencies, but rapid mobility is AMC's "bread and butter."

General Walter Kross, commander of Air Mobility Command and commander-in-chief of the U.S. Transportation Command, outlined four AMC objectives and seven key acquisition programs and program initiatives.

#### Four Major Themes and Goals of Air Mobility Command

The United States is ready to perform global missions through several means:

- Strategic Airlift, allowing the United States to carry heavy combat equipment to an austere environment at a great distance;

- Theater Airlift, supporting theater warfighting commanders with rapid air movement;

- Aerial Refueling, projecting global power nonstop from the Continental United States;

- Airdrop Operations, delivering to locations that have no infrastructure or delivering packages that can secure needed infrastructure;

- Aeromedical Evacuation, providing for the rapid, effective care of injured forces; and

- Operational and Executive Support Airlift, designed to be responsive to the unique needs of senior leadership and national command authority.

• The United States is committed to continual improvement of key processes.

Modernization of AMC allows the United States to operate in the 21st century.

1997 is the Year of the En Route System.

## Seven Key Acquisition Programs and Program Initiatives

The following technologies are planned to make the above possible:

Acquisition of 120 C-17 transport aircraft,

• New large and small aircraft loaders (specifically the 60K loader and Next Generation Small Loader),

 Global Air Traffic Management Systems for aircraft (the Future Air Navigation System or "FANS"),

More effective global information management systems,

 Modernization of the KC-135 tanker fleet (Project nickname: Pacer CRAG), and

 Moving the C-130 tactical transport fleet back into AMC from the Air Combat Command (thus enabling AMC to establish all Air Force airlift standards—including theater airlift).

Overall, the Air Force provides people with substantive quality of life improvements, particularly safety and protection through operational risk management.

### Technology Transfer from an Aircraft Manufacturer (J.W. Kelsey)

Let me provide some observations from a major developer of aircraft for both the commercial and military sectors.

## Large Potential Air Traffic Growth

It is clear that there will be significant growth in both passenger and cargo traffic. Individuals are placing increased value on personal mobility. At the same time, they are also putting greater importance on the value of time. The issue then becomes: can the system grow to meet the demand and expectations?

# Can the Air Transport System Grow to Meet the Projected Demand?

There are major challenges facing all of us. Among them are safety, air space congestion, terminal congestion, economics, and environmental and political constraints.

## Aircraft Technology Initiatives

Some of the new systems being developed are

Propulsion Control Aircraft (PCA),

 Intelligent Damage Adaptive Control System (IDACS),

- Free Flight (Future Air Navigation System),
- Enhanced Synthetic Vision, and
- Improved Flight Crew Situational Awareness.

#### Advanced Aircraft Concepts

Meanwhile, new vehicles are being considered. Included in the list are

- High Speed Civil Transport,
- Blended-Wing-Body, and
- Super-Short/Vertical Takeoff and Landing.

These technological trends have profound impacts on future aviation.

## CONCLUSION

Although the topic of technology transfer is often overworked, the panel discussion illuminated some possibilities toward an intelligent air transportation system. The following summation is offered:

1. The U.S. government, under the commitment to live within it means, is looking for ways to do more with less. Although DOD has been at the cutting edge of technological advances, a reverse direction of technology transfer is becoming more evident. The Global Reach mission of the U.S. Air Force, for example, will be increasingly dependent on the Civil Reserve Air Fleet as well as on Air Force assets.

2. This argues persuasively for technology transfer between the civilian and military communities.