

SUSTAINABLE AIRPORT MANAGEMENT MANAGING A *GREEN* AIRPORT

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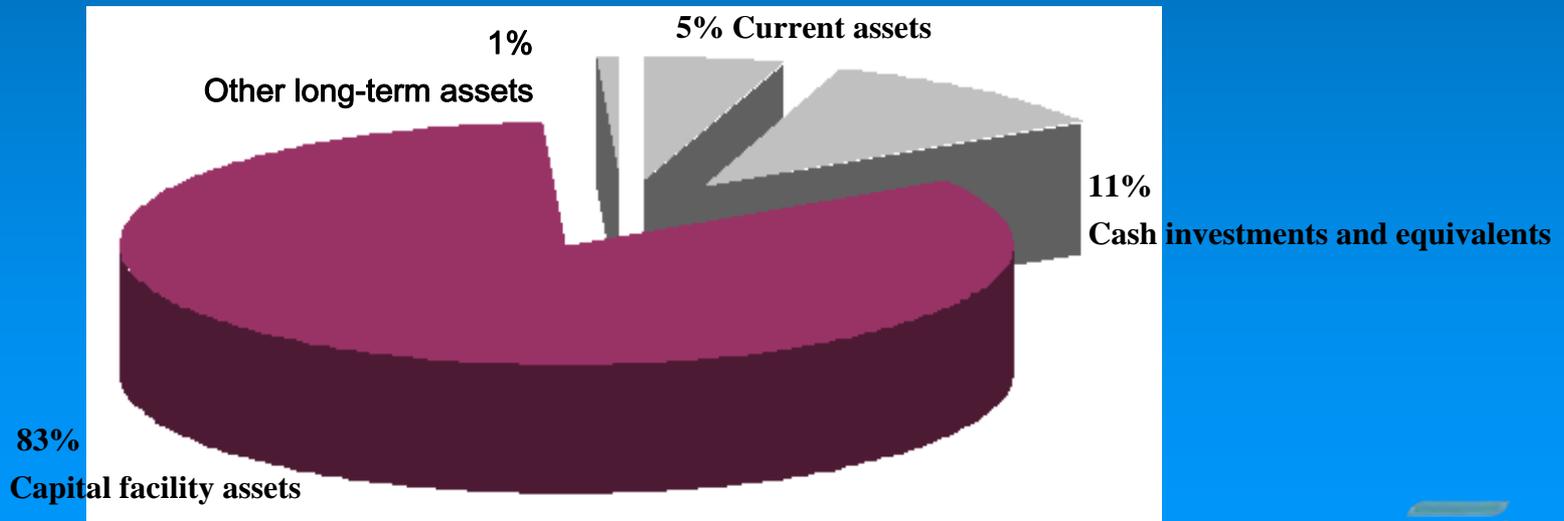
Seattle-Tacoma International Airport

- 31 million Annual Passengers - 2007
- 15th busiest in US, 25th busiest in world
- Asset replacement value of \$6.5B



Assets Drive Impacts

- Port is the owner, builder, operator, maintainer, and lessor for many facilities
- For every \$1 spent on construction, about \$3 of ongoing cost experienced
- Capital facilities are a core strategic resource enabling us to generate revenue
- Capital facilities are the largest asset we own, 83% of depreciated book value
- Strategically balance capital and operating costs (optimize total ownership cost)



Required Information

- What do we own and how long do we want it to last?
- Who is responsible for maintaining?
- What is the age, condition, and cost to replace?
- How long it last based on appropriate renewal funding?
- What can be done to minimize environmental implication of facility operation?

Policy Drivers

- Environmental and Financial performance need to be sustainable and are not mutually exclusive
- This is a continuous improvement opportunity in the Port's core competencies of designing, building, operating, maintaining and mitigating impacts
- For every dollar spent on construction somewhere between 3-5 dollars will/should be spent on maintenance and renewal of an asset during its life to achieve maximum value
- Initial or first costs and ongoing costs are clearly linked
- 75% of decisions which influence total costs are made in design, while 75% of costs occur after construction
- Built environment is a significant generator of green house gases



Goals of Sustainable Airport Management

- To make decisions fully informed on total cost of ownership implications
- To better manage long term capital and operating costs
- To promote environmentally sustainable development
- To conserve resources

Executive Direction

Issuance of Executive Policy EX-15 reinforces focus on total cost of ownership, environmental performance and strategic asset management (important first step)

Leveraging opportunities to increase Port's sustainable trajectory:

- Supporting projects to further reduce environmental footprint of operations
- Actively engaging in regional environmental recovery efforts
- Using eco-charrette at outset of any major capital investment
- Have joined USGBC using LEED criteria/processes and encourage staff accreditation
- Completed Clean Airport Partnership "Managing a Green Airport" Report
- Complete Green House Gas Emission Inventory & Report to Commission

The Clean Airport Partnership (CAP)

Non-profit corporation

Only organization in the U.S. devoted exclusively to working together with airports and communities to improve environmental quality and efficiency

Extensive knowledge of innovative programs implemented at airports globally
CAP is well recognized nationally, and has provided support to and conducted research for:

- U.S. Department of Energy
- U.S. Environmental Protection Agency
- U.S. Clean Cities Program
- National Renewable Energy Labs
- Local governments and airports, nationally



CAP was retained by the Port of Seattle to:

Candidly assess Sea-Tac's environmental achievements

Identify practical opportunities that remain for maximizing environmental performance

Utilize graphics and an innovative format to make its report for Sea-Tac user friendly and accessible to community and area leaders



Conclusions

Sea-Tac has one of the strongest most comprehensive environmental programs of any airport in the nation.

CAP regularly uses Sea-Tac as a model in U.S. and international presentations.

Sea-Tac in a unique position to heighten community awareness of its considerable achievements and to use its concourse facilities to promote replication of its programs in homes and businesses.

Solid Waste - Achievements

Coffee Grounds Recycled as Compost

“Pay as You Throw” Tenant Incentives

Waste Segregation and Centralized Collection

Turning Waste into Cement



Solid Waste - Opportunities

Comprehensive Waste Audit

Track and Report Recycling Activity

Expand Recycling Program, to include off aircraft waste

Buy more Recycle-Content Goods

Green Janitorial products and practices

Promote biodegradable food and beverage containers

Food waste composting

Air - Achievements

Landside Vehicle Emissions

Clean Taxi Program

Natural Gas Shuttles

Sea-Tac's Clean Vehicle Fleet

Expanding Access Via Fixed Rail Transit

Promoting Employee Transit Use and Ride-Sharing

Pay-on-Foot Parking and other garage efficiencies

Planning for Consolidated Rental Car Facility

Automated Vehicle Identification Program

Reduced Vehicle Idling

Ground Support Equipment

Converting Diesel to Electric

Aircraft

Fuel Hydrant System Reduces Fuel Truck Emissions

Expedite Aircraft Taxiing

Prohibiting Aircraft Powerback Reduces NOx Emissions

Greenhouse Gas Inventory Completed



Air - Opportunities

Landside Vehicle Emissions

- Emissions Versus Technology Standards

- Expand Taxi Efficiency

- Encourage Clean Rental Cars

- Require Cleaner Construction and Off-Road Vehicles

- Strengthen Employee Trip-Reduction Programs

- Further Strengthen the Automated Vehicle Identification Program

- Expand Use of Pay-on-Foot Parking and other garage efficiencies

- Consolidate Hotel Shuttles and Require Cleanest Operating Vans

Aircraft

- Gate Power and Pre-Conditioned Air Reduces Emissions

- Educate Carriers on Emission Reduction Strategies

Air/Climate Change - Opportunities

- Consider CO2 benefits in prioritization of air quality improvements strategies
- Include CO2 emissions and track progress as part of Sea-Tac's "Environmental Footprint"
- Examine transferability of European climate change offset programs to Sea-Tac

Building Efficiency - Achievements

Lighting Upgrades and Practices

Photocells

Full Cost-Based Utility Rates

Heating, Ventilation, and Air Conditioning Improvements

Adjusting Thermostats

Retro-Fitting Escalators

Improving Boiler Efficiency

25% Green Power/Renewable Energy Commitment

Establishing Building Design Standards

Obtaining Conservation Funding

Optimized pump-house controls

Leveraged efficiency projects to obtain \$1.2 Million in Agency reimbursements

Building Efficiency - Opportunities

Implement new conservation measures:

- Upgrade flush valves in Concourse

- Potential chilled water system efficiency improvements

- Expand heat recovery methods

- Upgrade parking terminal perimeter and road lights

- Review feasibility of strategies for airside optimization

Evaluate additional conservation measures:

- Reassess internal rate of return for energy conservation projects Consider new natural gas conservation measures

- Examine North and South satellite lighting and HVAC system upgrade

- Initiate airport-wide pressurization study

Widen comfort zone parameters for heating and cooling

Water - Achievements

- Wetlands Mitigation On-Site
- Wetlands Mitigation Off-Site
- Water Quality Improvements at Miller Creek
- Stormwater Management to Avoid Flooding, Sedimentation, and Contamination
- Stormwater Contamination Control
- Containment and Processing of De-Icing Effluent
- Organic Filter Media for Metals Removal Recycled as Compost



Water - Opportunities

Expand public access to wetland mitigation sites

Reconsider waterless urinals

Water System valve isolation

Wetland banking on excess property at Auburn

Continued Basin Plan Participation



Noise - Achievements

Purchasing Residential Property in High Noise Areas for the Third Runway

Insulating Homes and Schools within the noise contours

Avoiding Noise Problems Through Land Use Controls

Encouraging Airlines to “Fly Quiet”



Noise - Opportunities

Ground Power and Preconditioned air at Gates

Partner with Boeing on R&D for new technologies and procedures

Advocate for Continuous Descent Approach Procedures

Sustainability - Opportunities

Sustainable design

Modify design standards and master specifications

Establish sustainable facilities benchmark roundtable

Develop and implement Green Lease guidelines

Enhance efficiencies through greater common use systems

Sea-Tac's 2024 Environmental Footprint

2024 - What will it look like?

Passengers: 42,000,000

Cargo: 430,000 tonnes

Electricity: 225,000 MWH

Land Use: 2,899 acres

Fuel:

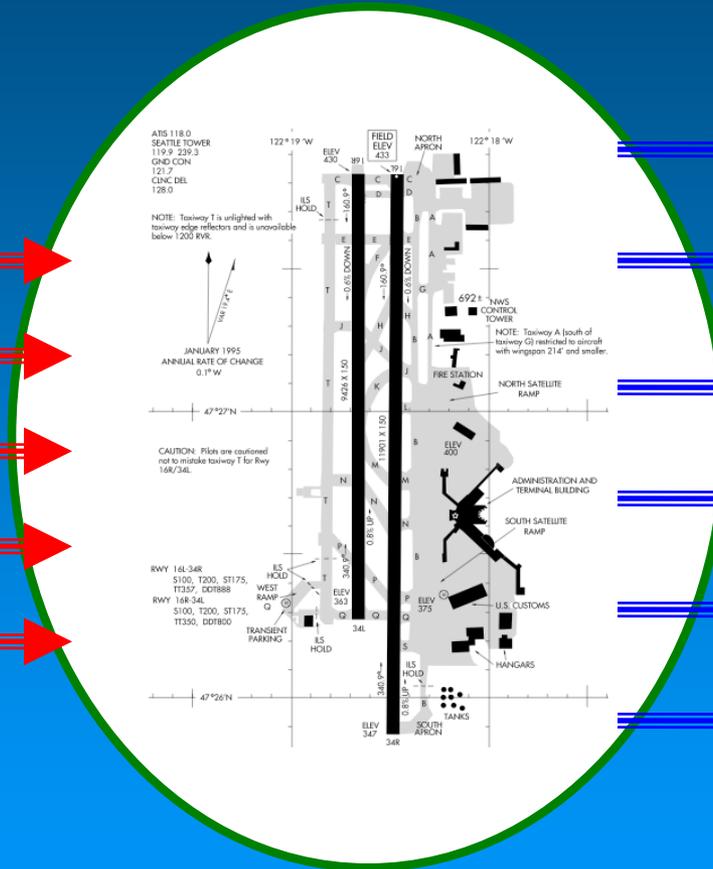
550,000,000 gal Jet A

5,000 gal diesel

225,000 gal gasoline

3,500,000 therms nat. gas

120,000 gge CNG



Air Emissions:

?

Treated Stormwater (IWS):

?

Hazardous Waste Disposal:

?

Wetland Coverage:

?

Active Remediation Projects:

?

Noise Impacts:

?

Environmental Footprint (definition): The measure of the burden or impact that a product, operation, or organization places on the environment.

Next Steps

Broad Array of Actions under Consideration, to include:

Policy considerations

Green procurement/recycling

Physical Plant/Capital Improvements

Employee Actions and Development

Continuous Improvement Process

Environmental Education Opportunities

Next Steps

Some are readily implementable, others will be part of a 5 year plan:

- Feasibility

- Environmental cost/benefit analysis

- Degree of environmental improvement should be proportionate to cost

- With rising fuel and energy costs, cost/benefit will shift

Develop environmental key performance indicators that support operational decision making

Coordination with community, airlines and tenants necessary

Dovetailed with State and Regional Initiatives:

- Attainment with NAAQS

- Puget Sound Partnership

- Climate Change Initiative