Satellite Industry Overview

FCC Rural Satellite Forum

Tuesday, January 27, 2004

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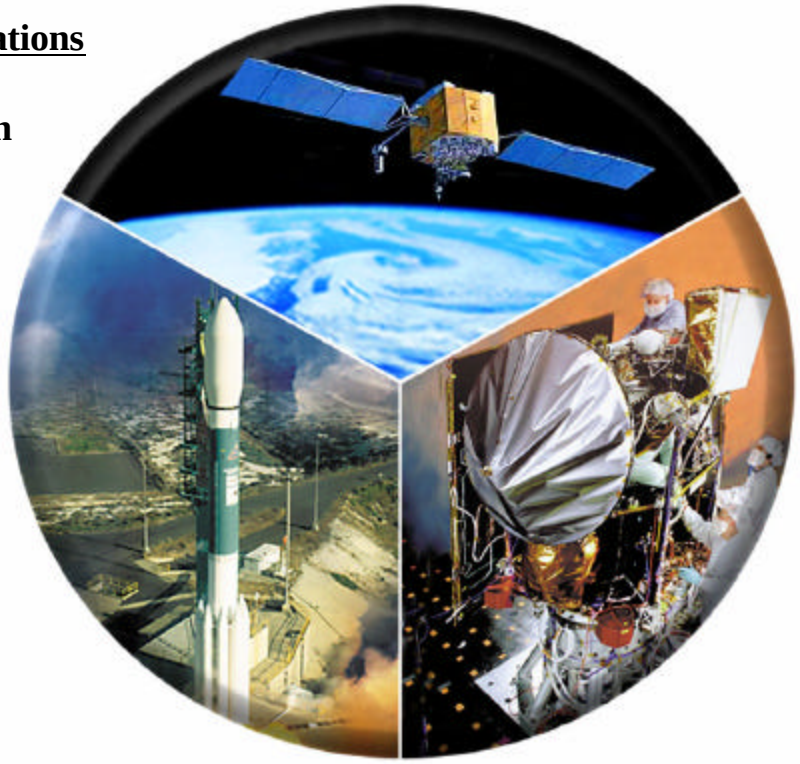
Satellite Industry Overview

Services & Applications

Voice/Video/Data Communications
- Rural Telephony
- News Gathering/Distribution
- Internet Trunking
- Corporate VSAT Networks
- Tele-Medicine
- Distance-Learning
- Mobile Telephony
- Videoconferencing
- Broadcast and Cable Relay
- VOIP

Direct-To-Consumer
- Broadband
- DTH/DBS Television
- Digital Audio Radio



GPS/Navigation
- Position Location
- Timing
- Search and Rescue
- Mapping
- Fleet Management

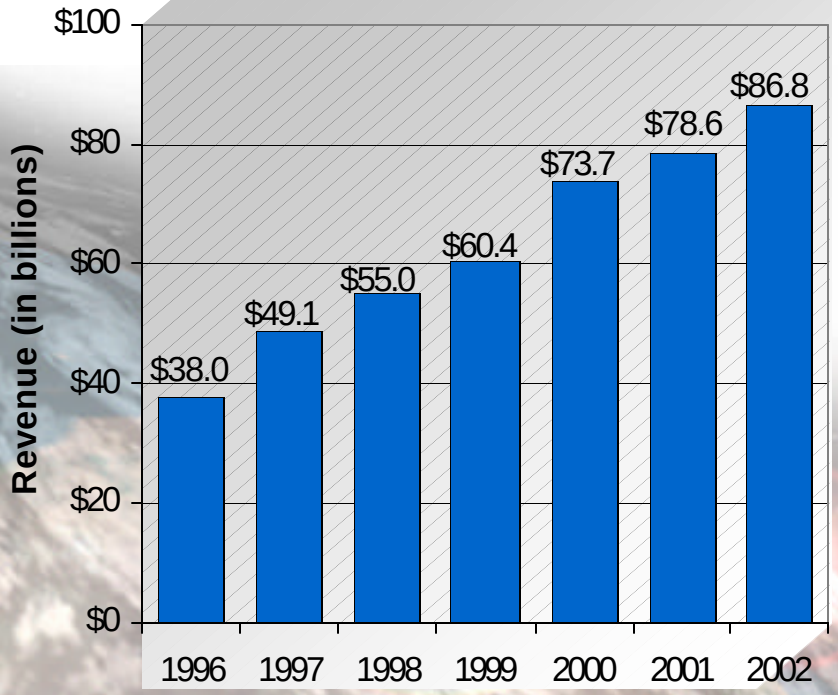
Remote Sensing
- Pipeline Monitoring
- Infrastructure Planning
- Forest Fire Prevention
- Urban Planning
- Flood and Storm watches
- Air Pollution Management

Infrastructure / Support Services

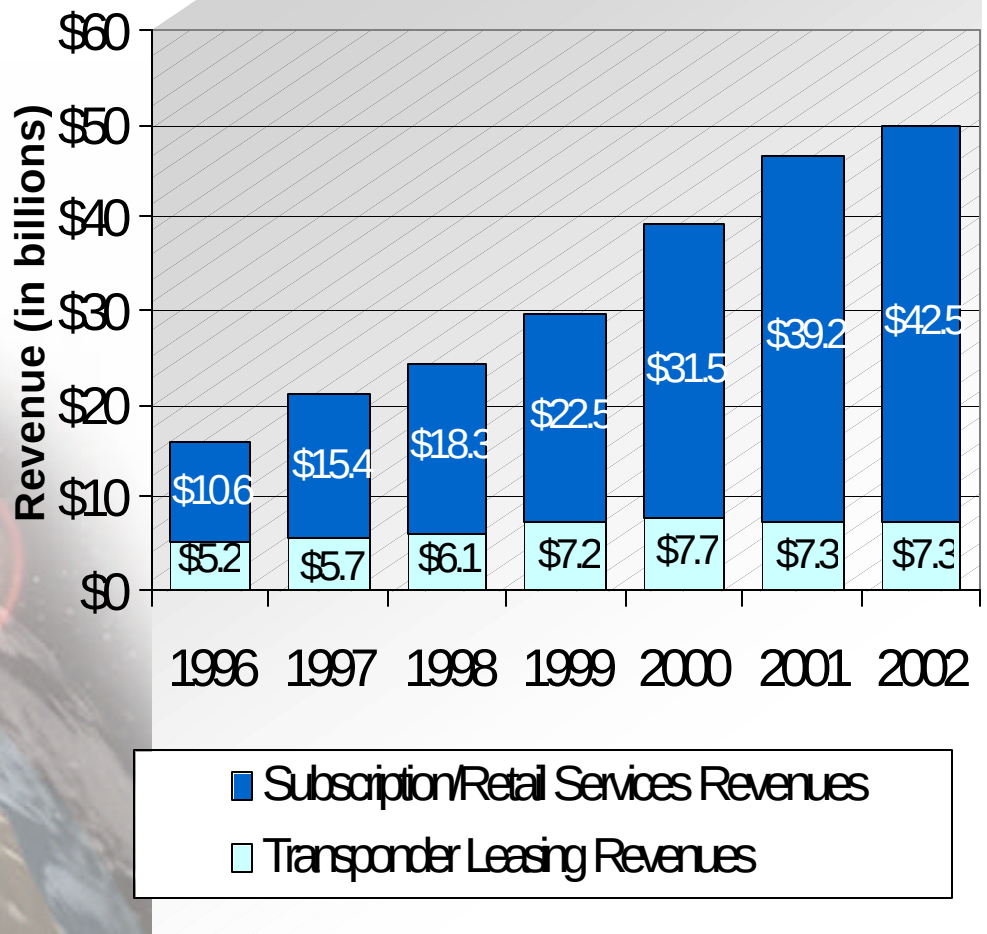
Launch Vehicles	Ground Equipment	Insurance	Manufacturing

World Satellite Industry Revenues

Overall Global Revenues

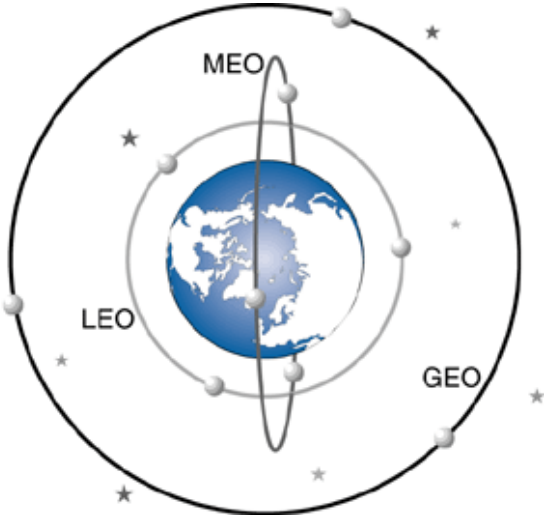


Satellite Services Revenues



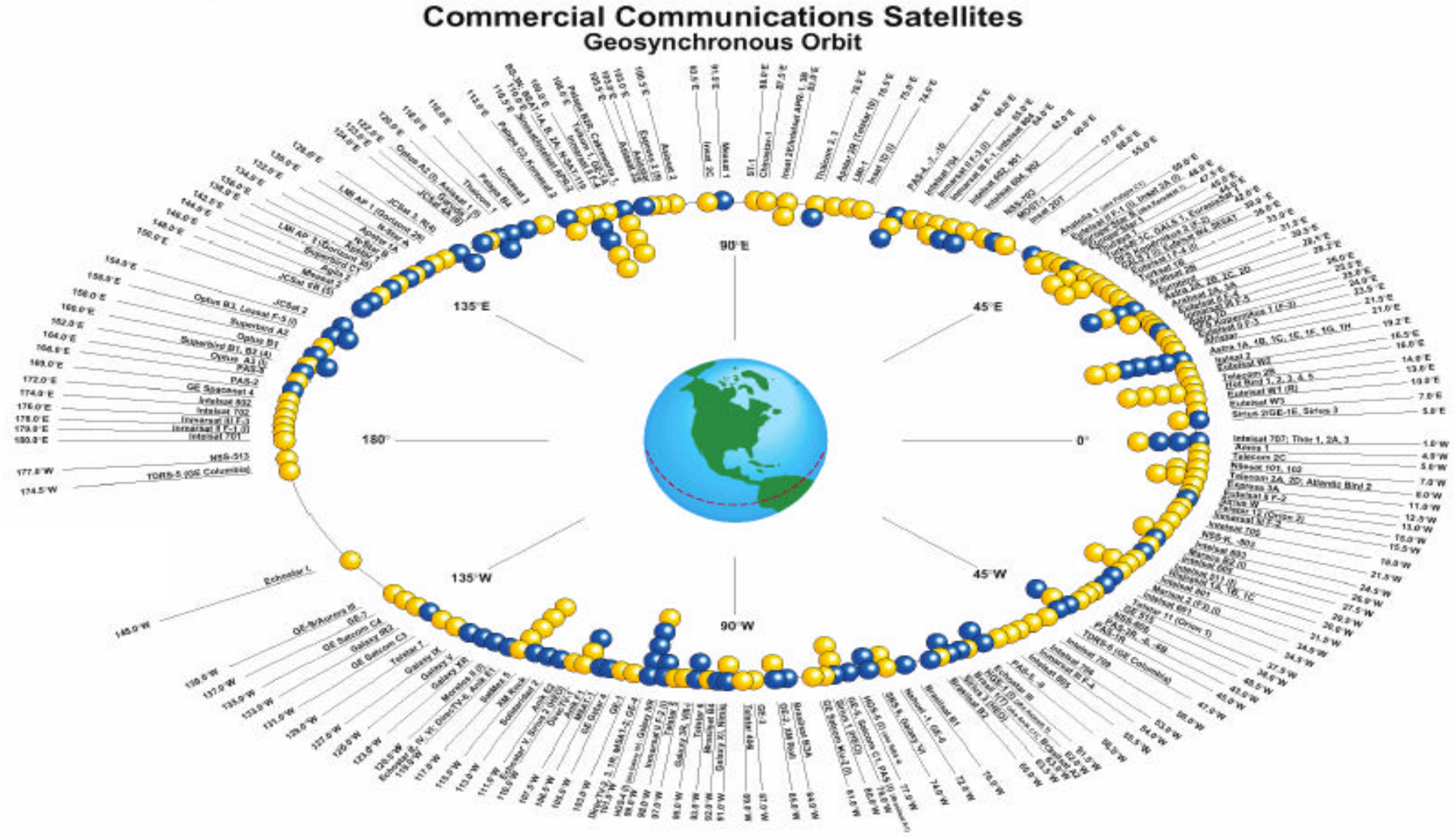
Satellite Orbits

- **3 most popular satellite orbits**
  - **LEO – Low Earth orbit**
    - Below 1,250 miles above earth
      - Takes 90 – 120 minutes to rotate around earth
  - **MEO – Medium Earth Orbit**
    - 6,250 miles above earth
      - Approximately 6 hours to rotate around earth
  - **GEO – Geosynchronous Orbit**
    - 22, 282 miles above earth
      - Approximately 24 hour to rotate around earth



Geostationary Orbit

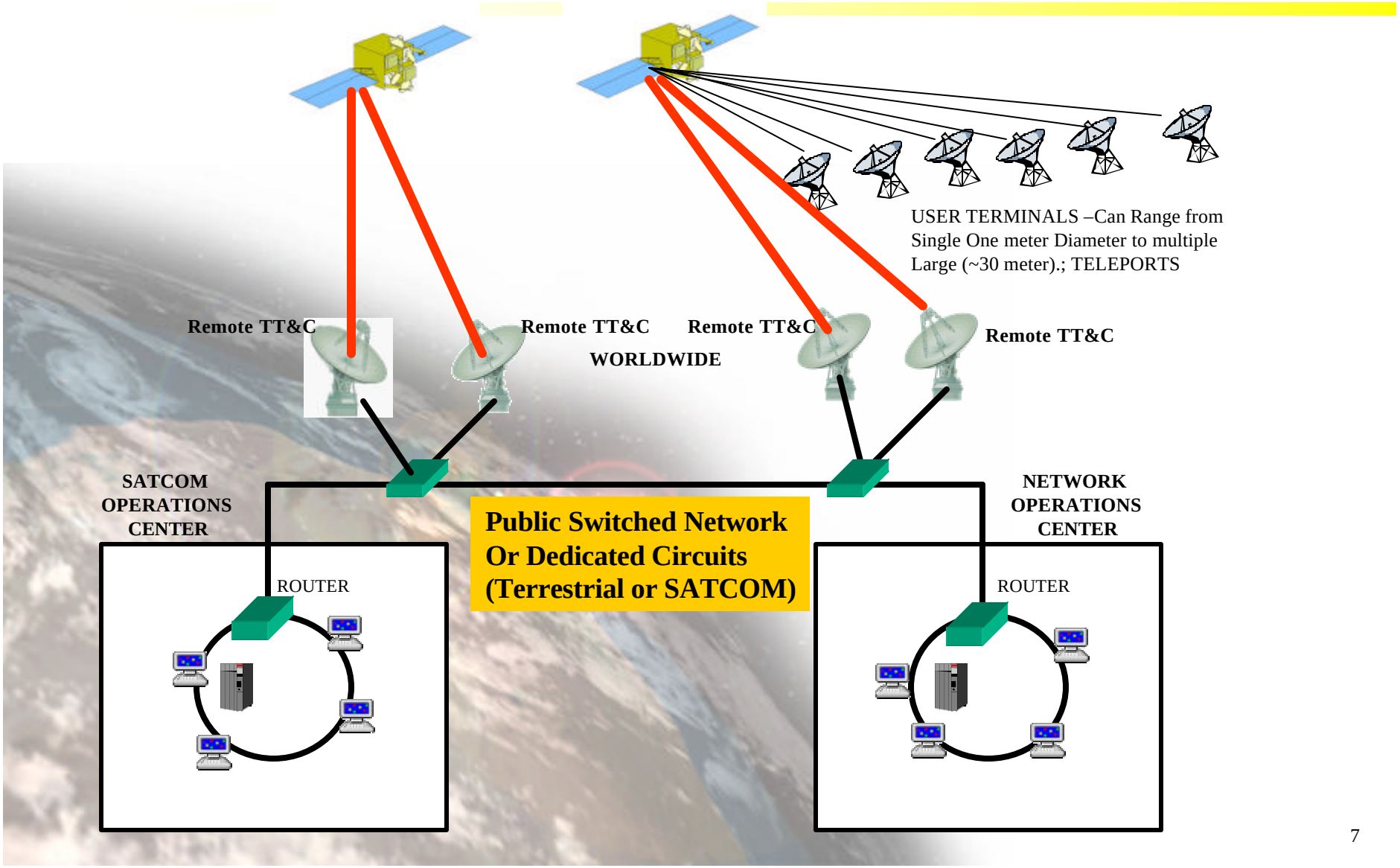
Figure 3: Geostationary Satellites by Orbital Location



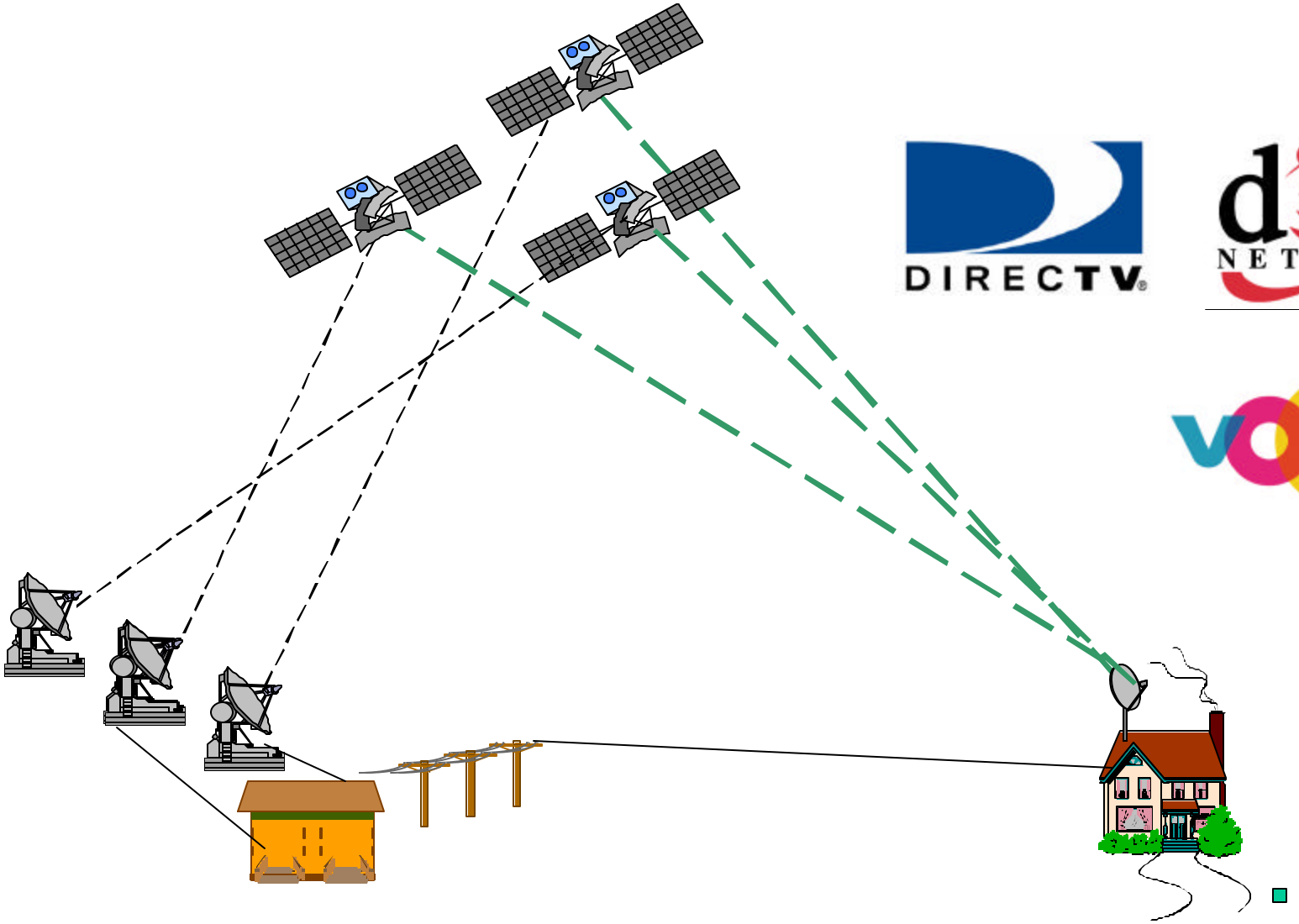
Fixed Satellite Services

- **Data/Telephony Communications**
- **Internet Trunking**
- **Internet Backbone Connectivity**
- **Video Services/DBS/DTH**
- **Corporate Network Services**
- **Connecting “Unfibered”/Low Teledensity Locations**
- **Cable Distribution/ Restoration/ Redundancy**

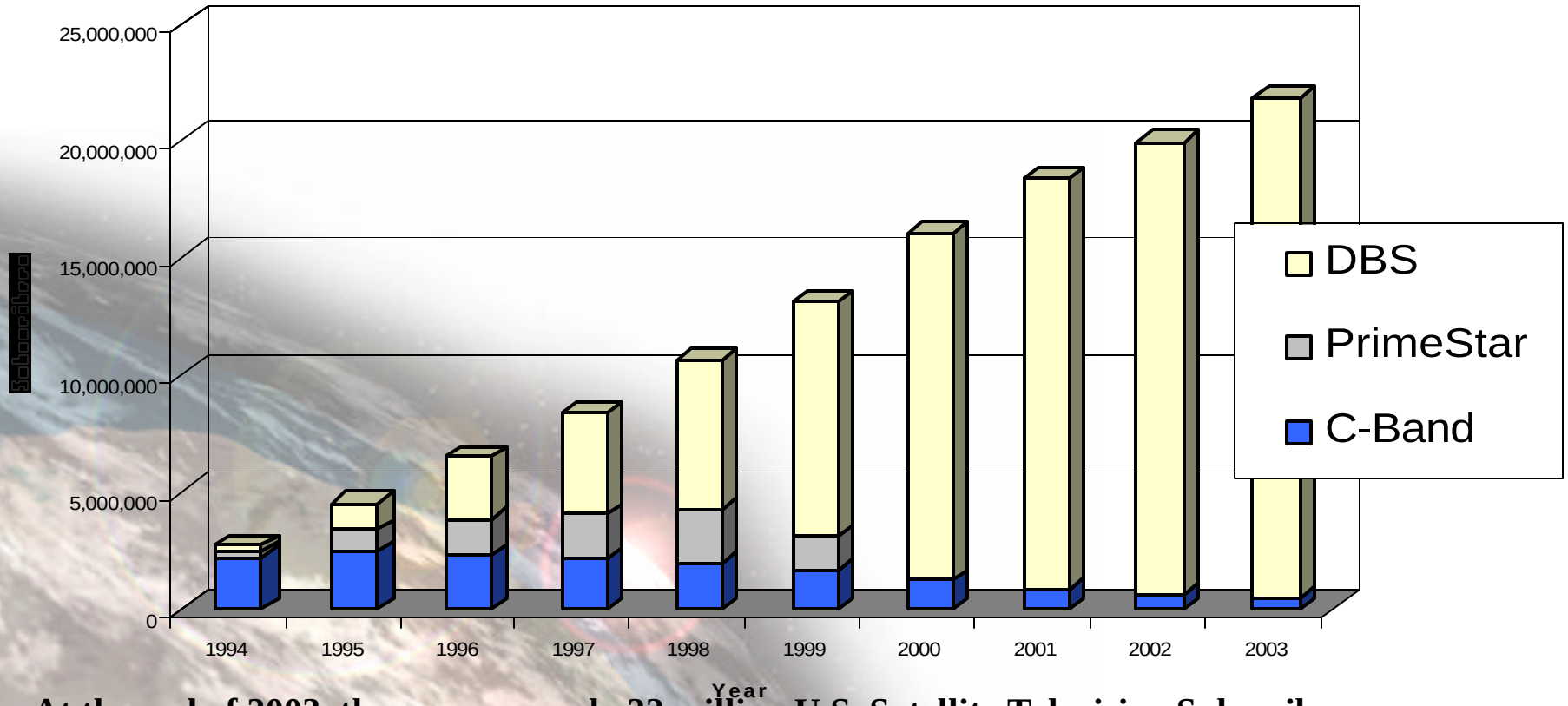
VSAT Satellite System



Typical DBS System



DBS Subscribers



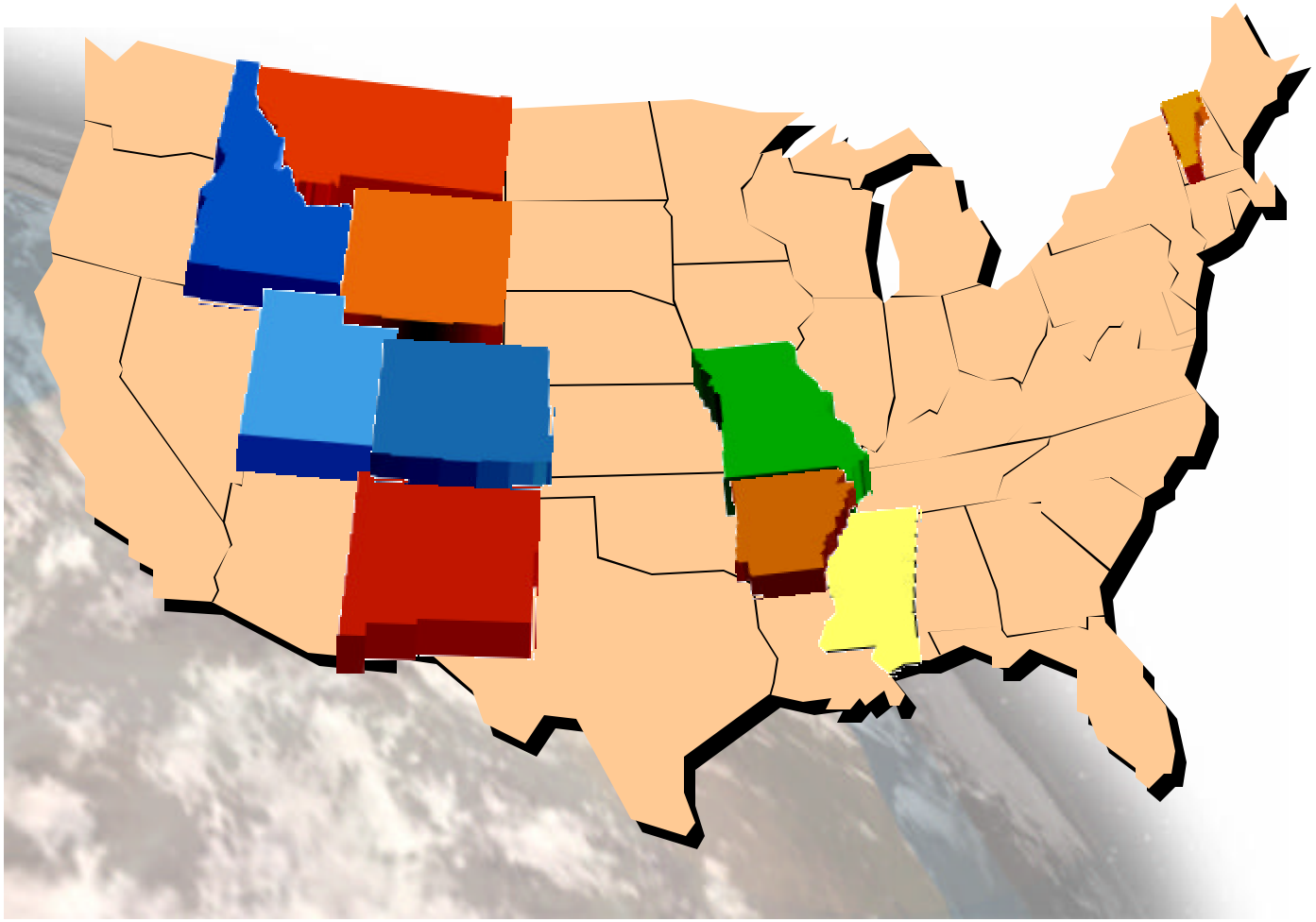
At the end of 2003, there were nearly 22 million U.S. Satellite Television Subscribers—over 20% of U.S. Television Households

- DBS- 21.4 million subscribers
- C-Band- 430,000 subscribers

TOTAL U.S. TELEVISION HOUSEHOLDS: 106.6 Million (source: Nielsen Media Research)

DBS Penetration

Top Ten States--Highest DBS Penetration



Vermont- 30%

Montana- 28.7%

Idaho- 26.5%

Utah- 26.1%

Wyoming- 26.1%

Missouri- 24.4%

Mississippi- 23.8%

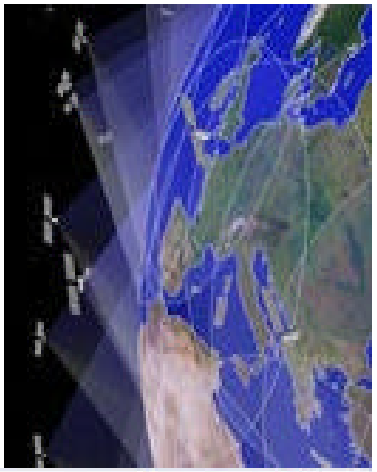
Arkansas- 23.2%

New Mexico- 21.8%

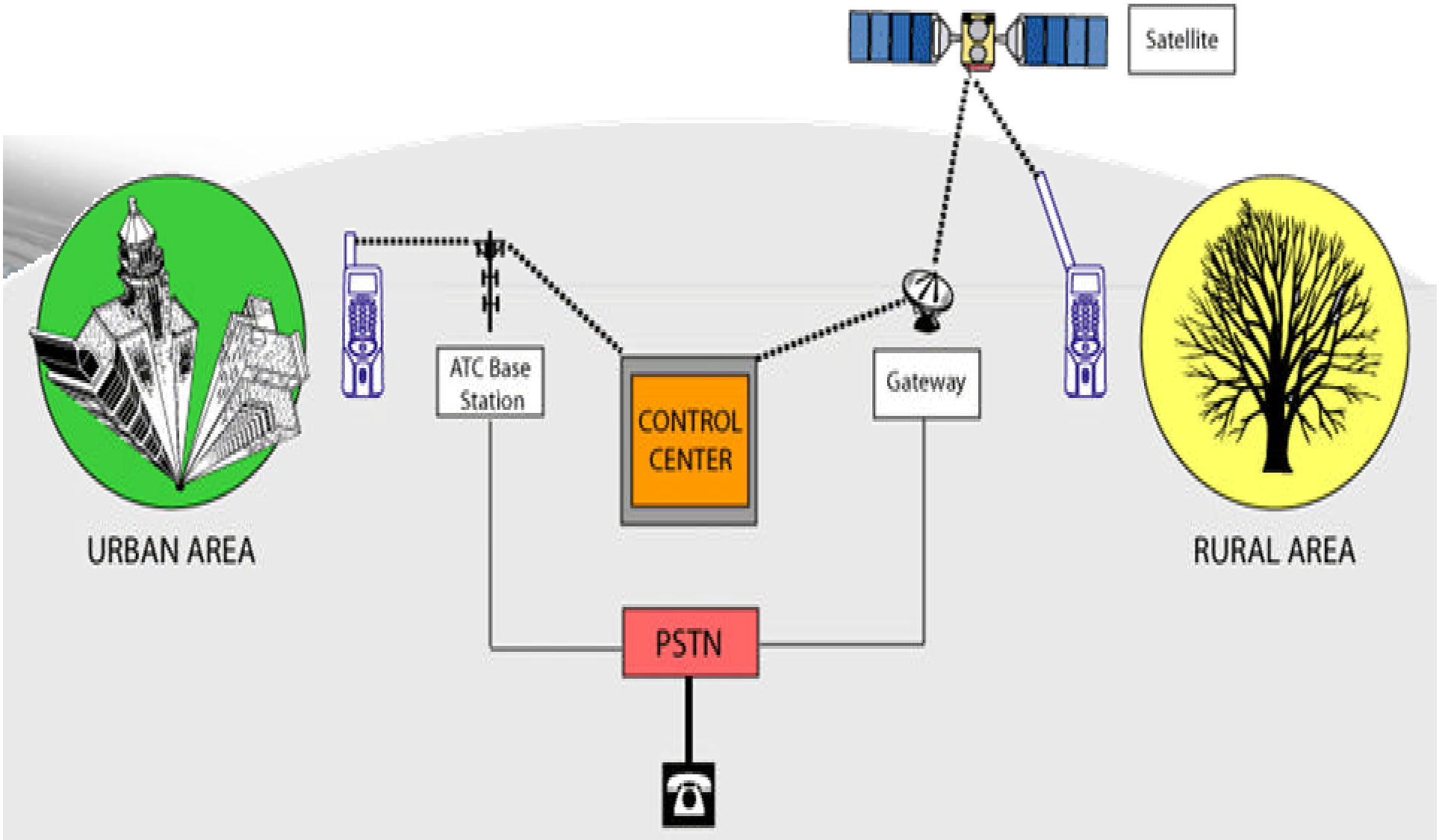
Colorado- 21.4%

Mobile Satellite Services

- **Anytime, anywhere telecom critical to homeland security**
- **Most reliable service for first response disaster recovery**
- **Remote data telemetry monitors US infrastructure**
  - **Utilities –oil/gas/water pipelines, electrical distribution**
  - **Trains/trucks – location/status monitoring**
- **Remote telephony key to infrastructure safety**
  - **Repair/maintenance of dams, bridges**
  - **Fiber restoration**
- **Maritime/Aeronautical communication**
  - **Lifeline for ships/planes**
  - **Emergency communications**
  - **Tracking dangerous shipments**
  - **Broadband commercial and government services**

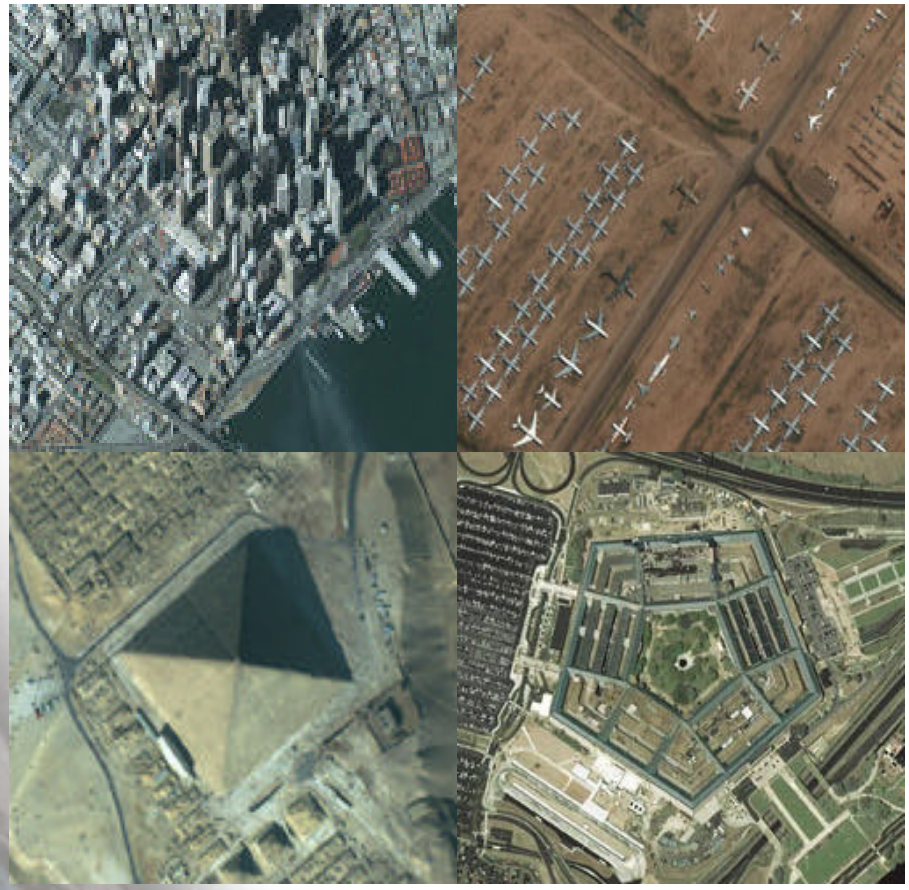


Satellite Telephony



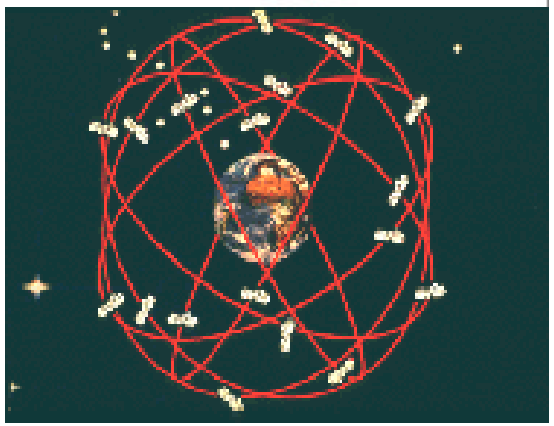
Remote Sensing

- **Provides scientific, industrial, civil, military and individual users with high-resolution images for:**
  - **natural resource monitoring**
  - **urban and utility/telecom planning**
  - **agricultural assessments**
  - **insurance and risk management**
  - **oil and gas exploration**
  - **mapping**
  - **natural disaster/emergency response**
  - **national/regional security**
- **Sub Meter commercial imagery**



Navigation – GPS

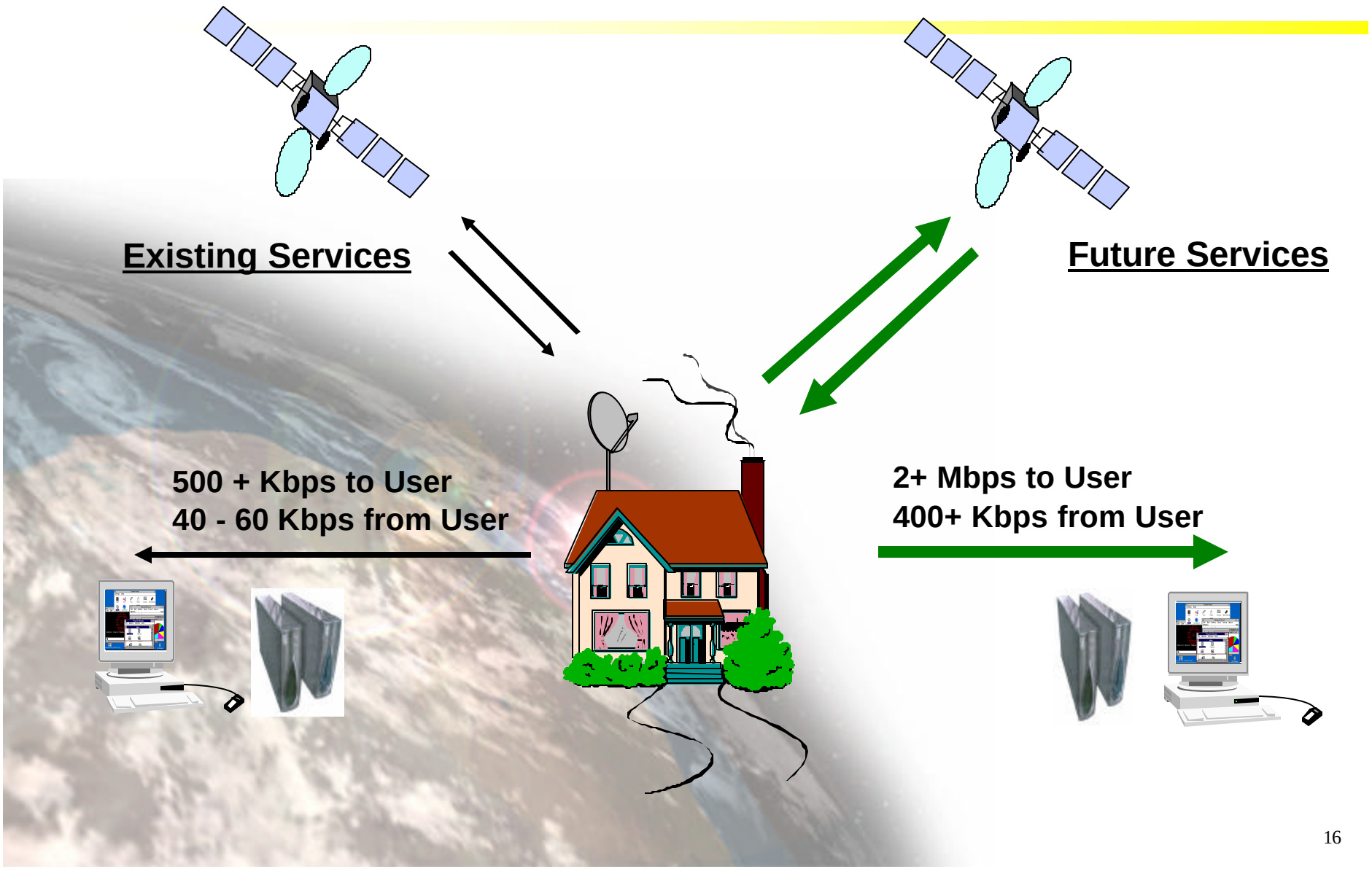
- **A military system that is now central to the lives of millions of civil and commercial users**
  - **Public safety dispatch – improves response time**
  - **Search and Rescue – locates emergency calls**
  - **Air Traffic Control – guides planes in all weather**
  - **Telecommunications – primary timing source, E-911 enabler**
  - **Transportation – tracks trains, trucks, vital shipments**
- **Underpins US Warfighting**
  - **Precision Munitions**
  - **Cruise Missiles**
  - **Unmanned Aerial Vehicles**



Emerging Services/Applications

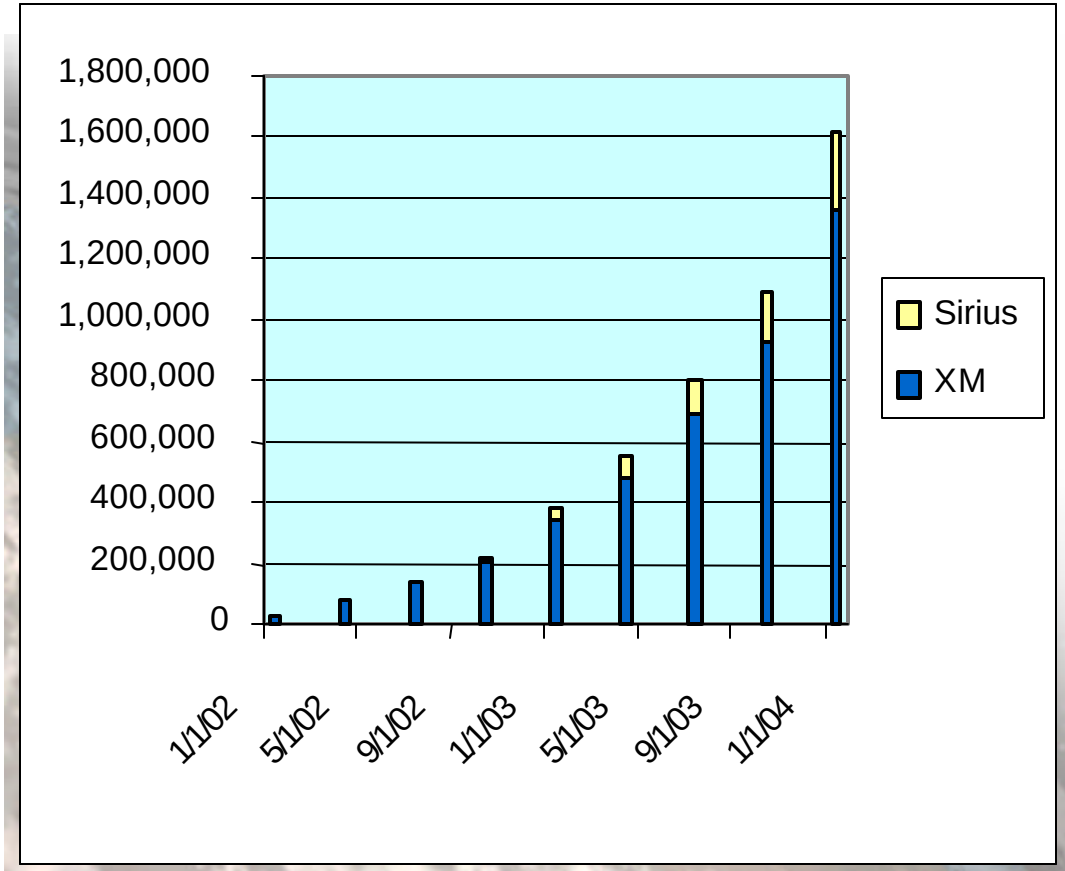
- **Satellite Radio**
- **Satellite Broadband**
- **Broadband Aeronautical**
- **DBS**
  - **Interactive TV**
  - **PVR**
  - **HDTV**

Consumer Satellite Broadband



Satellite Radio

Subscriber Growth



How a Satellite Radio System Works

Critical To The Economy

- Backbone of national TV, radio, and print media distribution
- Billions of data, credit, banking transactions daily
- Allows decentralized telecommunications and document storage for a variety of financial institutions and global trading operations
- Broadly used for inventory management, point of sale data collection, credit-card validation and e-mail delivery.
- Examples cut across every major US industry:
  - WalMart – every location
  - US Postal Service – every post office
  - Ford, GM - every supplier, dealership
  - RiteAid – every drugstore
  - Texaco, Exxon – every station

Satellites in Every-Day Life

Pump Gas

76 · Chevron · Texaco · bp · Tosco · Exxon Mobil · Sheetz · Phillips 66 · Shell · ARCO · Hess

Eat Out

Pizza Hut · Cracker Barrel · Wendy's · Shoney's · Outback Steakhouse · Carl's Jr.

Watch TV

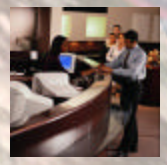
Blockbuster · DirecTV

Shop

Albertsons · Lowe's Improving Home Improvement · AutoZone · Kmart · Sterling Jewelers Inc. · Wal-Mart · Foot Locker · Best Buy.com · Casual Male Big & Tall · Ross Dress for Less · Walgreens As far as you want to go · Rack Room Shoes The Big Brands! The Big Savings! · Waldenbooks Brentano's · TJX The TJX Companies, Inc. · Circuit City · Sherwin-Williams

Transact Financially

A.G. Edwards Investments Since 1887 · American General Financial Group · SSB Bank Limited



Stay at Hotels

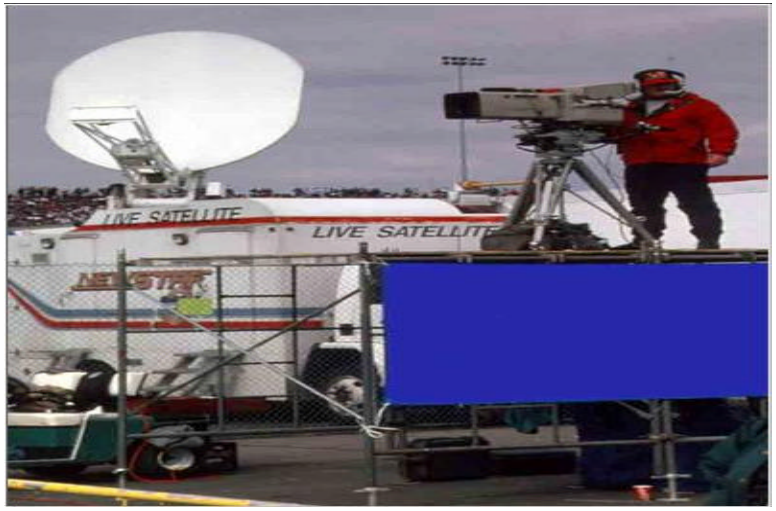
Best Western · Sleep · Comfort · Quality · Clarion · Rodeway · Econo Lodge · MainStay Suites

Buy & Service Automobile

Chrysler · AutoZone · BMW · GM · Nissan · Lexus · Toyota · Ford

Critical to Broadcast Industry

- **Newsgathering – First choice for live coverage, providing high-bandwidth video links from remote locations to capture "breaking news"**

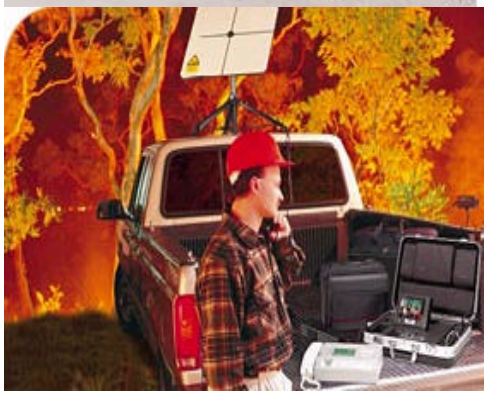


- **Program Delivery – Primary feeds for network TV and radio broadcasts to affiliates and cable TV head-ends**

Telecommunications Back-bone

Critical to Homeland Security

- Not subject to physical damage that terrestrial networks are exposed to
- Lifeline for emergency workers, first responders, government and military planners
- News organizations rely on satellite phones and satellite trucks to report from the scene
- Enable data telemetry which monitors US infrastructure in remote areas
- Public safety dispatch – improves response time by locating emergency calls
- Primary information source to millions of Americans



Emergency Preparedness Users

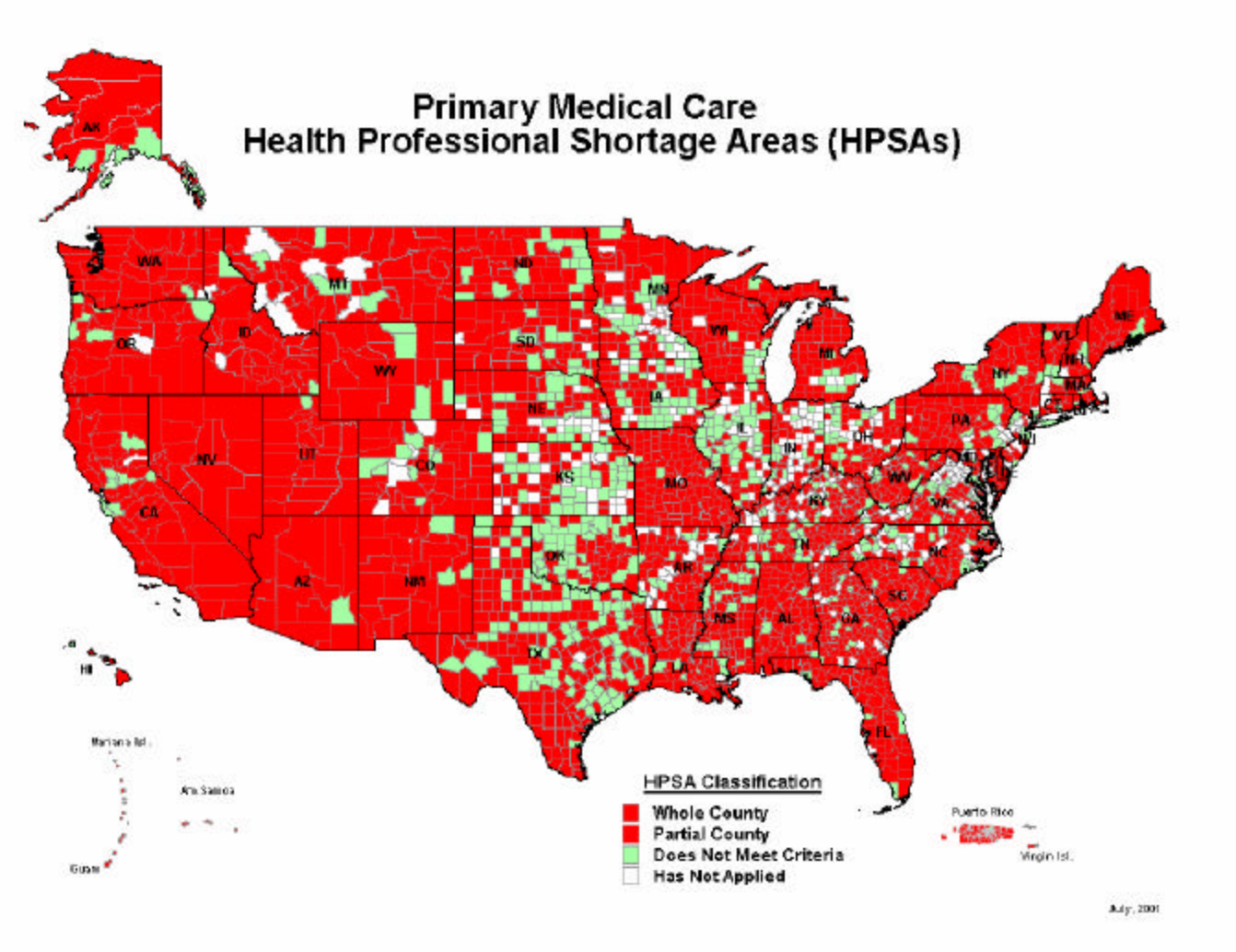
Bureau of Indian Affairs
Centers for Disease Control
Environmental Protection Agency
Federal Aviation Administration
Federal Bureau of Investigation
Fish and Wildlife Service
Food and Drug Administration
General Services Administration
Internal Revenue Service
National Institutes of Health
National Park Service
National Weather Service*
Nuclear Regulatory Commission
Transportation Security Agency
Social Security Administration
White House

U.S. Senate
U.S. Navy
U.S. Army
U.S. Air Force
U.S. Coast Guard
U.S. Marine Corps
U.S. Forest Service
U.S. Customs Service
U.S. Geological Survey
Department of Commerce
Department of Agriculture
Department of Justice
Department of State
Department of Homeland Security
Department of the Treasury
Department of Veterans Affairs
Agency for International Development

US Army Corps of Engineers®

Rural Satellite Applications

Health Professional Shortage Areas



Telemedicine Via Satellite

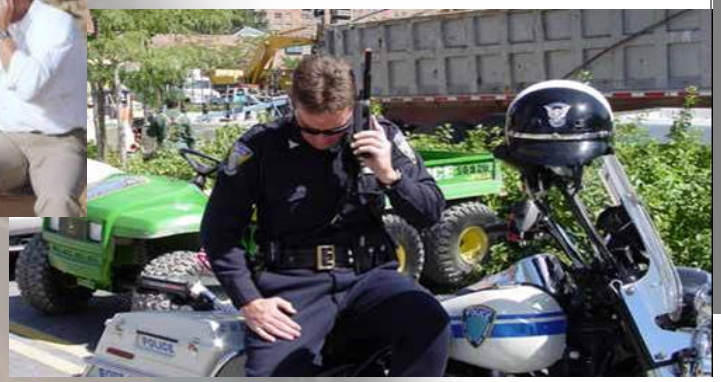
- **Remote medical diagnosis system for:**
  - **isolated sites (rural and remote hospitals, work sites, etc.)**
  - **mobile sites (ships, aircraft, etc.)**
- **Allows the user to identify patient identity, blood pressure, temperature, etc. collected in situ by non-medical personnel**
- **Avoidance of unnecessary evacuation or flight diversion for emergency treatment**

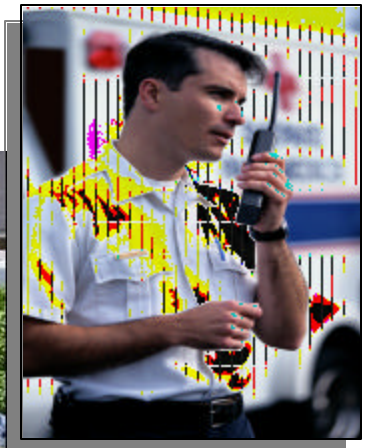
Distance Learning

- **Satellites provide distance learning for schools and students anywhere and everywhere**
  - **Live, two-way communication over Internet connections, including audio, video and online collaboration**
  - **Instructional tools (bulletin boards, online testing, homework postings, syllabus and course management software)**
  - **Collaboration tools (shared white boards, application sharing, specialized document cameras)**

Rural – Satellite Phones

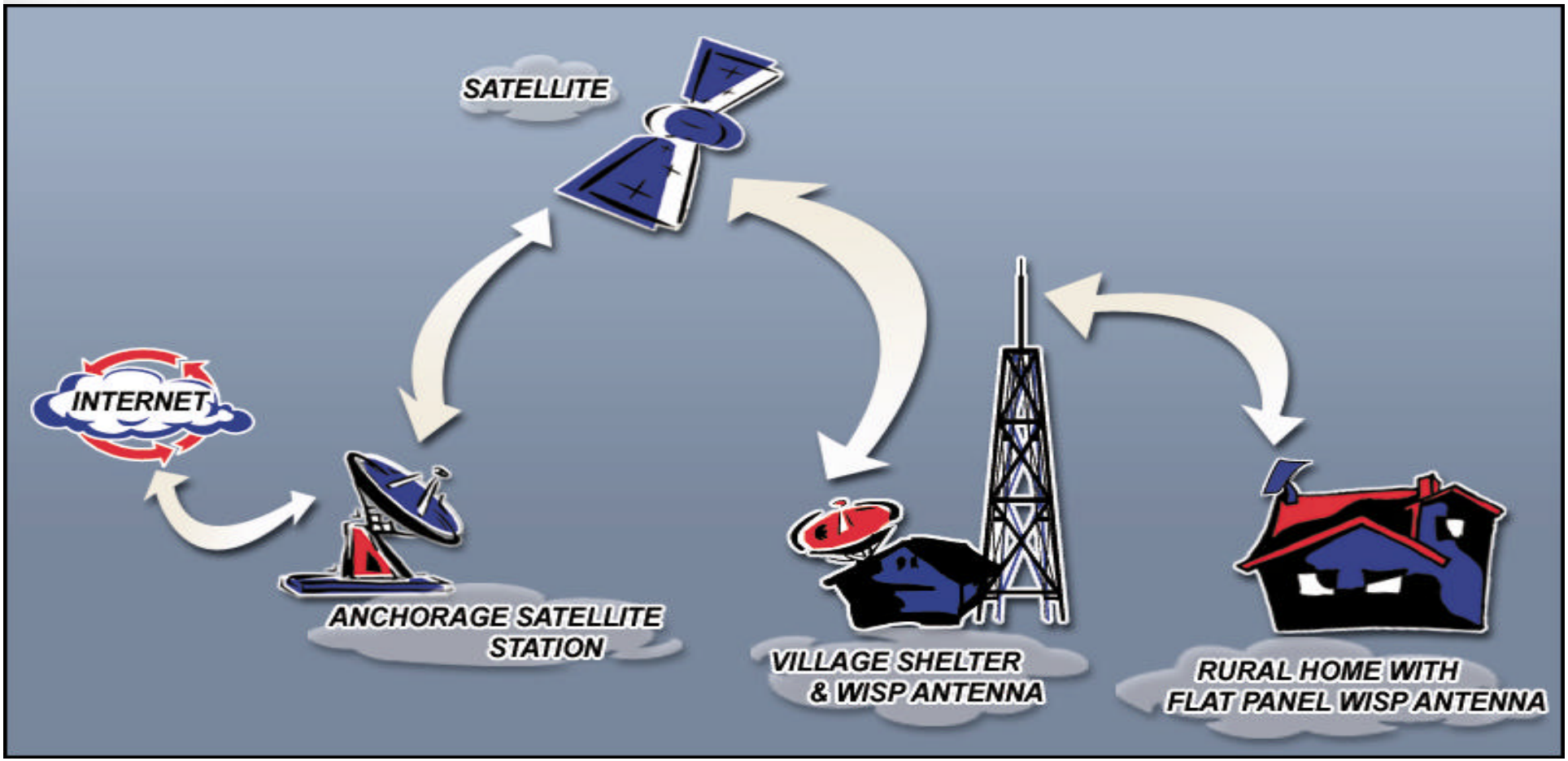
- **In the vast state of Texas, satellite radios are used to support a regional council that overseas trauma response in 22 counties with rural EMS and hospitals, the Texas Forest Service and the state's only urban search-and-rescue team.**
- **All rely on satellite dispatch radios to communicate when a catastrophe hits – whether it's a flash flood, tornado or explosion.**





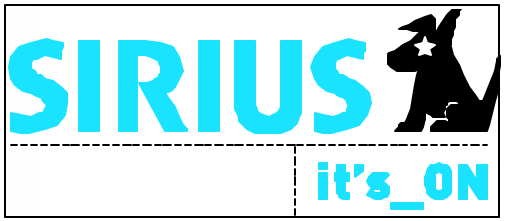
Rural - Hybrid Networks

- **Internet backbone distribution using satellite – local distribution using 2.4 GHz wireless**



Entertainment in Rural America

- **Digital Television**
- **Advanced Services- Digital/Personal Video Recorder**
- **High-Definition Television—Cable networks, pay-per-view sports and movies, original programming**
- **Satellite Radio**



Enabling Ubiquity

Satellites Are The Only Viable Option For Rural America