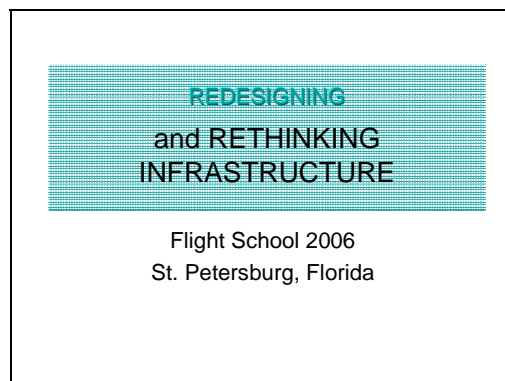


REMARKS OF ANDREW STEINBERG*

**BEFORE THE 2006 FLIGHT SCHOOL:
RE-DESIGNING AND RE-THINKING THE CNS INFRASTRUCTURE**

JUNE 15, 2006

ST. PETERSBURG, FLA.



GOOD AFTERNOON. IT'S A DELIGHT TO RETURN TO THIS CONFERENCE, AND I'M FRANKLY ENCOURAGED BY THE DISCUSSIONS OF THIS MORNING. IF THERE WAS A COMMON NOTE TO ALL OF THEM IT WAS THIS: ROBUST COMPETITION IN AIRCRAFT DESIGN AND IN AIR TAXI SERVICES -- COMBINED WITH THE FORCES OF THE PRIVATE CAPITAL MARKETS -- HAS BROUGHT INNOVATION BRINGING US CLOSER TO THE REALITY OF PERSONAL AIR TRANSPORTATION. AT THE SAME TIME, OF COURSE, OUR AVIATION SYSTEM IS ACTUALLY A FOUR-LEGGED TABLE -- NOT JUST AIRPLANES, AIRPORTS AND AIR CARRIERS, BUT ALSO A COMPLEX PHYSICAL COMMUNICATIONS, NAVIGATION AND SURVEILLANCE , **CNS**, INFRASTRUCTURE RUN BY THE FAA. I WANT TO SHARE SOME THINKING ON THIS FOURTH LEG OF THE TABLE. I CALL IT RETHINKING

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BECAUSE IT'S POSSIBLE THAT IN DEBATING WHEN AND HOW THE GOVERNMENT IS GOING TO MODERNIZE THE INFRASTRUCTURE, WE NEED TO BE SURE WE ASK THE RIGHT QUESTIONS.

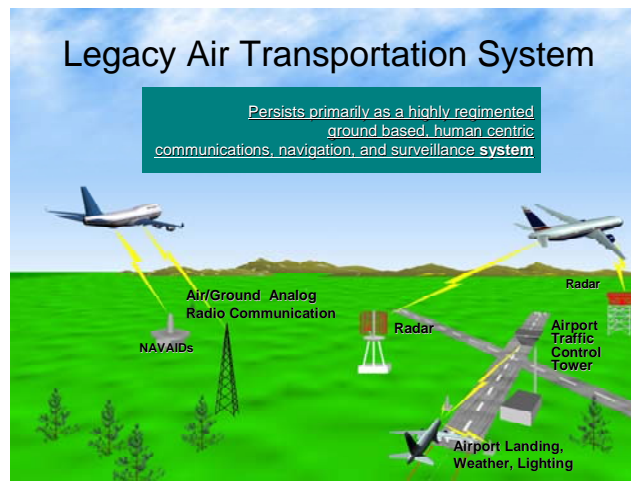
FIRST, A CAVEAT: I WAS FLATTERED THAT ESTHER DYSON ASKED ME BACK THIS YEAR TO TALK ABOUT HOW WE CAN BEST ADDRESS THE CHALLENGE OF MODERNIZING OUR CNS INFRASTRUCTURE, BUT MY REMARKS TODAY ARE SIMPLY MY OWN PERSONAL OPINIONS. I'M NOT SPEAKING AS THE FAA CHIEF COUNSEL IN AN OFFICIAL CAPACITY, MUCH LESS TAKING ANY DEFINITIVE POSITION. MY GOAL IS TO PROMPT **YOU** TO THINK THROUGH SOME IMPORTANT ISSUES.

WITH THAT OUT OF THE WAY, I THOUGHT THAT GIVEN THAT (1) I AM THE "CLOSER" AND (2) IT'S A FRIDAY AFTERNOON, AND (3) THE WEATHER IS NICE, (4) WE ARE IN FLORIDA AT A NICE RESORT, THE LEAST I COULD DO WOULD BE TO SHOW A SHORT MOVIE. SO HERE YOU GO:



WOW, AS MANY AS 10,500 LINES AT ANY ONE TIME! FORTUNATELY, THE SEQUEL TO THIS BLURRY BLACK AND WHITE VIDEO CLIP IS TODAY'S CRISP

TECHICOLOR REALITY IN WHICH WE CAN BARELY KEEP UP WITH THE PACE OF CHANGE IN TELECOMMUNICATIONS. I'D LIKE TO EXAMINE HOW THE SAME THING COULD HAPPEN SAFELY AND EFFECTIVELY WITH RESPECT TO THE CNS INFRASTRUCTURE THAT IS VITAL TO ON-DEMAND AVIATION.



TODAY, ON AN AVERAGE DAY, THE U.S. AIR TRAFFIC SYSTEM ACCOMMODATES A TOTAL OF 87,000 OPERATIONS – AND ABOUT 5000 AT ANY ONE TIME, OR ROUGHLY HALF THE NUMBER OF PHONE CALLS ACCOMMODATED BY MA BELL'S MANUAL SWITCHBOARDS IN THE 1930S. SO IF YOU LOOK EITHER AT TELECOM OR EVEN CAR TRAVEL, AIR TRAVEL IS OBVIOUSLY STILL IN ITS INFANCY. YET WE HAVE ALREADY REACHED THE POINT WHERE OUR EXISTING SYSTEM IS BECOMING OVERLOADED, AND WE ALL KNOW THAT IT IS NOT SCALABLE ENOUGH TO HANDLE THE PROJECTED INCREASES IN TRAFFIC IN CONTROLLED AIRSPACE THAT ARE COMING OR THE TRIPLING OF CAPACITY NEEDED BY 2025.


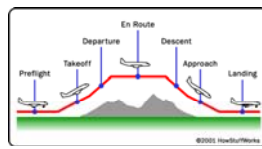
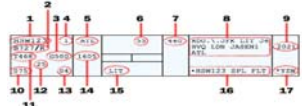
HOW DID THIS HAPPEN? THE CURRENT AIR TRAFFIC CONTROL SYSTEM HAS EVOLVED BY ADDING LAYER UPON LAYER TO AIR TRAFFIC CONTROL TOOLS

THAT, IN SOME INSTANCES, PRE-DATE THE 1940S. THE LEGACY SYSTEM THUS NOW FEATURES:

- ✓ A COMMUNICATIONS SCHEME THAT IS ALMOST TOTALLY RELIANT ON ANALOG RADIO TECHNOLOGY, DOES NOT USE SPECTRUM VERY EFFICIENTLY, AND REQUIRES USERS TO CONSTANTLY SWITCH FREQUENCIES.
- ✓ AN EXPENSIVE FIXED SET OF GROUND BASED NAVIGATION AIDS, MANY ADDED ONE AT A TIME TO ACCOMMODATE CHANGES IN AVIONICS. WE USE A DIFFERENT FREQUENCY FOR EACH VOR, DME AND ILS, REQUIRING THE FAA TO OPERATE RELATED GROUND INFRASTRUCTURE. OUR NEED FOR GREATER SECURITY MEANS MORE ADD-ONS.
- ✓ AIRCRAFT SURVEILLANCE PRINCIPALLY USING RADAR
- ✓ NAVIGATION IN WHICH PILOT SITUATIONAL AWARENESS DEPENDS HEAVILY ON GEOGRAPHY AND WEATHER, IN ADDITION TO SIGHT.
- ✓ ONLY RUDIMENTARY USE OF AUTOMATION TO SOLVE A COMPLEX SET OF DECISION-MAKING PROBLEMS

ATC Today

- Labor Intensive
- Complex
- Inflexible
- Late adopter

1. Aircraft call sign.
2. Type of aircraft/type of movement.
3. Actual speed across ground.
4. Number of amendments to original flight plan.
5. Time aircraft has been in climb.
6. The altitude at which the aircraft is flying. This is measured in feet. Multiply this number by 100 to give the altitude.
7. The altitude at which the aircraft is going. This is measured in feet. Multiply this number by 100 to give the altitude.
8. Flight route. This must show departure and destination airports. This can be abbreviated before entering your facility airspace.
9. Individual beacon code assigned to each aircraft.
10. Computer generated number for identification within the facility.
11. Filed time of arrival.
12. The airport number. This identifies in which sector the aircraft is flying.
13. The ATIS number. The number of strips printed for this flight in this sector.
14. Time aircraft crossed previous ATIS.
15. Time departure for the next strip.
16. Remarks area (the only place where free text can be entered).
17. Coordination number to adjacent ATC facility.

JUST AS IMPORTANTLY, TODAY'S AIR TRAFFIC CONTROL SYSTEM IS ALSO LABOR INTENSIVE FOR PILOTS AND AIR TRAFFIC CONTROLLERS. WHILE WE'VE CLEARLY MADE STEPS IN MODERNIZING THE SYSTEM WE ALREADY HAVE, WE STILL DEPEND ON HUMAN INTERVENTION FOR EVERY SINGLE FLIGHT IN CONTROLLED AIRSPACE TO ENSURE A SAFE AND REASONABLY ONTIME FLIGHT. INDEED, A SINGLE CROSS COUNTRY FLIGHT MIGHT INVOLVE AS MANY AS A DOZEN DIFFERENT FREQUENCIES, ONE FOR EACH ATC HANDOFF. IN ADDITION TO 15,000 CONTROLLERS, WE MAINTAIN A LARGE WORKFORCE OF MAINTENANCE TECHNICIANS TO KEEP THE GROUND BASED INFRASTRUCTURE RUNNING. BECAUSE OF OUR DEPENDENCE ON MANUAL TASKS, WE LOOK AT SAFETY IN TERMS OF REDUCING CONTROLLER OPERATIONAL ERRORS INVOLVING A LOSS OF SEPARATION BETWEEN AIRCRAFT AND RUNWAY INCURSIONS ON THE GROUND. LOOKING AT ATC TODAY AS A GIANT OPERATING SYSTEM FOR AIR TRANSPORTATION, IT APPEARS INFLEXIBLE, AS WELL AS FALLIBLE AND COMPLEX. HAVING SAID THAT, WE DO A GREAT JOB WITH THE CARDS WE'RE DEALT – NECESSITY HAS BEEN THE MOTHER OF INVENTION. BUT THE WAY WE MANAGE TRAFFIC TODAY GREATLY LIMITS CAPACITY. UNFORTUNATELY, AS I SAID BEFORE, EVEN WITH INVENTION, THE SYSTEM IS REALLY NOT SCALABLE ANYMORE.



TO DEAL WITH THIS, A FEW YEARS BACK THE U.S. GOVERNMENT LAUNCHED THE NEXT GENERATION AIR TRANSPORTATION SYSTEM INITIATIVE (NGATS), PROBABLY THE MOST AMBITIOUS AVIATION PROGRAM EVER UNDERTAKEN WITH INDUSTRY STAKEHOLDERS. THE FIRST REAL PRODUCT OF THE EFFORT CAME IN DECEMBER 2004 WHEN AN INTEGRATED PLAN WAS DELIVERED TO CONGRESS, LAYING OUT A COMMON VISION FOR THE NEXT GENERATION SYSTEM. THE PLAN IS PERIODICALLY UPDATED AND HAS BEEN BROKEN INTO EIGHT MANAGEABLE PIECES -- INCLUDING SAFETY, SHARED SITUATIONAL AWARENESS, AN AGILE AIR TRAFFIC SYSTEM, WEATHER, ENVIRONMENT, AND SO FORTH – WITH AN INTEGRATED PRODUCT TEAM, OR IPT, FOR EACH ACTIVITY. THE IDEA IS FOR THESE TEAMS TO GET US FROM GENERALITIES TO SPECIFICS, AND FROM OBJECTIVES TO DEPLOYMENT – IN OTHER WORDS, REAL WORLD IMPROVEMENTS.



THE PRIMARY RESPONSIBILITY FOR ASSEMBLING AND LEADING EACH IPT BELONGS TO THE JOINT PLANNING AND DEVELOPMENT OFFICE OR JPDO, WHICH IS AN INTERAGENCY OFFICE CONSISTING OF EXPERTS FROM FAA, NASA, THE WHITE HOUSE OFFICE OF SCIENCE AND TECHNOLOGY POLICY, AND THE DEPARTMENTS OF DEFENSE, COMMERCE AND HOMELAND SECURITY.

THE MERE EXISTENCE OF THIS OFFICE REPRESENTS A BOLD DEPARTURE IN THE WAY THAT FEDERAL AGENCIES WORK TOGETHER TO ACHIEVE COMMON OBJECTIVES. EQUALLY UNUSUAL IS A NEW ENTITY, THE NGATS INSTITUTE, AN ALLIANCE AMONG ORGANIZATIONS REPRESENTING MAJOR AVIATION STAKEHOLDER COMMUNITIES, WHO WILL RECRUIT, SELECT, AND ASSIGN PRIVATE SECTOR EXPERTS AND TECHNICAL RESOURCES TO PARTICIPATE ON IPTS, AND PERFORM TECHNICAL WORK FOR THE IPTS/JPDO. THE INSTITUTE WILL OPERATE UNDER GUIDELINES SET FORTH IN THE FUNDING AGREEMENT BETWEEN THE FAA/JPDO AND THE HOST ORGANIZATION, THE NATIONAL CENTER FOR ADVANCED TECHNOLOGIES (NCAT).

Key capabilities of Nex Gen

Communications network

1. "Network-enabled information access"

Vastly improved navigation

2. "Broad area precision navigation"
3. "Equivalent visual operations"
4. "Weather assimilation into decision loops"

Surveillance/ATM based on user need, risk, ability

5. "Performance-based NAS"
6. "Layered, adaptive security"
7. "Trajectory based operations"
8. "Super density operations"

THE JPDO IDENTIFIED SEVERAL CAPABILITIES IN COMMUNICATIONS, SURVEILLANCE AND NAVIGATION THAT THE NEXT GEN SYSTEM SHOULD OFFER. FIRST, IT WILL BE A TRUE **COMMUNICATIONS NETWORK** WITH "NETWORK-ENABLED INFORMATION ACCESS", ALLOWING THE REAMS OF DATA ALREADY GENERATED – FROM AIRCRAFT POSITION TO WEATHER TO POTENTIAL SECURITY THREATS – TO BE ASSEMBLED IN A BIG PICTURE AVAILABLE TO USERS AS APPROPRIATE. IN THIS NETWORK OF DIGITIZED COMMUNICATIONS, AIRCRAFT WILL BE MOBILE NODES, NOT ONLY USING AND GIVING DATA BUT ALSO ROUTING MESSAGES OR OTHER INFORMATION. DATA WILL INCLUDE FLIGHT PLAN INFORMATION, PILOT, PAX AND CARGO DATA, WEATHER, AIRCRAFT TELEMETRY

VASTLY IMPROVED NAVIGATION

“BROAD AREA PRECISION NAVIGATION”: SATELLITE NAVIGATION WILL ALLOW PILOTS TO MAKE PRECISION LANDINGS AT AIRPORTS WITH MINIMAL NAVIGATION FACILITIES. THIS OPENS UP 100S OF SMALLER UNDERUTILIZED AIRPORTS BY ALLOWING SAFE AND RELIABLE OPS IN MOST CONDITIONS

“EQUIVALENT VISUAL OPERATIONS,” THE ABILITY TO PROVIDE AIRCRAFT WITH CRITICAL INFORMATION NEEDED TO SAFELY FLY WITHOUT VISUAL REFERENCES AND TO MAINTAIN SAFE DISTANCES FROM OTHER AIRCRAFT DURING NON VISUAL METEOROLOGICAL CONDITIONS

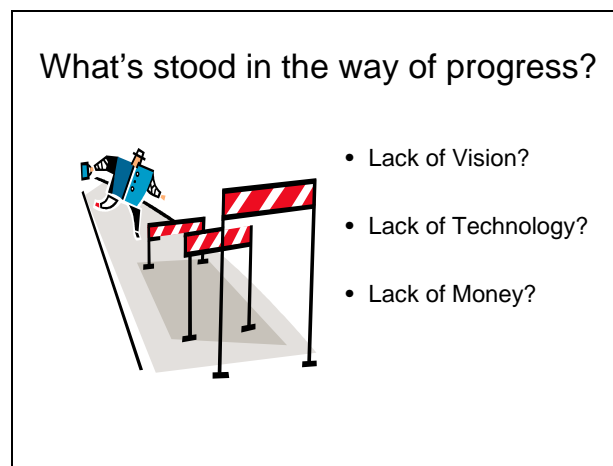
SURVEILLANCE – INCLUDING AIR TRAFFIC MANAGEMENT -- BASED ON USER NEEDS, RISKS, CAPABILITIES

A “PERFORMANCE-BASED NAS” REWARDING THE MOST CAPABLE AIRCRAFT (IN TERMS OF CNS EQUIPPAGE) WITH GREATER OPERATING FLEXIBILITY – INSTEAD OF TREATING A JETLINER THE SAME AS A PIPER CUB.

“LAYERED, ADAPTIVE SECURITY” – MEANING THAT THE RISK ASSESSMENT OF PAX AND CARGO WILL BE BUILT INTO THE SYSTEM AND WILL BEGIN LONG BEFORE EACH FLIGHT, NOT AT AIRPORT CHECK IN COUNTER.

“TRAJECTORY BASED OPERATIONS” – AIRSPACE WILL BE REGULARLY ADJUSTED, DYNAMICALLY, TO MEET USER AND SECURITY NEEDS, BASED ON DATA CRUNCHED FROM ACROSS THE ENTIRE NATIONAL AIRSPACE SYSTEM

“SUPER DENSITY OPERATIONS” MATCHING LANDSIDE INFRASTRUCTURE TO FUTURE DEMAND – ABILITY TO PERFORM CLOSELY SPACED AND CONVERGING APPROACHES WITH MUCH LESS SEPARATION AND NO REDUCTION IN SAFETY . . . GOOD STUFF.

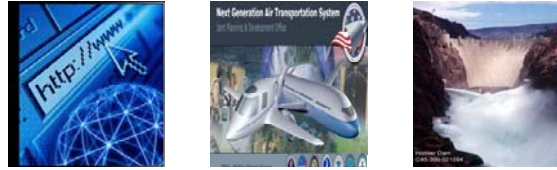


GIVEN THAT MANY OF THESE CONCEPTS AND THE UNDERLYING TECHNOLOGIES AREN'T ENTIRELY NEW – THOUGH THEY'VE NEVER BEEN SCOPED OUT IN AS COMPREHENSIVE A WAY BEFORE – YOU MIGHT REASONABLY ASK, “WHY HASN'T THIS ALREADY HAPPENED?” I'VE PUT UP A FEW POSSIBLE REASONS HERE. ARE ANY OF THESE ON POINT? IT'S CLEAR FROM THE PRIOR DISCUSSION WE HAVE THE “VISION THING” IN SPADES; THE JPDO HAS LAID OUT A COMPELLING PICTURE OF WHAT THE NEXT GEN SYSTEM NEEDS TO PROVIDE, AS HAVE MANY VERY CAPABLE PEOPLE AT THE FAA, NASA

AND ELSEWHERE. AT THE FAA A LOT OF INTERESTING WORK IS GOING ON AT THE TECHNICAL CENTER AS WE SPEAK CONCERNING THE VIABILITY OF AN AIRBORNE INTERNET. NOR HAS IT BEEN BECAUSE OF A LACK OF TECHNOLOGICAL ADVANCES. AND WHILE THE FAA CLEARLY FACES FINANCIAL CHALLENGES TODAY (AS OUR REVENUE PER FLIGHT OPERATION FALLS), AS AN HISTORICAL MATTER IT'S HARD TO BLAME A LACK OF RESOURCES. MORE THAN 30 YEARS AGO CONGRESS SET UP A TRUST FUND AT LEAST PARTLY FOR THIS PURPOSE AND FOR R&D; IT HAS TAKEN IN **\$175 BILLION** SINCE THEN MOSTLY FROM AIRLINE TICKET AND FUEL TAXES.

TO TAKE ONE EXAMPLE, THE BASIC CONCEPT FOR ADSB -- WHICH MAY BECOME THE BACKBONE FOR NGATS -- GOES BACK TO THE EARLY 1970s; THE FIRST LINK TECHNOLOGY TO TRANSMIT ADSB SIGNALS WAS DEVELOPED IN SWEDEN IN THE 1980S; THE OTHER TWO (UAT AND 1090) DATE TO THE 1990s. RTCA, INC. – THE PRIVATE, NON-PROFIT THAT DEVELOPS AND ADVISES THE FAA ON CNS/ATM SYSTEM ISSUES -- FIRST IDENTIFIED ADS-B AS AN ENABLING TECHNOLOGY FOR FREE FLIGHT, WHEN? . . . **IN 1995!** IN FACT, ADSB IS ALREADY BEING USED IN SELECT SELF-CONTAINED AREAS.

Major 'infrastructure' projects



AS WE FIGURE OUT HOW TO GET FROM NEXT GEN CONCEPTS TO DEPLOYMENT, WE MAY NEED TO RETHINK WHAT WE MEAN **BY** "INFRASTRUCTURE."

HISTORICALLY, WE'VE USED THAT TERM TO REFER COLLECTIVELY TO ROADS, BRIDGES, RAIL LINES -- PUBLIC WORKS THAT ARE NEEDED FOR AN INDUSTRIAL ECONOMY TO FUNCTION. AN EXAMPLE IS THE HOOVER DAM, BY THE WAY, ON THE RIGHT SIDE OF THE SCREEN. BUT PEOPLE NOW USE *INFRASTRUCTURE* TO REFER LOOSELY TO ANY SUBSTRUCTURE OR UNDERLYING ARRANGEMENT THAT FACILITATES ECONOMIC ACTIVITY. THAT'S MY DEPICTION OF THE INTERNET, ON THE LEFT, FOR INSTANCE. IN AVIATION WE PROBABLY MEAN BOTH: WE'LL ALWAYS HAVE AIRPORTS, RUNWAYS, AND TERMINALS. WE'LL ALSO HAVE THE SKY, AND FORTUNATELY, WE DON'T HAVE TO BUDGET FOR IT! BUT WHERE DO AIRCRAFT CNS SERVICES FIT IN AS INFRASTRUCTURE?

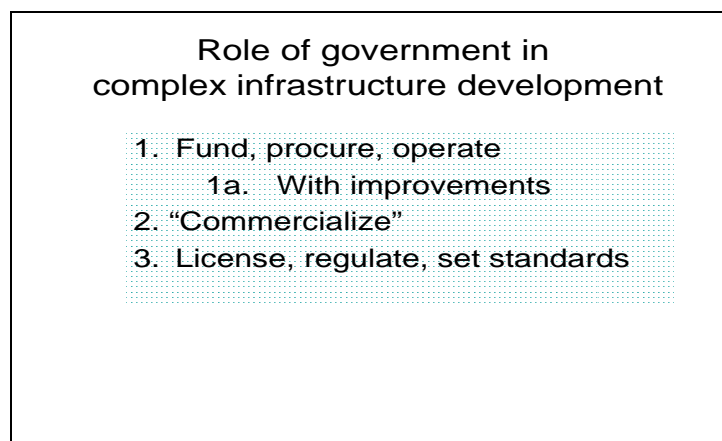
Major infrastructure projects

	Internet	Hoover Dam	NGATS
IT/data centric	✓	✗	✓
Networked, interoperable	✓	✗	✓
Natural monopoly	✗	✓	??
Static, predictable benefits	✗	✓	✗
Must be safe and secure	✓	✓	✓
Must be scalable	✓	✗	✓

IS DEPLOYING NGATS MORE LIKE CONSTRUCTING THE HOOVER DAM.....OR THE INTERNET? I TRIED NOT TO STACK THE DECK HERE -- REALLY. BUT WHAT DOES THIS TELL US?

FIRST, THE NEXT GEN SYSTEM IS HEAVILY RELIANT ON TECHNOLOGY; IT'S ALMOST ALL ABOUT USING I.T. TO MOVE PACKETS OF DATA THAT, IN TURN, ENABLE THE AIRCRAFT TO MOVE PEOPLE SAFELY, AFFORDABLY AND RELIABLY. TECHNICAL INNOVATION WAS NEEDED WHEN THEY BUILT THE HOOVER DAM BUT IT WAS ABOUT ENGINEERING; THEY HAD TO PUMP REFRIGERATED WATER VIA TUBES INTO WET CONCRETE, TO MAKE SURE IT SET AND CURED CORRECTLY. DESPITE BEING CALLED A SYSTEM, NGATS OBVIOUSLY NEEDS TO BECOME A NETWORK, OR ELSE IT ISNT MUCH BETTER THAN WHAT WE HAVE TODAY.

IS IT A NATURAL MONOPOLY LIKE THE HOOVER DAM IS? WHEN NGATS IS VIEWED AS AN DISTRIBUTED, PEER TO PEER NETWORK, IT'S HARD TO IMAGINE A MONOPOLY PROVIDER OF EVERY CNS SERVICE. THE BENEFITS OF NGATS, I WOULD SUBMIT, ARE NOT KNOWABLE, ANYMORE THAN THEY WERE WITH THE INTERNET, WHEREAS WE KNEW UPFRONT THAT THE BOULDER DAM WOULD PROVIDE FLOOD CONTROL FOR THE COLORADO RIVER BASIN, ENABLE IRRIGATION, AND PROVIDE A WATER SUPPLY FOR SOUTHERN CALIFORNIA . WITH JUST 5000 FLIGHTS ONLINE AT A TIME, WE CANT PREDICT WHAT BENEFITS WE WILL SEE IN A MUCH BIGGER SYSTEM. HERE'S THE ONE AREA OF COMMON GROUND WITH THE HOOVER DAM: NGATS MUST BE SAFE AND SECURE BECAUSE OF THE ROLE THAT AIR TRANSPORTATION PLAYS IN PEOPLE'S LIVES AND, AS WE HAVE DISCOVERED, IN HOMELAND DEFENSE. BUT THE SAME CAN BE SAID, AT LEAST IN RETROSPECT, FOR THE INTERNET. FINALLY, WE ALREADY KNOW THE NEXT GEN SYSTEM MUST BE FREELY SCALABLE TO MEET OUR OBJECTIVES.



THE NATURE OF THE CNS INFRASTRUCTURE MAY TELL US SOMETHING ABOUT THE RIGHT ROLE FOR THE U.S. GOVERNMENT IN THIS PICTURE. THUS FAR,

ONLY TWO CHOICES HAVE REALLY BEEN PRESENTED TO POLICY MAKERS. THE FIRST IS TO STAY ON THE CURRENT PATH. THAT IS, IN CONTRAST TO THE REST OF THE AVIATION SYSTEM (THE THREE LEGS OF THE STOOL), WHERE THE FUNCTION OF THE FEDERAL GOVERNMENT HAS BEEN SIMPLY TO REGULATE, WE CONTINUE TO DESIGN, OWN AND OPERATE THE NEXT GEN INFRASTRUCTURE. THIS IS THE TRADITIONAL APPROACH, IN WHICH THE FAA PLAYS THE LARGEST ROLE. EACH YEAR THE ADMINISTRATION PROPOSES A BUDGET, CONGRESS APPROPRIATES FUNDS (TO R&D, TO FACILITIES & EQUIPMENT, AND TO OPERATIONS), IDENTIFYING THE SPECIFIC PROGRAMS AND PROJECTS TO BE ACCOMPLISHED, AND THEN THE AGENCY IMPLEMENTS THE LAW.

THE CURRENT PROCESS HAS NO SHORTAGE OF CRITICS. IN 1997 THE NATIONAL CIVIL AVIATION REVIEW COMMISSION (NCARC), CHAIRED BY NOW SECRETARY NORM MINETA, WARNED OF EXACTLY WHAT IS NOW HAPPENING:

THERE ARE DARK STORM CLOUDS ON THE HORIZON..... THE PRESENT PROCESS BY WHICH THE AIR TRAFFIC CONTROL SYSTEM . . . IS FINANCED AND MANAGED WILL NOT MEET THE FUTURE NEEDS OF THE NATIONAL ECONOMY AND THE TRAVELING PUBLIC.

THE FAA HAS BOTH LARGE CAPITAL REQUIREMENTS AND LARGE DAY-TO-DAY OPERATING NEEDS. THE FAA IS UNIQUE FOR A GOVERNMENT AGENCY IN THAT IT PROVIDES AROUND-THE-CLOCK, 365-DAYS-A-YEAR AIR TRAFFIC CONTROL SERVICES — A LINCHPIN OF OUR NATION'S ECONOMIC WELL-BEING. HOWEVER, THE FAA IS FUNDED AND BUDGETED

LIKE OTHER GOVERNMENT AGENCIES, MOST OF WHICH DO NOT HAVE THIS TYPE OF OPERATING RESPONSIBILITY.

BEING SUBJECT TO THE INCREASINGLY STRINGENT FEDERAL BUDGETARY SPENDING CAPS, THE AGENCY IS PLACED IN THE UNSUSTAINABLE POSITION OF HAVING TO FORGO CAPITAL DEVELOPMENT PROGRAMS IN ORDER TO KEEP THE DAY-TO-DAY OPERATIONS ADEQUATELY STAFFED.

UNLESS THE BUDGETING AND FUNDING PICTURE IS DRAMATICALLY ALTERED SO THAT AVIATION REVENUES CAN BE DIRECTLY LINKED TO THE PROGRAMS THEY OSTENSIBLY SUPPORT, RISING OPERATING EXPENSES WILL OUTSTRIP THE FAA'S ABILITY TO MAKE CAPITAL INVESTMENTS IN AIR TRAFFIC CONTROL AND AIRPORTS. WHEN FACED WITH LIMITED RESOURCES, OPERATING AND MAINTAINING THE PRESENT SYSTEM PREVAILS OVER THE NEED TO MODERNIZE.

FOR THESE REASONS, THE CURRENT FAA ADMINISTRATOR, MARION BLAKEY, HAS BEEN VERY PUBLIC ABOUT WANTING TO IMPROVE ON THE TRADITIONAL APPROACH. BECAUSE THE CURRENT SCHEME OF TICKET TAXES IS SET TO EXPIRE IN 2007, THE FAA HAS BEEN ASKING CONGRESS, THE INDUSTRY, WALL STREET, AND A LIST OF EXPERTS FROM A TO Z FOR SUGGESTIONS ON A BETTER WAY TO FUND OUR AVIATION SYSTEM — ONE THAT 'S FAIR TO ALL ITS USERS, GIVES THEM GREATER SAY ABOUT MODERNIZATION DECISIONS, AND LINK FAA'S REVENUE STREAM TO ITS COSTS. AS HAS BEEN PREVIOUSLY ANNOUNCED, THE AGENCY IS WORKING ON SUCH A PROPOSAL, WHICH IS DESIGNED TO CREATE A STABLE FUNDING STREAM THAT WILL MAKE IT EASIER

TO PLAN AND MAKE CAPITAL INVESTMENTS – THAT IS, BE MORE LIKE A BUSINESS, BECAUSE WE ARE RUNNING ONE. I HASTEN TO ADD, THIS IS *NOT* ABOUT INCREASING THE AMOUNT OF MONEY COMING TO US.

A SECOND APPROACH, TRIED ELSEWHERE IN THE WORLD, IS TO SEPARATE THE AIR TRAFFIC CONTROL ASSETS AND PEOPLE FROM THE GOVERNMENT AIR NAVIGATION SERVICE PROVIDER (ANSP) AND SPIN THEM OFF – TO A CORPORATE ENTITY OR JOINT VENTURE OF SOME SORT, FULLY OR PARTLY PRIVATIZED. THE COMMON FEATURE OF ALL OF THESE EFFORTS IS THAT THE RESULTING ENTITY ENJOYS “FINANCIAL AUTONOMY IN ITS GOVERNANCE ARRANGEMENTS” ACCORDING TO ONE ADVOCATE -- THAT IS, THEY COLLECT FEES DIRECTLY FROM USERS, HAVE THE ABILITY TO BORROW MONEY, AND SPEND ON CAPITAL PROJECTS LIKE A PRIVATE CORPORATION. THE PROPONENTS OF THIS APPROACH, WHICH HAS BEEN TAKEN IN THE U.K., IN CANADA, EVEN IN FRANCE TO SOME DEGREE, ARGUE THAT IT SPEEDS UP MODERNIZATION EFFORTS, IMPROVES SERVICE QUALITY, REDUCES COSTS, PROVIDED FINANCIAL STABILITY – ALL WITH THE SAME OR BETTER LEVEL OF SAFETY. UNLIKE THE FIRST, THIS APPROACH IS CONTROVERSIAL AND HAS BEEN CRITICIZED IN SOME QUARTERS. THERE’S NOT ENOUGH TIME TO DEBATE THE PROS AND CONS OF THIS APPROACH -- A TWO-YEAR STUDY JUST CAME OUT, FROM CANADA, SEEMINGLY DISPROVING THE CRITICISMS – BUT IT’S WORTH ACKNOWLEDGING THAT IT EFFECTIVELY REPLACES A PUBLIC MONOPOLY SERVICE PROVIDER WITH A PRIVATE ONE.

MY QUESTION FOR YOU IS: MIGHT THERE BE A THIRD APPROACH THAT WE'RE OVERLOOKING WITH OUR PREOCCUPATION ON FINANCE AND GOVERNANCE? AS YOU LOOK FOR SOLUTIONS, SHOULDN'T YOU CONSIDER THE NATURE OF THE INFRASTRUCTURE CHALLENGE BEFORE DECIDING WHO SHOULD PROVIDE IT, CONTROL IT AND PAY FOR IT? GOING BACK TO MY EARLIER SLIDE, IF THIS IS MORE LIKE **ENABLING** THE INTERNET THAN **CONSTRUCTING** THE HOOVER DAM, THAT WOULD SUGGEST FOCUSING PUBLIC EFFORTS ON STANDARD SETTING AND -- GIVEN THE CRITICAL NATURE OF AIR TRANSPORTATION -- ON ENSURING ADEQUATE INVESTMENT, SAFETY, SECURITY, RELIABILITY AND SYSTEM INTEGRITY THROUGH THE PERMITTING AND REGULATION PROCESS. THE EXISTING TELECOM INFRASTRUCTURE WAS NOT BUILT BY THE FCC -- BUT IT WORKS BECAUSE OF IT. LIKewise, MOST OF THE AVIATION SYSTEM INFRASTRUCTURE -- FROM AIRPLANES, TO AVIONICS, TO RUNWAYS AND TERMINALS -- WAS NOT BUILT BY THE FAA, BUT WORKS BECAUSE OF OUR WATCHFUL EYE.



I WILL CLOSE WITH THIS THOUGHT: MOST WOULD AGREE THAT THE INTERNET WOULD NOT EXIST IN ITS CURRENT FORM BUT FOR GOVERNMENT RESEARCH FUNDING AND SOME JUDICIOUS POLICY DECISIONS. WHAT DID THE GOVERNMENT DO RIGHT HERE? A LOT. WE RECOGNIZED THE VALUE OF PARTNERING WITH INDUSTRY AND ACADEMIA IN ORDER TO TAP THE EXPERTISE OF THE COUNTRY'S BEST AND BRIGHTEST. THE GOVERNMENT CONTINUES THIS TRADITION TO GREAT EFFECT. IT TOOK A 'TECHNOLOGY NEUTRAL' APPROACH THAT ULTIMATELY ALLOWED THE BEST TECHNOLOGIES AND STANDARDS TO PREVAIL. DARPA'S RESEARCH AGENDA AND MANAGERIAL STYLE GAVE RESEARCHERS CONSIDERABLE AUTONOMY, AND THE AGENCY HEDGED ITS BETS AND SPREAD ITS INVESTMENTS. WHILE FEDERALLY FUNDED RESEARCH LED TO VALUABLE INNOVATIONS SUCH AS TCP/IP, OTHER IMPORTANT AND COMPLEMENTARY TECHNOLOGIES SUCH AS THE ETHERNET AND UNIX WERE PRIVATELY FINANCED. GOVERNMENT ALSO KNEW WHEN TO BOW OUT AND TO EXIT THE STAGE. WE GRADUALLY ENTRUSTED PRIVATE FIRMS AND OTHER ENTITIES WITH THE RESPONSIBILITY OF OPERATING THE INTERNET. INDEED, THE GRADUAL PRIVATIZATION OF THE NATIONAL SCIENCE FOUNDATION'S INTERNET BACKBONE, NSFNET, COINCIDED WITH EMERGENCE OF A MARKET FOR PRIVATE ACCESS TO THE INTERNET.

THE DEVELOPMENT OF THE INTERNET SHOWS HOW THE FEDERAL GOVERNMENT CAN CREATE A VALUABLE INFRASTRUCTURE -- IN THE

CONTEMPORARY SENSE OF THE TERM -- WITHOUT NECESSARILY OWNING AND OPERATING IT. IS THERE A LESSON HERE FOR AVIATION? I HOPE SO.