Toronto 2014

- Third most rapidly growing metropolis in N. America
- Huge and growing extent of urban sprawl
- Dependency on cheap petroleum, hydro
- Sustainability will be a challenge
Toronto 2014

• The GTA has serious air pollution problems
  – Kills an estimated 8-10,000 people each year
• Ontario MOE monitors air quality
• Has just 4 monitoring stations in Toronto
  – Bay/Wellesley; Kennedy/Lawrence; Yonge/Finch; 401/Islington
  – And just 9 for the GTA as a whole
• MOE network will not support detailed mapping of air pollutants
Toronto 2014

• We have serious and deadly air pollution
  – It must be taking a severe toll on human life and health dollars
• The public does not seem to care that much
• It is not a major priority for public authorities
How did we get here?

- Take a look at the historical changes in the city’s air pollution
Historic Urban Air Pollution

• Its scholarly literature is small
  – London, Manchester, Pittsburgh
• It lacks spatiality
  – No maps/few maps/crude maps
• It lacks temporality
  – Little information of how it changes over time
A problem:

• MOE can make crude maps of air pollution
  – Because they have monitoring stations
• But how do you map historic air pollution?
  – When there were no monitoring stations
One Solution

• Air pollution generates sediment
  – Dust, particles, chemical films
• Find enough urban sedimentary columns
  – And you might reconstruct past air pollution
• It is expensive, technical, dependent on chance survival of sediment
• The sediment is unrepresentative of the airborne pollutants
Dust Jars

• In the 1930s researchers deployed dust jars to catch Toronto’s urban dust fall
  – They estimated about 200/tons/sq mile/year

• Scale up to the whole city in the 1930s, about 50 square miles:
  – 10,000 tons/year dustfall over the city

• But the city emitted 165,000 tons of dust
  – Dust jars missed 85% of the dust
Smoke

• Is mostly made of tiny particles (mostly Pm1)
• Dust jars, local sedimentary sinks tend to capture only the large particles (Pm30, Pm100)
  – Can’t assume the same chemistry as smaller particles
• It will be very problematic to reconstruct urban air pollution history from local sediment
• We really need a way to sample historical air pollution while it is still airborne
A key problem

• How do you map historic air pollution?
• Soil & sediment sampling
  – Expensive, technical …
Test #1

• Does the visibility pattern match industrial land use, likely the biggest source of smoke?
  – Compare 1920s visibility with industrial land use in 1923 Goads insurance atlas
Test #2

• Does the visibility pattern match newspaper references to smoke issues?
  – Content analysis of 1920s newspaper coverage
Air Pollution

• Early 1930s:
  – Dustfall 10-20 times present levels
  – 600-1200 parts per billion of suspended particles
  – Catastrophic by modern standards, probably an underestimate
Air Pollution

- Experts on the health effects of air pollution tell us that excessive coal smoke increases the incidence of
  - Bronchitis
  - Pneumonia
- Early C20th
  - Pneumonia & bronchitis the city’s biggest killers in the winter (air pollution?)
  - Few pink lungs in Toronto
Air Pollution

• Tracking potential air pollution deaths is difficult
  – Bronchitis and pneumonia don’t have to be caused by air pollution
  – Even if they are, the air in which places is relevant?
  – Most complex in adults

• Use infant deaths instead
  – Most geographically sensitive
Test #3

• Does the visibility pattern connect to urban respiratory health?
  – Compare visibility patterns to infant respiratory mortality
  – Bronchitis & pneumonia appear to be the key disease categories
  – Infants likely to be the most spatially sensitive
Toronto 1903: Bronchitis and Pneumonia as % of deaths

Jan-03  Feb-03  Mar-03  Apr-03  May-03  Jun-03  Jul-03  Aug-03  Sep-03  Oct-03  Nov-03  Dec-03

All
Infants
Air Pollution

• Very high degree of correlation between infant respiratory death (bronchitis, pneumonia) and mapped patterns of air pollution

• Mortality probably worse for poor inner city districts, working-class areas close to industry, for poor ethnic immigrants
  – Environmental justice?
Toronto 1880-1930

- 20,200 deaths from pneumonia
- 6,100 deaths from bronchitis
- Combined: responsible for 12.6% of all deaths
- Tuberculosis: 12,700 deaths
- Air pollution the city’s biggest killer in the winter, and the second largest killer overall
  - Second only to polluted water
  - Contemporary medical profession hardly noticed
Air Pollution

• But makers of patent remedies were well aware of routine respiratory illnesses of historic Toronto
ASTHMA speedily relieved and a cure effected by the use of Owbridge’s Lung Tonic

In successful use for over 28 years.
At all druggists, price 35 cents and 75 cents.

“What a grand medicine the Lung Tonic is for Asthma. I have had Asthma about 20 years, and after taking two bottles I feel quite a new man.”
W. Breddell, 21 Thames Street, Stirling.
BLEEDING OF THE LUNGS
is cured and the weak parts healed by

Owbridge's Lung Tonic

—in successful use for over 28 years.—

Prepared by W. T. OWBRIDGE, HULL, ENGLAND.
At all druggists, price 35 cents and 75 cents.

"Your Lung Tonic has done wonders for me in stopping my cough and bleeding from the lungs. It certainly in a wonderful medicine." ADA FLETCHER, Lawson Street, Darlington.
Don't let Coughs & Colds lay you up.

OWBRIDGE'S LUNG TONIC heals irritated membranes as it spreads over your throat and passages. It "lifts out" your cough, breaks up your cold, and prevents recurrence by strengthening your resistance powers.

OWBRIDGE'S is not only a wonderful remedy, but also is a great preventative. Give it to the children, regularly, these days. Take it, yourself.

The British Remedy in 1874

OWbridge's Lung Tonic

Your druggist has Owbridge's the famous British remedy.
Onbridge's Lung Tonic

One careful mother looks from her window and calls it "an Owbridge morning" if it's wet and chilly. She means that the children must take a dose of Owbridge's before leaving for school.

Owbridge's is pleasant to take and positively harmless. The children like it, and this mother's carefulness wards off many coughs and colds and the more serious things that grow out of them.

Ask for Owbridge's.
There is no substitute. At all stores.

for Coughs and Colds
To soothe inflamed air passages and clear up coughs and colds, there's nothing quite so effective as OWBRIDGE'S, famous for over fifty years.
"please, Mummy, make the cough stop!"

Poor little tot, restless and feverish, racked with coughing, awake half the night! How simple… how sensible… to get Owbridge’s. Half a teaspoonful to a teaspoonful, every three hours… and the magic of healing begins.

It’s marvellous the way Owbridge’s breaks up coughs and colds.

**The British Remedy**
**Est. 1874**

Owbridge’s stops the cough QUICK!
World War 1

• Wartime conditions boosted coal demand but hampered imports of ‘clean-burning’ anthracite coal
  – US bans anthracite imports to Canada from 1916
• Toronto combustion shifts to bituminous and soft coals
• Air pollution gets much worse
World War 1

• Death records show a dramatic increase in bronchitis, pneumonia deaths in Toronto

• Hospital records (Sick Kids, Toronto General) show a surge in infant deaths due to bronchitis, pneumonia

  – [Link to HSC Annual report for 1917]
<table>
<thead>
<tr>
<th>Age</th>
<th>Deaths</th>
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<tr>
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<td>24</td>
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<tr>
<td>80+</td>
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</tr>
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</table>
World War 1

• Influenza strikes in October 1918
  – Kills 800 Toronto people in that month alone
  – Mostly young adults aged 20-40

• But the immediate context is one of reduced urban air quality
  – Due to wartime conditions

• May boost/reduce influenza deaths
  – But probably significant
World War 1

• Toronto’s air pollution worsened under wartime conditions

• Leaving the 1918 Influenza outbreak aside
  – We appear to have 1,200 respiratory deaths in excess of the pre and post-war levels
World War 1

• In other words, Toronto had about 1,200 direct civilian casualties in the First World War
  – Most of them small children
  – Unacknowledged by historians

• Roughly similar death toll to influenza
  – Air pollution killed 1,200
  – Influenza 1,360
Air Pollution

• Had a dramatic effect on health
• How did it affect living arrangements?
• Did air pollution shape the city’s residential patterns?
• Let’s look at some advertising:
Test #4

• How do the visibility patterns compare with urban social geography?
HIGH PARK PLATEAU

FINE OAK TREES and EXCEPTIONAL VIEWS

All Civic Conveniences and Improvements.

Frontages facing this property all built upon.

Within two to three minutes from three car lines, and within easy reach of new West Toronto and new Roncesvalles, King and Queen R.R. Station.

An early selection will secure the most desirable lots.

PHONES:
MAIN 1265-1266
After Office Hours:
PARK 1250

SZELISKI & McLEAN
(Exclusive Agents for Owners)
22 Toronto St., TORONTO

TEMPORARY OFFICE:
Opposite the Grounds
At 445 INDIAN ROAD

HIGH-CLASS REASONABLY RESTRICTED

Building Lots

We recommend this as the very choicest residential property of the entire WEST END.

Take College Street car to Indian Road, and walk ONE BLOCK NORTH

FOR FURTHER PARTICULARS, DESCRIPTIVE PAMPHLET AND SCENIC VIEWS, APPLY TO

PAUL VON SZELESKI.
ERNST L. McLEAN.

JOHN E. STONE.
College Heights

A NEW SUBDIVISION
in the most exclusive district around or in Toronto

OPENING TO-DAY, SATURDAY

This is your opportunity to see and secure a site in the best and most exclusive restricted residential district around Toronto at prices never again possible.

High altitude, dry, clear and pure air, magnificent view, overlooks ravine (which it is proposed to use as part of the boulevard and driveway around the city), beautifully wooded lots, convenient transportation, will be in the best restricted residential district and most exclusive in the city.

Literature and full information gladly sent on request.

FREE Automobile service to inspect property from Avenue Road street cars at St. Clair Avenue, or from our office, all day Saturday.

Phones Main 5893-5894.

TANNER & GATES
46 Victoria St.  TORONTO
SUNSHINE PARK
NORTH TORONTO
BUY AT PRESENT VALUES FOR FUTURE ADVANCE

Homesites convenient to the city with all suburban advantages. For genuine investments, buy North Toronto property. You can’t fail to make money. Buy for your home or buy for investment—the values are right and the location is the best in Toronto.

SUNSHINE PARK LOTS OF 50 FEET FRONTAGE CAN BE BOUGHT FOR $500 PER LOT.

Double your money—buy now in Sunshine Park. Only a half hour’s pin to the corner of Queen and Yonge Streets, Sunshine Park is ideally located between Avenue Road and Bathurst Street, in North Toronto, and is in a direct line with the city’s growth. Homes are being built on lots adjacent to Sunshine Park.

HIGH ELEVATION—BEAUTIFUL SURROUNDINGS.

For the man who prizes fresh air, rustic scenery, favorable living conditions and plenty of ground on which to raise his table necessities, we say buy in Sunshine Park. Look at the size of the lot, 60x150 feet, and selling now for $500. We know of no better value.

DO NOT DELAY—BUT SEE US NOW.

J. C. HAYES CO., Limited
168 Bay Street. Tel. M. 7140

North Toronto Office, corner Yonge and Glen Road.
Tel. N. 5620
Four Kinds of Best

CHOOSE from four of North Toronto's best residential properties while prices are at their lowest. From standpoints of HEALTH, CONVENIENCE AND BEAUTY. These splendid properties are recommended for home or investment.

SATURDAY our motor cars will take visitors to these properties. This is your invitation to come along. Phone or call personally to arrange for the motor car trip to one or more properties that interest you.

Lawrence Park
A garden suburb, beautifully landscaped and terraced. A convenient tract served by Metropolitan cars and provided with electricity, sewers, water and gas. A safe and substantial investment. See this property in one of our motor cars. Street cars stop at our office on property.

Kendal Hill
Superior residential property in the Highlinton Avenue district. A most desirable location with the prospect of doubling in value. Present prices are low and terms liberal. See the property. Phone one of our motor cars will call for you. The sooner you buy the better your bargain.

Glebe Manor
Just beyond Heath Street on the Metropolitan car line, Glebe Manor has the added advantage of being very near the city centre. It is just where dust ends and pure air begins. This tract will soon be built up with homes, and prices will be greatly in advance of what they are now. Now is the time to buy. Visit the property with us Saturday. Branch office at Yonge and Glebe Road.

Hampstead Park
A good move for the working man. A homesite here is the beginning of better health, more room to live in, a garden, no visits from the landlord—and all for $10 down, balance $35 monthly. Take this step towards home ownership Saturday. Let us show you the property. Phone us where and when our motor car shall call.

DOVERCOURT LAND, BUILDING AND SAVINGS COMPANY, LIMITED

24 ADELAIDE STREET EAST

W. S. DINNIE, President

TEL. MAIN 7280
LAWRENCE PARK ESTATES
And Southern Addition STRATHGOWAN

The only highly developed suburban residential property in Toronto. Handsome homes surrounded by beautiful gardens, ranging in value from $5,000.00 to $20,000.00, adorn the property. Toronto's most prominent citizens are building on the Lawrence Park Estates. $150,000.00 has been spent by the Company in developing and improving the property, under the direction of experts. $13,000.00 is being spent annually in maintaining the high standard of excellence. 500 acres, all in one property, under one splendid scheme of comprehensive and artistic landscape development. (The White Estate shows remainder already built.)

DOVERCOURT LAND BUILDING & SAVINGS
Company Limited
Established 1885

LARGEST OWNERS & DEVELOPERS OF REAL ESTATE IN CANADA

Advantages of Lawrence Park
- Lake Ontario
- ravines
- parks
- recreation
- public transportation

DOVERCOURT LAND BUILDING & SAVINGS
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Company Limited
Established 1885

LARGEST OWNERS & DEVELOPERS OF REAL ESTATE IN CANADA
A Beautiful Home mid Beautiful Landscape Surroundings may be had by any purchaser of lots in that Finest of Suburban Parks—

Lawrence Park

Any person who wants to flee from the dust, noise, hurry-scurry, and cramped-up surroundings of the city and yet have all the city comforts, need go no further than Lawrence Park. Thousands of dollars are being spent to make this one of the loveliest residential park districts to be seen in any city. Lots are for sale at starting-off prices.

Those who Buy Now will Profit Handsomely Later.

May we send you our Illustrated Book on Lawrence Park?

Dovercourt Land, Building, & Savings Co., Limited

24 Adelaide St. E. Phone M. 7280
Lawrence Park

COMBINES THE DELIGHTS OF OUTDOOR LIFE AND FREEDOM WITH THE COMFORT OF A HOME.

GIVE your children every consideration when purchasing a home-site.

Give them play-grounds where they may obtain the benefits of out-door pastimes unmolested; give them the opportunity to make the most desirable acquaintances as play-mates; let them enjoy to the fullest the invigorating atmosphere of a location designed and planned by eminent architects to produce health and happiness for its residents—finally—give them a home in Lawrence Park, Toronto's newest and most select suburb.

Here they may have grounds a-plenty, health in abundance, and an ideal home.

Lawrence Park is situated at an elevation of 640 feet above Lake Ontario—think of the benefits derived from this alone—unrivalled ventilation, bracing atmosphere, elimination of the city's smoke and soot and the many advantages of a comely home, though only 30 minutes are consumed in reaching the business sections.

Phone Main 7281 and an automobile will be at your service to show you Lawrence Park in its entirety.

NORTH TORONTO OFFICE.
YONGE STREET, Opposite Glen Grove
Open daily from 8 a.m. to 5 p.m. Phone N. 4154

Lawrence Park Estates
(The Dovercourt Land, Building and Savings Co., Ltd.)
24 Adelaide Street East
Phone Main 7281
TORONTO
Now Ready for Sale!

SNOWDEN HOMES

NEAR TEDDINGTON PARK BLVD. $4,500 NEAR ROSEDALE GOLF CLUB

"Close to Millionaires Row"

Brand new artistic Brick Homes — 6 large rooms, hardwood floors two flats, electric grate, laundry, driveway, model kitchen and elaborate display of cupboards—a veritable joy for the housewife.

HIGHLY RESTRICTED SECTION — NEAR CARS

$1,000 saved by purchasing now

EASY TERMS, RESPONSIBLE PARTIES CAN PAY

$300 - $400 - $500 Cash

A wonderful opportunity to make a wonderful investment. Values here are sure. The best of neighbors and close to schools and churches. Get out where the air is pure. Get value for your money. Get established—right now—in one of these gems of homes.

10 SALESMEN AT YOUR SERVICE

R. B. RICE & SONS, Realtors

2013 Yonge Hud. 3022—Hud. 3400

66 Victoria—Elgin 5116

"AN EXCLUSIVE LISTING"

• 1925
The Only Highly Developed Suburban Residential Property in Toronto
Situated on Yonge Street in the Most Attractive Residential Portion of North Toronto
400 feet above the Lake Level.

Dry and pure air. Cooler in summer and warmer in winter. Wide sidewalks. Well kept roads. Large open spaces and Park Reservations.

One of the finest ravines in Ontario crossed by several rustic bridges runs along the front of the property.

A Club House, Bowling Green and Tennis Courts all add to the pleasure and charm of the Lawrence Park Estates and help to make it a beautiful and convenient place in which to build your home.

The Home of Your Heart's Desire

Every one choosing the thought of owning a home building the home of his heart's desire. Lawrence Park Estates appeals to every man and woman in their search for a permanent and durable setting for their proposed home. You can't build a home without the best. Why not own a home of your own? A lot in Lawrence Park is one of the best investments in Canada.

The property is a subdivision in the ordinary sense of the word, but a highly developed district of 200 acres, which is being rapidly built up with high-class homes, and for which there is an increased demand from builders and people who wish to build. As an investment in Lawrence Park Estates is easily converted into cash. In proof of the fact, 80 per cent of the owners of lots in this property have sold 80 per cent of the lots they held there, and all of them are glad that they sold them. This is a very strong indication of the desirability of the property.

Lawrence Park Estates, either for a home or an investment, is also a beautiful preparation on the market to buy.

A model of the property is in view at the City Homes Exhibit at the fair. You have an opportunity to view the homes of a comparatively new and rising metropolis. Take the time to see the houses, and learn the facts of the story. We invite you to visit the exhibition. You will be interested and entertained.

Established 1883

DOVERCOURT LAND BUILDING & SAVINGS
COMPANY LIMITED
LARGEST OWNERS & DEVELOPERS OF REAL ESTATE IN CANADA

The Place To Live In

Where there is no dust, no noise, no smoke, where the air is clear and pure and sweet, where there is a beautiful landscape, and where there are all modern conveniences, such as pure drinking water, gas, electric light, and sewers. The ideal place in North Toronto for suburban homes is found in Lawrence Park.

Take Metropolitan car, to Glen Grove. Office on the ground.

Lots are $20 Per Foot Up
Call or write for maps and terms.

Dovercourt Land, Building, & Savings Co., Ltd.
24 Adelaide St. E.
Tel. Mala 7280
Test #4

- Do wealthy people show a tendency to avoid the smoke?
Test #4

- Some tendency for wealth to avoid smoke
- But other processes are at work too
Air Pollution

- There is a tendency for middle and upper classes to flee the smoky inner city
  - Abandon once-fashionable Jarvis & Sherbourne streets by 1915
- Middle-class suburbs established in clean-air districts, with clean-air advertising
(At Least) Two Kinds of Suburbs

• **Industrial:**
  – Industry seeks sufficient space to make mess, cheaply
  – Attracts industrial worker residence

• **Affluent:**
  – Middle and upper income people seek ways of avoiding industry, mess
SILVERTHORN PARK ADDITION

The Most Convenient Place for the Workingman to Build his Home

In the city limits, water and sidewalks to be put in immediately; on St. Clair Ave. Close to several car lines. Fine big lots at very low prices.

CITY PROPERTY IS THE BEST INVESTMENT

The majority of our population are workingmen who are desirous of owning their own homes. In fact, the demand for medium-priced workingmen's lots is never satisfied. SILVERTHORN PARK addition is one of the very few opportunities left for the investor and the builder to buy in the city. The location is ideal. The building restrictions are very moderate, and the terms easy.

OUR AUTOMOBILES WILL TAKE YOU OUT ON SATURDAY.

Automobiles will meet the Carlton cars at Landowne and Royce during Saturday afternoon. It will pay you to be there. Call, phone, or write for prices and plans. Real Estate Department.

The Title and Trust Company, Corner Bay and Richmond Streets. Main 6215

How Would You Like to Live Here?

Within easy walking distance of 25 large factories where you and your family will have an opportunity to supply the demand for good workmen.
Don’t Let the Giant of City Congestion Crush Out Your Home Life
A Dynamic Pattern over Time

• Tests of the visual technique are possible in C20th
• Difficult for C19th
TORONTO 1905
Probability of visibility below 500m

visibility isolines
urban area
TORONTO 1915
Probability of visibility below 500m

- visibility isolines
- urban area
TORONTO 1935
Probability of visibility below 500m

visibility isolines
urban area

4km scale
Changes over Time

• Visibility mapping suggests highly dynamic patterns over space and time
• Can we measure the temporality of Toronto’s air pollution?
Temporality

• Existing studies of historic urban air pollution are very weak on spatial patterns and variation over time.
Figure 8.5 Air pollution in London since the seventeenth century, comparing predicted values with fogs and later measurements.

Some would argue, where legislative flexibility operated to the advantage
Toronto Combustion 000 tonnes CE

- Coal
- Wood
- Incineration
- Petroleum

Graph showing the combustion of different fuels from 1820 to 1960.
Toronto Air Pollution

Mean visibility (metres) vs estimated particulate emissions from coal burning
Some Results

• There are signs that photo analysis is able to reveal both the spatiality and the temporality of historic urban air pollution.
Some Results

- Measuring historic urban air pollution may help us understand the spatiality and temporality of
  - Urban disease, mortality, demography
  - Urban social geography
Conclusions

- Toronto has a long and rather significant air pollution history
- Has shaped health patterns
- Shaped and continues to shape its residential patterns
- Covers many issues of environmental justice
Conclusions

• Even today air pollution is deadly, but crudely mapped
• Can be mapped historically, and in some detail
• Modern Toronto has been shaped, continues to be shaped by its energy consumption and air pollution patterns