

# **Airport Environmental Management – An Overview**

**ICAO Environment Seminar  
1-2 April 2014  
Mexico City, Mexico**

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GAP**



# **Airport Environmental Management**

- 1. Noise**
- 2. Local Air Quality**
- 3. Greenhouse Gas Emissions**
- 4. Water**
- 5. Solid Waste**
- 6. Other Issues**



# **1 Noise - Overview**

## **Aircraft Noise Management**

- **Reducing actual noise levels using aircraft modernization and flight track management**

## **Land Use Planning**

- **Reducing the number of people subject to high noise levels**

## **Community and Communications**

- **Improving community understanding, attitudes and acceptance of airport activity**

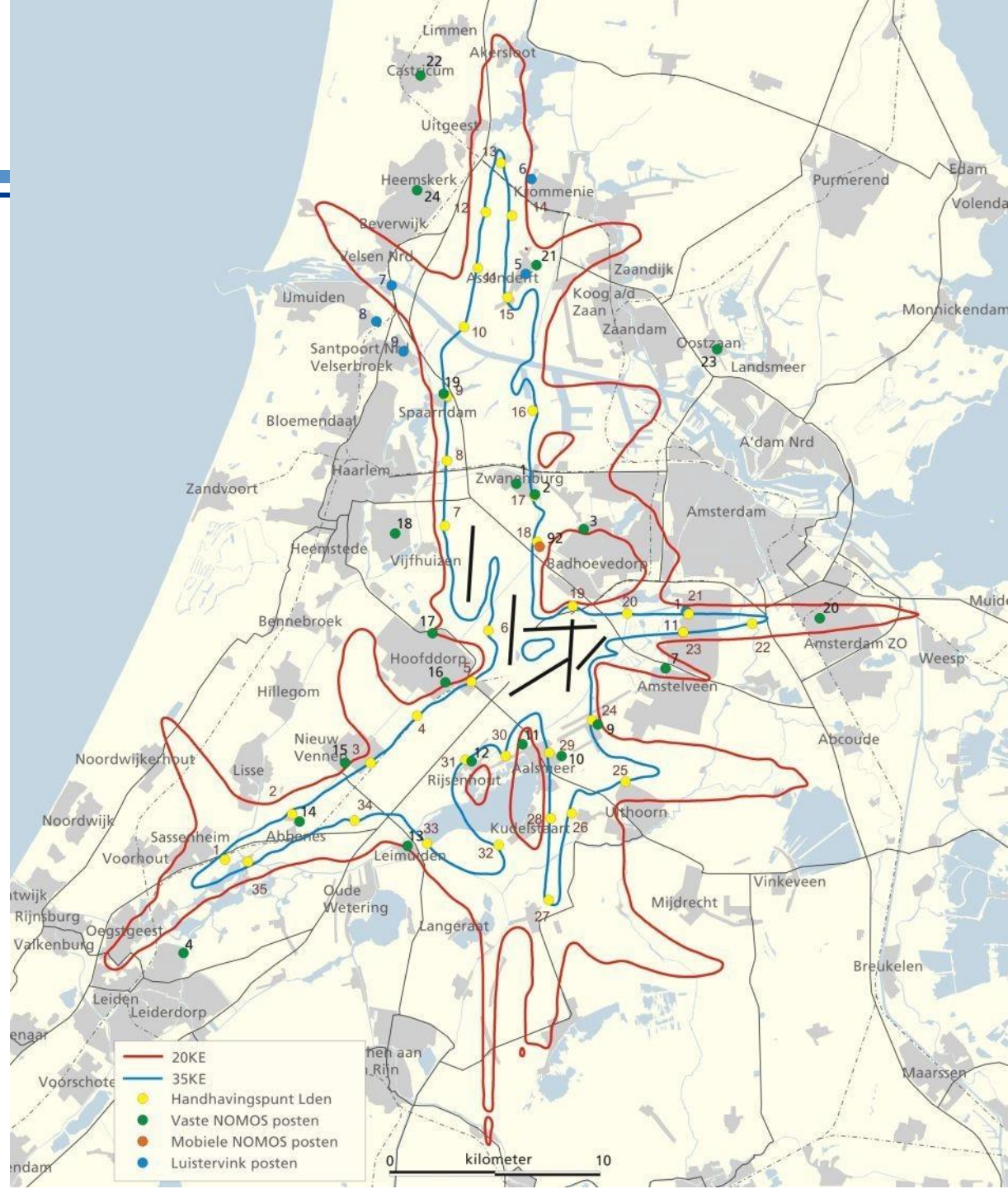


# 1 Noise

## Managing noise

- Runway use
- Tracks to avoid urban areas
- Modern aircraft fleet

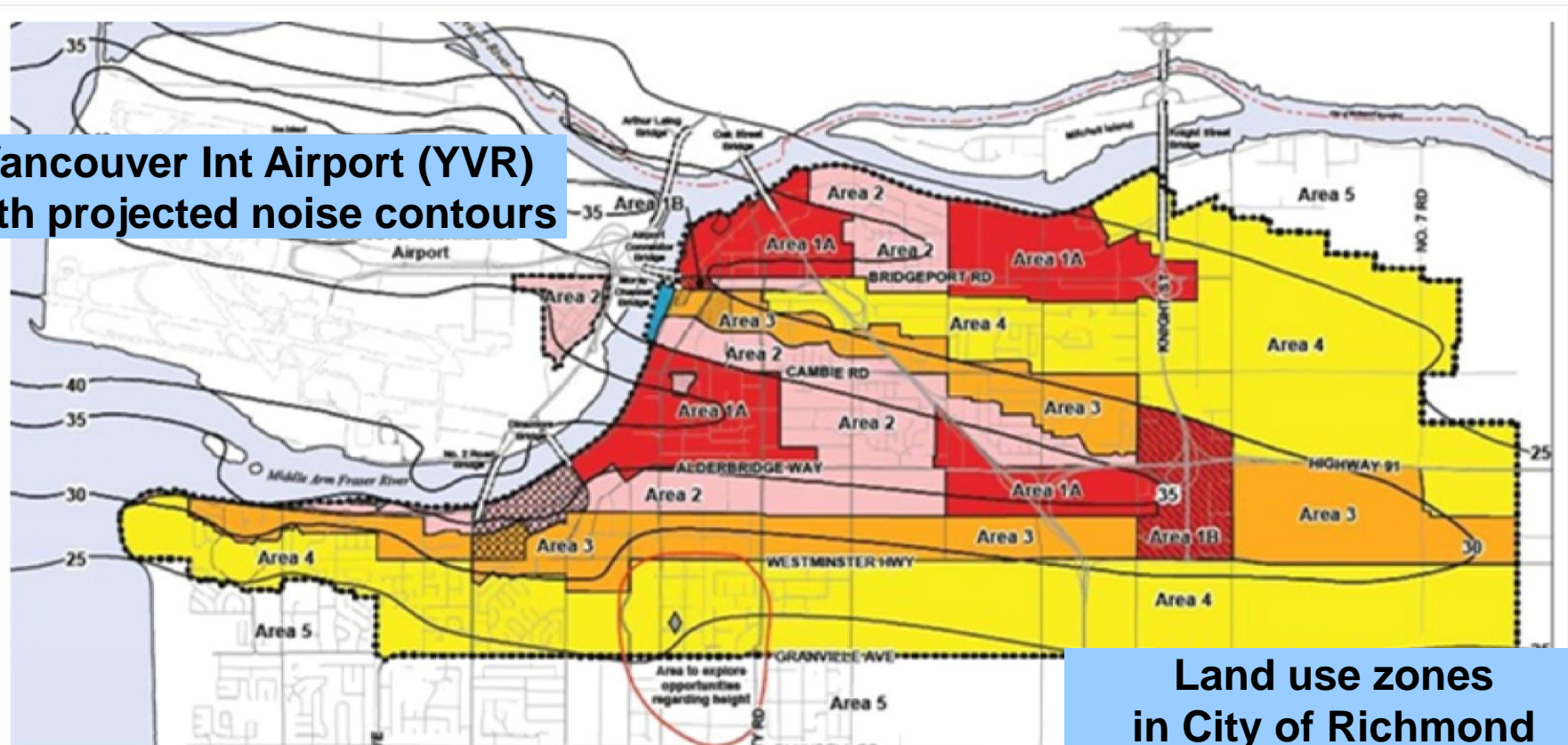
(Schiphol AMS)



# 1 Noise - Land Use Planning

- Local government authorities zone the land.
- Need to avoid residences, schools and hospitals in noise affected areas.

**Vancouver Int Airport (YVR)  
with projected noise contours**

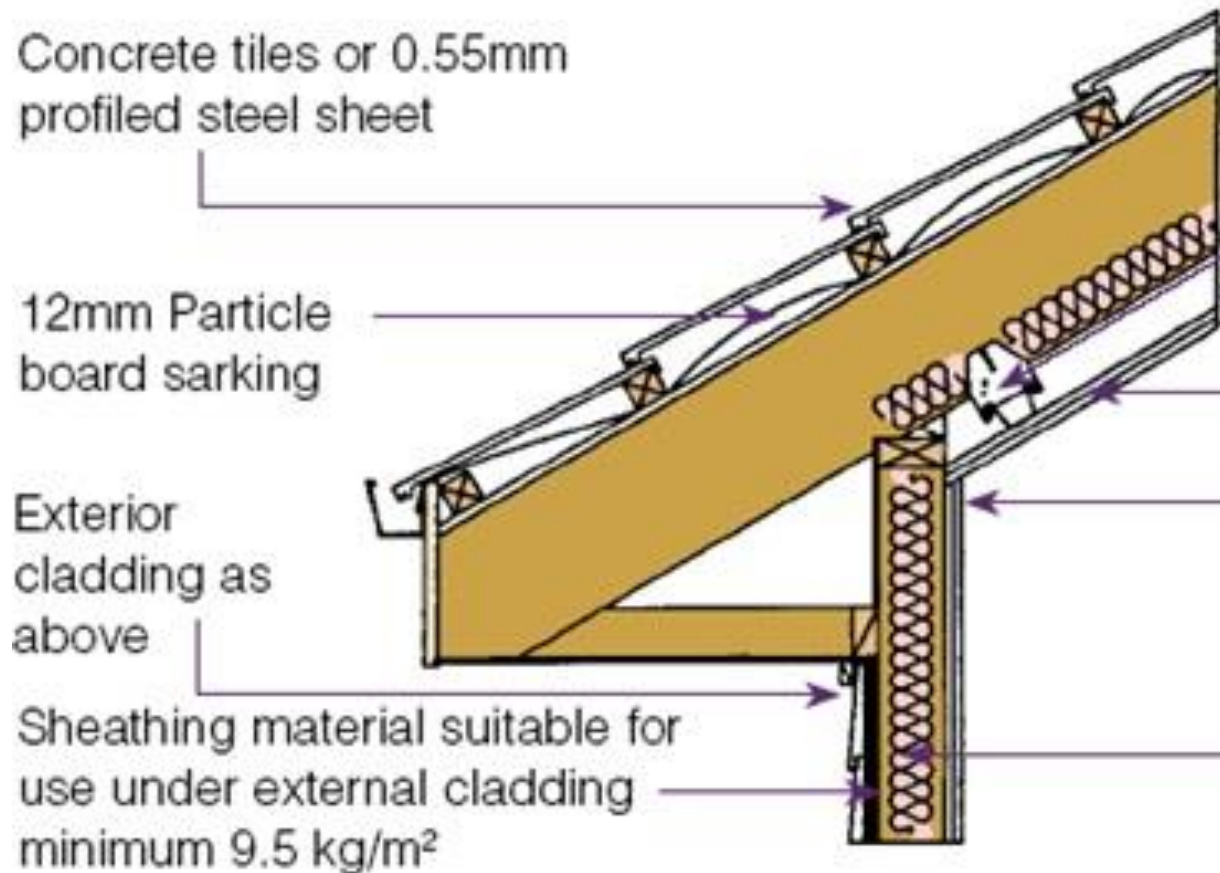


**Land use zones  
in City of Richmond**



## 1 Noise - Land Use Planning

### Sound insulation and ventilation of existing and new housing (only a partial solution)



# **1 Noise - Community and Communications**

- **Informing and interacting with communities**
- **Airport website**
- **Managing complaints and noise forums**
- **Focus on Sustainability elements – Impacts and Benefits on Environment, Society and Economics**
- **Noise-tracking web sites**
- **Clear, transparent and up to date information**

# 1 Noise Tracking Websites

## WebTrak

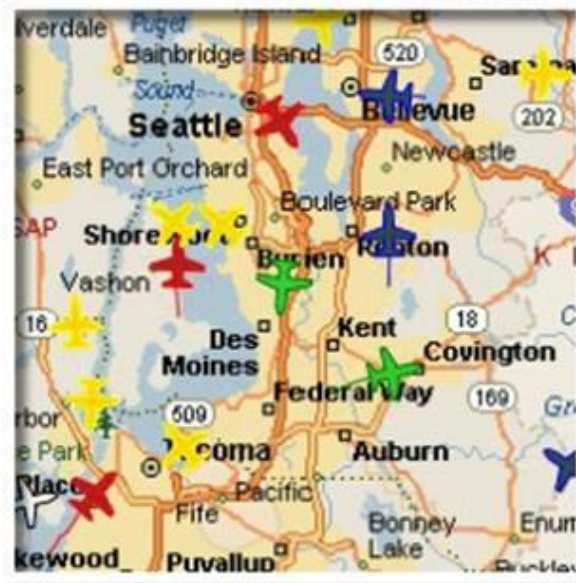
Airports are increasingly realizing that community engagement is more and more important to the operations of the airport. The growing challenge is how to manage this continuous engagement to realize the best results for both the general public and the airport.

**Lochard has launched the first in a series of low-risk subscription services aimed at improving and maintaining valuable dialogue with the airport's external stakeholders. This takes the pressure off your operations team and eases the pressure for your management team.**

WebTrak provides live aircraft movements. It gives the community access to flight and noise data and reduces the need and time for airport employees to explain where aircraft actually fly, how often, who they are and where they go.

[Read more...](#)

PRINT 



### Visit WebTrak Sites



**Heathrow**



**Gatwick**



**Seattle**



**Sacramento**

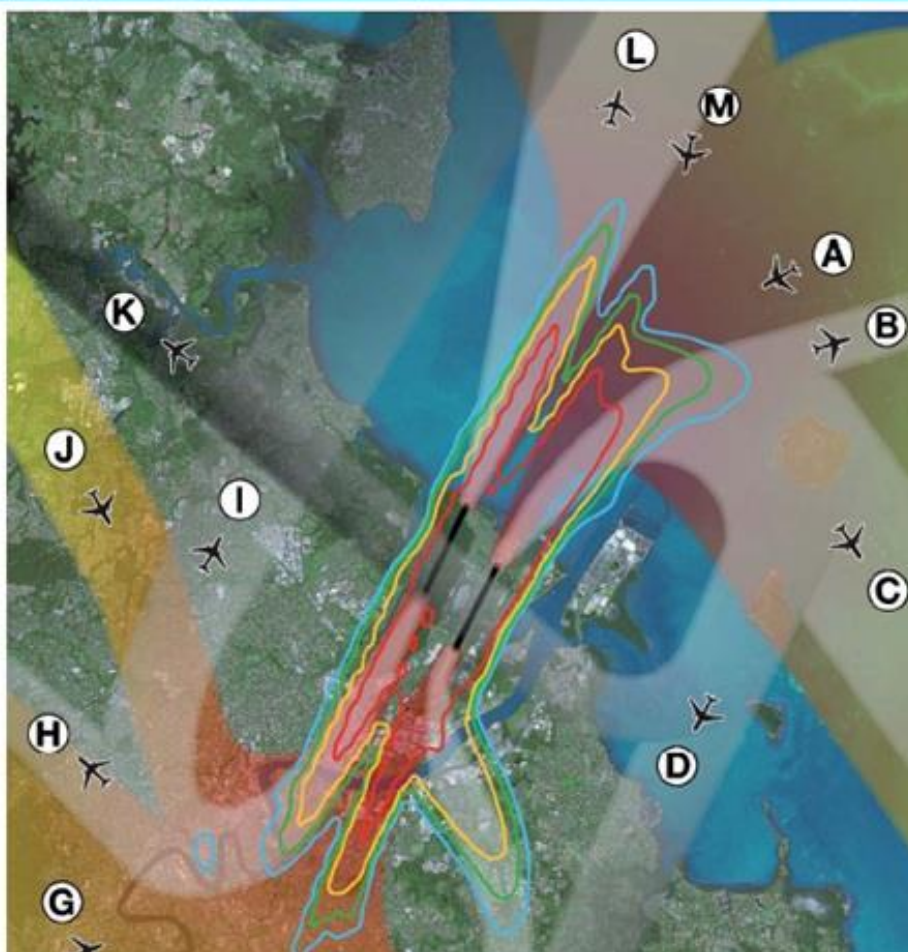
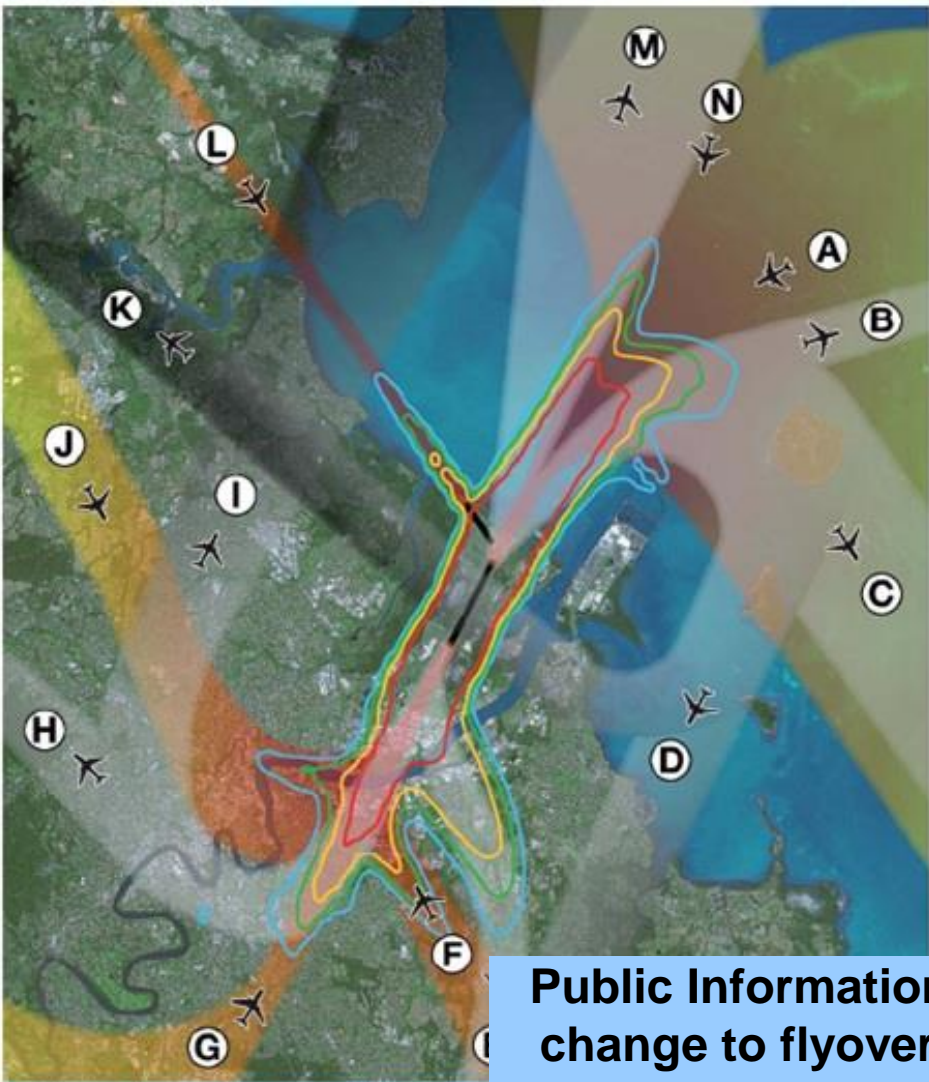


**San Jose**



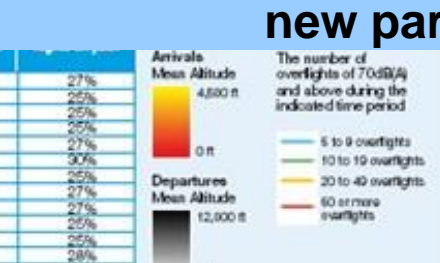
**Stansted**



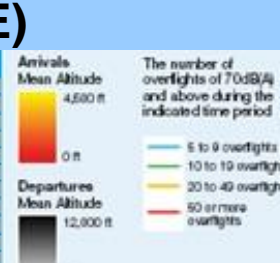


Public Information: Graphics to demonstrate the expected change to flyovers with and without the construction of a new parallel runway at Brisbane (BNE)

Flight path	Flight type	Average number of jet flights on flight path	Expected minimum and maximum numbers of jet flights on path	Percentage of Brisbane Airport total jet flights on path
A	Arrival	60	0 - 133	16%
B	Departure	1	0 - 2	<1%
C	Departure	7	0 - 13	2%
D	Departure	59	0 - 110	16%
E	Departure	66	0 - 122	17%
F	Arrival	46	0 - 108	12%
G	Arrival	28	0 - 177	8%
H	Departure	9	0 - 19	2%
I	Departure	21	0 - 47	6%
J	Arrival	23	0 - 53	6%
K	Departure	3	0 - 6	1%
L	Arrival	1	0 - 2	<1%



Flight path	Flight type	Average number of jet flights on flight path	Expected minimum and maximum numbers of jet flights on path	Percentage of Brisbane Airport total jet flights on path
A	Arrival	57	0 - 135	15%
B	Departure	11	0 - 22	3%
C	Departure	7	0 - 13	2%
D	Departure	64	0 - 110	17%
E	Departure	53	0 - 125	14%
F	Arrival	62	0 - 126	17%
G	Arrival	7	0 - 69	2%
H	Departure	7	0 - 17	2%
I	Departure	16	0 - 46	5%
J	Arrival	22	0 - 53	6%
K	Departure	5	0 - 10	1%



## **2 Local Air Quality (LAQ) - Overview**

### **Regulations/Guidance**

- **Permitted air quality pollutant levels**

### **Inventory**

- **Identify sources and quantities of emissions**

### **LAQ Assessment**

- **Monitoring pollutant concentrations**
- **Modelling dispersion – source to receptor**

### **Mitigation of Sources**

- **Actions to reduce emissions**

## 2 LAQ – Regional Regulation

**Example limits on local pollutant concentrations –  
µg/m<sup>3</sup>**

	SO <sub>2</sub>		NO <sub>2</sub>		CO		PM10	
	1 hr	1 yr	1 hr	1yr	1 hr	8 hr	1 d	1 yr
<b>WHO</b>	<b>125</b>	<b>-</b>	<b>200</b>	<b>40</b>	<b>30</b>	<b>10</b>	<b>-</b>	<b>-</b>
<b>EU</b>	<b>350</b>	<b>20</b>	<b>200</b>	<b>40</b>	<b>-</b>	<b>10</b>	<b>50</b>	<b>40</b>
<b>Australia</b>	<b>520</b>	<b>50</b>	<b>220</b>	<b>50</b>	<b>-</b>	<b>10</b>	<b>50</b>	<b>-</b>
<b>Brazil</b>	<b>-</b>	<b>90</b>	<b>320</b>	<b>100</b>	<b>40</b>	<b>10</b>	<b>150</b>	<b>-</b>
<b>Canada</b>	<b>900</b>	<b>60</b>	<b>400</b>	<b>100</b>	<b>35</b>	<b>15</b>	<b>-</b>	<b>-</b>



## 2 LAQ – Assessment - Measurement for Compliance

### Monitoring (measuring) pollutant concentrations

- Compliance with regulated limits



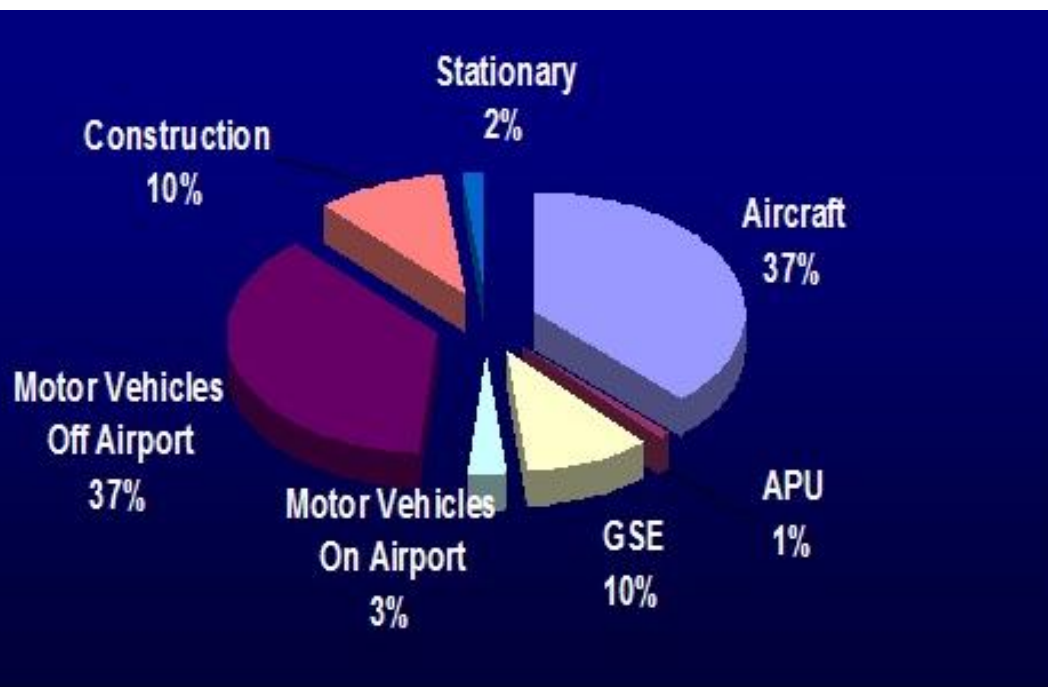
Red = points of non-compliance



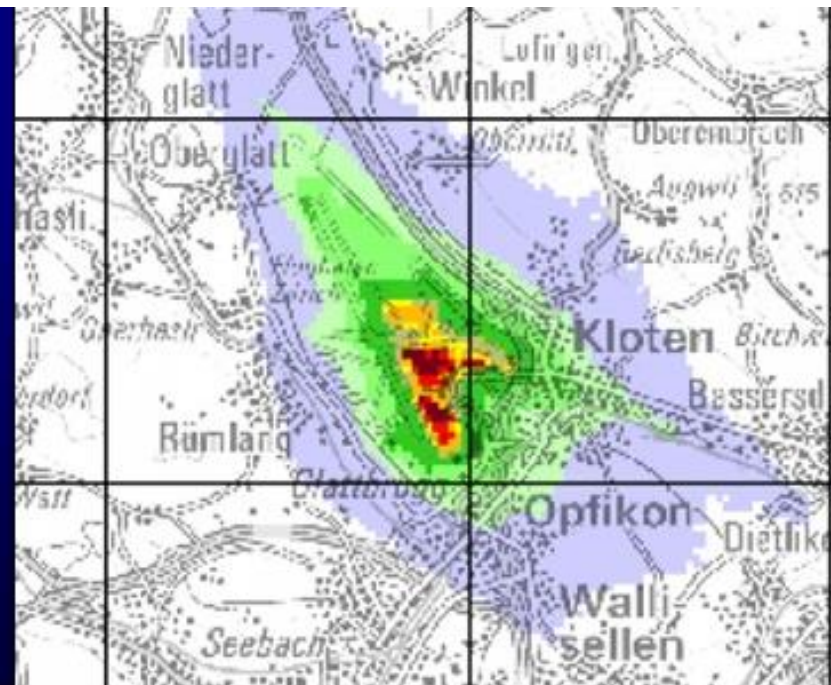
## 2 LAQ – Modelling and Source Apportionment

### Modelling (calculating) pollutant concentrations

- Inventory of emissions sources
- Calculating physical and chemical dispersion
- Source apportionment



Inventory of NOx Emissions



Calculated NOx Concentrations (ZRH)

## 2 LAQ Mitigation – Reducing Emissions

**Providing fixed electrical power (400Hz) and pre-conditioned air to aircraft at terminal gates replaces APU usage and allows engine switch-off.**



## 2 LAQ Mitigation – Reducing Emissions

**Automated metro line  
between terminals  
and train station  
replaces shuttle  
buses for 140 000  
PAX per day.**

**Reduction of 2500 t  
CO<sub>2</sub> and 15 t NO<sub>x</sub> per  
year.**

**(Paris CDG)**





## 2 LAQ Mitigation – Reducing Emissions

**Ground vehicle fleet replacement – CNG, SULEV, Hybrid and Electric vehicles.**

**Rapid recharge station for Electric Vehicles  
(DFW Dallas Fort Worth)**





## **3 Greenhouse Gas Emissions Management**

**ACI Guidance Manual**

**ACERT Inventory Tool**

***Airport Carbon Accreditation***

- Certification of achievements**

**More detail will be provided in the ICAO State Action  
Plan Workshop tomorrow.**

## 3 GHG Guidance Manual

- Emissions Categories  
– Scopes 1, 2, and 3
- Inventory
- Goal Setting
- Reducing emissions
- Carbon Neutrality
- Reporting and Certification

Also ES and FR

[www.aci.aero](http://www.aci.aero)



### Guidance Manual: Airport Greenhouse Gas Emissions Management



## 3 GHG Inventory



**ACERT v2.0**

**Do-It-Yourself Airport  
Emissions Inventory Tool**

**Developed by ACI and  
Transport Canada**

**Free, no expertise  
required**

**Email: [acert@aci.aero](mailto:acert@aci.aero)**

### Airport Carbon and Emissions Reporting Tool ACERT

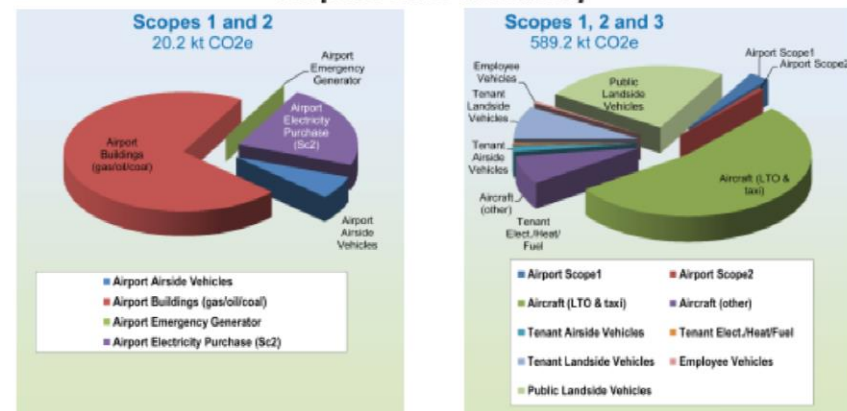
SEA 2011

Airport: Seattle-Tacoma International Airport Country: United States Aircraft mvmts: 314,947  
Report Date: 18/6/2012 Ems Factor: 31.3 g CO<sub>2</sub>/kWh Passengers: 32,819,798

Entity	Source	Scope	Greenhouse Gases (t)					CO <sub>2e</sub> %
			CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2e</sub>	CO <sub>2e</sub> %	
Airport Operator	Airport Airside Vehicles	1	1,212	0.25	0.10	1,249	0.2%	
	Airport Buildings (gas/oil/coal)	1	14,421	0.26	0.03	14,435	2.4%	
	Airport Emergency Generator	1	16	0.00	0.00	17	0.0%	
	Airport Electricity Purchase	2	4,537			4,537	0.8%	
			<b>Airport Operator Sub-total</b>					<b>3.4%</b>
Tenants (including airlines, government, shops etc.) and Employees	Tenant Aircraft (LTO & taxi)	3	307,489	9.66	27.82	316,316	53.7%	
	Tenant Aircraft APU	3	42,149	1.32	3.81	43,359	7.4%	
	Tenant Aircraft Engine Run-ups	3	456	0.01	0.04	469	0.1%	
	Tenant Aircraft De-icing	3	0			0	0.0%	
	Tenant Airside Vehicles	3	8,947	1.73	0.74	9,211	1.6%	
	Tenant Buildings (gas/oil/coal)	3	2,827	0.03	0.03	2,837	0.5%	
	Tenant Electricity Purchase	3	-			-		
	Tenant Fire Training	3	48	0.08	0.39	170	0.0%	
	Tenant Landside Vehicles	3	48,411	17.22	4.04	50,024	8.5%	
	Airport Employee Vehicles	3	3,142	1.14	0.26	3,246	0.6%	
			<b>Tenant Sub-total</b>					<b>72.2%</b>
Public (including Passengers)	Ground Access	3	126,643	40.71	10.57	130,776	22.2%	
	Cars, taxi	3	12,181	1.05	0.99	12,510	2.1%	
	Bus, shuttles Rail	3	22	-	-	22	0.0%	
			<b>Public Sub-total</b>					<b>24.3%</b>
<b>TOTAL</b>			<b>Total CO<sub>2e</sub> Emissions (t)</b>					<b>100%</b>
<b>Summary</b>			<b>589,180</b>					
Airport Scope 1			15,701	2.66%				
Airport Scope 2			4,537	0.77%				
Airport Scope 3			568,942	96.57%				

The aircraft emissions calculations were based on generic aircraft data.  
The landside traffic calculations were based on estimated traffic data.  
(\* Data for illustration only)

### Airport GHG Inventory



### THANKS

ACERT was initially developed by Transport Canada and its consultant EBA with the Canadian Airports Council.  
A global version was developed with the further assistance of Zurich Airport and Toronto Pearson Airport.

### 3 GHG - *Airport Carbon Accreditation*

Carbon management standard designed for the airport industry.

#### Level 1: Mapping

- Inventory of airport emissions



#### Level 2: Reduction

- Mitigation of airport-owned emissions



#### Level 3: Optimisation

- Involving stakeholders in emissions reduction



#### Level 3+: Neutrality

- Offsetting residual airport emissions



[www.airportcarbonaccreditation.org](http://www.airportcarbonaccreditation.org)

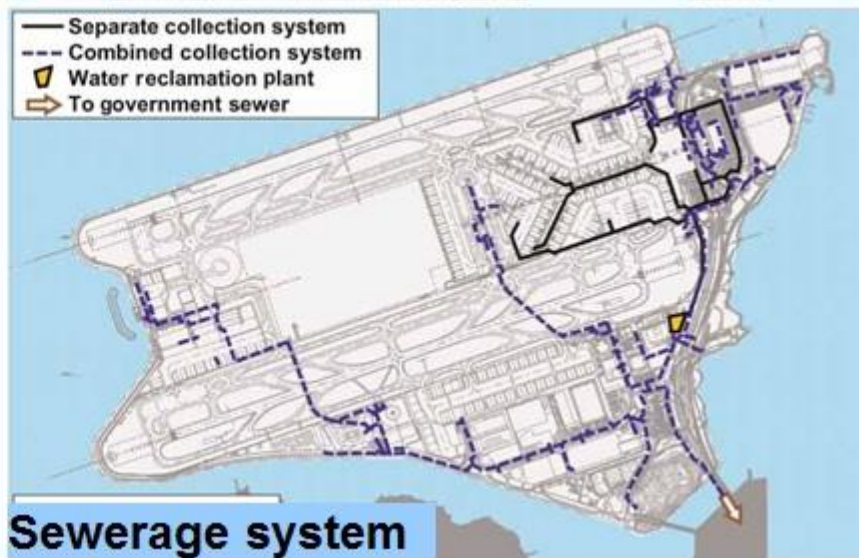
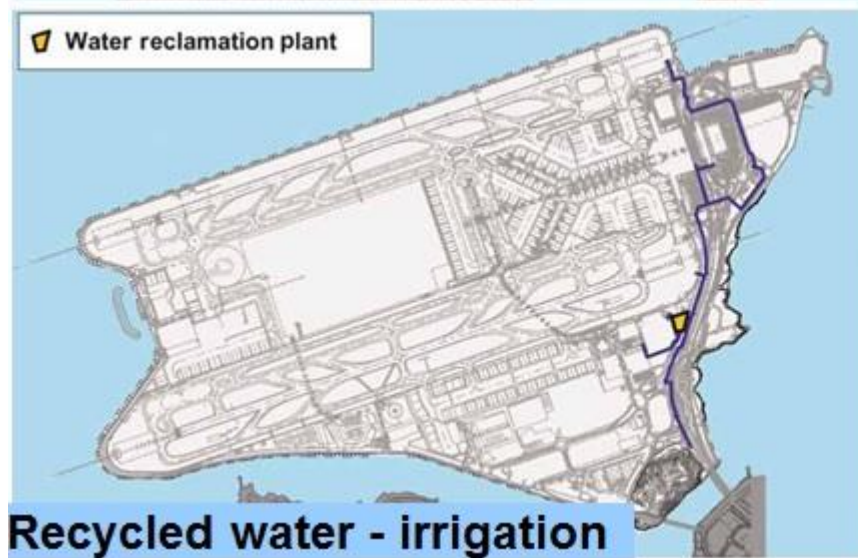
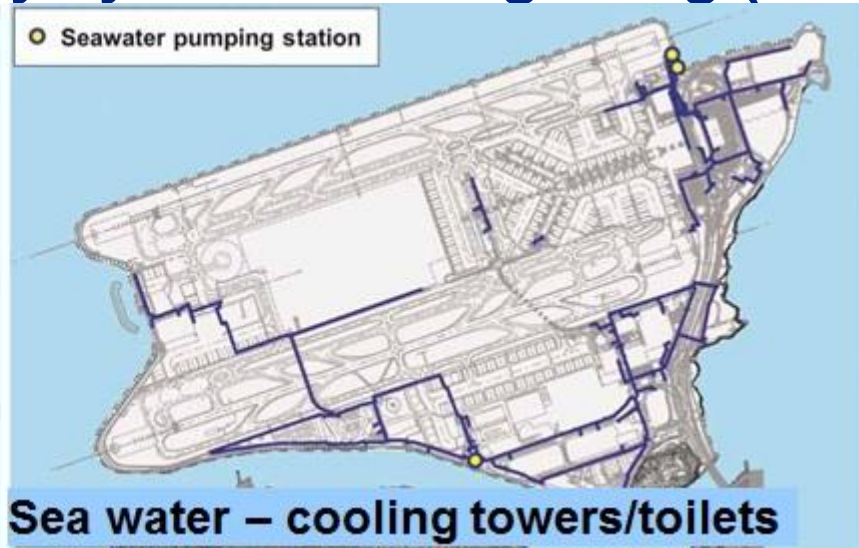
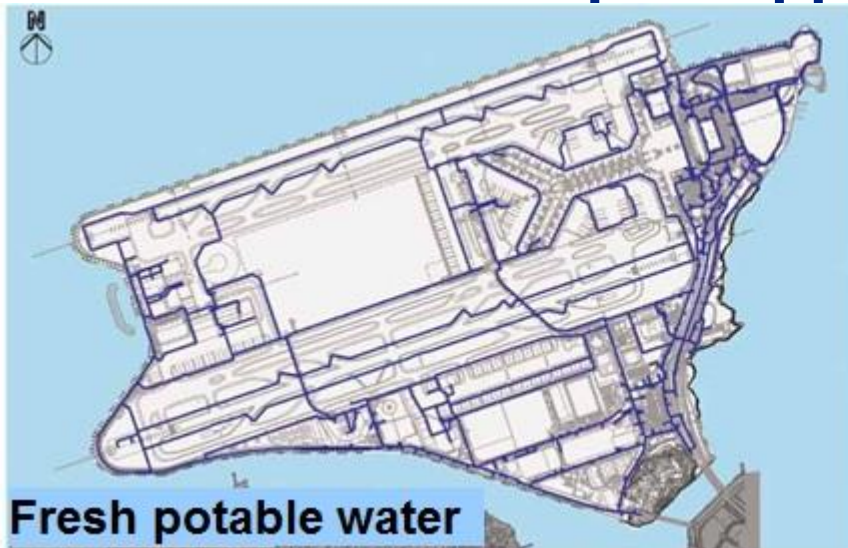


### ***3 Airport Carbon Accreditation***

- **Launched by ACI Europe in 2009**
- **Also available in Asia-Pacific and Africa regions**
- **ACERT v2.0 approved for *Airport Carbon Accreditation* Level 1 (Mapping) and Level 2 (Reduction)**
- **Independently administered**



## 4 Water - Use - Triple supply system at Hong Kong (HKG)





## 4 Water – Storm Water Management – SeaTac (SEA)

- Capture
- Storage
- Treatment
- Outflow control



## 5 Waste Management

Identifying waste streams

- Terminal, deplaned, office, maintenance
- Hazardous materials

Reducing waste production

- Awareness





## 5 Waste Management

### Waste Hierarchy

#### Reuse Recycling

- Paper, cardboard, aluminium, composting



## 6 Other Environmental Matters

### Planning and Development

- Wildlife and habitat
- Historical and archeological issues

### Emergency Planning and Response

- Hazardous Materials
- Spill Management
- Soil and water contamination

### Proactive Environmental Initiatives

- Operating and life-cycle costs
- Occupational Health and Safety

**Gracias  
Thanks**

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