



# Planning the Sustainable Urban Design Roadmap

Community Design That Anticipates The Next Generation

Friday June 15, 2012

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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 20 years has seen a 2 or 3 times increase in diseases, asthma diabetes, depression, hearth disease
- **Climate Change**
  - CO<sub>2</sub> 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.

# CONVERGING ISSUES

May 25, 2011 - Shelia Fraser, Auditor General, warns of the harsh choice Canadians will have to face – tax hikes or program cuts due to:

1. An aging population
2. Aging infrastructure
3. Effects of climate change



Shelia Fraser discusses the impacts:

• “... we can expect people will need more health care services and will be drawing on public pensions. Obviously, balancing these fiscal pressures will be a major challenge.”

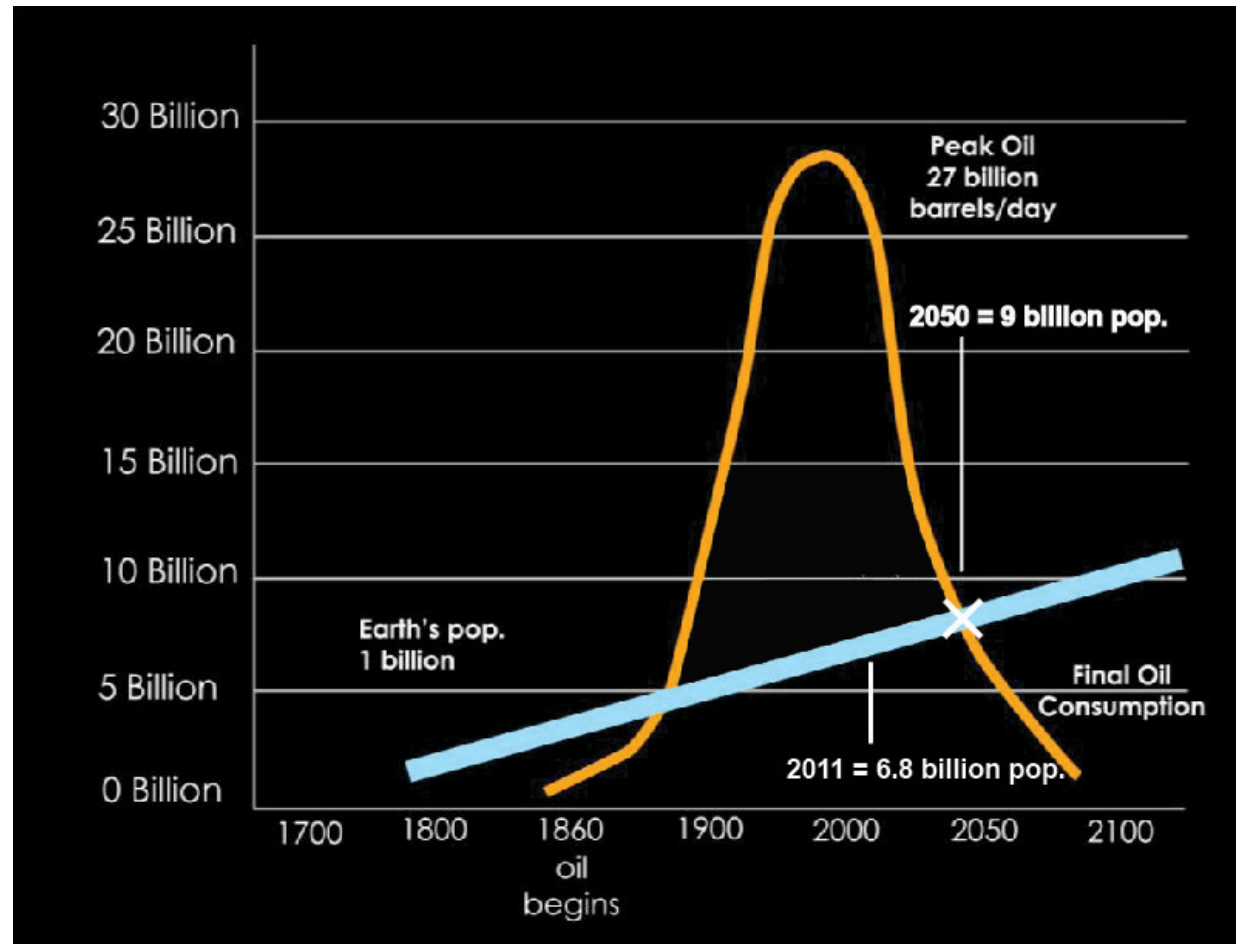
• “Melting permafrost is undermining roads, buildings and pipelines... and climate change could also affect key economic sectors such as forestry, mining, fisheries and agriculture.”

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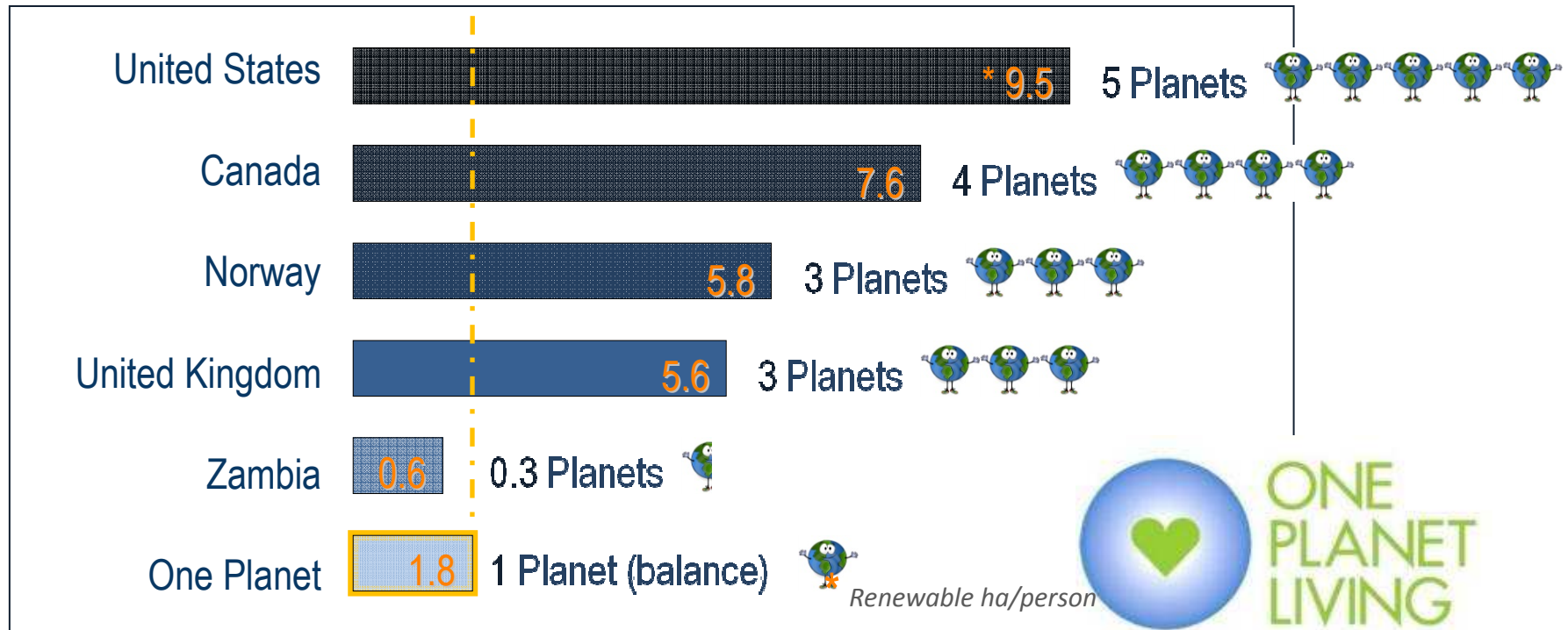
# CONVERGING ISSUES ENERGY

- **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



# CONVERGING ISSUES

EARTH'S RESOURCES, ONE PLANET LIVING

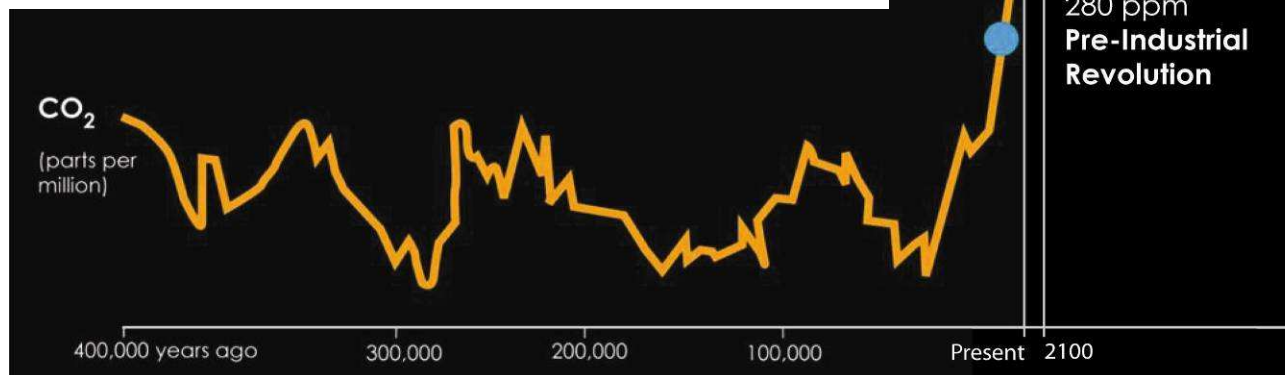
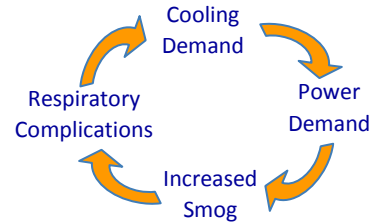




# CONVERGING ISSUES

## EARTH'S RESOURCES, ONE PLANET LIVING

- Increased demand on cooling systems & power demand; 2010 hottest summer on record.
- Even if CO<sub>2</sub> 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 CO<sub>2</sub>. Rocketing economies of China & India, with more than 1 billion people each, ensures that CO<sub>2</sub> will continue to rise.



# CONVERGING ISSUES

## EARTH'S RESOURCES, ONE PLANET LIVING



- 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

# CONVERGING ISSUES

## 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



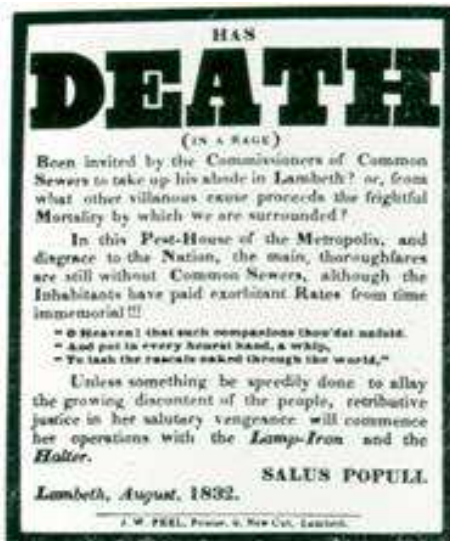
	Age 65+ Seniors % of Society
2001	13%
2021	18%
2031	24%

-Census of Canada



# CONVERGING ISSUES PUBLIC HEALTH WELFARE

- Disease of the 19th Century
  - TB
  - Cholera
  - Yellow Fever
- Treatment
  - Public Works
  - Water Quality / Treatment



30 A poster of 1832 illustrating the agitation about sanitary conditions in London (from L. Wright, *Chimney and Ditch*).

# CONVERGING ISSUES

## EARTH'S RESOURCES, ONE PLANET LIVING



- Disease of the 19th Century  
Typhoid
- Appalling typhoid death rates until;  
1910 Chlorination  
1914 Milk Pasteurization

*'American City Magazine'*



# CONVERGING ISSUES

## HEALTH ISSUES

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### The Shift from Communicable Diseases to Chronic Diseases

#### Diseases of the 21st Century (Chronic)

Hypertension, Diabetes, Heart Disease, Cancer, Osteoarthritis and; Depression

- All have doubled or tripled in the last 20 years
- Diabetes has doubled world-wide since 1980
- 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



# CONVERGING ISSUES

## HEALTH ISSUES

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### Diseases of the 21st Century

#### Respiratory Health

- Doubled in the last 20 years, greatest increase is with children
- Transportation and buildings are the worst offenders (buildings, in the city; transportation, in the suburbs)

#### Treatment

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





# CONVERGING ISSUES

## 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)

#### Treatment

- 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

## 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 24% of children and youth use active transportation to get to and from school.

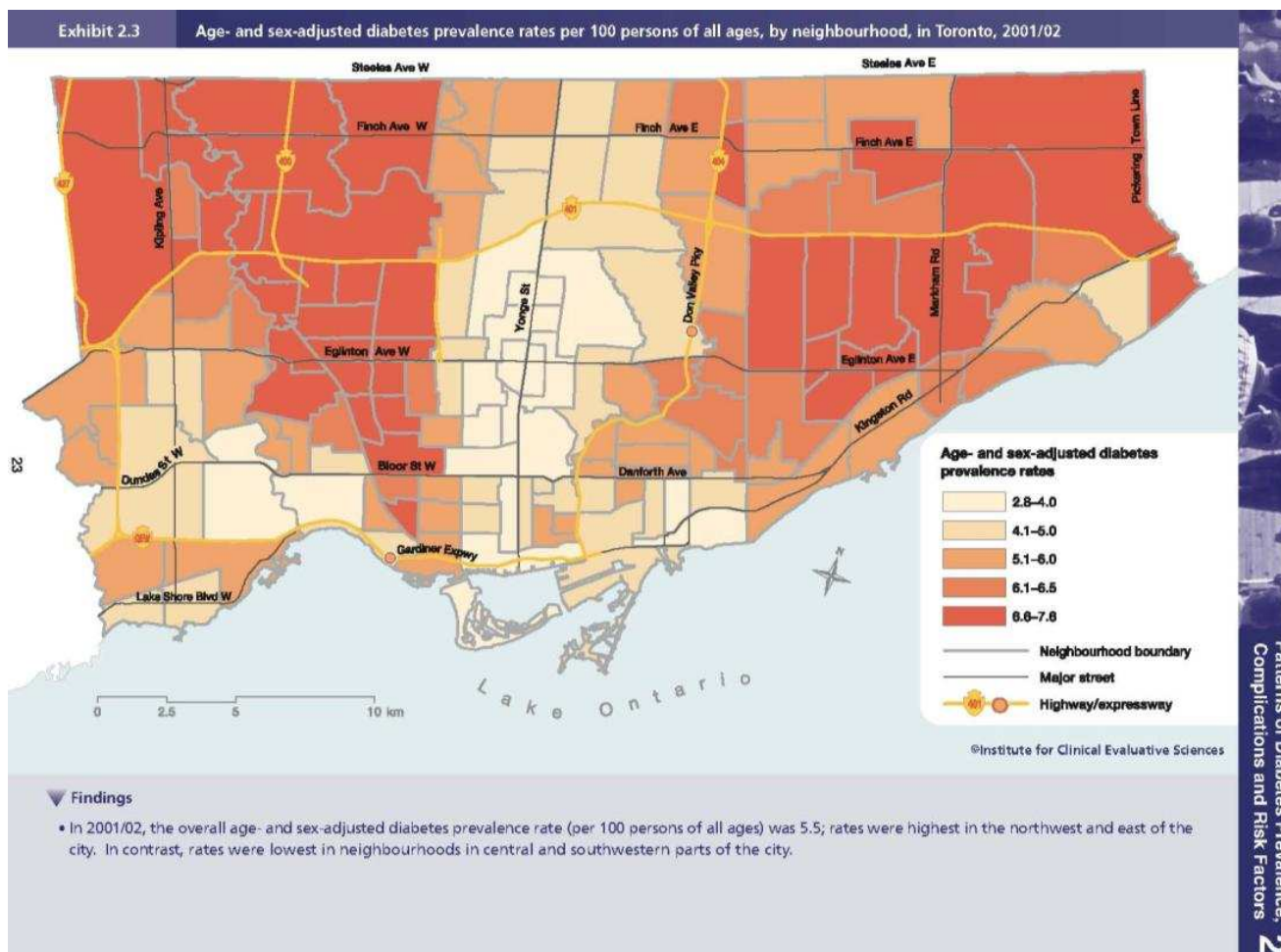


# CONVERGING ISSUES HEALTH ISSUES

ICES ATLAS- Institute for Clinical Evaluative Sciences

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

Diabetes Prevalence Rates





# CONVERGING ISSUES

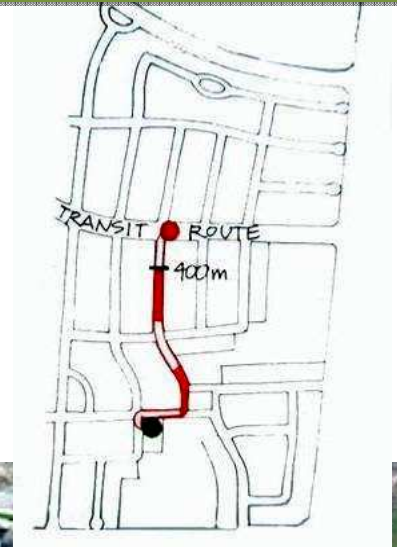
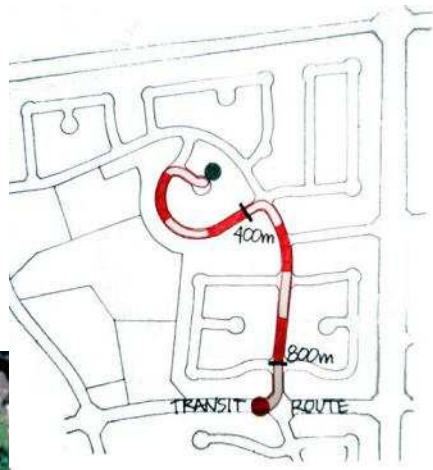
## SUSTAINABILITY AND THE BUILT ENVIRONMENT



- 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 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.
- Two generations to get to 80% is too little, too late.



# LEARNING FROM THE PAST STREET CONNECTIVITY





# LEARNING FROM THE PAST OPEN SPACE



# LEARNING FROM THE PAST HISTORY OF THE SUBURBS

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## Market Place Realities

Consequences:

- Vanishing house and degraded streetscape
- An old model of house building trying to adapt to new economic realities





# LEARNING FROM THE PAST STREET RIGHT-OF-WAY

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20m ROW and 8m setback



15.5m ROW and 3m setback




# LEARNING FROM THE PAST 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 THE PAST TRANSIT PERCEPTION




**LUCKILY, THERE'S AN AFFORDABLE ALTERNATIVE.**

**Chevrolet Cavalier VL Sedan**  
**\$12,998** (MSRP) **0** (down payment) **\$178** (monthly payment)

**\$1,000** (cash rebate)


**Features:**

- 5-Year/100,000-Mile Powertrain Warranty
- 3.2 Liter ECOTEC Engine
- Dual Front Air Bags
- 55-45 Fuel Economy (City/Highway)
- 3-Speed Getting Manual Transmission
- Traffic Detection System
- 16 Speakers



MSRP excludes tax, title, license, dealer fees, and optional equipment. \$1,000 cash rebate requires purchase of a new vehicle. See dealer for details. ©2005 GM Corp. Buckle up, America!

**the fast track to**  
**OWNING**  
**in the city**  
do it the better way on **king st. west**



**\$790** monthly

carrying from



# PROVIDING FOR OUR FUTURE

## KEY ELEMENTS OF GOOD 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.





# PROVIDING FOR OUR FUTURE

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**



# PROGRAMS

Energy Star, OBC 2012, LEED-ND, LEED-H, LEED-NC, BREEAM, Green Globes, Green Star, One Planet Living


HOMES
NEIGHBORHOOD DEVELOPMENT (IN PILOT)
COMMERCIAL INTERIORS
CORE AND SHELL
NEW CONSTRUCTION
SCHOOLS, RETAIL, HEALTHCARE


## OBC 2012

## PILOT VERSION




### LEED for Neighborhood Development Rating System


Developed through a partnership of the Congress for New Urbanism, Natural Resources Defense Council and the U.S. Green Building Council






EXISTING BUILDINGS




The quality mark for environmentally sound buildings

Winner - 'Best Program' Award at the 2005 Tokyo World Sustainable Building Conference

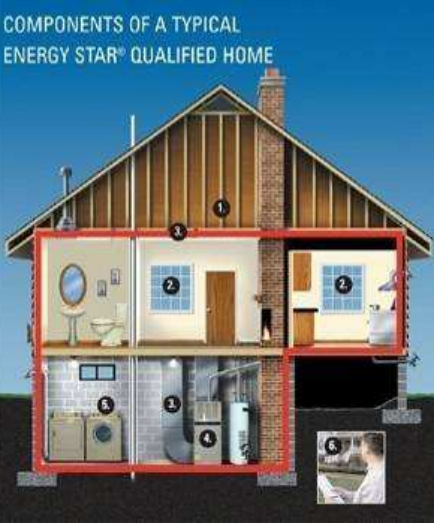


The Government's Code for Sustainable Homes


Delivering a step change in home building practice




COMPONENTS OF A TYPICAL ENERGY STAR® QUALIFIED HOME




Green Globes Design Environmental Assessment For New Buildings



Multi Unit Residential PILOT





The race is on to improve built and natural environments before the damage is out of control...



# CASE STUDIES

## URBAN INFILL

### WEST DON LANDS

- Former Brownfield
- 64 ha (157acs), 883 Units
- Major new community in Toronto, 42 ha (104 ac)
- 6,000 units (1,200 assisted living); 15,000 population
- District Energy (DE) plant combined with public uses and parkland features
- District Energy plant serves the entire plan area, construction to begin late 2009
- Mixed use, public transit, high order public realm, starts October 09
- City owned, mandatory hook-up; LEED-ND points were a consideration
- 40% energy reduction target





# CASE STUDIES URBAN INFILL

## EVERGREEN BRICKWORKS

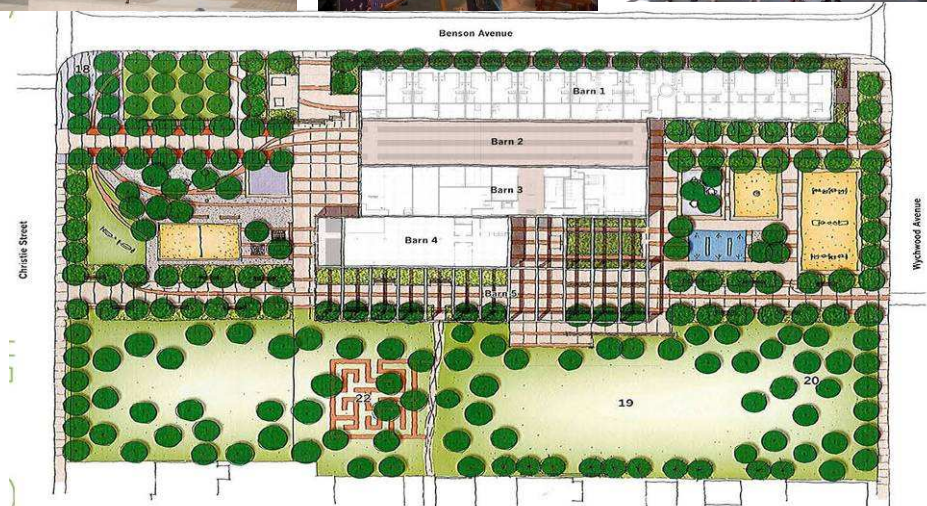
- Opened in 1889, and for the next 100 years the site was one of the best brickyards in Canada
- In the 1980's the site was taken over by the City of Toronto, Toronto Region Conservation Authority (TRCA), and the Province of Ontario.
- The site opened to the public in 1996
- \$6 million dollars were raised to transform the site
- Received LEED Platinum certification
- Preserved many of its geological and industrial heritage features
- 16 historic factory buildings have been revitalized through adaptive re-use
- Converted into a publicly accessible park, natural area, and a community environmental centre
- Site focuses on nourishing a sustainable lifestyle through social programming such as workshops, markets, education and site operations.



# CASE STUDIES URBAN INFILL

## ARTSCAPE WYCHWOOD BARN

- Conversion of the old TTC streetcar repair barn into a multipurpose community centre with residential units, office space, and gallery
  - Original building constructed between 1913 and 1921
  - Artscape began in 2008 in partnership with the City of Toronto and The Stop Community Food Centre
  - Received LEED Gold certification
  - Geo-thermal heating, energy-efficient lighting, a storm-water recycling system and several other conservation features
  - Utilized surrounding lands to develop a new city park
  - Focuses on arts, culture, ecological stewardship, historical preservation, urban agriculture, and affordable housing
- The site has become home to 26 artists and their families, 17 other individual artists, and offices for 11 non-profit organizations





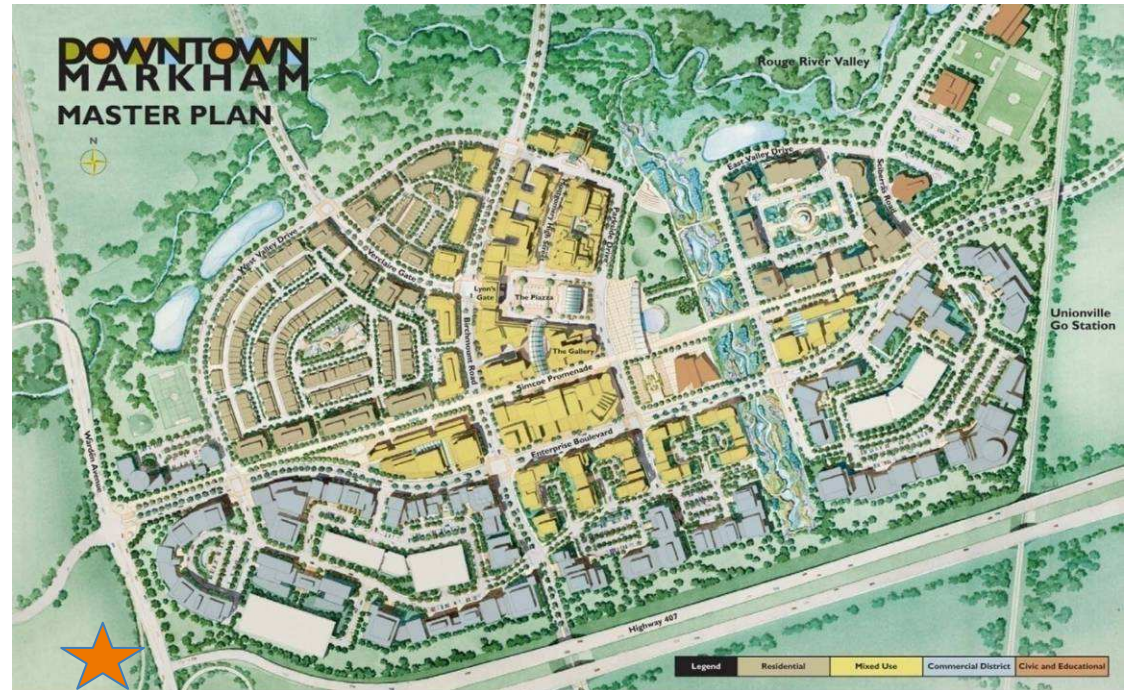
# CASE STUDIES

## NEW URBAN DESIGN

### MARKHAM CENTER

- 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*



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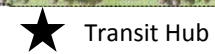


# CASE STUDIES

## NEW URBAN DESIGN

### MOUNT PLEASANT

- Major new community in Brampton
- Transit Hub - GO Transit station and Brampton Transit
- Diversity of uses within the core area
- Promotes walkability (active transportation)
- Strong Urban Design promotes liveability
- Diversity of housing promotes life cycle housing
- Joint Use for common buildings – School, Library, Community Center



Transit Hub

The Planning Partnership

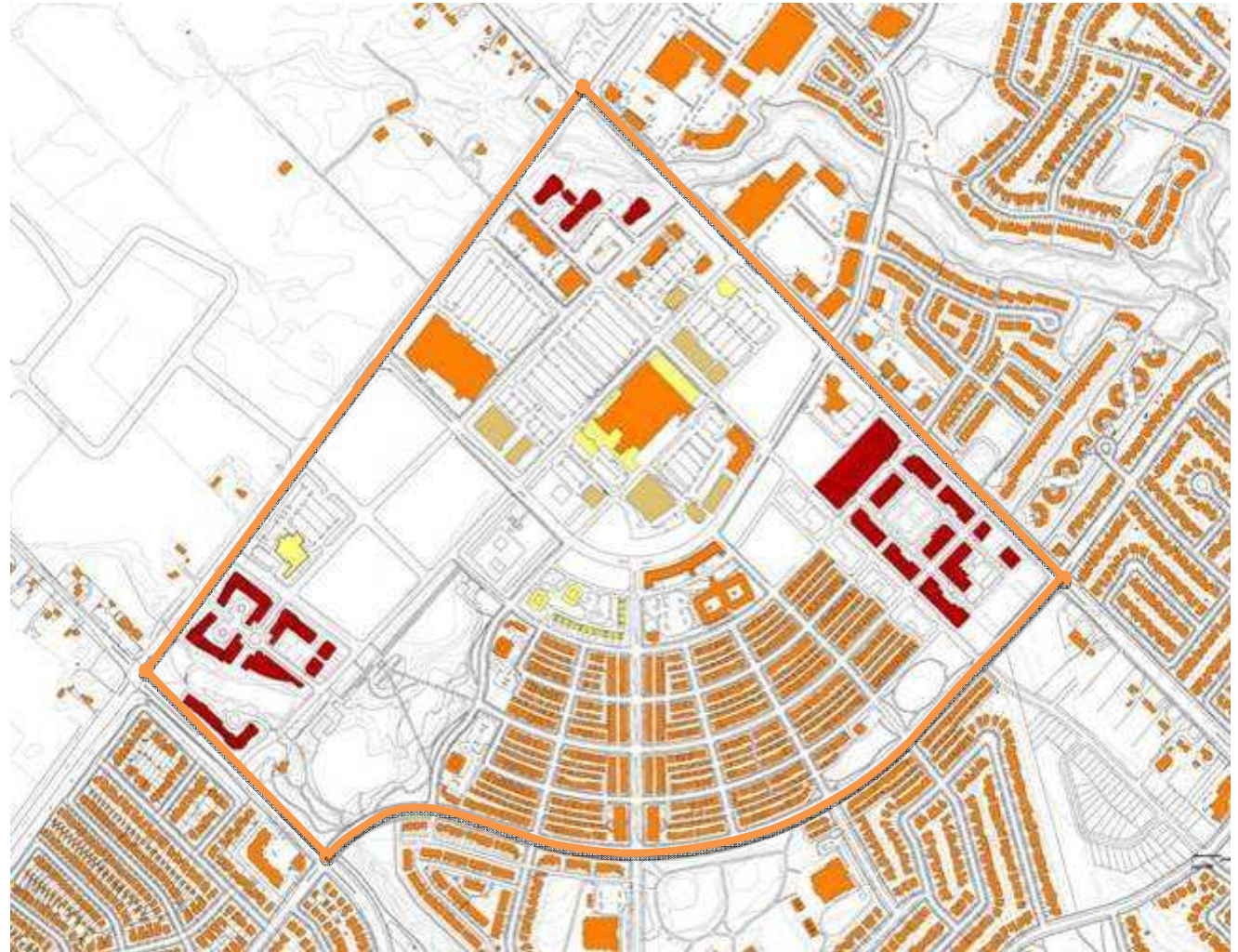


# CASE STUDIES

## NEW URBAN DESIGN

### OAKVILLE UPTOWN CORE

- Initiated in the Mid-90's
- Strong New Urbanist principles
- Poor Market Condition
- Vision Delayed
- Challenge of Big Box Scale
- Major influx of High Density Residential Buildings





# CASE STUDIES

## NEW URBAN DESIGN

### OAKVILLE UPTOWN CORE

- Established Urban Form
- Significant High Density
- Connected Main Street
- Big Box Transformation

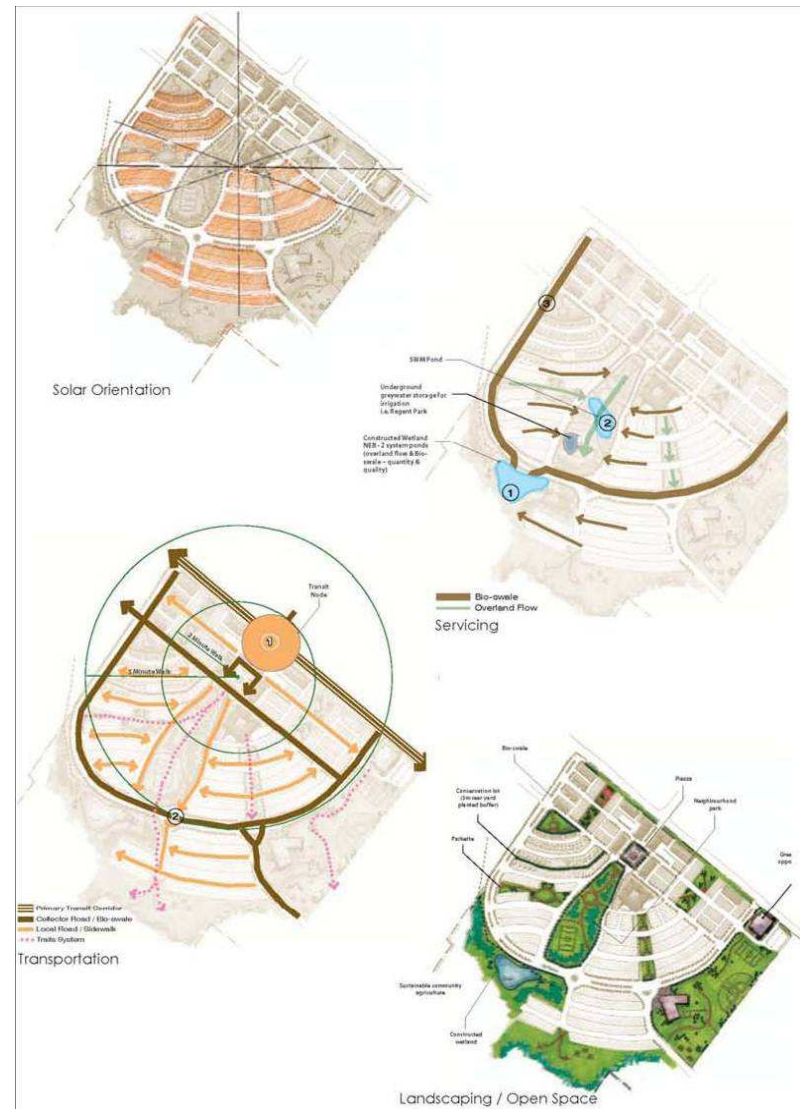




# CASE STUDIES GREENFIELD DEVELOPMENT

## ECO TECH VILLAGE

- 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



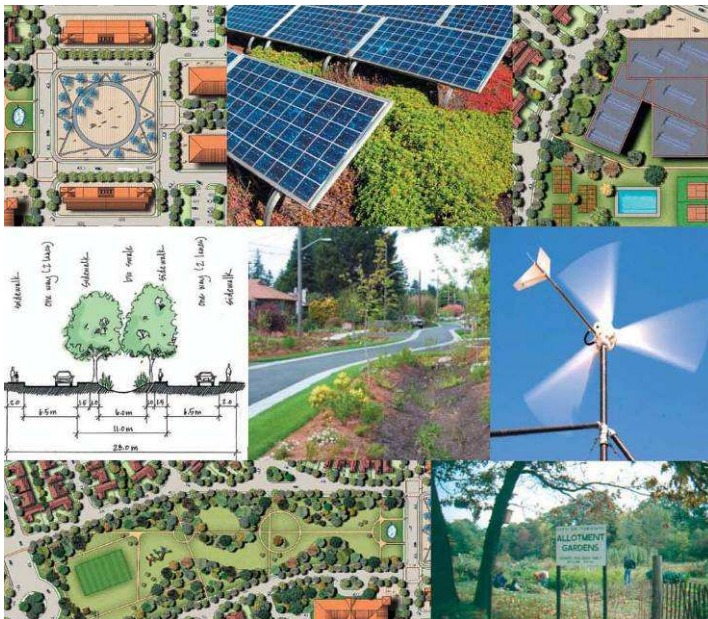
# CASE STUDIES GREENFIELD DEVELOPMENT

## ECO TECH VILLAGE

### Community Design

Layering of Functional Needs:

-Would have scored well in LEED for Neighbourhood Development Program



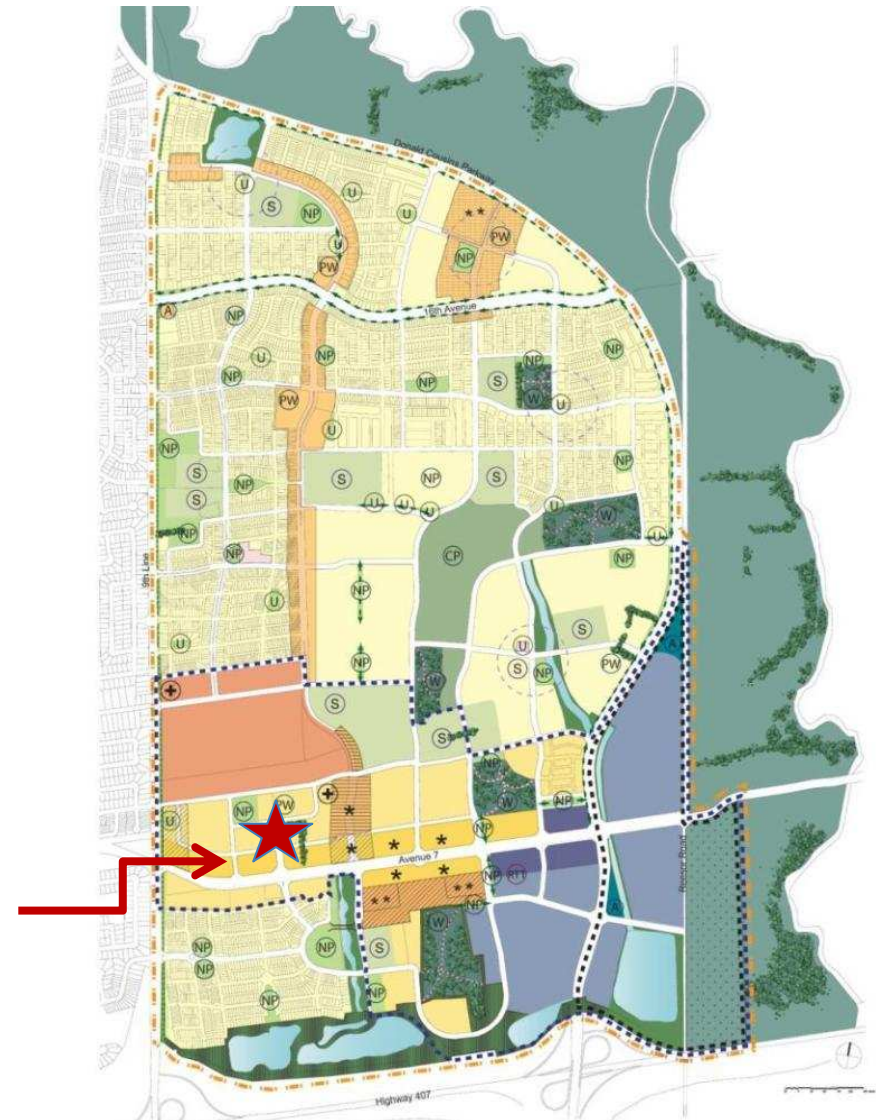


# CASE STUDIES GREENFIELD DEVELOPMENT

## CORNELL COMMUNITY

- 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 ft<sup>2</sup> , opens 2011
- Heating/cooling/steam – hospital; heating/cooling - Cornell Centre
- DE is influencing Urban Design plans for Centre Area

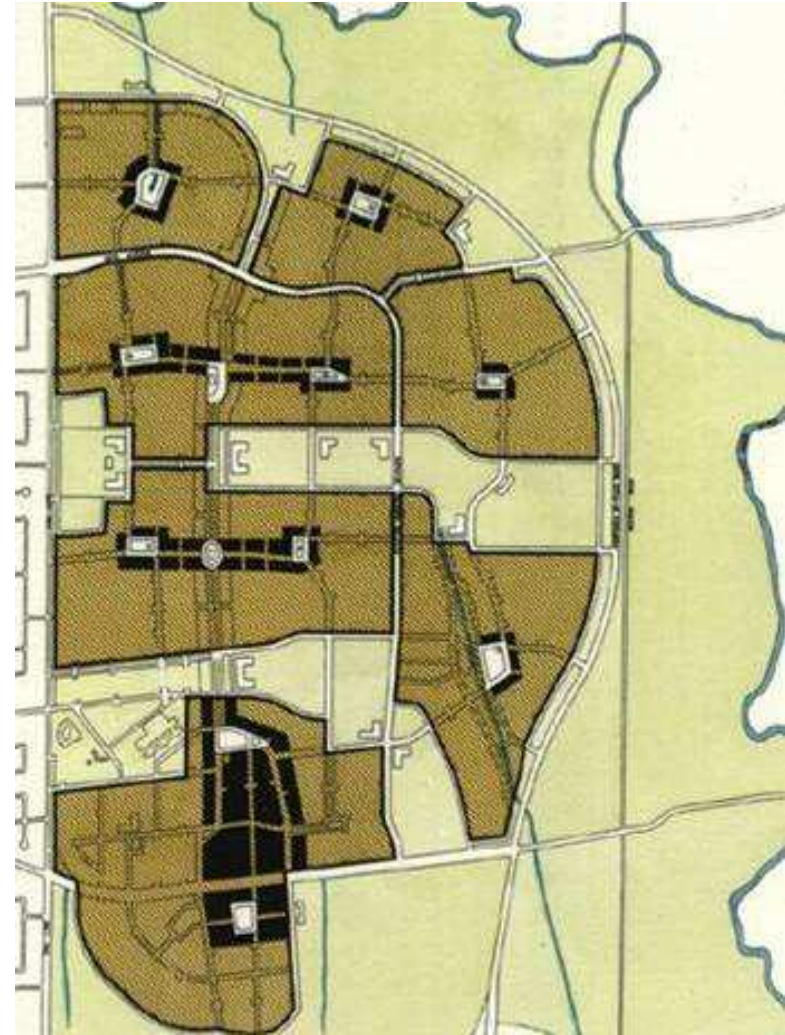
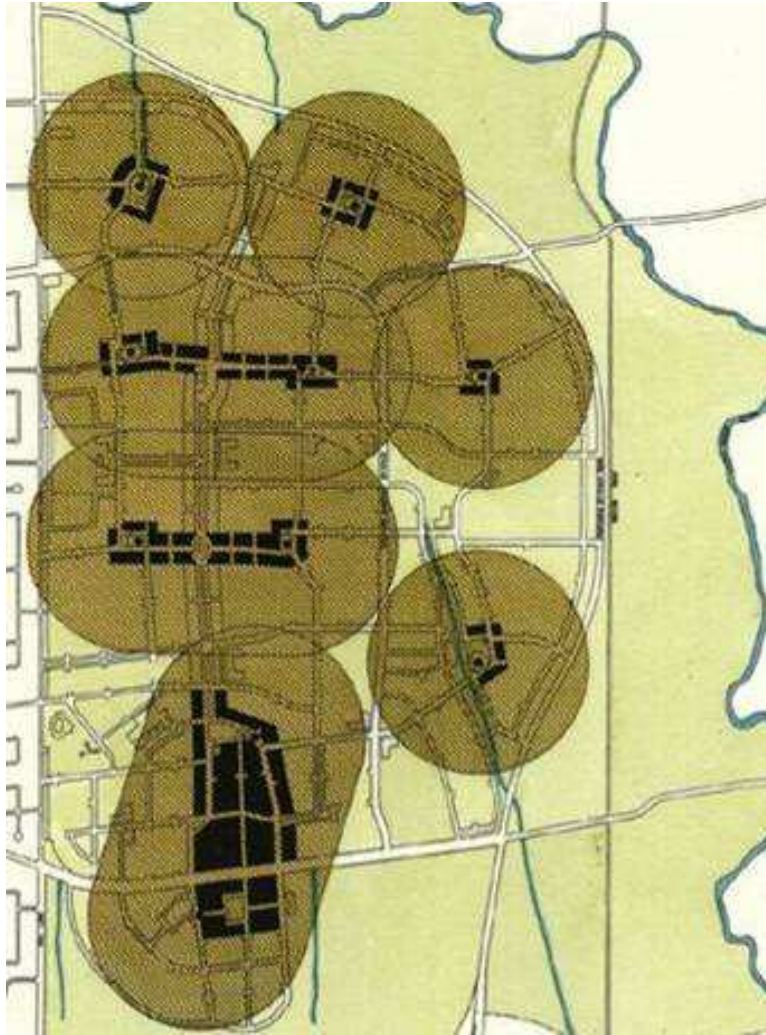
*District Energy Plant*





# CASE STUDIES GREENFIELD DEVELOPMENT

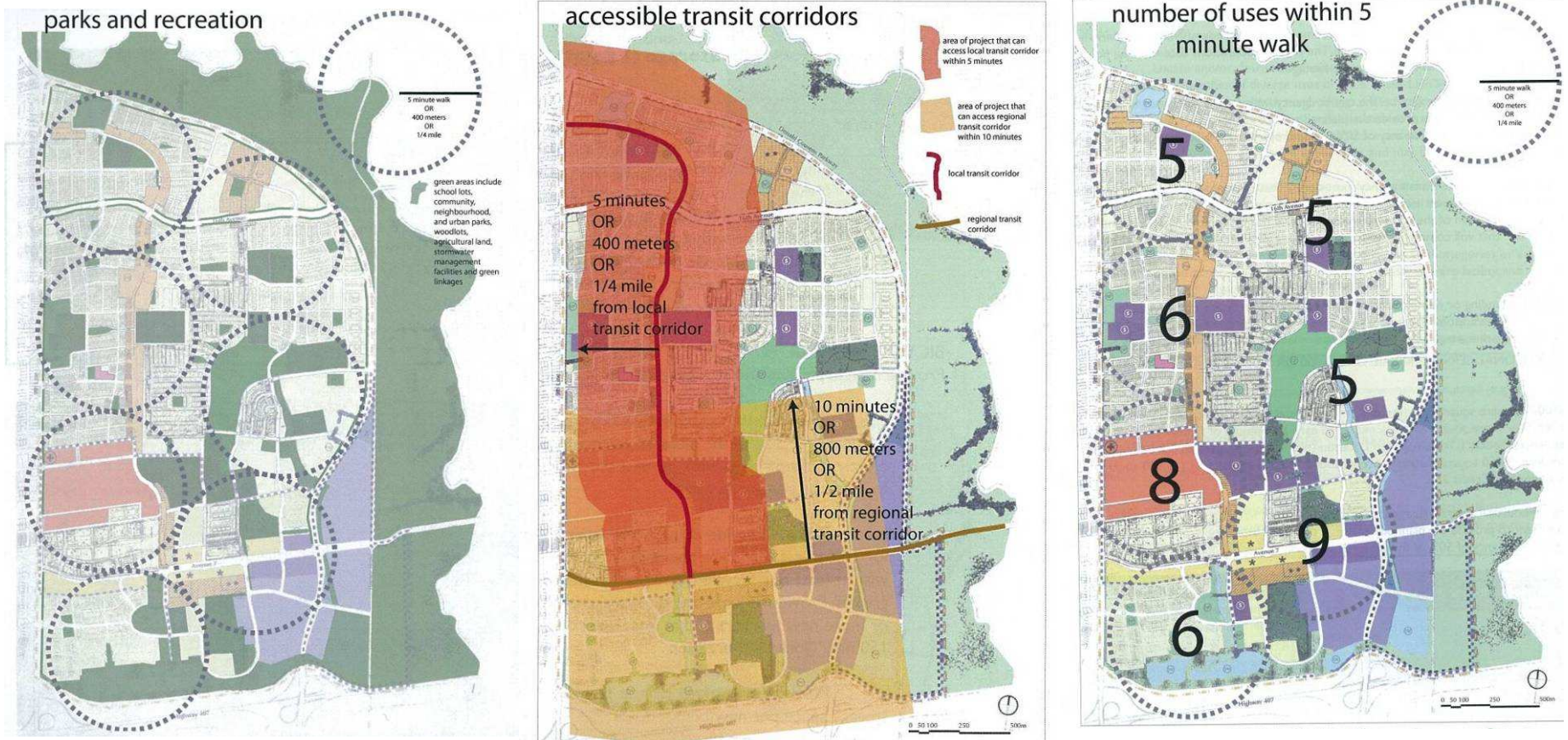
## CORNELL COMMUNITY





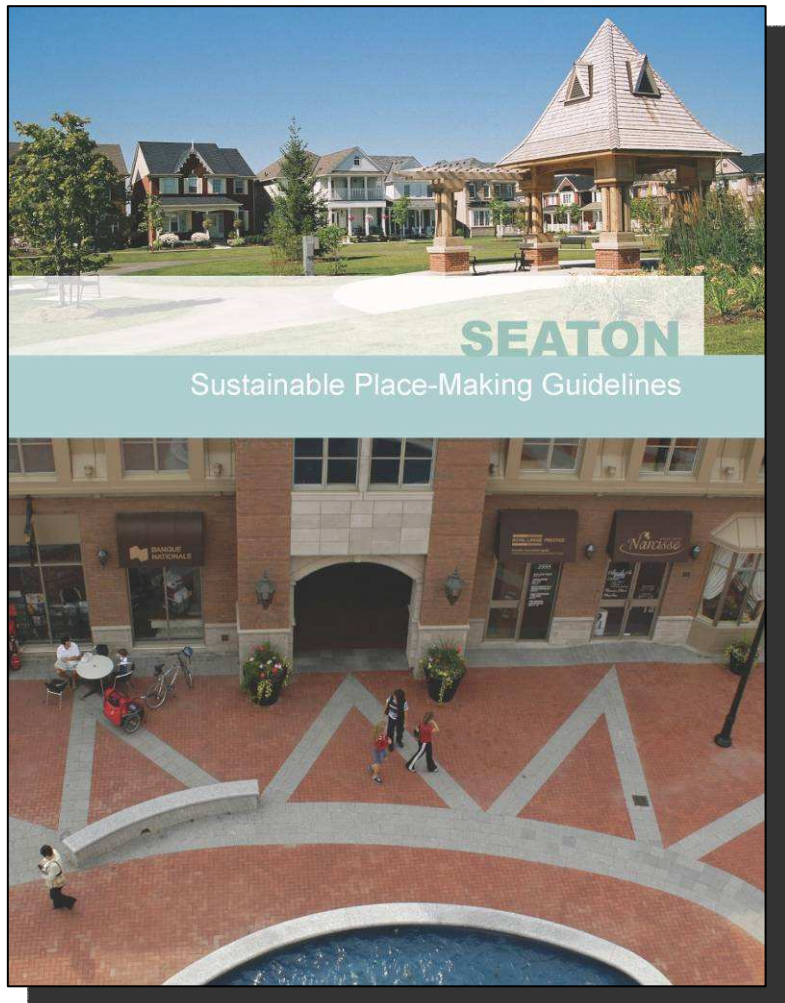
# CASE STUDIES GREENFIELD DEVELOPMENT

## CORNELL COMMUNITY



# CASE STUDIES SUSTAINABLE GUIDELINES

## SEATON COMMUNITY

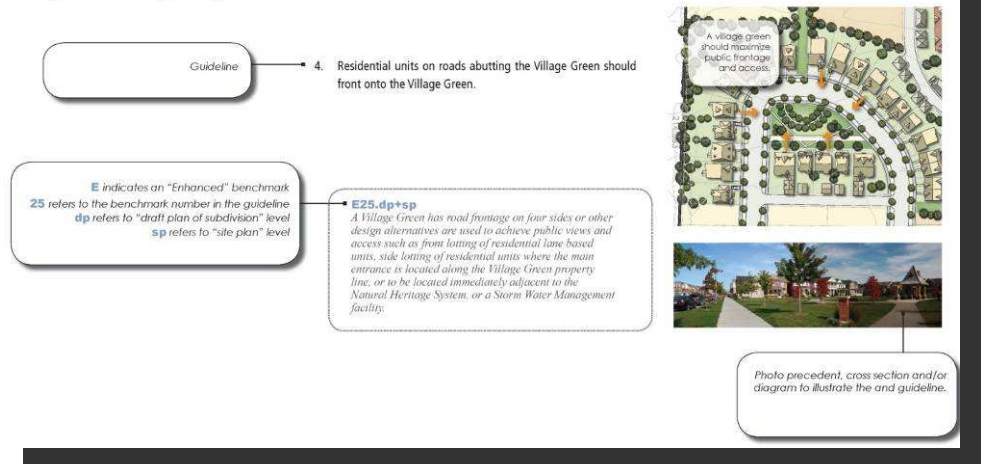


SEATON  
Sustainable Place-Making Guidelines

City of Pickering, Seaton Community

Sustainable Place-Making Guidelines

Explanation of the guideline/benchmark in the Guideline document:

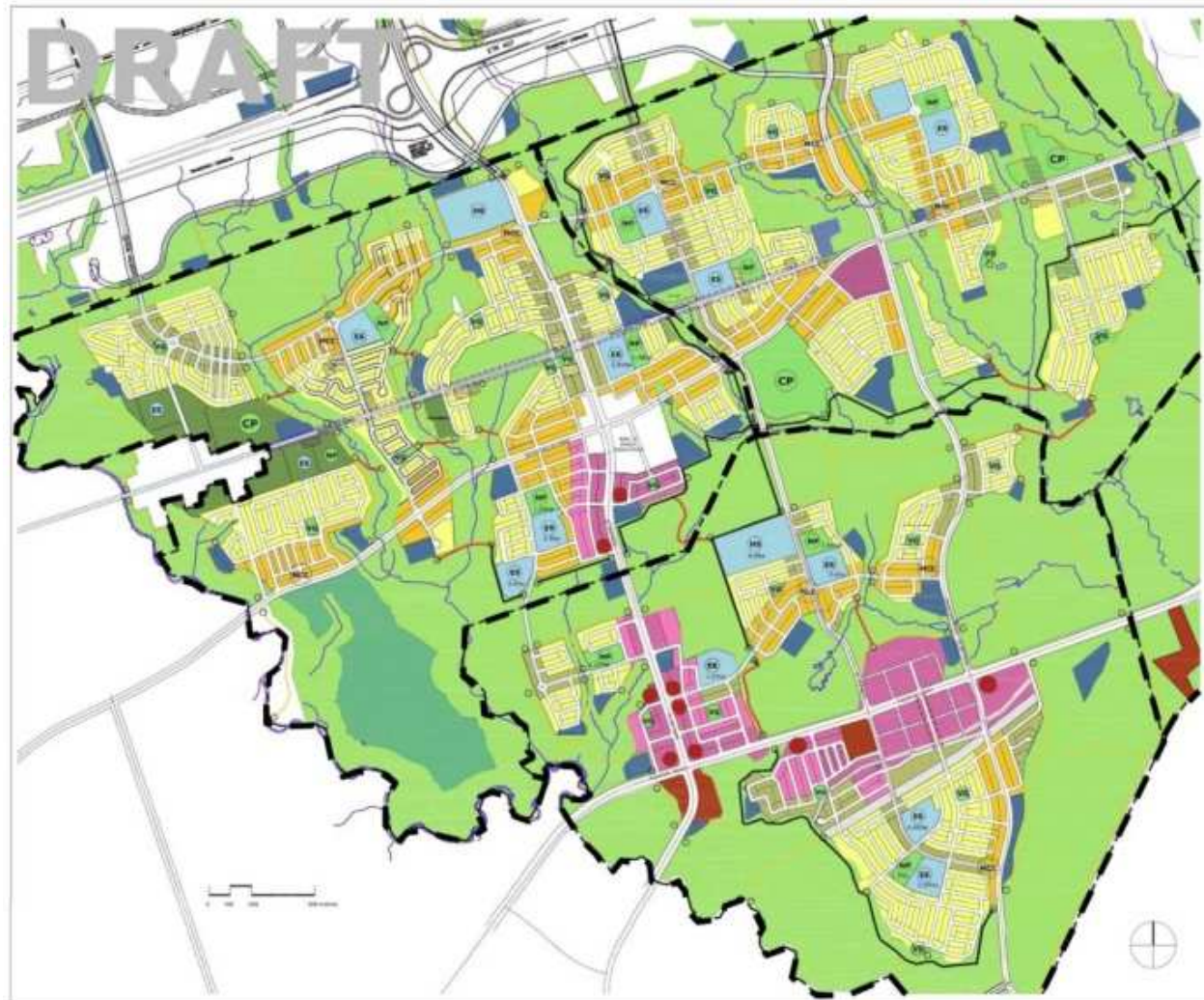


- **Developed** in conjunction with the Amendment Policies, the Neighbourhood Plans, and Landowner meetings
- **Approach** – holistic sustainability, including energy, water, solid waste, in addition to public health, social/cultural and natural environmental considerations Secondary Plan
- **Combined Document** – Urban Design & Sustainable Guidelines



# CASE STUDIES SUSTAINABLE GUIDELINES

## SEATON COMMUNITY



Seaton, New Town scale → 65,000 people

The **Planning** Partnership

# CASE STUDIES SUSTAINABLE GUIDELINES

## REGION OF PEEL HEALTH STUDY

	<p>Region of Peel</p> <h3>Health Background Study</h3> <p>DEVELOPMENT OF A HEALTH BACKGROUND STUDY FRAMEWORK</p>
	<p>May 27, 2011</p> <p>Prepared by The Planning Partnership</p>
	<p><b>In Association With:</b></p>

### Region of Peel Health Background Study



**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*

### Density

**What is density?**  
Development density refers to the number of people, dwelling units, and/or jobs that will be accommodated in a specific area (e.g. 50 people and jobs combined per hectare).

Density can be calculated on either a gross or net basis. Gross density includes infrastructure, such as streets and parks, in the overall density measurement, whereas net density only includes the land area within a development parcel (e.g. the land directly occupied by the structure and its private outdoor amenities). Gross density provides a more complete measure of how efficiently land is used across an entire community or urban area.

In some instances, the density of mixed use and non-residential uses is measured by the Floor Area Ratio (FAR) or Floor Space Index (FSI), where the gross area of a building is divided by the area of its development lot.

**Why does density matter?**  
Higher development densities create demand and support for a broader variety of services, employment opportunities, transit and other community destinations/facilities within a closer distance. Increasing the number of destinations in a community creates opportunities for active transportation (walking, bicycling, etc.), which is a key component of creating healthier places to live. Higher densities also allow for a more efficient use of resources, which supports sustainable initiatives related to health promotion, such as reduced emissions from buildings and cars.

**What does density look like?**  
Higher density development can take on a variety of forms depending on the context, and is achieved using a number of approaches that all result in a more compact use of land, including:

- Reduced lot sizes, frontages and setbacks
- Efficient lot configuration
- Increased site coverage of buildings
- A mix of higher-density structure types (stacked row houses, multi-levels, apartment buildings, etc.)
- Reduced parking supply and the introduction of structured and/or on-street parking
- A compact street network, achieved through layout and reduced right-of-way dimensions (in terms of the number of traffic lanes, the width of traffic lanes and/or the boulevard).

The images above show how density can be increased through both a suburban "regalblock" and "sub and lower level" design credit Street Repair Manual, by Galina Tchakova.

Shown here are attractive building types that achieve higher densities than traditional single-family homes, including from left to right: apartments in Port Credit, townhouses near Markham and Dundas, and stacked townhouses near Lakeshore in Mississauga.

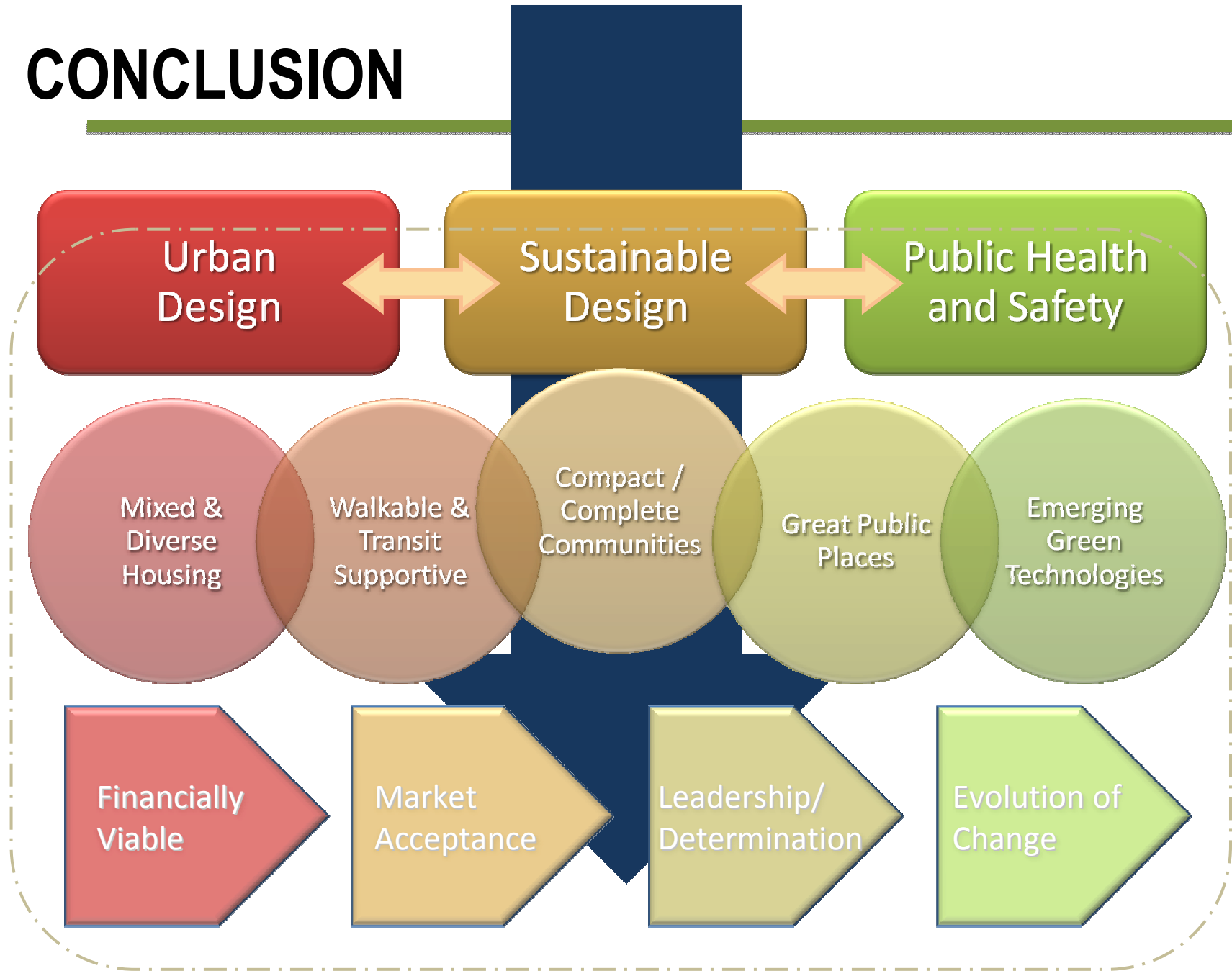
- Measures health impacts of the built environment
- Inform planning decisions



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# CONCLUSION





# The **Planning** Partnership

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