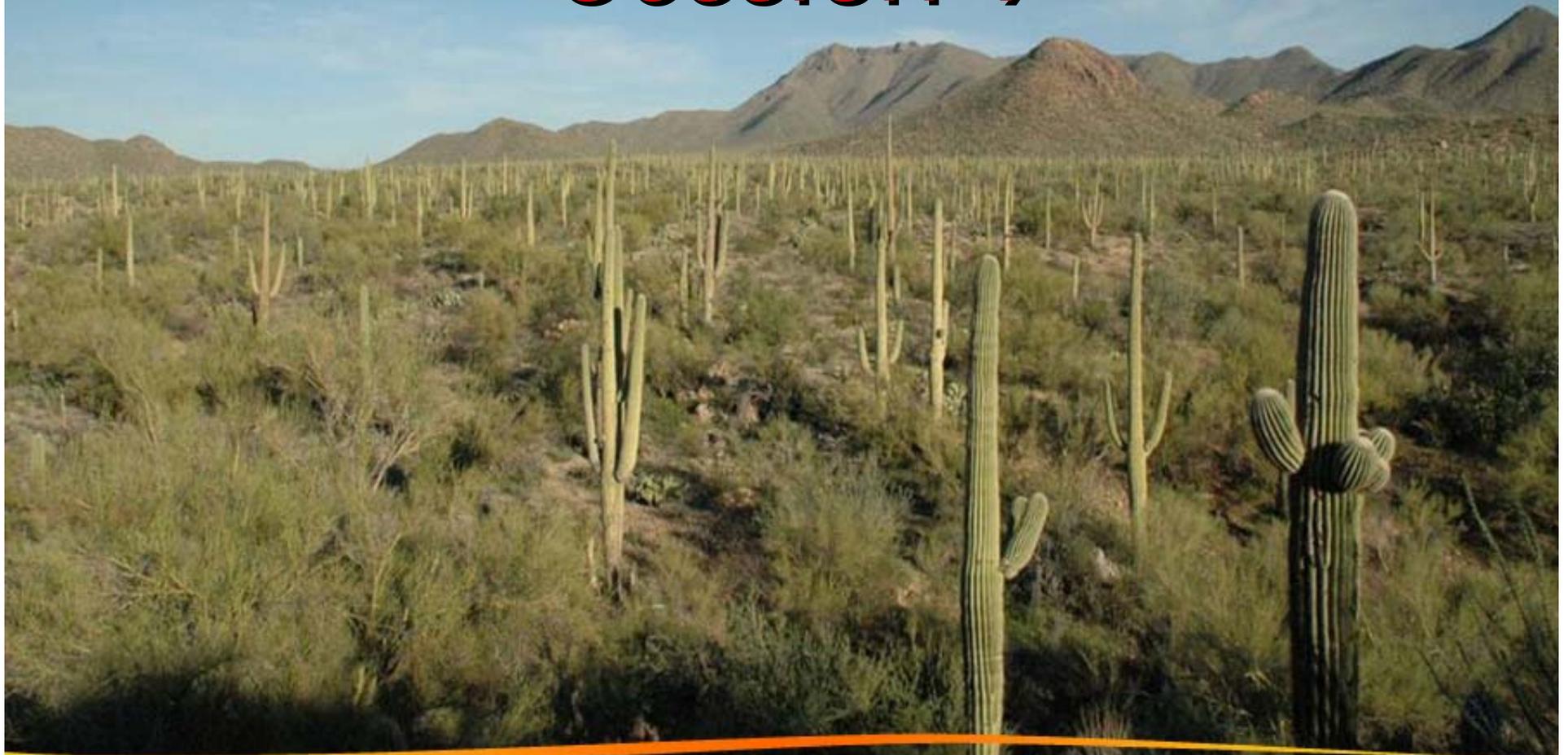


# SUSTAINABILITY TRACK

## Session 9



Phoenix, AZ

August 3-6, 2008



Morse U.S. Courthouse  
Eugene, OR



NOAA  
Suitland, MD



EPA Science and Technology  
Kansas City, KS



U.S. Census Bureau  
Suitland, MD

# Existing Building Fixes

Lance Davis, AIA, LEED

GSA

# EB Guidance

- ▶ **Employ Integrated Assessment, Operation, and Management Principles**
- ▶ **Optimize Energy Performance**
- ▶ **Protect and Conserve Water**
- ▶ **Enhance Indoor Environmental Quality**
- ▶ **Reduce Environmental Impact of Materials**

# Employ Integrated Assessment, Operation, and Management Principles

- ▶ Integrated Thinking
- ▶ Commissioning



USDA  
Manhattan, KS



FDA  
White Oak, MD



Denver Federal Center  
Lakewood, CO



St. Elizabeth's  
Washington, DC

# Optimize Energy Performance

- ▶ **Verify Energy Efficiency**
  - **ENERGYSTAR**
  - 20% reduction to 2003 baseline
  - 20% better than ASHRAE 90.1 2007
- ▶ **Measurement and Verification**



Sam Nunn Atlanta Federal Center  
Atlanta, GA



EPA Computer Center  
RTP, NC



Land Port of Entry  
Calais, ME



Metzenbaum U.S. Courthouse  
Cleveland, OH

# Protect and Conserve Water

- ▶ **Indoor Water**
  - 20% reduction per 2007 baseline
  - 20% reduction per uniform plumbing code
- ▶ **Reduce outdoor potable water use by 50%**
- ▶ **Use EPA's WaterSense program**



NPS  
Omaha, NE



DHS  
Omaha, NE



SSA  
Auburn, WA



DOT  
Washington, DC

# Enhance Indoor Environmental Quality

- ▶ **ASHRAE Standards**
  - 55 – 2004 – Thermal Conditions
  - 62.1 -2007 - Ventilation
- ▶ **Moisture Control**
- ▶ **Daylight or Occupant Controls**
- ▶ **Low emitting materials**
- ▶ **Protect indoor air quality**



Duncan Federal Building  
Knoxville, TN



EPA Headquarters  
Kansas City, KS



Oklahoma City Federal Building  
Oklahoma City, OK



Shared Point of Entry  
Sweetgrass, MT

# Reduce Environmental Impact of Materials

- ▶ Recycled Content Products
- ▶ BioBased Content Products
- ▶ Environmentally Preferable Products
- ▶ Waste and Materials Management
- ▶ Eliminate Ozone depleting compounds



Byron Rogers U.S. Courthouse  
Denver, CO



U.S. Courthouse  
Seattle, WA



Moakley U.S. Courthouse  
Boston, MA



EPA Lab  
Chelmsford, MA

# Atlanta Federal Center

## Your Energy Conservation Efforts At Work

By 2005, we aim to qualify as an ENERGY STAR building!



AFC Energy Use (GWh/yr)



We have saved \$138,000  
(compared to the last 12 months)

Since Dec. 2001 -- you have helped lower our power bills



THE ENERGY STAR Project Committee





John J. Duncan Federal Building  
Knoxville, TN

# John J. Duncan Information

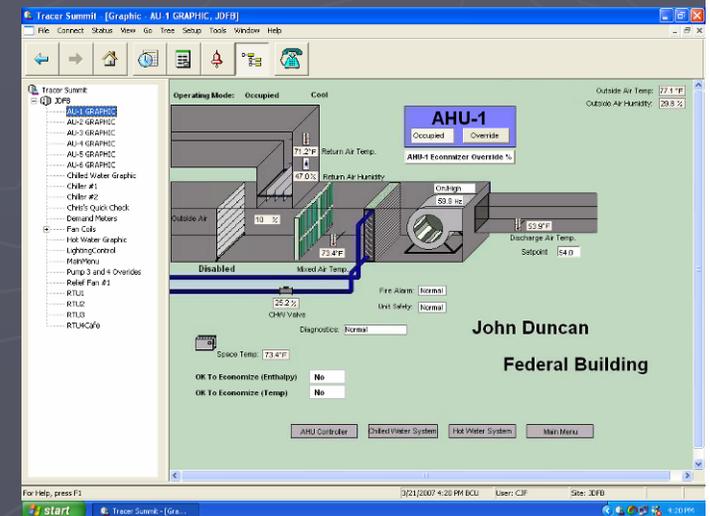
- ▶ Eight Story Facility Dedicated in 1988
- ▶ 172,683 USF and 2 Underground Parking Decks
- ▶ Seventeen Agencies (FBI, IRS, OSM...)
- ▶ Constructed of Concrete and Steel w/ Tennessee Granite and Glass Facade

## Success Model:

- ▶ Goal Setting (E.O. 13123, Energy Star, FEMP, LEED, Earth Award)
- ▶ Team Work
  - ▶ GSA
  - ▶ Urban-Meridian Joint Venture
  - ▶ Knoxville Utilities Board
  - ▶ University of Tennessee
  - ▶ Contractors (Trane, DPM, Initial Plants, Rubberific, Falcon,.... General Contractors)

# Energy Management & Smart Decisions

- ▶ Opportunity: Outdated BCS, Costly Repairs
- ▶ Solution: 360 Degree Approach to Implementation of BCS
  - Trane Building Control System:
    - ▶ Chill Plant
    - ▶ Boilers
    - ▶ AHU's
    - ▶ VFD's (Building Motors)
    - ▶ Lighting
    - ▶ Economizer
    - ▶ Restroom Exhaust
    - ▶ Garage Relief Fan
    - ▶ Supplemental Air Units (After Hours)



# Energy Management and Smart Decisions II

- ▶ Opportunity: Outdated Cooling Tower, Large Motors, Leaking
- ▶ Solution: SWOT Analysis of Tower, Replacement Determined
  - New Stainless Steel Tower
  - Premium Efficiency Fill
  - Replacement of Two 15hp Motors with Two 7.5hp Premium Efficiency Motors
  - Variable Frequency Drives
  - Access Ladders and Cat Walk

# Energy Management and Smart Decisions III

## ▶ Construction

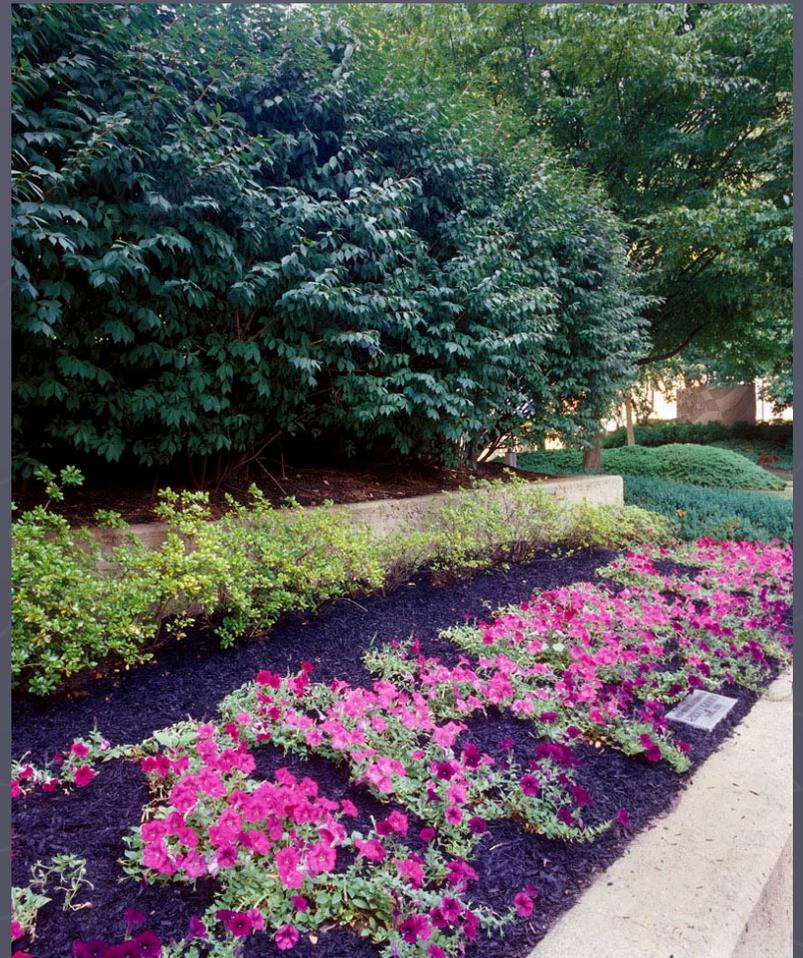
- ▶ Lighting Retrofits, Motion Sensors, Natural Day Lighting, Recycling of Products, IAQ, Recycled Content Products, Low VOC Products

## ▶ Building Lighting Retrofit

- ▶ Offices, Hallways, Maintenance/Cleaning Areas, Garage

## ▶ Demand Metering & Load Shedding

## ▶ Purchasing Green Power (Solar, Wind, Methane)



# Water Savings

- ▶ Cooling Tower
- ▶ Waterless Urinals
- ▶ ½ gpm Aerators vs. 2 ½ gpm Aerators
- ▶ Rain Water Capture for Irrigation



# \$avings:



- ▶ “Compared to an average building, this building saves the equivalent of about 91,000 gallons of gasoline per year, or the amount of fuel required to drive 216 million automobile miles per year. Another perspective would be to say that compared to an average building, savings here is the electricity equivalent of 18 train cars of coal if their contents were burned to make electricity.” Jim Powell Regional Director, DOE 4-18-05
- ▶ E.O. 13123 Goal of 52,499 BTU's/GSF was surpassed by 33% with attainment of 35,693 BTUs/GSF
- ▶ Annual Savings of 290,160 KWH
- ▶ Annual Water Savings of 400,000+ Gallons
- ▶ Return on Investment of 3.7 Years

# Environmental Sustainability

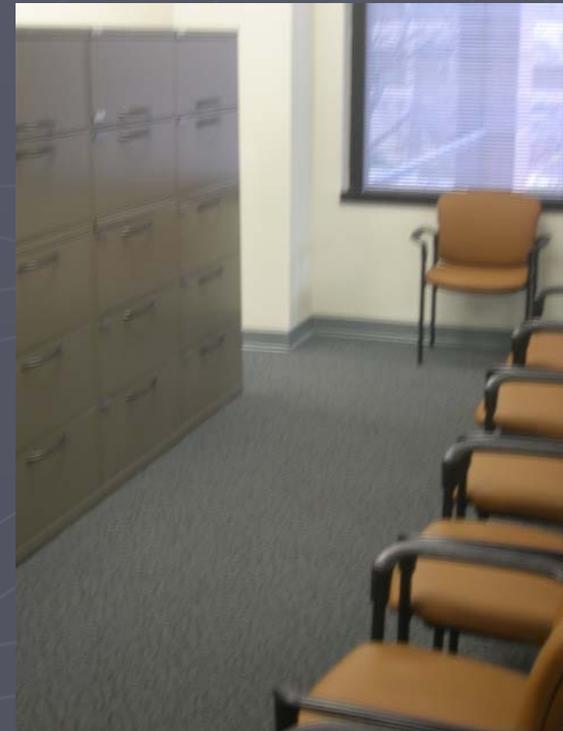
- ▶ “Green” Cleaning Products
- ▶ Recycled Janitorial Products
- ▶ Recycling of Aluminum, Plastic, Mixed Paper, Cardboard
- ▶ Rubber Mulch
- ▶ Recycle/Reuse of Carpet
- ▶ Procurement of Recycled Content Products
- ▶ Rain Water Capture for Landscaping
- ▶ Construction Debris Recycling
- ▶ IAQ Plan for Construction (Dust, VOCs...)
- ▶ Purchase Green Power (Wind, Solar, Methane)

# Environmental Impact:

## Annually

- ▶ 30% of all waste diverted from landfill
- ▶ 13.75 tons of mixed paper
- ▶ 1,300 pounds of aluminum
- ▶ 12,000 square feet of carpet
- ▶ 700 pounds of moving boxes
- ▶ 400,000+ gallons of water





# Awards/Certifications

- ▶ Energy Star (94): 2005
- ▶ Federal Energy Management Program Designation: 2006
- ▶ Federal Energy and Water Management Award: 2006
- ▶ USGBC LEED-EB Certification: 2007
- ▶ Energy Star (95): 2007
- ▶ 2007 BOMA Southeast Region Earth Award
- ▶ 2008 BOMA Southeast Region Earth Award
- ▶ 2008 BOMA International Earth Award



Morse U.S. Courthouse  
Eugene, OR



NOAA  
Suitland, MD



EPA Science and Technology  
Kansas City, KS



U.S. Census Bureau  
Suitland, MD

# Questions

Lance Davis, AIA, LEED

Lance Davis, AIA, LEED

GSA

[lance.davs@gsa.gov](mailto:lance.davs@gsa.gov)