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AVIATION OPERATIONAL MEASURES FOR FUEL AND EMISSIONS REDUCTION WORKSHOP

Ambient Air Quality at Airports

Leonard Taylor

President

Tradewind Scientific Ltd

Airport Panel – Part 2
Ottawa, 5-6 November 2002

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Air Quality Monitoring at Major Airports

- Background & Objectives
- Monitored Parameters – Criteria Pollutants
- Measurement Methodology
- Data Analysis
- Overview of Canadian Data – Last 20 Years
- Future Programs – New Technology

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The Airport Physical Environment

The Physical Environment – Monitoring and Compliance

Air Quality

Surface Water Quality

Noise

Soil and Groundwater

Air Quality Issues

- Climate Change.
- Smog.
- Acidifying Emissions.
- Ozone Depleting Substances.

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Airport Operations Affecting Air Quality

- Aircraft Activities

  *fueling, cleaning, maintenance.

- Non-aircraft Activities

  *terminal operations, heating plants, vehicles maintenance, road access.

- Other Sources of Pollutants

  *passenger vehicles traveling to and from the airport

  *heating/power plants

  *incinerators

  *firefighter training

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Airport Air Quality Monitoring
Principal Parameters

1. Carbon Monoxide
2. Nitrogen Dioxide and Nitric Oxide
3. Ozone
4. Suspended Particulates (TSP, PM10)
5. Sulphur Dioxide
6. Hydrocarbons, Volatile Organic Compounds
7. Wind Direction & Speed

Regulatory Measures

Environmental:

- Federal - Environmental
- Provincial / State
- Local

Contaminant	Concentration Units	Duration or Interval	Environment Canada Guidelines			MOE Criteria
			Maximum Desirable	Minimum Acceptable	Maximum Tolerable	
Carbon Monoxide	mg/m3	8 hour 1 hour	6 15	15 35	20 -	15.7 36.2
Nitrogen Dioxide	ug/m3	annual 24 hour 1 hour	60 - -	100 200 400	- 300 1000	- 200 400
Ozone	ug/m3	annual 24 hour 8 hour 1 hour	- 30 - 100	30 50 - 160	- - - 300	- - - 165
Sulphur Dioxide	ug/m3	annual 24 hour 3 hour 1 hour	30 150 - 450	60 300 - 900	- 800 - -	55 276 - 690
Particulate Matter (PM)	ug/m3	annual 24 hour	60 -	70 120	- 400	60 120

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Design of Airport Air Quality Studies

- Monitoring vs. Modeling
- Site Selection
- Instrumentation Systems
- Data Collection Requirements
- Analysis and Interpretation

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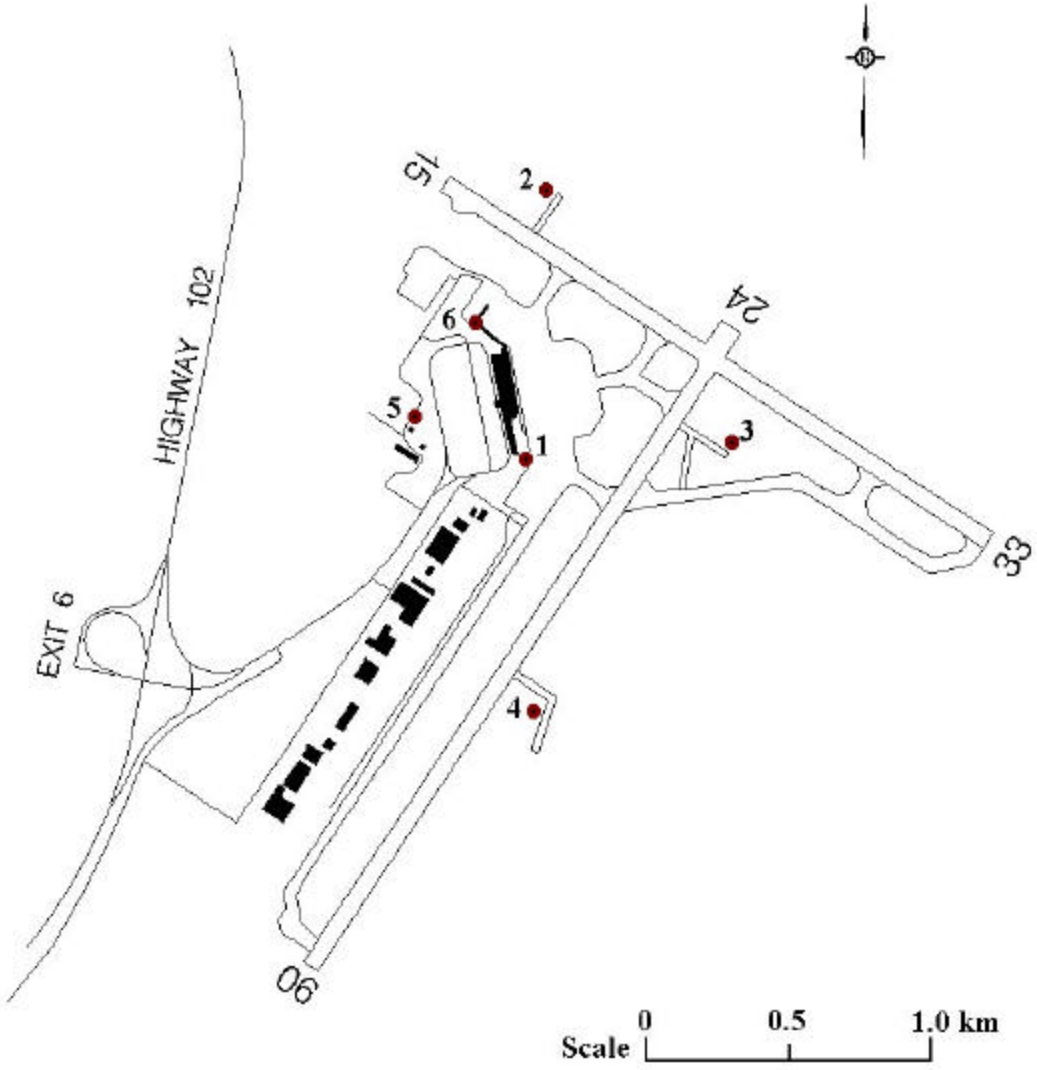
Monitoring Site Selection



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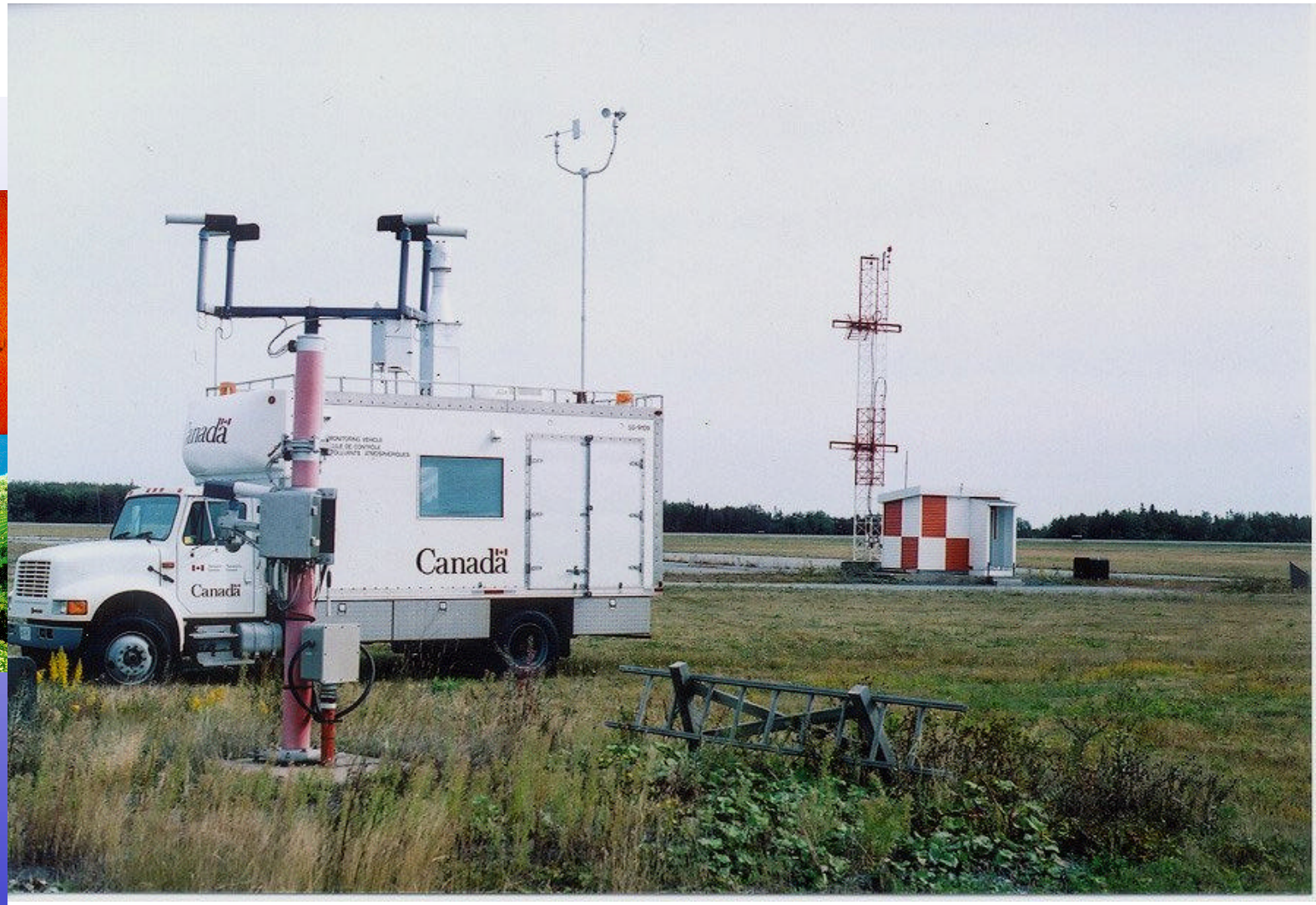
TC Mobile Air Quality Lab



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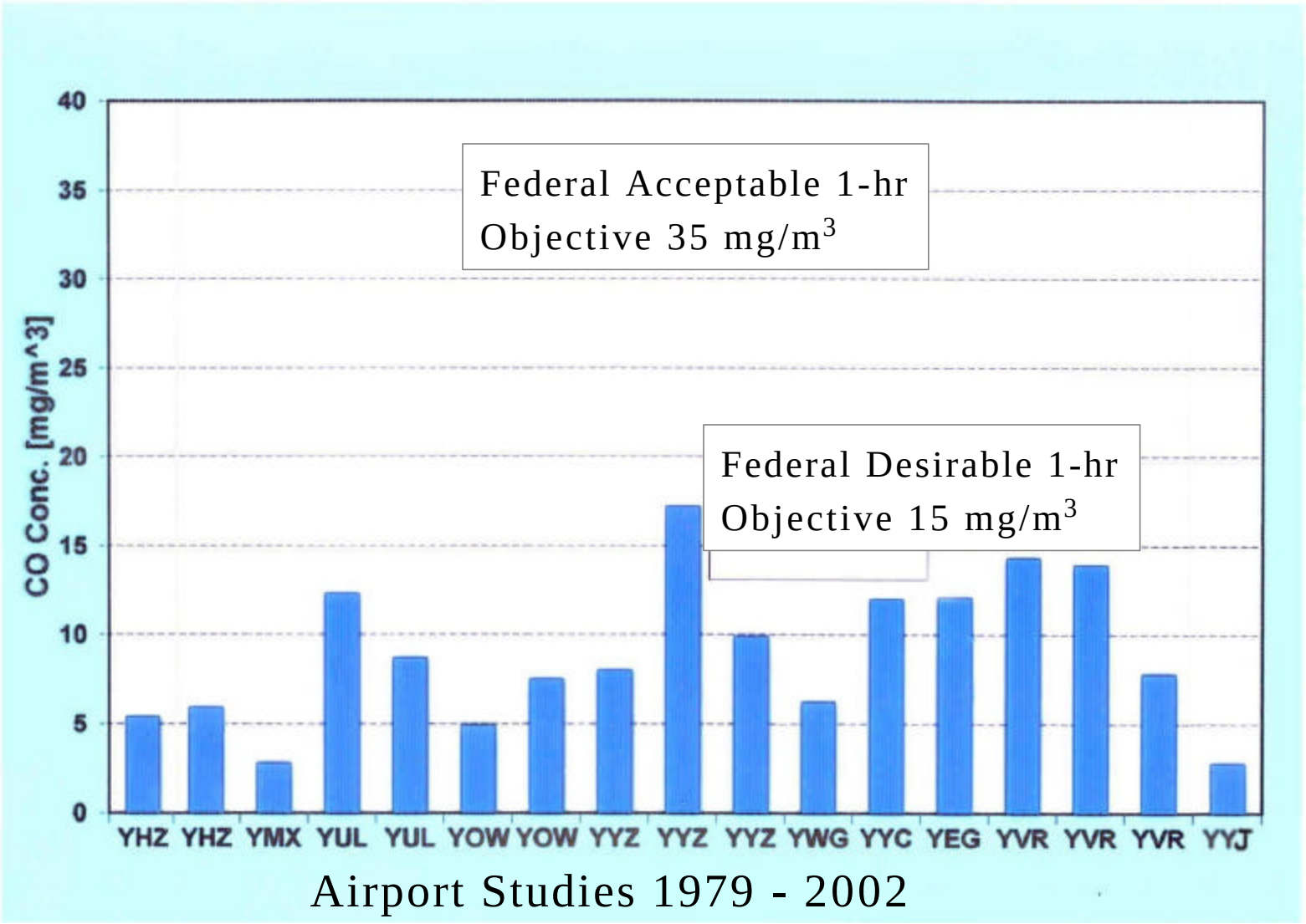
1- hour Maximum Carbon Monoxide Concentrations at Canadian Airports



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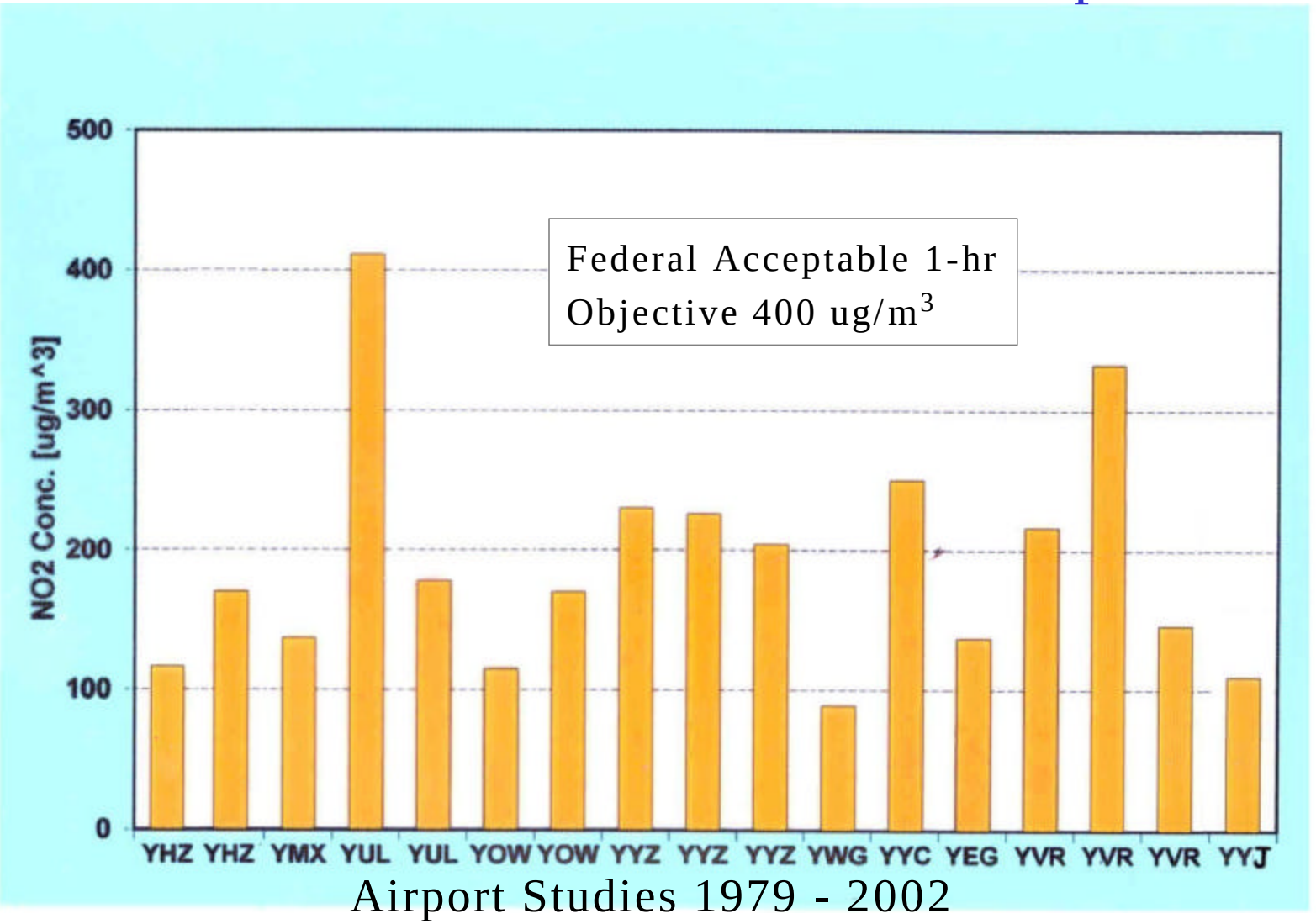
1 – Hour Maximum Nitrogen Dioxide Concentration at Canadian Airports



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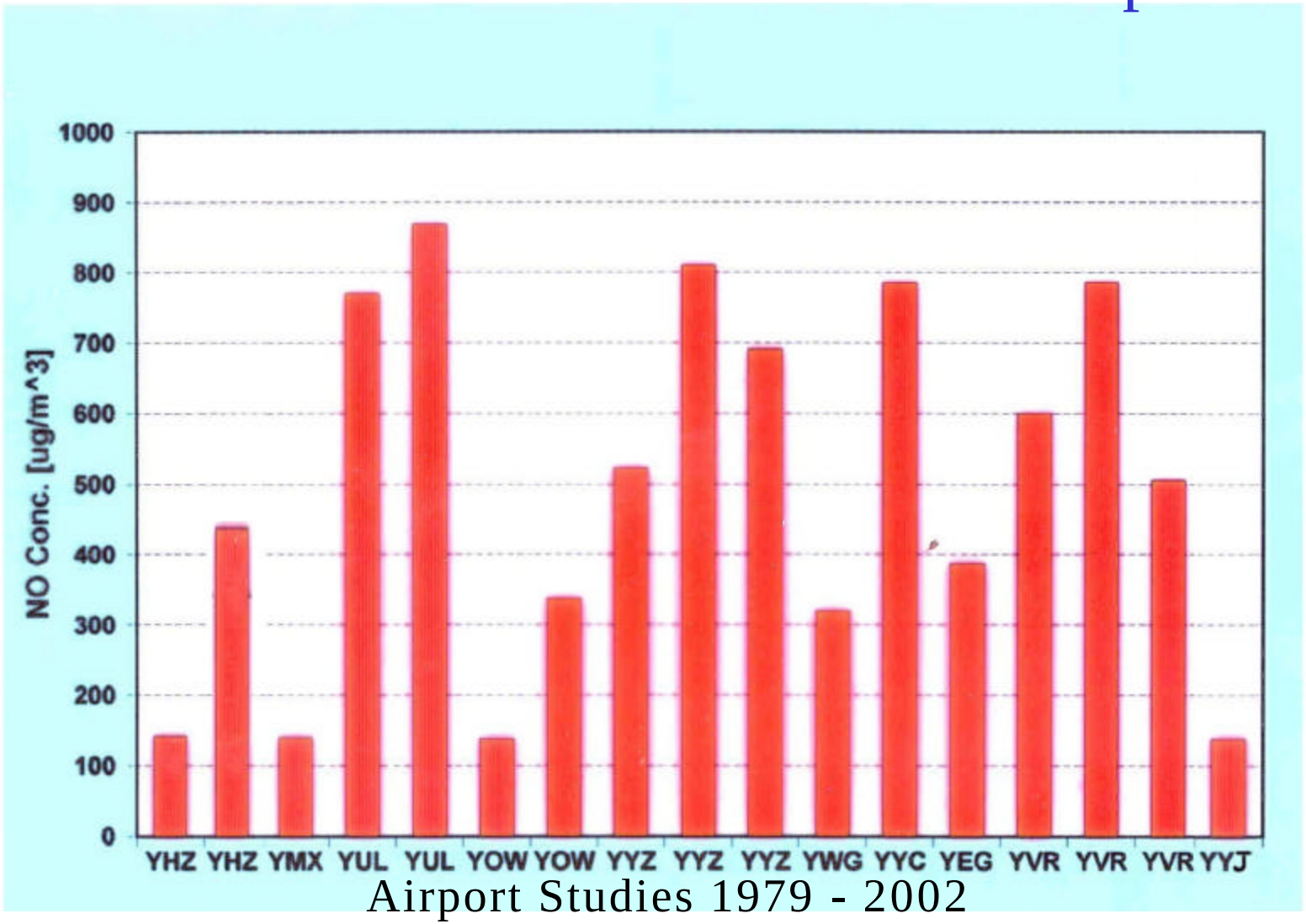
1 – hour Maximum Nitric Oxide Concentrations at Canadian Airports



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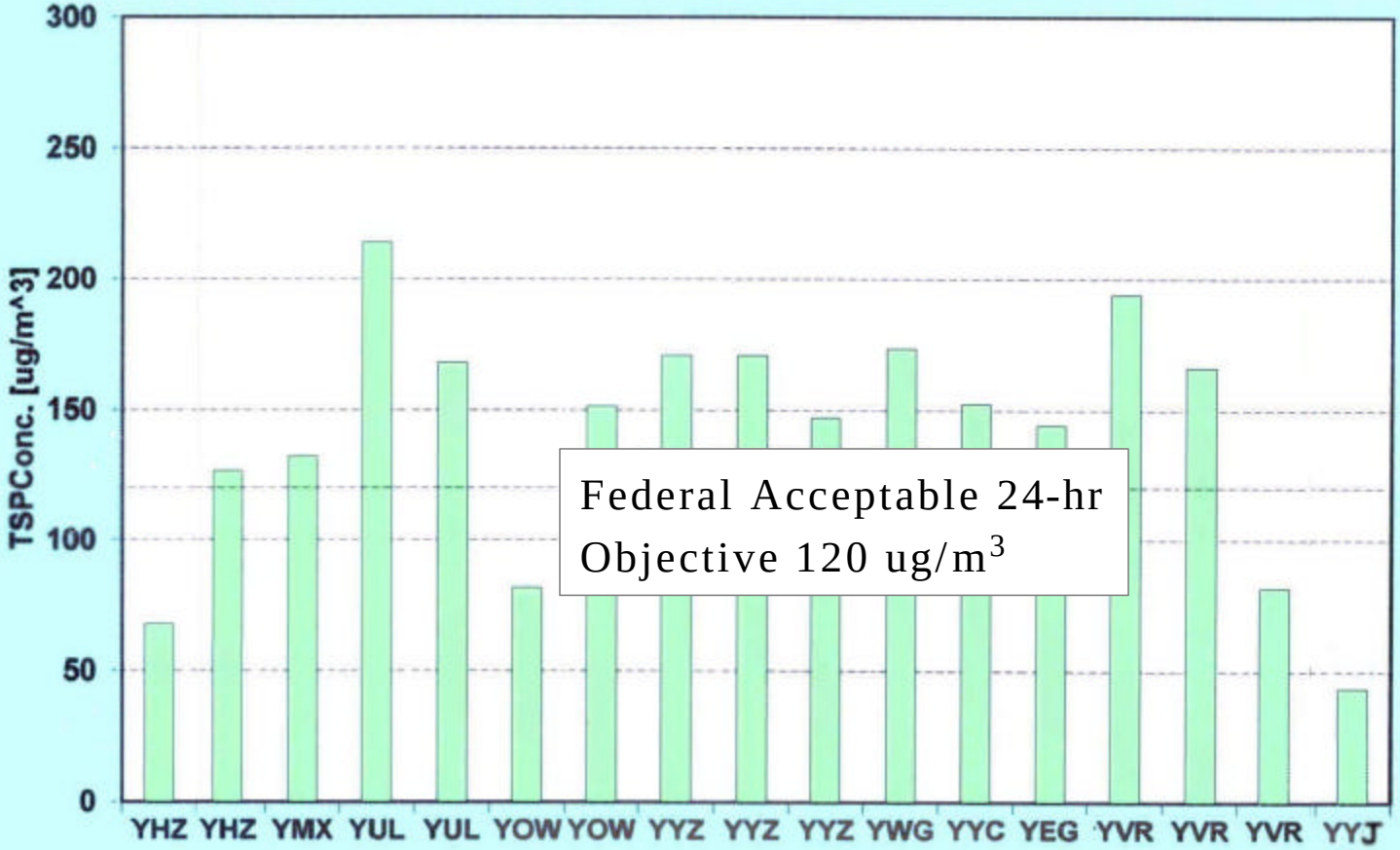
24 – Hour Average TSP Concentrations at Canadian Airports



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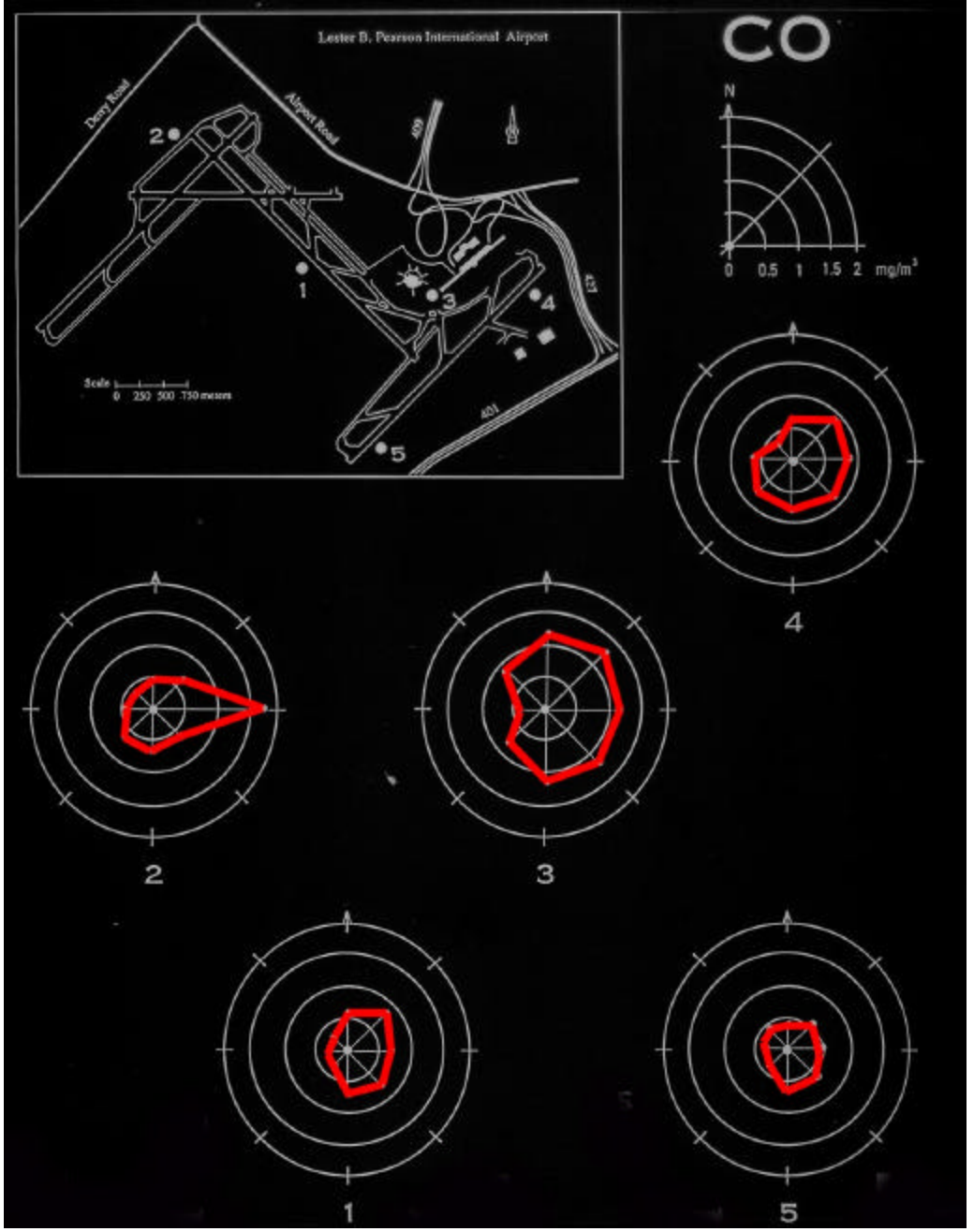

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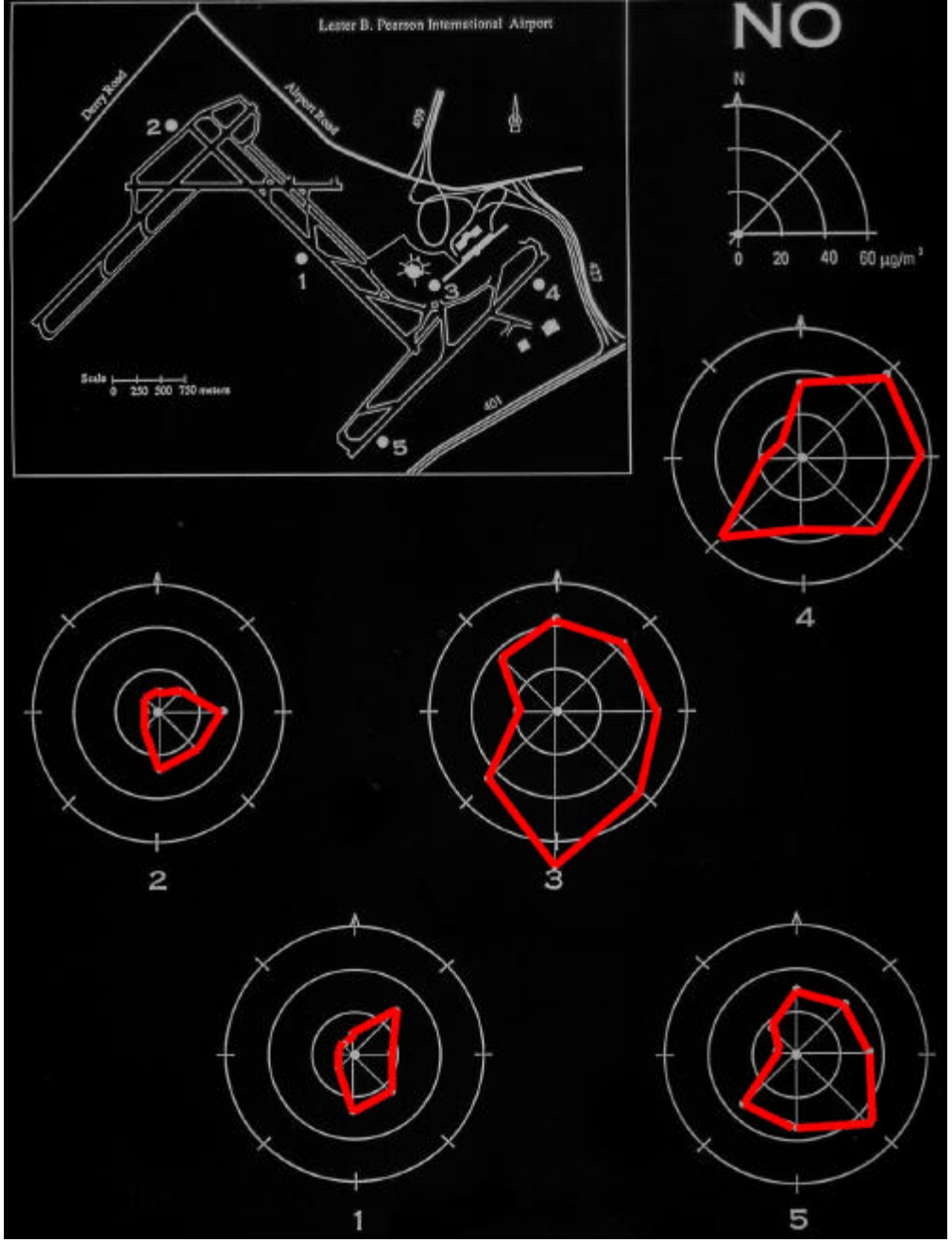

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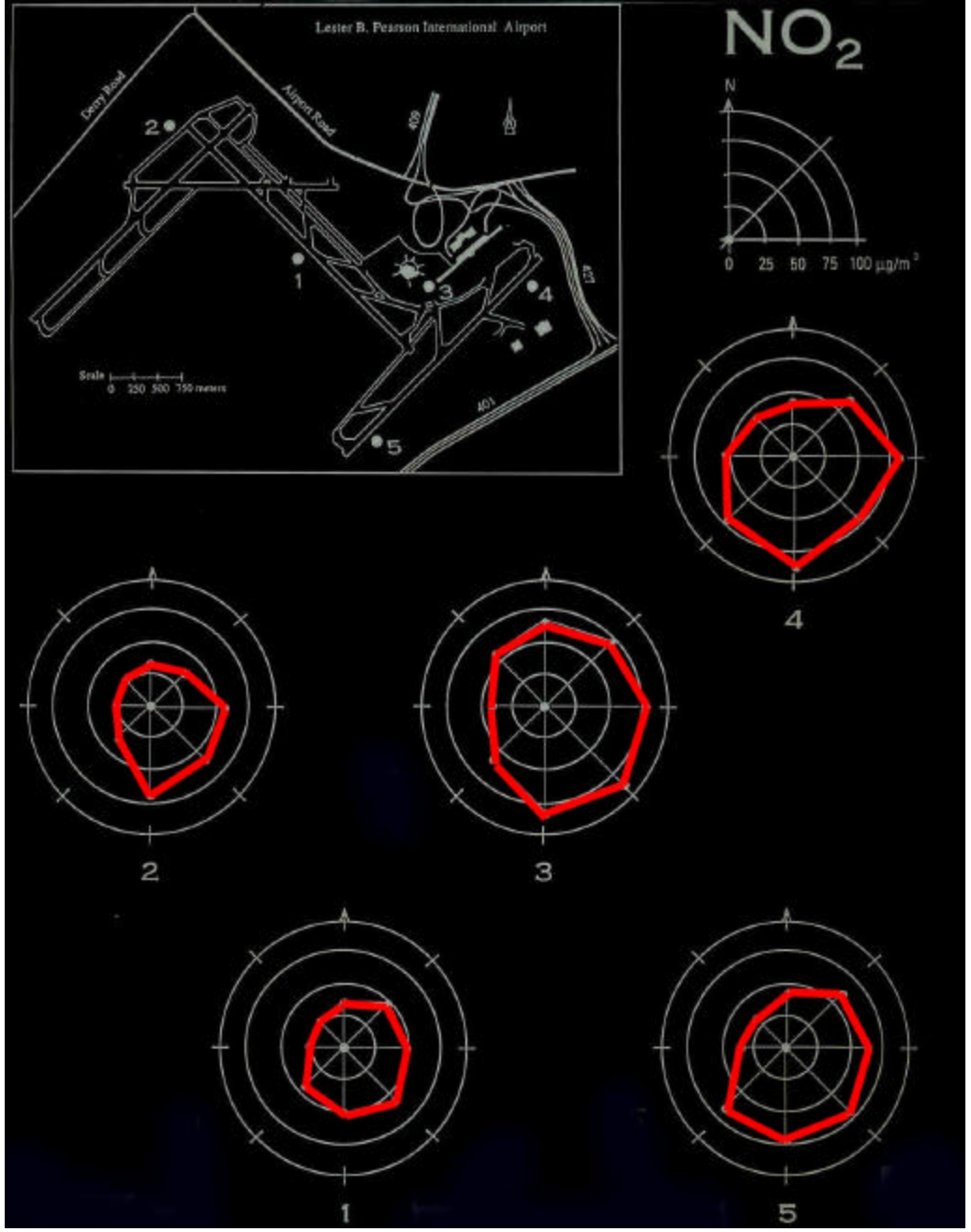

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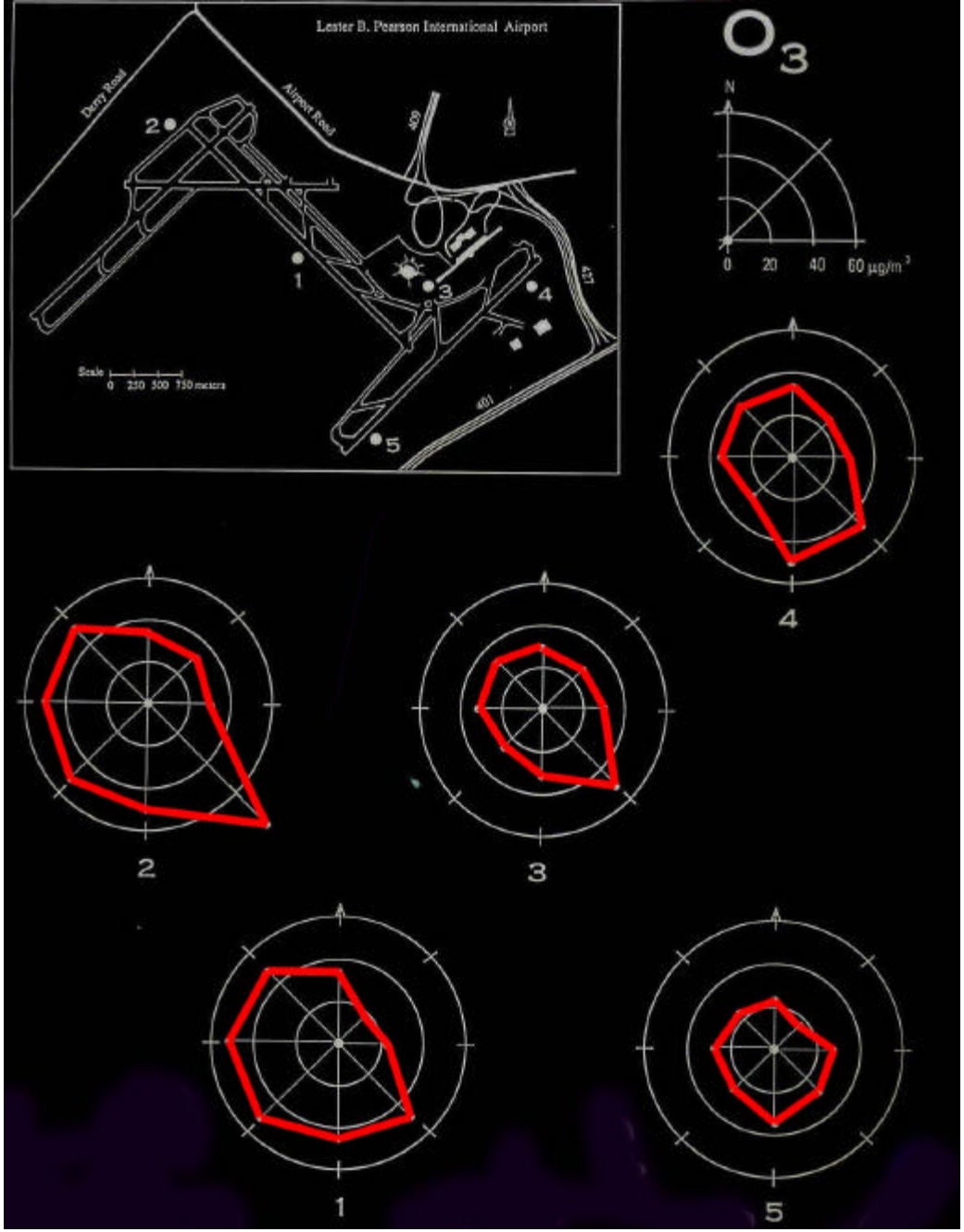

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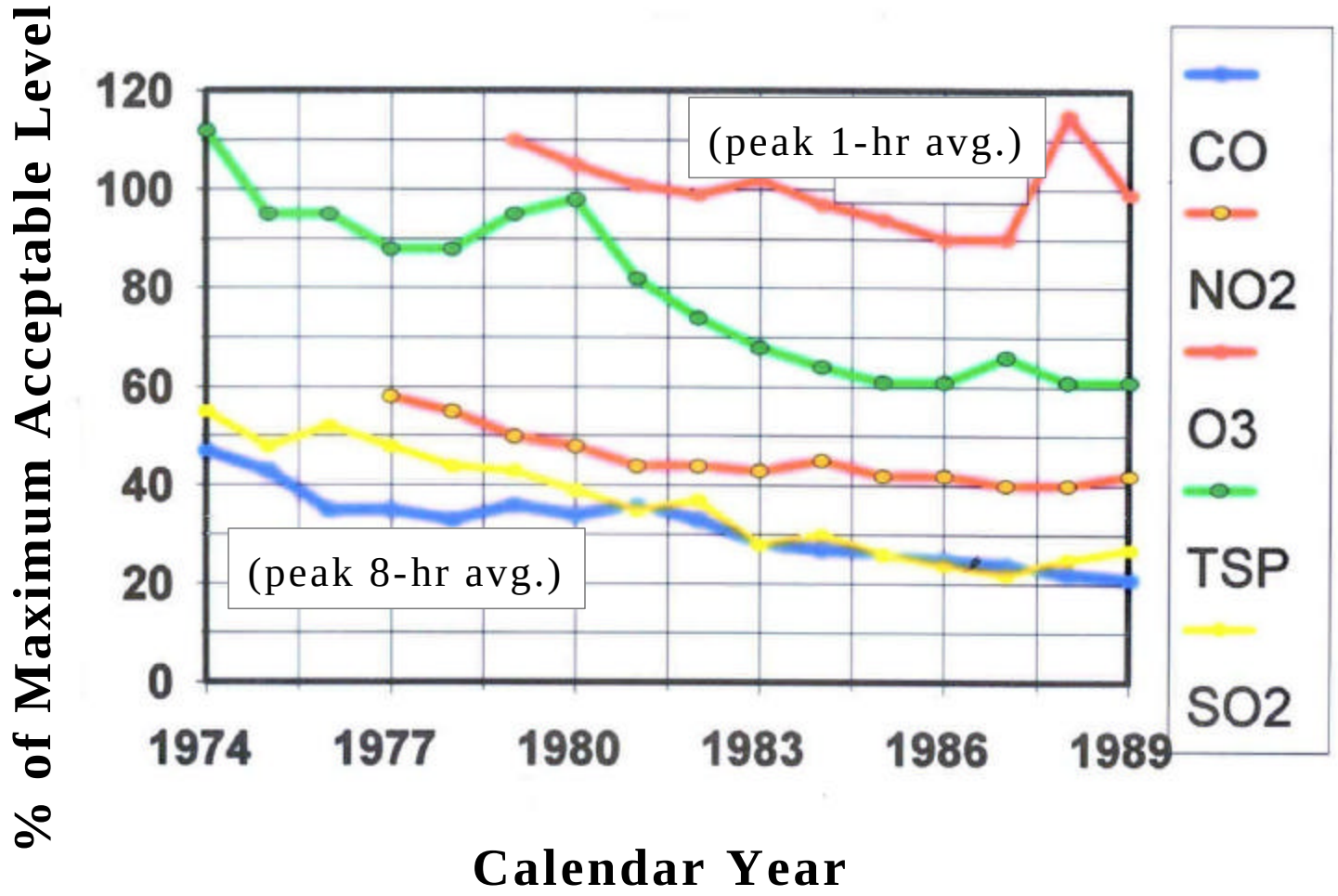
Trends in Canadian Air Quality 1974 – 89 (Annual Avg. except CO & O_3)



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Air Quality Monitoring at Major Airports

- Airport Air Quality at most sites compares favourably with that of surrounding metropolitan areas.

- Exceedences of National Air Quality Objectives are infrequent for carbon monoxide and nitrogen dioxide; more common for ozone and suspended particulates.

- Present activities at major airports do have a measurable impact on air quality; however this effect is often small in comparison to the urban area emissions.

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Air Quality Monitoring at Major Airports (Cont.)

- Highest concentrations for all pollutants except ozone are recorded near main terminal apron and access traffic areas.
- The long-term trends in Canadian urban air quality indicate stable or decreasing emissions of major pollutants; airports may have to implement corresponding mitigative measures.
- Airport air quality monitoring can provide substantial objective data in support of air quality management Programs.

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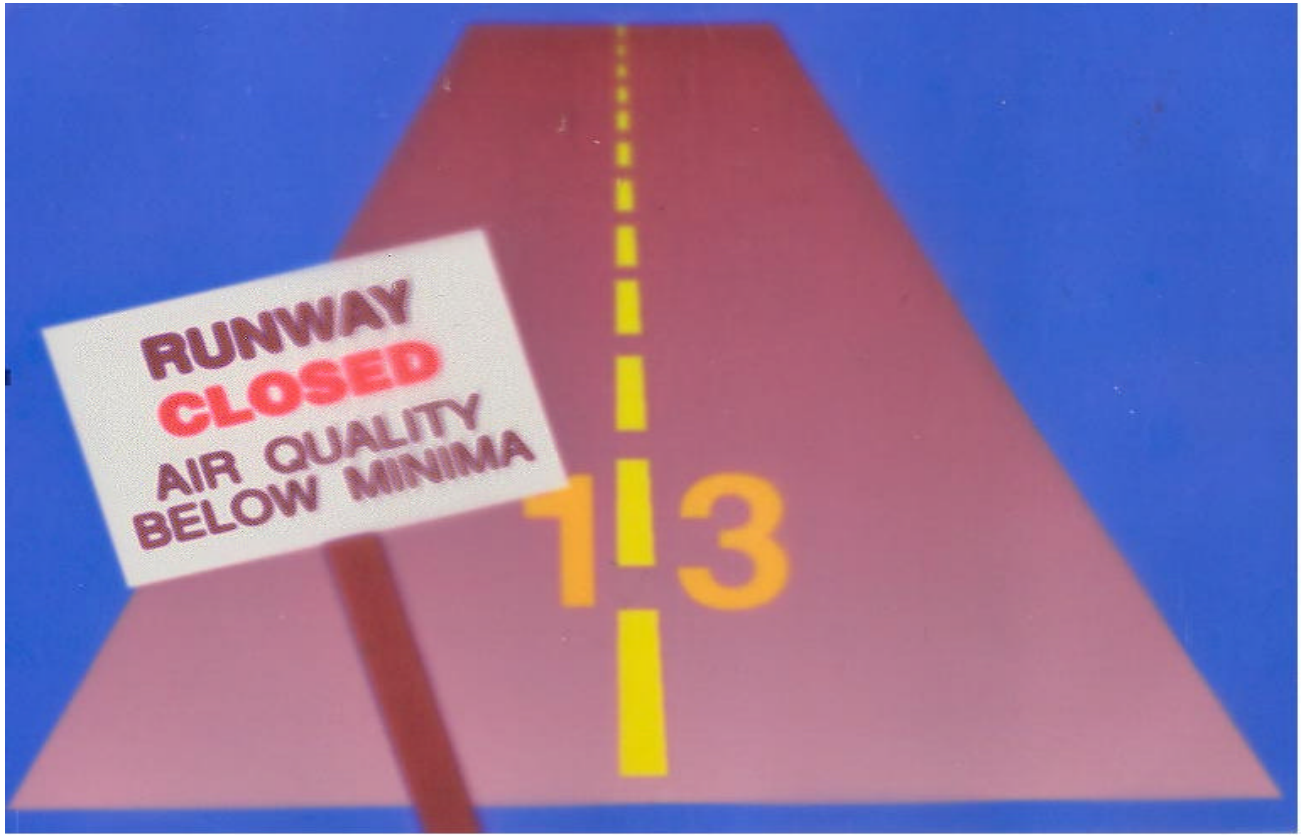

Thank you !

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