Winnipeg Airports Authority Inc.

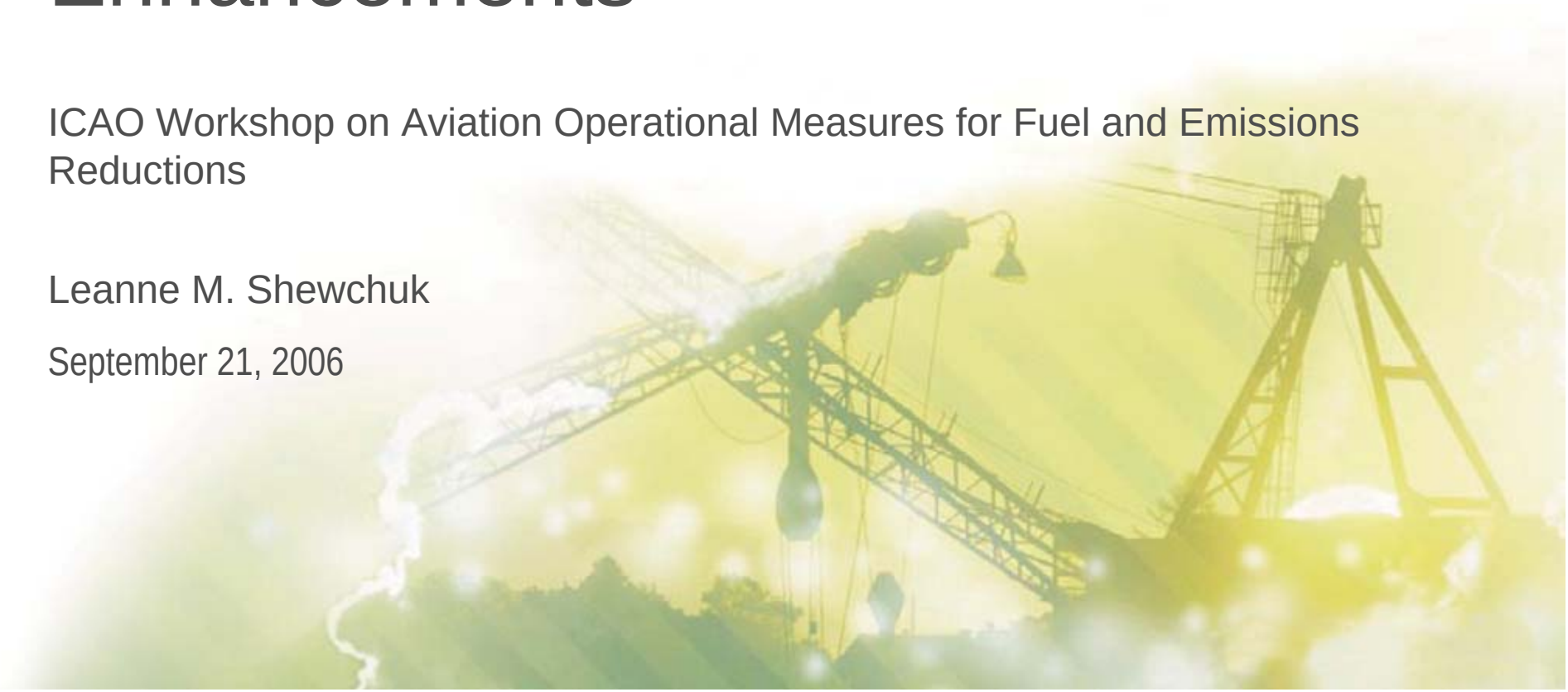
Leading Transportation Innovation and Growth

Airport Infrastructure Enhancements

ICAO Workshop on Aviation Operational Measures for Fuel and Emissions Reductions

Leanne M. Shewchuk

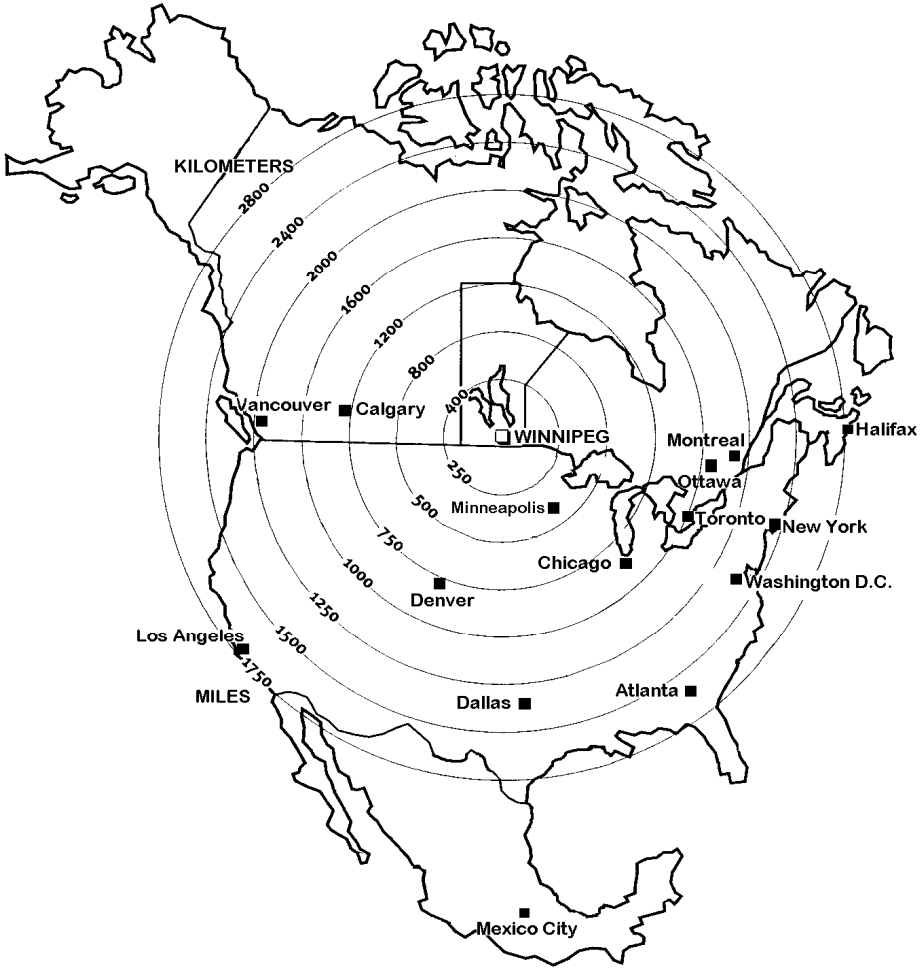
September 21, 2006



Winnipeg International Airport

- Mid sized Canadian Airport
- Service full range of aircraft type
- International, Transboarder
- Diverse stakeholders & interested parties
  - Airlines, operators
  - Local business
  - Community
  - Government

*environment is one focus



Success Factors

1. Plan ahead
   - capitalize on opportunities
   - efficient and cost effective implementation and
2. Accessible information and data
3. Financial incentives from government and utilities
   - reduce the risk factors with early adaptation
   - reduce the life cycle cost
4. Consider multiple aspects and viewpoints

Emissions Reduction Opportunities for Airports

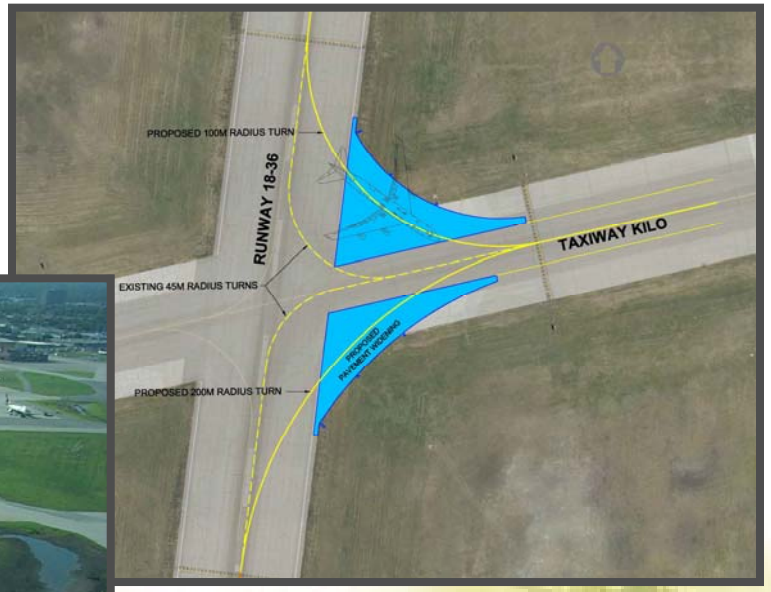
Infrastructure Enhancements

- Airfield
- Facilities
- Construction Practices
- Equipment and Vehicles

Airfield Infrastructure

Efficient airfield layout and configuration

- High speed runway exits
- Holding bays
- Taxiway configuration
- Central deicing facilities

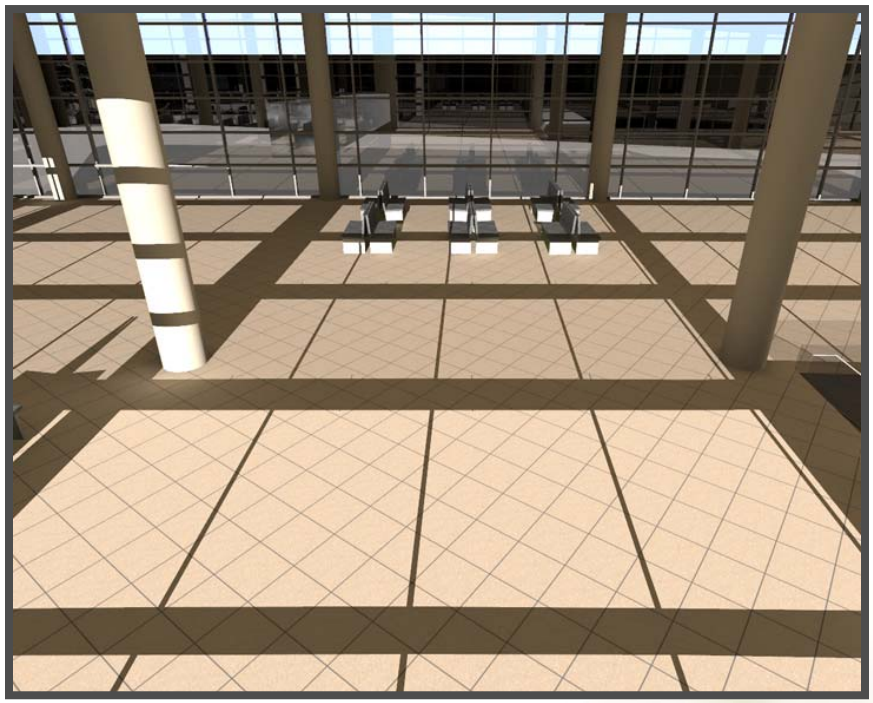


Facilities

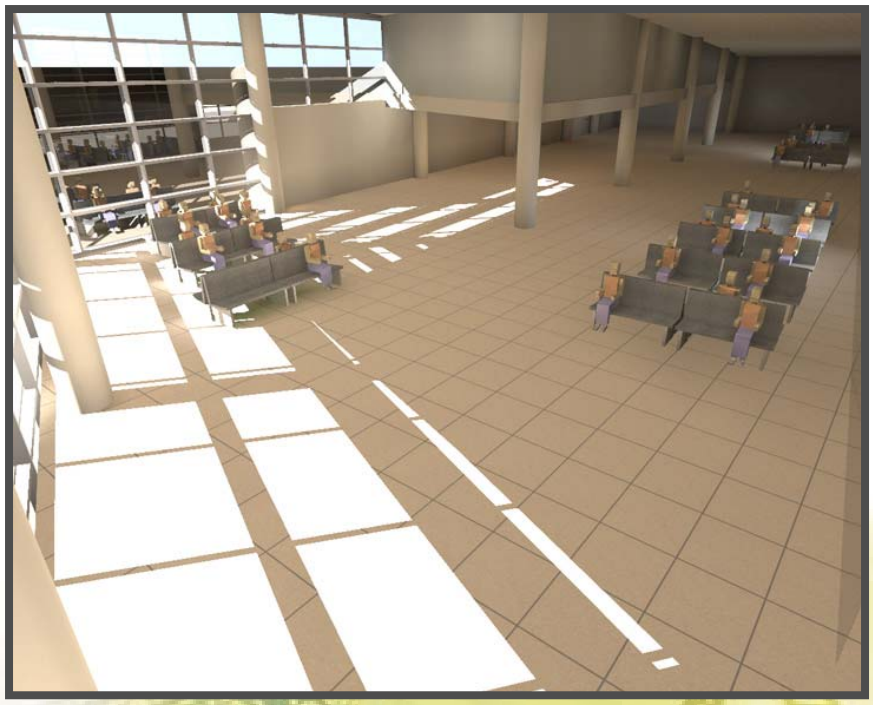
"The intent of the WAA is to strive for a high performance building for the Air Terminal Building where energy and environmental performance is achieved through a thoughtful design, and the application of modern technologies and building techniques."

Excerpt from WAA ASR Environmental Impact Assessment

Design Features of LEED ATB



Fritting and sun shades

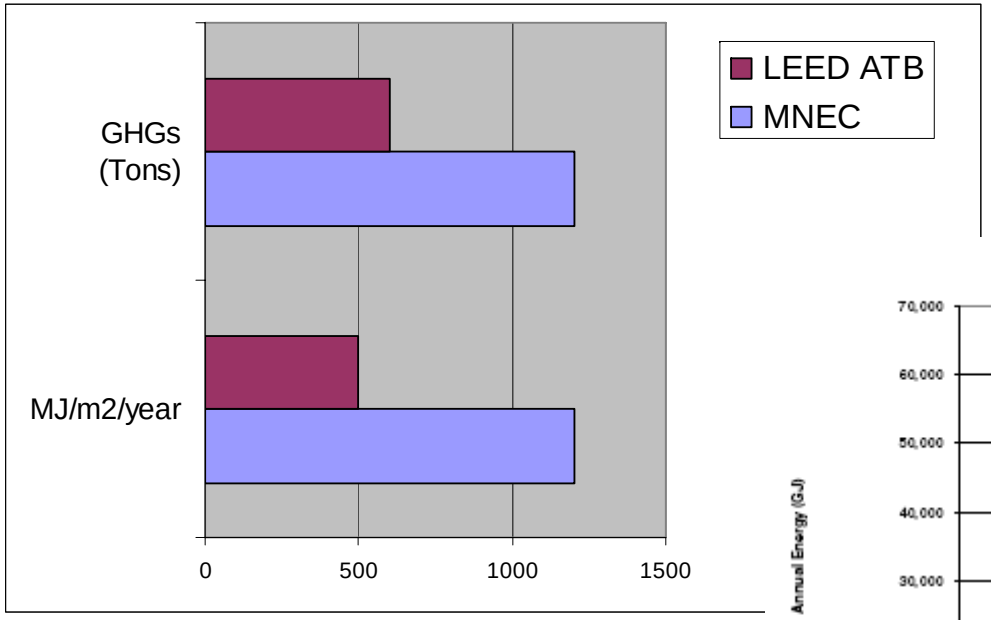


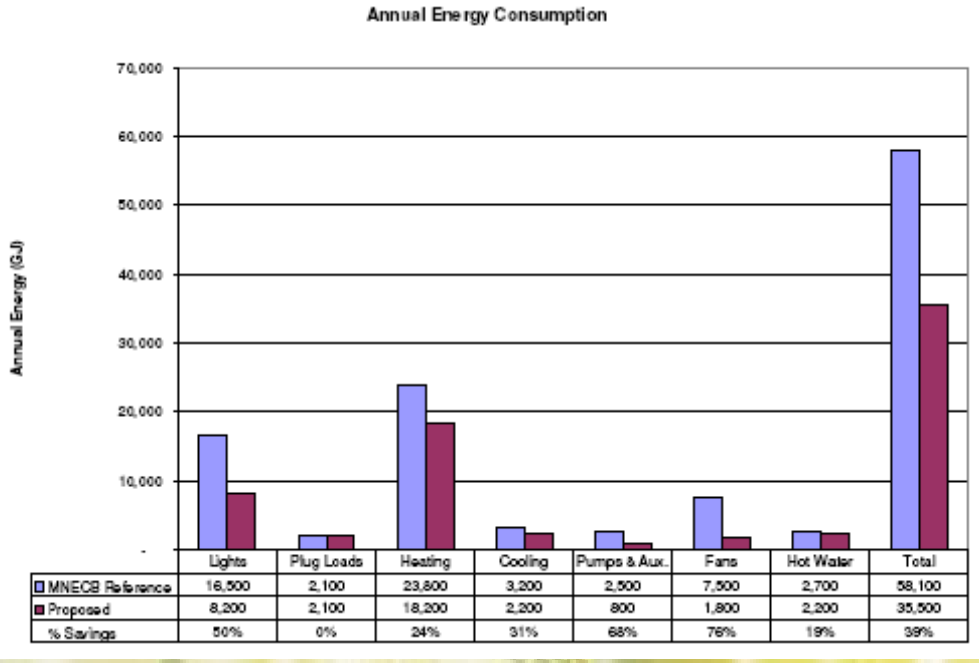
In-floor Radiant Heating along Windows

Energy Conservation Measures

- Ventilation Demand Control
- Heat rejection from process loads to heat other spaces
  - Retail: 50 tons
  - Baggage Scanners: 20 tons
  - Computer Servers: 20 tons
- High efficiency heat
  - 75% efficient exhaust air heat recovery on all systems
  - High efficiency heating plant 96% efficient condensing boiler

Modeled Range of Savings





	Lights	Plug Loads	Heating	Cooling	Pumps & Aux.	Fans	Hot Water	Total
MNECB Reference	16,500	2,100	23,800	3,200	2,500	7,500	2,700	58,100
Proposed	8,200	2,100	18,200	2,200	800	1,800	2,200	35,500
% Savings	50%	0%	24%	31%	68%	76%	19%	39%

Construction Practices

- Planning ahead
  - Environmental Protection Plans
  - Reusing and recycling materials on site to save hauling emissions
- Emissions Standards
  - Meet or exceed where appropriate and cost effective i.e. Asphalt plants

ESTIMATED HAULING EMISSIONS REDUCTIONS				
NOx	**SOx**	**CO**	**PM10**	**Hauling Offset**
117700	2140	24396	5136	10700 hrs

Equipment & Vehicles

–Fleet Vehicles
–At Bridge Units (FIP)

Emissions reductions (in kg)	GPU monthly	GPU annual	APU per month	APU annual
CO2	7,583	91,002	20,423	245,075
NOx	140,800	1,690	560	6,723
PM	8	96	24	287
CO	54	650	156	1,868

Looking Forward

- Celebrate successes to advertise accomplishments
- Keep the momentum with positive recognition
- Financial incentives
- **Must** respect community viewpoint and priorities. i.e.) noise and water quality

The greatest utility / benefits are going to be achieved working in partnership with each other