

**AIR QUALITY  
IN THE  
CENTRAL OKANAGAN**

**A Discussion Paper within the  
Regional Growth Strategy**

**October 2001**

# ***Planning for the Future***

**Regional District of Central Okanagan  
District of Lake Country  
District of Peachland  
City of Kelowna**

The Central Okanagan Regional Growth Strategy is a coordinated plan by local governments and provincial agencies to manage future growth by using resources wisely and supporting a high quality of life.

Air Quality is one of seven key regional issues examined through Growth Strategy Discussion Papers.

Copies of the Discussion Paper are available from

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# ACKNOWLEDGEMENTS

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## *Aided by*

Environment Canada, BC Ministry of Water, Land & Air Protection, Ministry of Forests, Okanagan Similkameen Health Region, Kelowna Regional Transit, Ministry of Transportation, Ministry of Energy & Mines, Ministry of Agriculture, Food & Fisheries, Ministry of Sustainable Resource Management, BC Growth Strategies Office, Westbank First Nation, City of Kelowna, and Central Okanagan Regional District

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Public awareness is supported by weekly Air Quality "VideoCam" Media coverage by CHBC News and daily Air Quality reports aired by radio stations of the Central Okanagan.

# **Air Quality in the Central Okanagan A Discussion Paper**

## **Executive Summary**

Residents of the Central Okanagan place high priority on protecting the region's water resources and air quality. This support comes in part through greater understanding and public concern over climate change, ozone depletion, and rising rates of respiratory illness; as well as the clearly visible "smog" that periodically appears trapped in the Okanagan. Recent actions have included the establishment of air quality monitoring and reporting programs supported by provincial and federal agencies, as well as a regional air quality program supported by communities of the Central Okanagan.

Topography and weather conditions in the Okanagan slow the dispersal of air pollutants, leading provincial meteorologists to identify the Valley as one of three areas of provincial concern. This has resulted in additional monitoring equipment and reporting processes that allow local communities to better understand the links between human activity and daily air quality conditions.

Through the auspices of the Central Okanagan Regional Growth Strategy, the municipalities of Kelowna, Lake Country and Peachland commissioned this Air Quality Discussion Paper. Its purpose is to evaluate and build support for the actions or strategies needed in order to manage and to improve air quality during a period of continued strong economic and urban growth. The report was developed through public dialogue and in consultation with representatives from provincial and federal meteorology programs, provincial agricultural and transportation agencies, public health officers and municipal managers.

### ***Fast Facts...***

- > Environment Canada samples air quality hourly in the Central Okanagan and monitors for five pollutants – fine particulates, sulphur dioxide, nitrogen oxides, carbon monoxide, and ozone. Two pollutants – fine particulates and ground level ozone – periodically exceed national standards.
  
  - > From 1996 to 1999 monitoring data has shown that the air quality in Central Okanagan was "good" on average 88% of the time, "fair" 11% and "poor" 1% of the time. Human caused instances of "fair" or "poor" air quality are primarily due to vehicle emissions, dust attributed to vehicles and smoke from burning. Other instances when national standards for particulates were exceeded are attributed to forest fires or dust carried from outside the Okanagan Valley. The Okanagan also has high levels of ozone attributed to natural sources and vehicle emissions; however, more research needs to be completed before it is known how fossil fuels and natural background levels affect ozone formation in the Okanagan.
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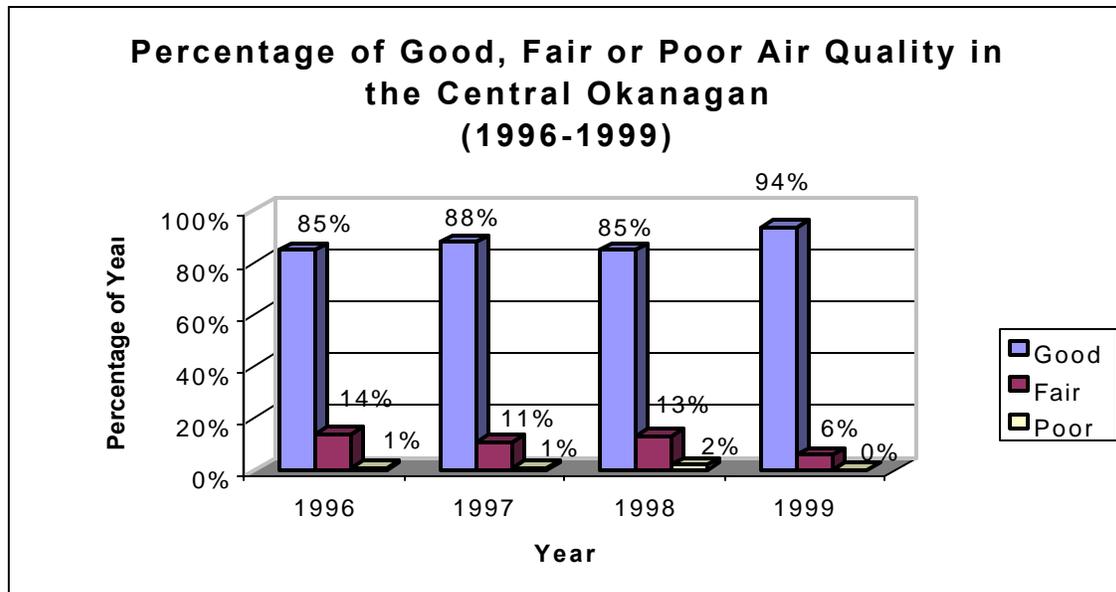


Figure 1 (Source: BC Environment, Lands and Parks)

- > The Okanagan Valley lies perpendicular to the prevailing winds, resulting in an increased number of calms and therefore greater air stagnation. In summer months, higher temperatures and increased sunlight can result in greater concentrations of ground-level ozone. In winter months, thermal inversions trap cold air below a layer of warmer air inhibiting the dispersion of pollutants.
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- > More people equate to more vehicles. There are 104,000 registered vehicles now in the Central Okanagan and increased growth will produce more emissions that can result in deteriorated air quality.
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- > A 1995 study by Levelton and Associates predicts that, by the year 2013, vehicles in the Central Okanagan will emit over 7,500 tonnes of fine particulates annually into the airshed from tire wear, brake linings, engine emissions and road dust. That works out to 20 tonnes daily.
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- > Outdoor air pollutants, primarily fine particles and ozone, are causing health problems in our region. About 10% of the population is considered most "at risk". If conditions worsen, the entire population will be affected to some degree.
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- > People most affected by air pollution include the very young (ages 0-5) and the elderly. People with lung conditions such as asthma, bronchitis and emphysema are particularly sensitive as well as people with heart conditions and those with sensitive eyes.

## ***Current Initiatives***

Current and upcoming projects underway by local and provincial agencies, community groups and businesses reporting through the Central Okanagan Regional Air Quality Program include:

- Daily Air Quality Index and Venting Reports (ongoing)
- Air Quality Health Effects and Costs Survey
- Visual Opacity (Smoking Vehicles) Assessment of Diesel Powered Heavy Duty Vehicles and Light Duty Gasoline Powered Vehicles in the Okanagan
- Voluntary Emissions Clinic (annual)
- Wood Stove and Fireplace Inventory Survey
- Great Okanagan Wood Stove Exchange Program
- Agricultural Wood Waste Feasibility Study
- Open Burning Bylaw Improvements
- Advertising Campaign to Promote the Dangers of Wood Smoke and Vehicle Emissions
- Partners for Climate Protection Program.

## ***Key Recommendations***

In looking at the projections of future growth and development, and considering the level of understanding about air quality, it is recommended that the Central Okanagan region continue its efforts to assess and to proactively manage air quality. These efforts will require, first and foremost, continued communication and collaboration between agencies.

- **Managing Air Quality** - The Central Okanagan Region should continue its efforts to assess and proactively manage air quality to protect the health of its citizens.
- **Agency Co-operation** - Governments must work together to implement air quality initiatives within the Central Okanagan region as well as the Okanagan Airshed. Co-operation between responsible agencies should continue to be fostered (e.g.: through the Technical Steering Committee and Regional Air Quality Committee) so that important issues are addressed with a minimum duplication effort.
- **Air Quality Monitoring** - The current systems of monitoring and reporting of ambient air quality conditions should be maintained and enhanced, as they are key foundations to all management strategies. The Central Okanagan region should work cooperatively with other agencies to encourage the expansion of monitoring programs to other regions of the Okanagan airshed, and to assess variations in air quality between urban and rural or between low elevation and mid elevation segments of the airshed.
- **Education** – General education and promotional activities are considered valuable in building awareness and in bringing about individual change in behaviour. The current level of educational and promotional activity should be maintained within the context of an annual and 5-year plan.
- **Fine Particulates** - Analysis of research demonstrates a link between fine particulates and health of individuals within the Central Okanagan. Efforts to and bring about changes in practices related to particulate emissions should continue as a priority action. A three-year plan to reduce fine particulates from wood smoke has been developed by the Regional Air Quality Committee.

- **Ozone** - There is a health concern related to high levels of ozone found in the Central Okanagan. However, the cause of ozone in this region is not well understood. Research in this area is underway; however, further research needs to be identified to determine how man-made precursors to ozone affect ozone concentrations in our airshed.
- **Public Involvement** - The Central Okanagan Regional Air Quality Program should continue to include involvement of the public and stakeholders in the process of developing strategies to reduce air pollution.
- **Episode Management** - Air quality episode management procedures should be developed so that all agencies and operations “under permit” are aware of steps needed to reduce emissions when air quality advisories are issued.
- **Economic Issues** - Clean air and a healthy economy are both important. All levels of government and members of the community should seek and promote cost-effective means for improving regional air quality.
- **Greenhouse Gas Reductions** - Communities across Canada are involved in a commitment to reducing greenhouse gas emissions. This is an activity in which local governments and provincial agencies have an opportunity to “lead by example” by monitoring and changing operations as needed.
- **Energy Efficiency** - Governments should co-ordinate energy reduction and efficiency policies and programs to support regional air quality and global climate change initiatives.

### **Recommendations For Managing Future Growth And Development**

- **Integrated Land Use Planning** – Local governments within the Central Okanagan should implement land use policies that will accommodate future growth in a manner that fulfills clean air quality goals.
- **Transportation Planning** – It is recommended that the transportation sector (regional, provincial/federal) should be engaged in planning for air quality improvement. Air quality research should be linked directly to the analysis of regional transportation options and planning programs. Emission reduction strategies should be directed at reducing the levels of air pollutants associated with vehicle traffic, including road dust and vehicle emissions. These strategies are viewed as timely, as they correspond to regional efforts directed as transportation demand management and at expensive transportation corridor improvements.
- **Total Maximum Daily Load** - Initiate a process that links land use decisions and present practices in the Central Okanagan region to an analysis of “load levels” of various pollutants in the airshed (using the emissions inventory and dispersion models recommended below). This may require making request to provincial authorities to amend the permit process in a way that allows existing load levels to be considered in the review of applications for new permits.

## Research Recommendations

Research is essential for obtaining a better understanding of current and future air quality and contaminant effects. Research gaps currently exist in our understanding of the mechanisms involved that degrade Central Okanagan air quality. In order to identify management priorities the following research components are required:

- **Emissions Inventory** - An earlier emissions inventory needs to be enhanced and regularly updated, to determine accurate emission amounts from all sources. A detailed and accurate emissions inventory is essential for air quality management. The relative contributions from permitted and non-permitted sources provide an indication of the mechanisms that will be required to achieve any emissions reductions.
- **Health Costs** - Expand local research on health related costs due to air quality conditions. This will provide improved understanding, and lay the groundwork for a long-term study that would provide a tracking mechanism for determining improvements or degradation of air quality effects on health. This will strengthen the rationale for action, and support implementation of an airshed management plan.
- **Speciation Analysis** - This study would be used to analyse the content of fine particulates captured at the KLO Air Station. This would allow the determination of where the particulates came from (source) as well as the percentage of each source in the sample (i.e.: the percentage from road dust, percentage from wood smoke, percentage from vehicle emissions, etc.).
- **Dispersion Model** - This model is used to simulate the concentration and dispersion of pollutants throughout the airshed depending on weather conditions and sources of emissions. This model can be used to estimate pollution concentrations (loading) in the airshed given a predicted change in emissions.
- **Ozone Research** - An emissions inventory and modeling of the local ozone-forming process needs to be completed to identify Nitrogen Oxides (NOx) and Volatile Organic Carbon (VOC) management needs. A completed and accurate emissions inventory of the airshed is needed before modeling research can occur.
- **Cost Implications** – Develop a multi-year and multi-partner budget projection so that short and long term strategies and research recommendations can be advanced.

## Monitoring of Progress

It is recommended that communities of the Central Okanagan monitor progress of regional air quality initiatives by measuring three indicators:

1. A lower average Air Quality Index (improved ratings over the course of a year)
2. A reduction of PM<sub>10</sub> (Particulate Matter) increments, and
3. Fewer health problems associated with airborne pollutants.

## ***Taking Action***

Implementing action on the above recommendations requires support from the communities of the Central Okanagan. As a first step, the following endorsements are made in support of the discussion paper and its recommendations.

### **Regional Air Quality Committee:**

June 27, 2001

*“The Regional Air Quality Committee endorses the recommendations in the Central Okanagan Air Quality Discussion Paper; Regional Air Quality program staff (will) examine cost implications of the recommendations including all jurisdictions in the Okanagan air shed; and (The Committee) recommends referral of the Discussion Paper to Municipal Councils and the Regional Board for information.”*

### **Intergovernmental Advisory Committee:**

August 23, 2001

In supporting the Air Quality Discussion Paper, the Intergovernmental Advisory Committee recommends that the link between traffic congestion and air quality be identified.