Urban Form in Suburban Places
Reinventing Suburbs Session

FCM Sustainable Communities Conference
February 8, 2011

Daniel H. Leeming BA, DIP CP, MES, FCIP, RPP
The **Planning** Partnership ; Partner, Urban Design and Planning

CONVERGING ISSUES

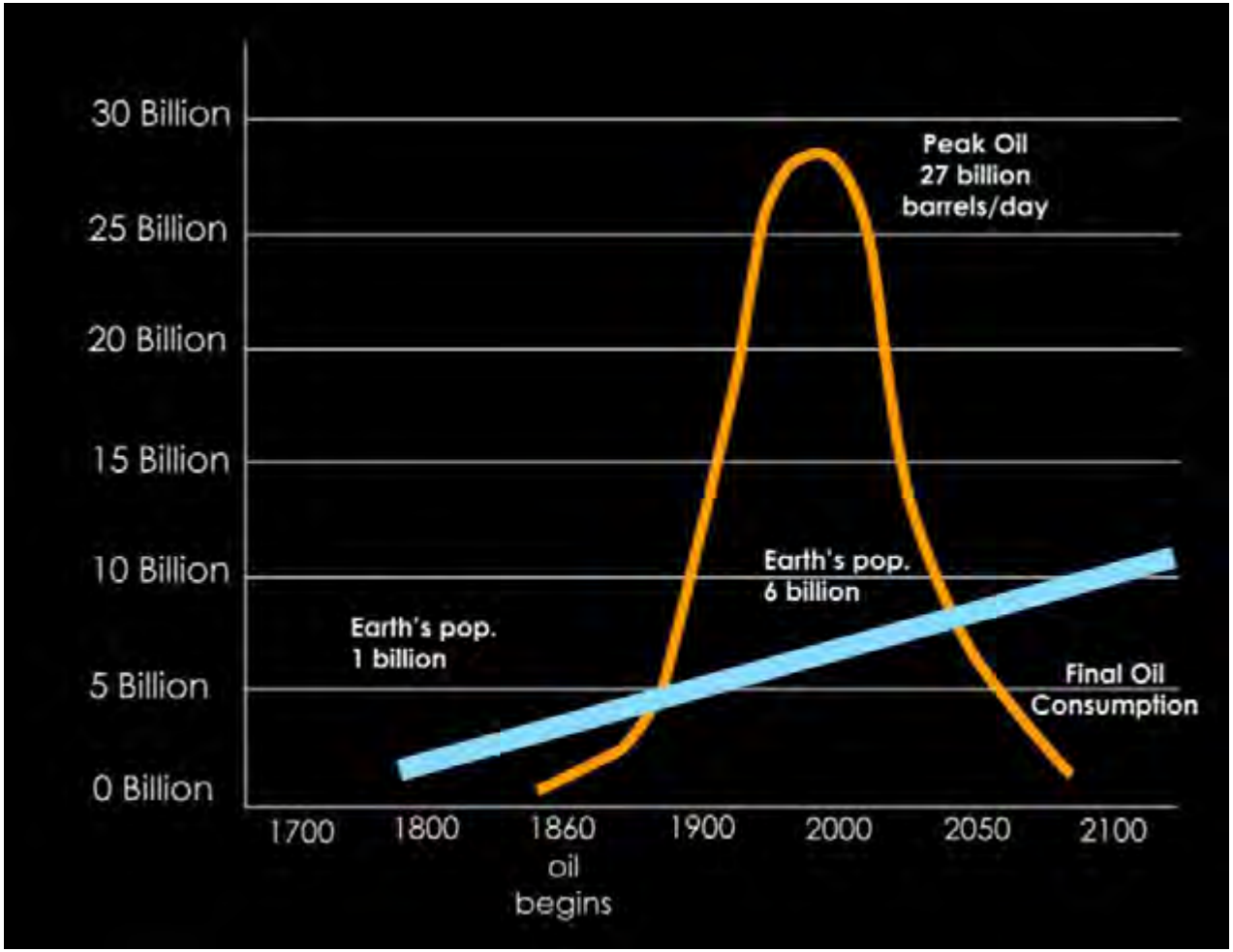
- **Rising Costs of Energy**
  - Days of cheap energy are over
- **Aging Population**
  - In 20 years, 1 in 4 Canadians will be 65+
- **Public health**
  - Last 20years has seen a 2 or 3 times
  - increase in diseases, asthma diabetes,
  - depression, hearth disease
- **Climate Change**
  - CO_2 levels are the highest in 500,000
  - years and growing

All of these issues are linked to how we design and build our communities

With the convergence of these issues, we have just one generation to make serious change before things get out of hand.

ENERGY

- **Earth's oil capacity:**
  2 trillion barrels
- **Remaining capacity at peak:**
  1 trillion barrels
- **Consumption:**
  27 billion barrels/year
- **Final consumption:**
  2041(37 years)
- **Population 1800:** 1 billion
- **Population 2000:** 6 billion



ENERGY

- At Peak oil consumption:

  A 10% shortfall will triple cost of oil;

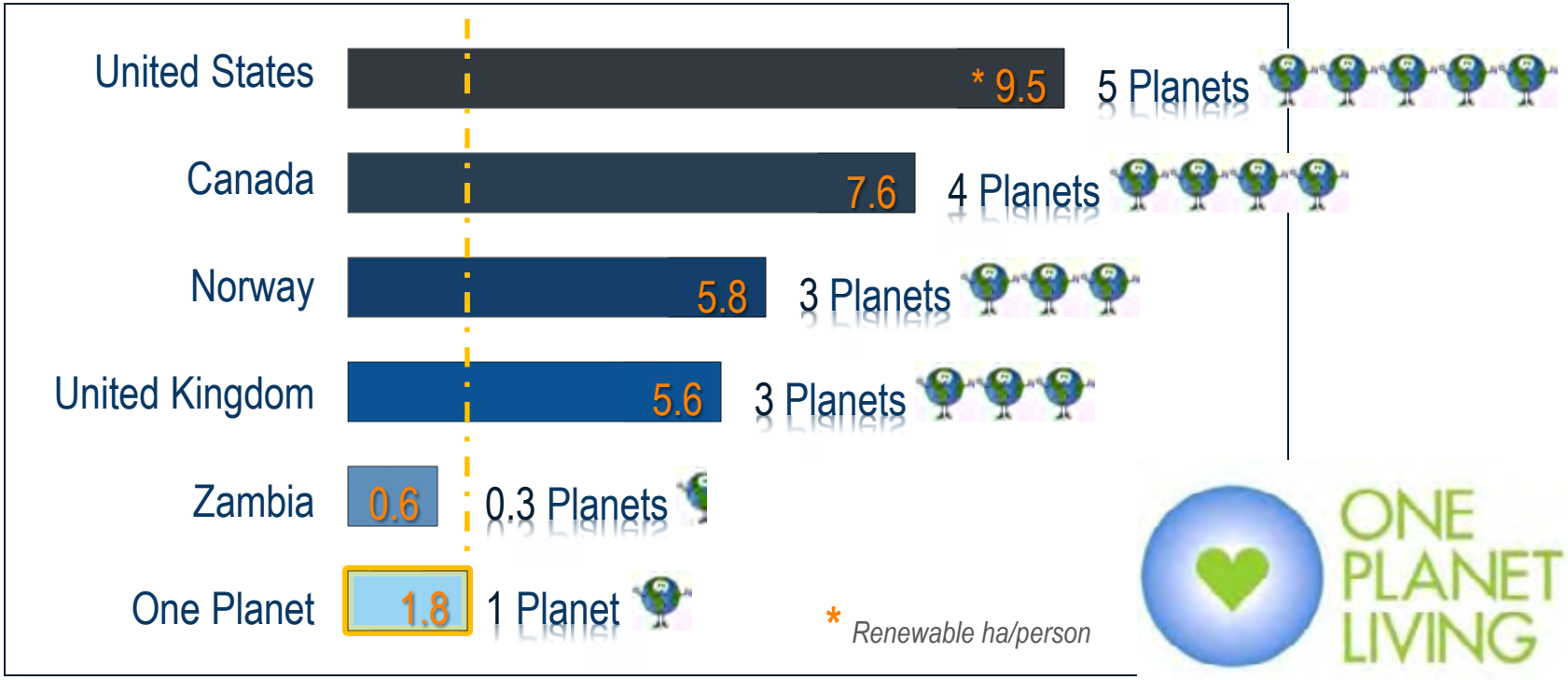
  Low Density Energy Costs

  $ 4,000.00 Buildings
  $ 4,000.00 Transportation (2.5cars/household)
  $ 8,000.00

- Some alternative fuels not a solution. Ethanol and hydrogen have a very low return on investment
  (ie. Competes with food production and uses energy to produce energy).

- Reducing reliance on water helps to reduce reliance on energy. Pumping water is a huge user of energy.

EARTH`S RESOURCES, ONE PLANET LIVING



AGING POPULATION

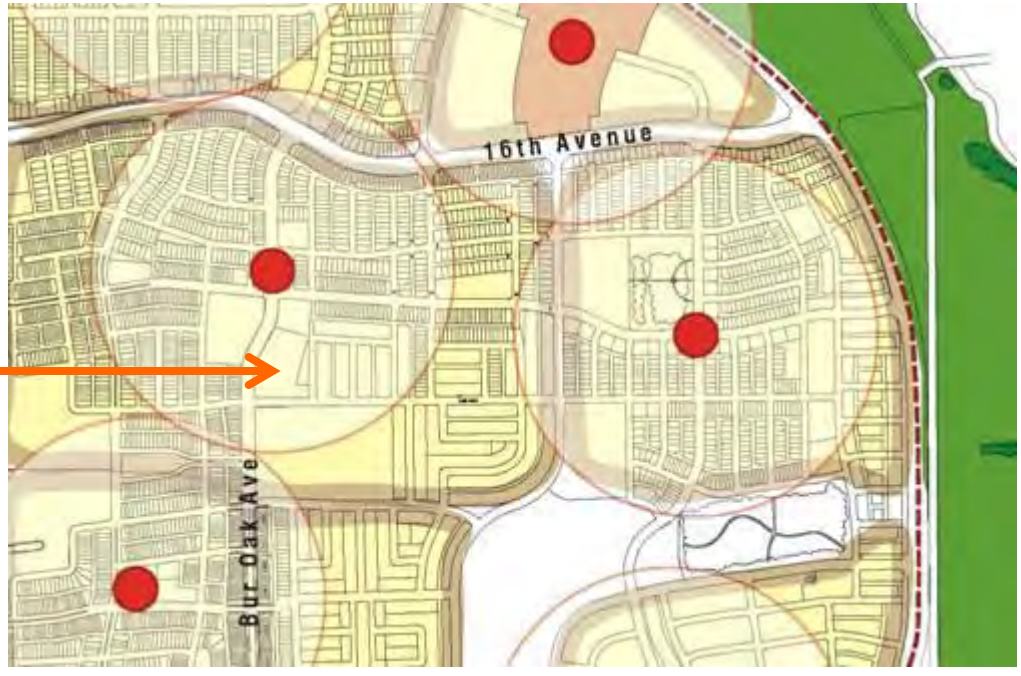
- 'Working-to-aged ratio' increases from 100:44 to 100:61 by 2031
- Household formation growing faster than population growth
- 3 to 5 year backlog for Long-Term Care
- Increasing health care costs

	65+ Seniors % of Society
2001	13%
2021	18%
2031	24%

Census of Canada

AGING POPULATION

- Introduce a range of housing options and services in order to age in place

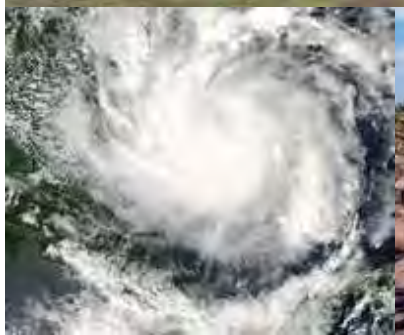


Long Term Care Facility in Cornell, Markham; Ontario

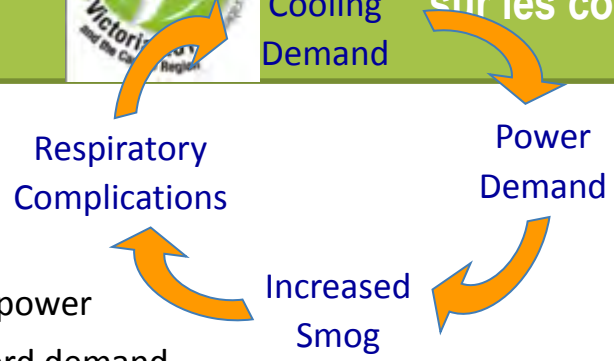
CLIMATE CHANGE

- An increase of 1 to 2 degrees Celsius in global temperature =
  - Sea Coasts – storms & rising sea levels cause growing erosion of coasts
  - Species – 30% at risk of extinction; increasing coral reef death
  - Flooding and depleted croplands in Pakistan / Bangladesh

- An increase of 4 to 5 degrees Celsius in global temperature results in `Positive Feedback Loops` =
  - Melting of Arctic Tundra, warming of Southern oceans & melting of ice caps
  - Wheat and rice crop failures
  - A 30% increase in China's rice needs means 50% of world production



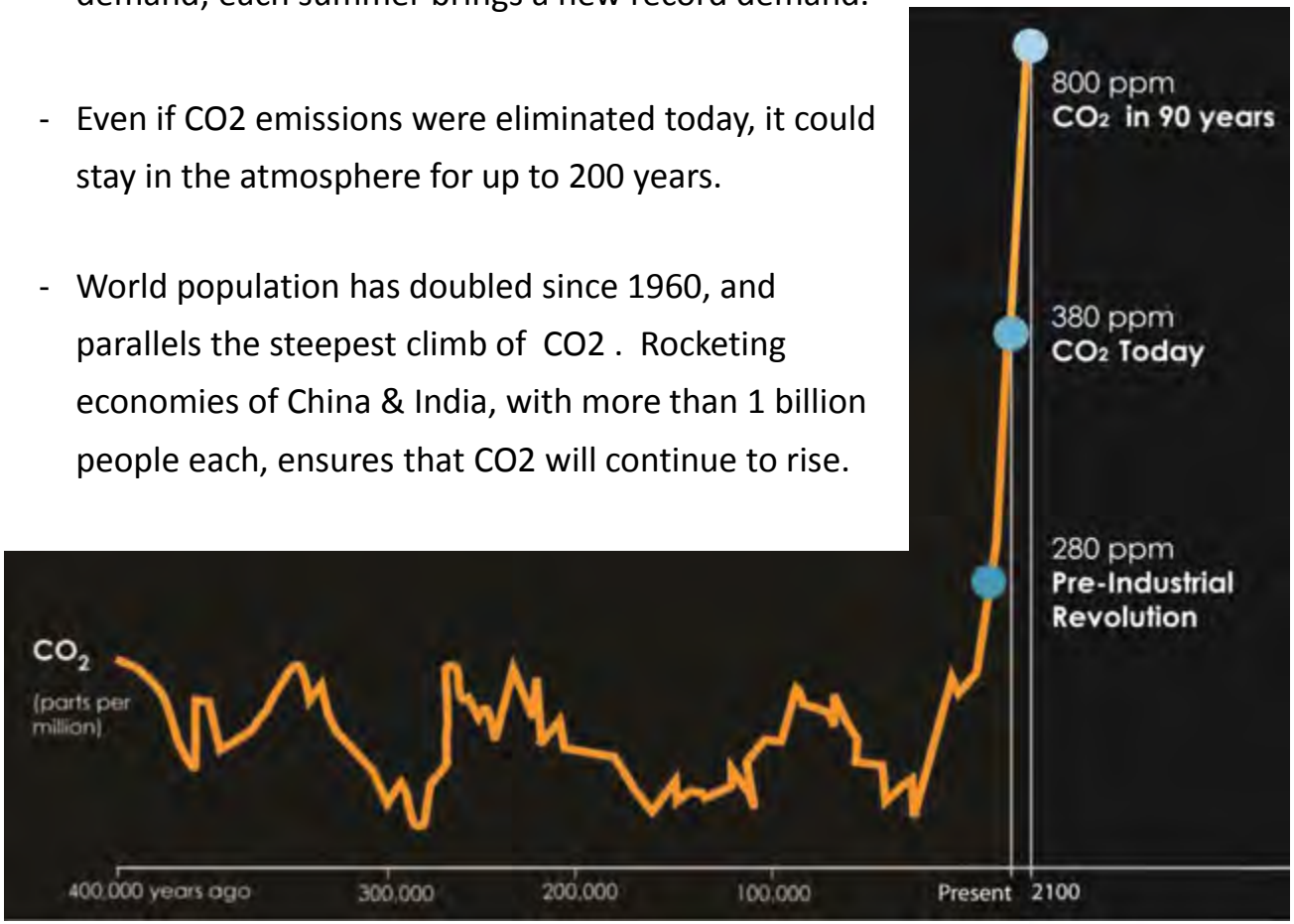
CLIMATE CHANGE



- Increased demand on cooling systems & power demand; each summer brings a new record demand.

- Even if CO2 emissions were eliminated today, it could stay in the atmosphere for up to 200 years.

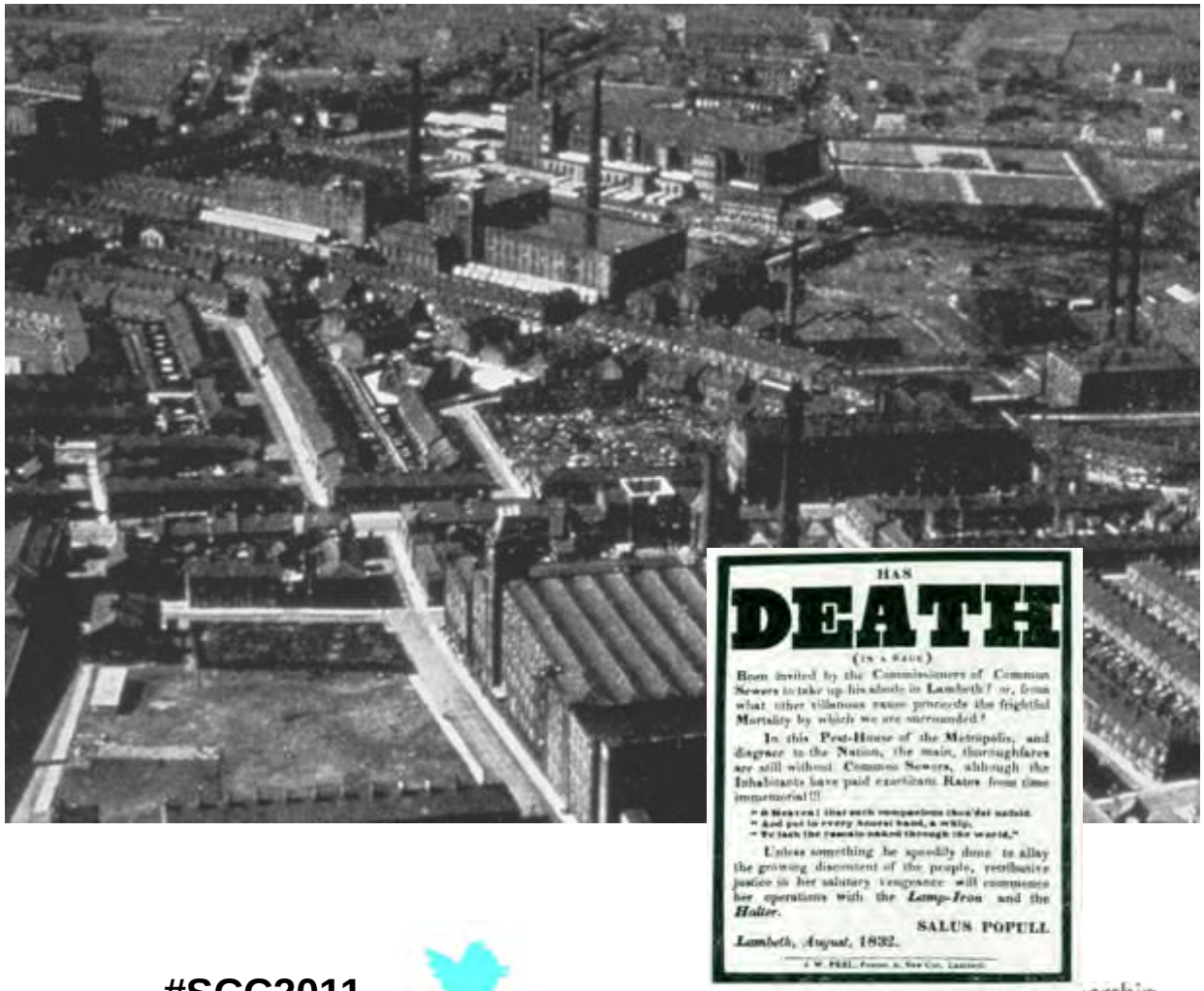
- World population has doubled since 1960, and parallels the steepest climb of CO2 . Rocketing economies of China & India, with more than 1 billion people each, ensures that CO2 will continue to rise.



PUBLIC HEALTH AND WELFARE

- Disease of the 19th Century
  - TB
  - Cholera
  - Yellow Fever

- Treatment
  - Public Works
  - Water Quality / Treatment

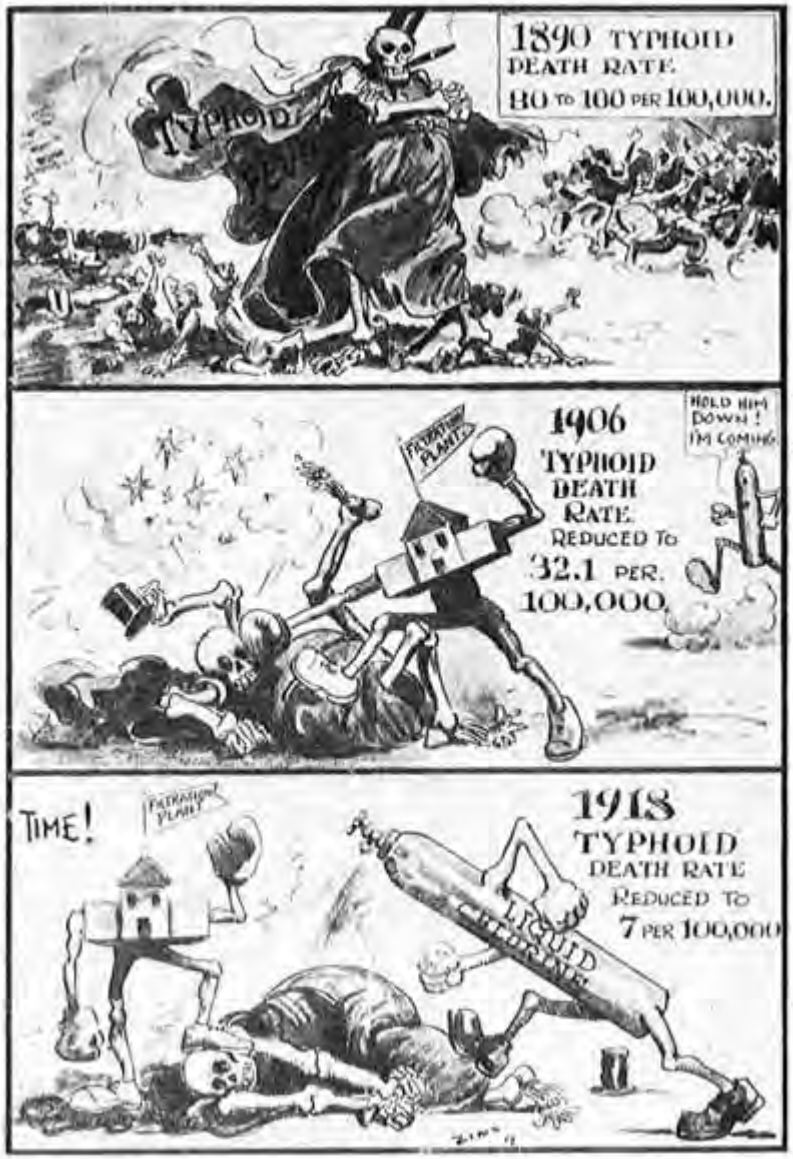


HEALTH ISSUES

- Disease of the 19th Century
  Typhoid

- Appalling typhoid death rates until;
  1910 Chlorination
  1914 Milk Pasteurization

'American City Magazine'



HEALTH ISSUES: The Shift from Communicable Diseases to Chronic Diseases

Diseases of the 21st Century

Diet & Exercise

- Hypertension, Diabetes, Heart Disease, Cancer, Osteoarthritis and; Depression -All have doubled or tripled in the last 20 years
- 2% of Canadians are underweight; 25-30% are overweight
- 9% of premature deaths are now due to obesity
- Child obesity has tripled in 20 years
- 3 million people have diabetes in Canada, est. cost by 2020- $17 billion

Treatment

- Diet & Education
- Exercise, 60 minutes of moderate activity daily, for adults; 90 minutes for children
- Improve / Build Environments that encourage walking / cycling / recreation at all levels

HEALTH ISSUES

Diseases of the 21st Century

Respiratory Health

- Transportation and buildings are the worst offenders (buildings, in the city; transportation, in the suburbs)
- $1 Billion lost to direct healthcare costs and lost productivity costs

Treatment

- Promote alternatives to high automobile dependence
- Promote alternative low emissions energy sources
- Better education on land use planning & lifestyle choices

HEALTH ISSUES

Diseases of the 21st Century

Mental Health

- Mental health disorders, depression & anxiety have tripled in the last 20 years
- Depression affects 121 million people worldwide, the leading cause of disability and 4th leading contributor to global disease (WHO)
- Mental disability costs Canadians $14.4 billion in treatment, medication & lost time
- Anti-depressant medication in US rose from $32 million in 1988, to $89 million in 1998 (178%)
- Social Capital (social, political, economic networks, ie. volunteer time) has dropped significantly

Treatment

- Promote alternatives to high automobile dependence
- Education about loneliness, inactivity, depression and commuting stress
- Improve / encourage exercise opportunities
- Improve opportunities for social interaction at all levels
- Build better public meeting places (structured and unstructured) into communities at all scales

CONVERGING ISSUES: Children's Health

active healthy kids CANADA

The Power to Move Kids™

Physical Activity Report Card Indicators

- Access to community programs
- Community infrastructure
- Built environment
- Proximity to parks
- Active transportation
- Neighbourhood safety and support
- Municipal regulations

Active Healthy Kids Canada 2010

Physical Activity Levels Report Card

Grade "F"

Only 12% of Canadian children meet Canada's physical activity guidelines (Public Health Agency of Canada) of 90 minutes per day of activity.

"C-" for Physical Education

"D" for Family Physical Activity

"B" for Proximity & Accessibility to Physical Activity Facilities

"D" for Usage of Facilities, Programs, Parks & Playgrounds

FCM FEDERATION OF CANADIAN MUNICIPALITIES FÉDÉRATION CANADIENNE DES MUNICIPALITÉS

CONVERGING ISSUES: Children's Health

(Physical Activity and the Built Form)

Statistics

- In 1971, the average age at which children began to watch TV was 4 years; today, it is 5 months.
- > 90% of kids begin watching TV before the age of 2, despite recommendations that screen time should be zero for children under 2, and limited to 1 hour for kids 2-5.
- National data shows 15.2% of 2-5-year-olds are overweight and 6.3% are obese.
- Regional data shows that less than 1/3 of children and youth use active transportation to get to and from school.

CANADIAN HEALTH MEASURES SURVEY

- Canadians of all ages are heavier, bigger-bellied, weaker and, by every conceivable measure, less fit than they were a generation ago, according to grim new data from Statistics Canada
- The report on children and youth states "Children are taller, heavier, fatter and weaker than in 1981"
- *The Canadian Health Measures Survey released by StatsCan and the Public Health Agency of Canada involved 5,600 Canadians from ages 6 to 79. Data was collected at 15 sites across the country, including in Toronto.*

Statistics Canada took the measure of the average 12-year-old and the average 45-year-old in 1981 and 2007–2009: The results weren't pretty.

	GIRLS Age 12		BOYS Age 12		WOMEN Age 45		MEN Age 45	
	1981	2007–2009	1981	2007–2009	1981	2007–2009	1981	2007–2009
BODY COMPOSITION								
HEIGHT	153.1 cm (5'0")	**155.9 cm (5'1")**	150.9 cm (4'11")	**155.8 cm (5'1")**	161.5 cm (5'4")	**162.3 cm (5'4")**	173.0 cm (5'8")	**175.3 cm (5'9")**
WEIGHT	42.7 kg (94 pounds)	**47.6 kg (105 pounds)**	41.6 kg (92 pounds)	**48.0 kg (106 pounds)**	63.2 kg (139 pounds)	**68.4 kg (151 pounds)**	77.4 kg (171 pounds)	**86.6 kg (191 pounds)**
BODY MASS INDEX	18.4 kg/m2	**19.5 kg/m2**	18.1 kg/m2	**19.2 kg/m2**	24.1 kg/m2 - normal weight	**25.8 kg/m2 - overweight**	25.7 kg/m2 - overweight	**27.9 kg/m2 - overweight**
% overweight/obese	14%*	**25%***	14%*	**31%***	13%*	**24%***	12%*	**27%***
WAIST CIRCUMFERENCE	62.4 cm (24.6")	**68.0 cm (26.8")**	64.9 cm (25.6")	**66.2 cm (26.1")**	76.3 cm (30.0") - low risk	**83.4 cm (32.8") - increased risk**	90.6 cm (35.7") - low risk	**97.0 cm (38.2") - increased risk**
% considered at risk	9%*	**28%***	<3%*	**15%***	18%*	**47%***	15%*	**38%***
HIP CIRCUMFERENCE	81.2 cm (32.0")	**86.0 cm (33.9")**	78.0 cm (30.7")	**84.0 cm (33.1")**	98.5 cm (38.8")	**102.5 cm (40.4")**	99.0 cm (39.0")	**102.7 cm (40.4")**
WAIST-TO-HIP RATIO	0.76	**0.79**	0.83	**0.82**	0.77	**0.81**	0.91	**0.95**
FITNESS TESTS								
GRIP STRENGTH	43 kg	**40 kg**	49 kg	**44 kg**	62 kg - very good	**56 kg - good**	104 kg - very good	**94 kg - good**
SIT-AND-REACH	32.0 cm	**28.2 cm**	26.5 cm	**21.4 cm**	30.2 cm - good	**31.5 cm - good**	23.1 cm - fair	**26.7 cm - good**

* Girls/boys aged 15–19, women/men aged 40–59

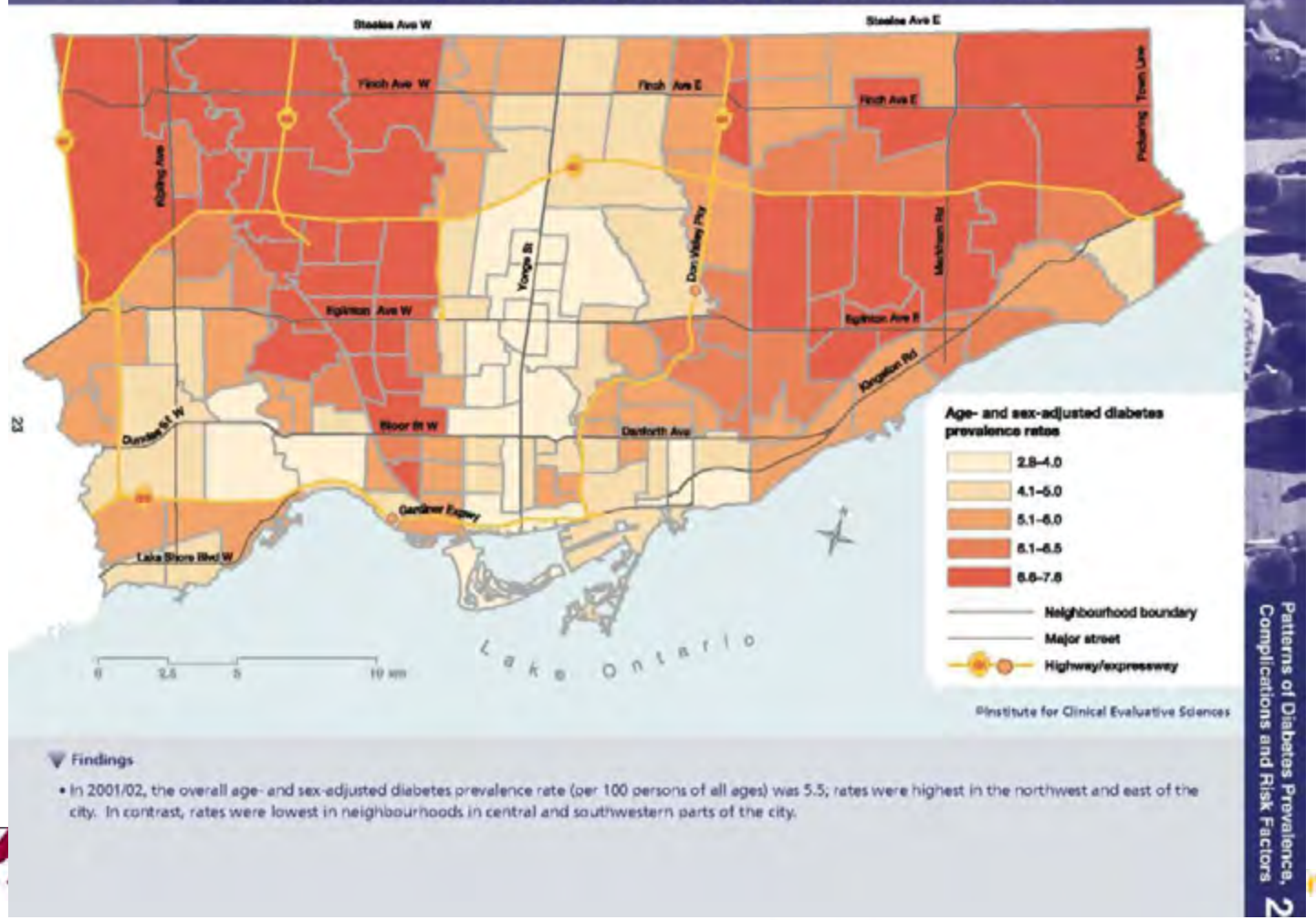
TRISH HUMLASTER / THE GLOBE AND MAIL ■ SOURCE: STATISTICS CANADA

ICES ATLAS- Institute for Clinical Evaluative Sciences

Diabetes Prevalence Rates

(Neighbourhood Environments & Resources for Healthy Living- A Focus on Diabetes in Toronto)

Exhibit 2.3 Age- and sex-adjusted diabetes prevalence rates per 100 persons of all ages, by neighbourhood, in Toronto, 2001/02



Findings

- In 2001/02, the overall age- and sex-adjusted diabetes prevalence rate (per 100 persons of all ages) was 5.5; rates were highest in the northwest and east of the city. In contrast, rates were lowest in neighbourhoods in central and southwestern parts of the city.

PUBLIC HEALTH ISSUES AND THE BUILT ENVIRONMENT

Many communities and health care facilities contribute to:

- A lack of diversity of land uses and full range housing options
- Require increased travel time & car dependence
- Increased live-work separation
- Encouraged active sports facilities over full range of facilities that reflect broader society
- Promoted traditional health care, 'treat the disease', verses the broad-based prevention strategy

SUSTAINABILITY AND THE BUILT ENVIRONMENT

- Scientific evidence that regular physical activity can reduce various chronic disease by 50%.
- The costs of many diseases have been clearly linked to our built environment.
- The doubling and tripling every 20 years of health care costs is not sustainable, healthcare already struggling
- Rising fuel costs will replace building, transportation, food production systems.
- Climate change is just starting as greenhouse gasses spike upward.
- Goals of 20% CO2 reduction by 2030 and 80% by 2050 means profound change.

LEARNING FROM OUR MISTAKES

Street Connectivity

LEARNING FROM OUR MISTAKES

Open Space

rship

LEARNING FROM OUR MISTAKES

Street Right-of-Way

20m ROW and 8m setback

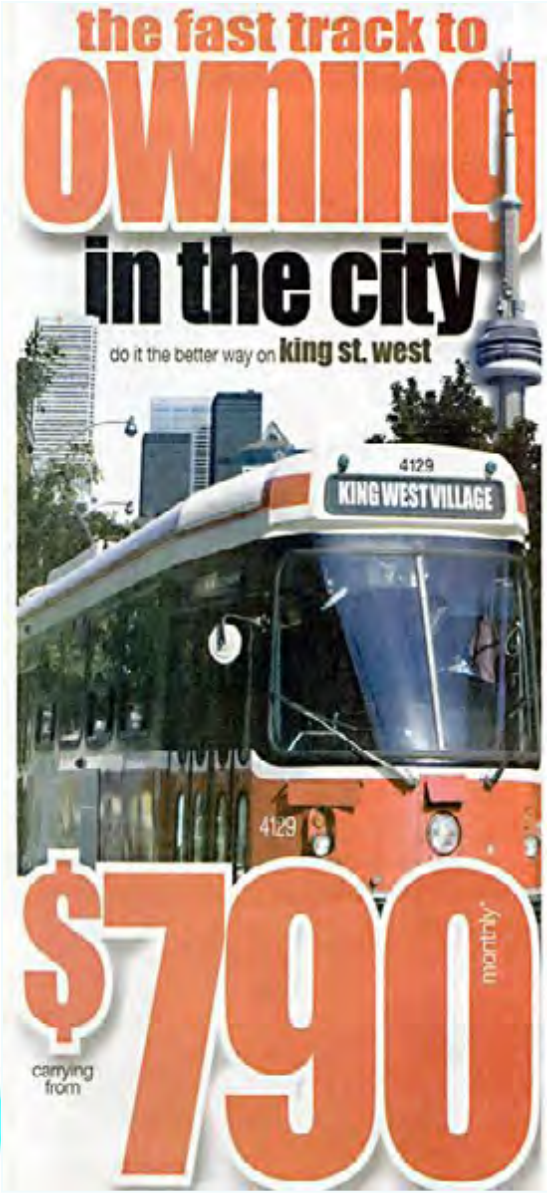
15.5m ROW and 3m setback

LEARNING FROM OUR MISTAKES

Great Streets

- Permeable by design;
- Natural traffic calmers;
- Contribute to livability of a community;
- Their defined hierarchy acts to identify location in communities; and,
- Provide 30% of public realm.

LEARNING FROM OUR MISTAKES



Transit Perception

Partnership

PUBLIC HEALTH AND THE BUILT ENVIRONMENT

Ontario Professional Planners Institute

- The costs of many diseases have been clearly linked to our built environment.
- The doubling and tripling every 20 years of health care costs is not sustainable.
- Our over-burdened healthcare system can barely keep up now.

MARKHAM LEISURE MASTER PLAN

(January 2010)

Effective long-term planning requires an understanding of existing and emerging trends. These **high level trends are shaping how leisure services** are provided and in Markham they **form the philosophy** behind the Master Plan`s goals and recommendations:

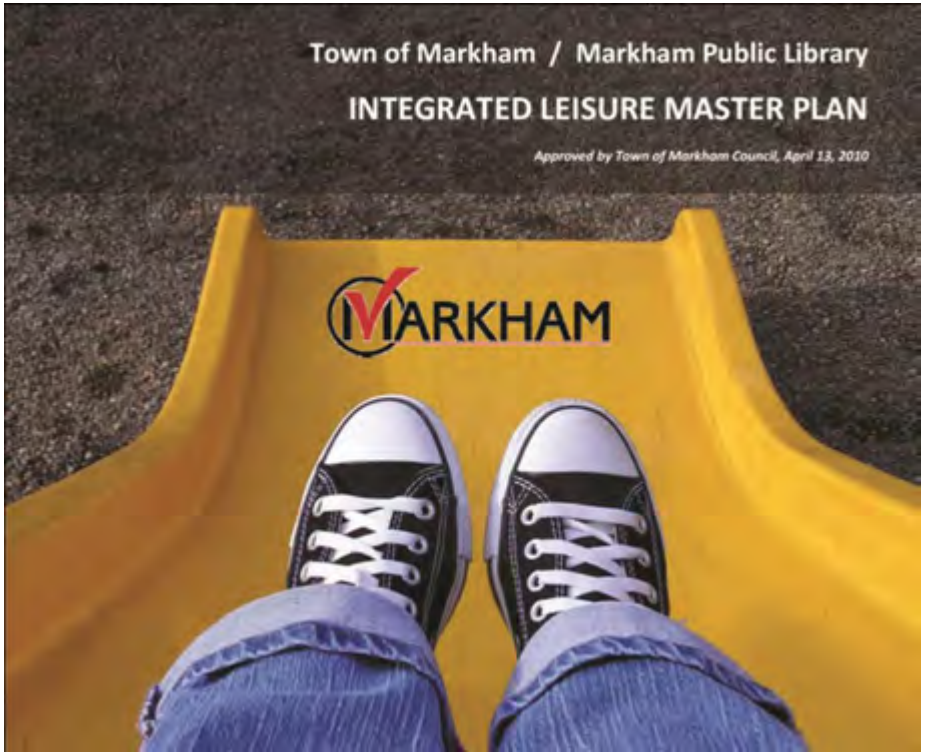
-Demographics and Social Factors

-General Provision of Services

-Parks and Recreation

-Arts and Culture

-Technological Innovations (Library Sector)



Not only Parks and Programming, but also encompassing:

- *Ageing Society*
- *Physical Health*
- *Mental Health*
- *Social / Cultural*

http://www.markham.ca/Markham/Departments/BMFT/BMFT_parks.htm

THE IMPORTANCE OF URBAN DESIGN IN SUSTAINABLE & HEALTHY DEVELOPMENT

- Issues of Sustainability and Public Health have a huge impact on the way we are and will plan and design our cities and neighbourhoods

- Compact, complete, walkable communities with diverse housing options, that are sustainable, healthy, liveable and beautiful require a comprehensive, integrated, design based approach

- There is significant experience, but a lot more needs to be done

- There is a stringent need for new approaches, new techniques and tools, alternative development standards, measurements and indicators




KEY ELEMENTS OF GOOD URBAN DESIGN

- Create compact urban form that builds upon existing urban areas and decreases regional sprawl;
- Build mixed-income, diverse housing and walkable neighbourhoods in both Greenfield and infill locations;
- Ensure equitable distribution of housing mix with transportation options;
- Reinvest in urban areas to support the economic well being of an entire region;
- Create and revitalize visible, accessible and linked range of open space opportunities
- Build neighbourhoods and towns in patterns that accommodate peoples everyday needs; and,
- Preserve a region's agricultural heritage and environmental systems;
- Use infrastructure investments wisely and set performance criteria for allocation of government funds.

KEY ELEMENTS OF SUSTAINABLE DESIGN

Energy

Onsite renewable energy sources
Reduced demand
Reduction of petroleum-based fuels
Solar orientation
Heat Island reduction
Local food production

Water

Enhanced stormwater management
Waste water management
Water efficient landscaping
Infrastructure energy efficient

Waste

Waste management reduction
Recycle content
Existing building reuse

Air Quality

Reduced greenhouse gasses
Reduced auto use
Improved public transit
Housing and job proximity

Green Infrastructure Technology

Certified green building
Building energy efficiency
Building water efficiency
District heating and cooling
Infrastructure energy efficiency

✓ Good Urban Design is an excellent platform from to build a good sustainability program upon





LEED FOR NEIGHBOURHOOD DEVELOPMENT

- LEED-ND goes beyond any other set of standards for the sustainable evaluation of complete community development in North America

- Compliments good urban design and enhances it through practical sustainable initiatives

- Intended to encourage market transformation (applicable to both private and public sectors)

- Being used by various progressive developers/builders in advance of mandatory standards

- Direct impact on climate change as well as addresses other current issues:
  energy change, public health, ageing society




MARKHAM CENTRE

- 98 ha (243 ac); 9,500 people
- LEED Gold / Urban Design
- Medium and High Density
- District Energy Utility owned by Town of Markham
- BRT / LRT Central Route
- Voluntary hook-up
- 100% of buildings connected to date: office, high rise, mid rise
- Density Drives:

  Walkable urban centres; New economic regimes; High levels of transit; Social, cultural mix; Sustainable initiatives.

District Energy *Plant*

THE CURRIE BARRACKS, CALGARY

- First in Canada and the largest to date worldwide, to earn LEED ND gold certification.
- Sustainable, mixed-use urban village by Canada Lands Company, is the last of the three sites on the former military base in Calgary
- Size: 88 ha (217 ac)
- Land Uses:
  Residential, retail, office, institutional, recreational:
  - 3,000 housing units of various types (single family, urban estate, multi-family townhomes);
  - 18,580 m2 (200,000 ft2) of retail services in a mixed-use format, and
  - 27,871 m2 (300,000 ft2) of office space;
  - 8 ha (20 ac) of open space
- Density: 40 u/ha (16 u/ac)
- Population: 3,000 units

CORNELL COMMUNITY, MARKHAM

- Major new community in Markham
- Based on New Urbanist principles
- Compact, connected and complete; 40,000 population
- Diverse Housing Range
- 5 min. walk neighbourhoods
- Transit service
- Diverse open Space System
- Cornell centre includes: Regional Hospital, BRT/LRT system, mid-high density residential, retail, office
- DE plant can support 4,000,000 ft2 , opens 2011
- Heating/cooling/steam – hospital; heating/cooling - Cornell Centre
- DE is influencing Urban Design plans for Centre Area

District Energy *Plant*

GREEN EARTH VILLAGE

- Projected population of 13,000
- Secondary Plan; scale- 400ha (1,000 acres), for private sector
- Central mobility hub
- 5 min. walk- node and neighbourhood
- Healthcare facility
- Significant sustainable goals, 50% reduction energy/water and solid waste / Testing ground for new systems and economic viability
- District energy

ECOTECH VILLAGE, DEMONSTRATION PLAN

- 64 ha (157acs), 883 Units
- 5 min. walk to central shops and transit
- Mixed Use / Diverse Housing
- Transit Node
- 95% Passive Solar Alignment
- Engineered wetland / Stormwater Management
- Bio Swale Connected to Stormwater Facilities
- Underground Greywater Storage
- Community Allotment Gardens
- Photovoltaic Roof Panels
- Centralized Compost Area
- Communal Geothermal
- Walkable School with Green Roof
- Greenbelt Linkage
- Environmental Home Display

ST. MICHAEL'S HOSPITAL HEALTHY DEVELOPMENT INDEX

(Centre for Research on Inner City Health with The Planning Partnership)

Region of Peel
Working for you

Leading with Innovation
Serving with Compassion

ST. MICHAEL'S HOSPITAL
A teaching hospital affiliated with the University of Toronto

- In **response to Peel Council's direction** to comment on municipal development applications and the lack of quantifiable tools in existing literature to **measure health impact of built environments**
- The purpose of the **Index- to comprehensively evaluate land development applications** from a health perspective and **provide health-based rationale to inform planning** decisions.
- **Made up of two parts** designed to be used in tandem – the **Evaluation Tool** and **Scorecard**, the HDI would be used for **evaluating proposed communities** throughout all stages of the planning process.

THE INTERFACE_ LEED-ND and the CDC

- *The CDC supports public health efforts to design and build active communities that make it easier for people to live healthy lives. LEED-ND is one of those public health efforts.*
- *44% of all LEED-ND Credits are directly related to specific physical health initiatives.*

- Expert review panel findings revealed that many of the LEED-ND rating systems features could contribute to several health benefits. These include:
  - Reduce the risk of obesity, heart disease, and hyper tension *(promotes walking)*
  - Reduce the risk of asthma and other respiratory diseases, and reduce air pollution and injuries from vehicle crashes *(encourages the use of public transit)*
  - Increase social connection and sense of community *(encourages community participation and the delivery of appealing and comfortable street environments)*
  - Improve mental health *(promotes the reduction of commuting time and the delivery of open spaces)*
  - Encourage healthier diets *(promotes community-based and local food production)*

THE INTERFACE_ LEED-ND and the UPHN

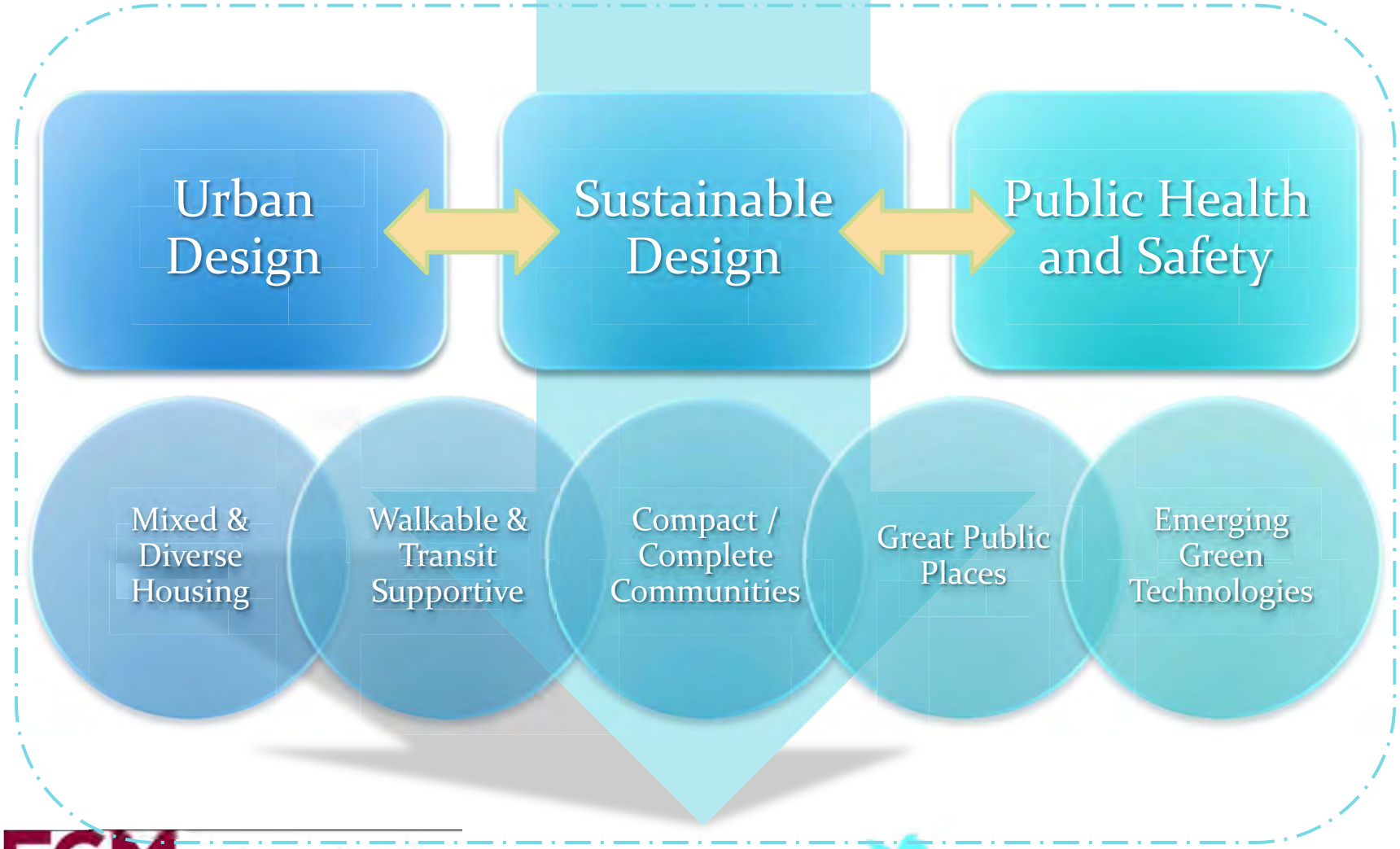
- *The UPHN is a network of the Medical Officers of Health for 18 of the largest cities in Canada.*
  - "As public health leaders, deal with the challenges of rising rates of chronic disease, declining physical activity levels, elevated rates of diabetes and burgeoning levels of childhood obesity."
  - "Recognise the pressing need to ensure that we build communities which support physical activity instead of perpetuating urban design which fails to address health needs."

- *"The UPHN supports the ongoing work of Canada Green Buildings (CaGBC) in developing and refining formal approaches to implement a system of criteria for certifying neighbourhood designs through the development of the Canadian LEED guidelines for Neighbourhood Development (LEED-ND)."*

URBAN PUBLIC HEALTH NETWORK
RÉSEAU CANADIEN POUR LA SANTÉ URBAINE

The Planning Partnership

CONCLUSIONS



Sustainable Communities
Conference and Trade Show

Conférence et salon professionnel
sur les collectivités durables

The Planning Partnership

1255 Bay Street, Suite 201
Toronto, Ontario
M5R 2A9

FEDERATION OF CANADIAN MUNICIPALITIES
FÉDÉRATION CANADIENNE DES MUNICIPALITÉS

#SCC2011