Community Energy Planning: A BC Perspective

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Itinerary

- Communities, Carbon & Energy
- British Columbia Context
- City of North Vancouver
- Surrey
- Township of Langley
- Metro Vancouver
- Nelson
- Best *Process* Review








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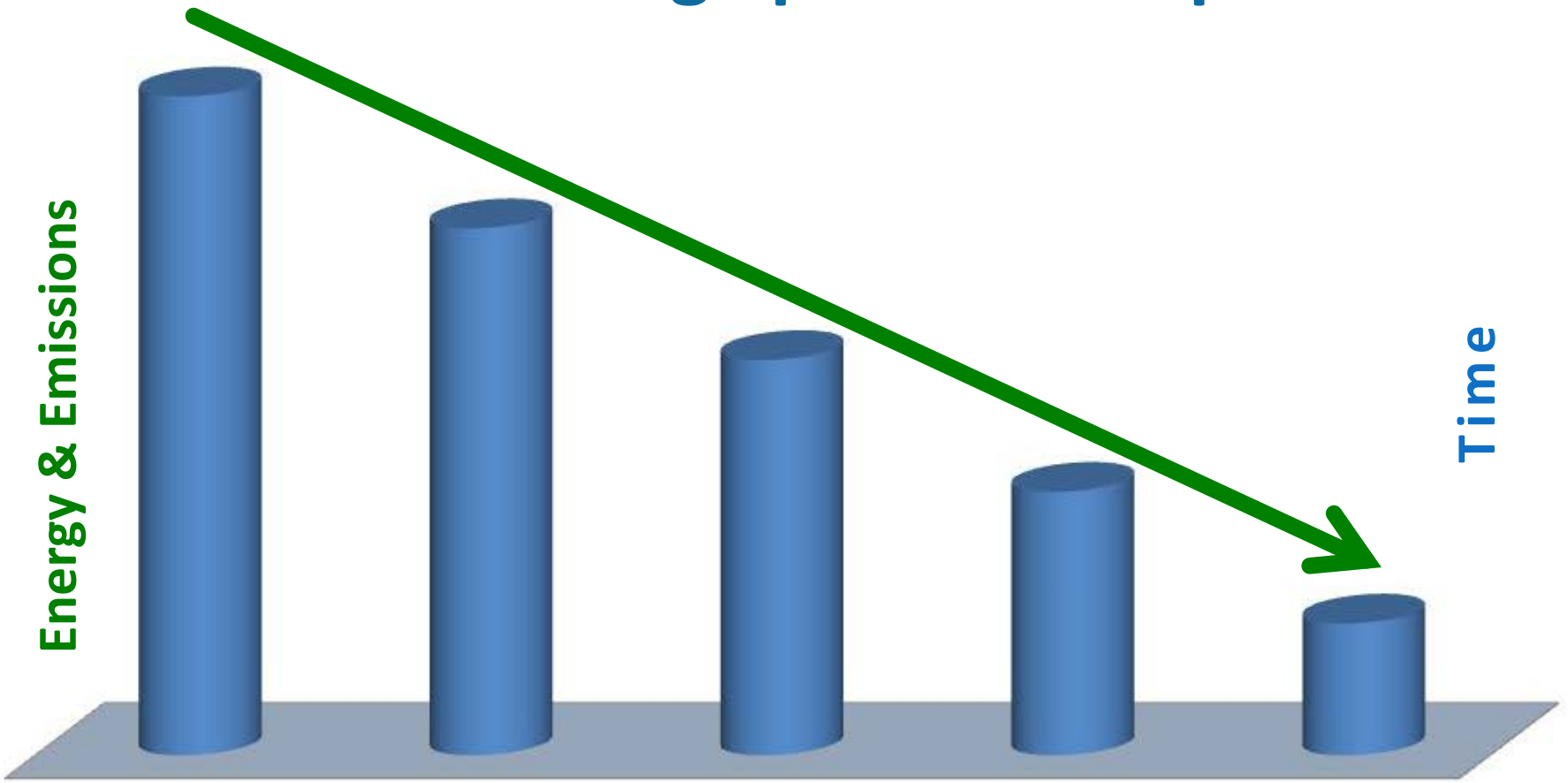
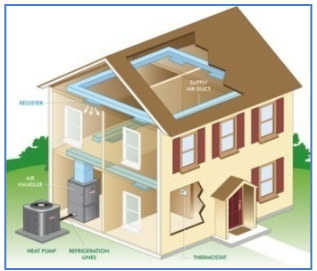
Communities, Carbon & Energy

Sustainable Energy Land Use Synergies

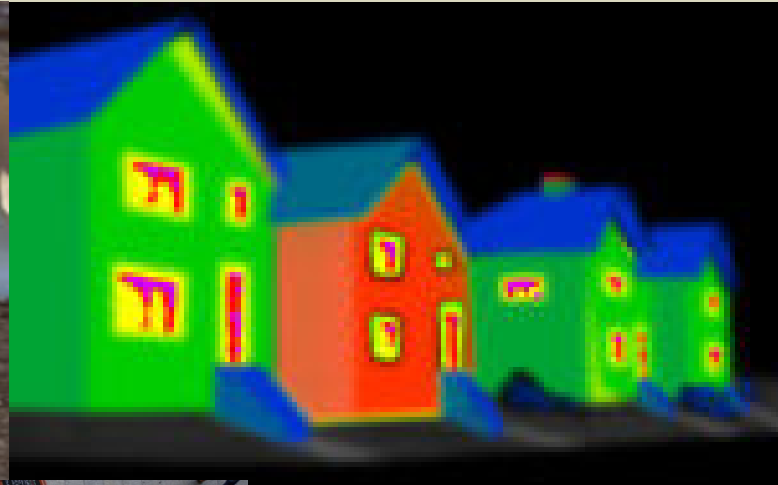
Buildings & Energy Supply	Principle	Transportation
• **Buildings:** smaller; shared walls increase efficiency • **Dist Energy:** base load	Density	• **Active Transpo:** proximate destinations • **Transit:** cost effective
• **Dist Energy:** residential-commercial mix balances load	Diversity	• **Active Transpo & Transit:** proximate key destinations
• **Heat Optimization:** co-locating heat sources and sinks permits heat sharing	Destination	• **Active Transpo:** proximate destinations • **Transit:** cost effective
• **Buildings:** passive design • **Dist Energy:** Integrated build out	Design	• **Active Transpo & Transit:** well designed places increase active transpo and transit

E&E Planning Spatial Principles





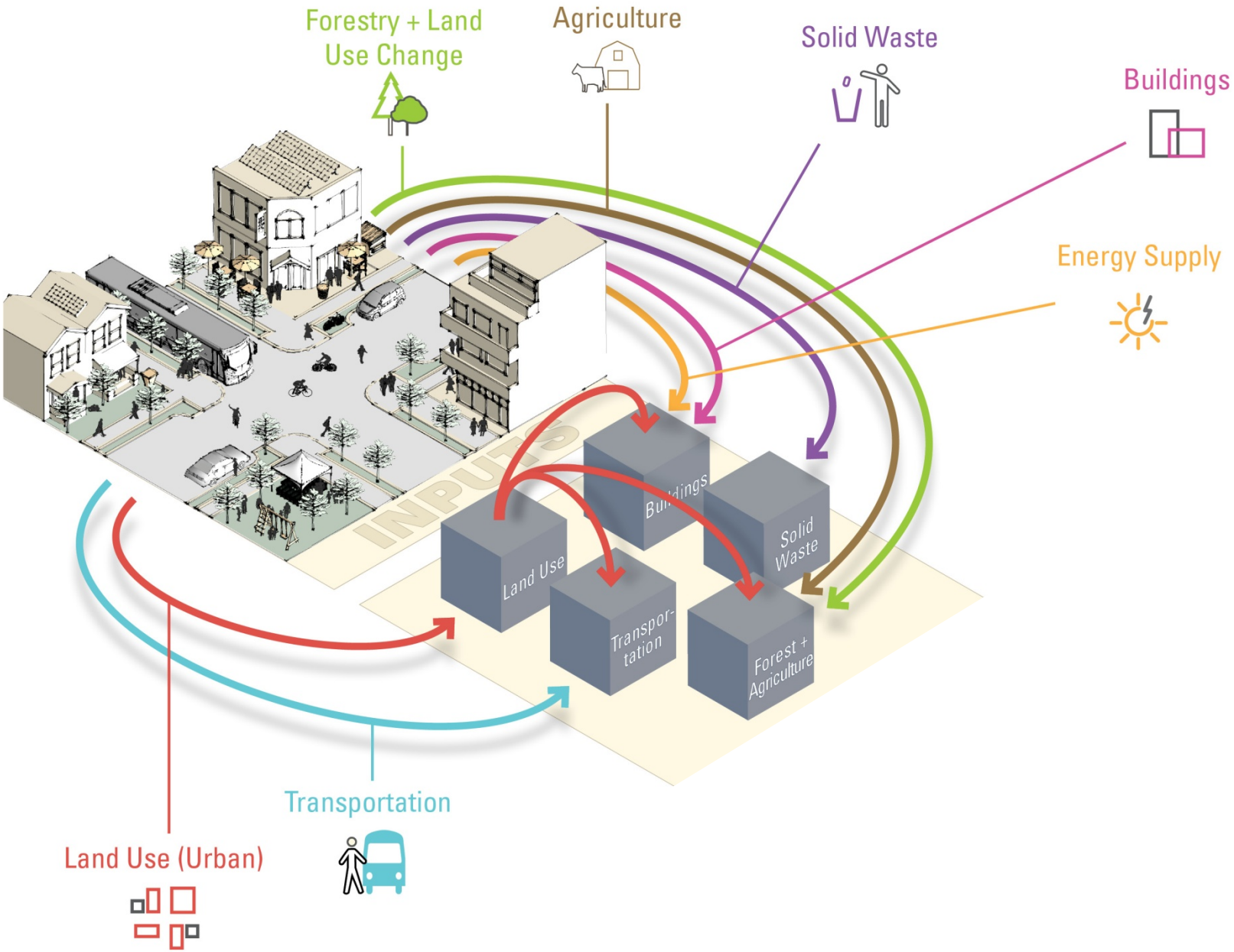









Community Energy and Emissions Mapping And Planning (CEEMAP) Tool



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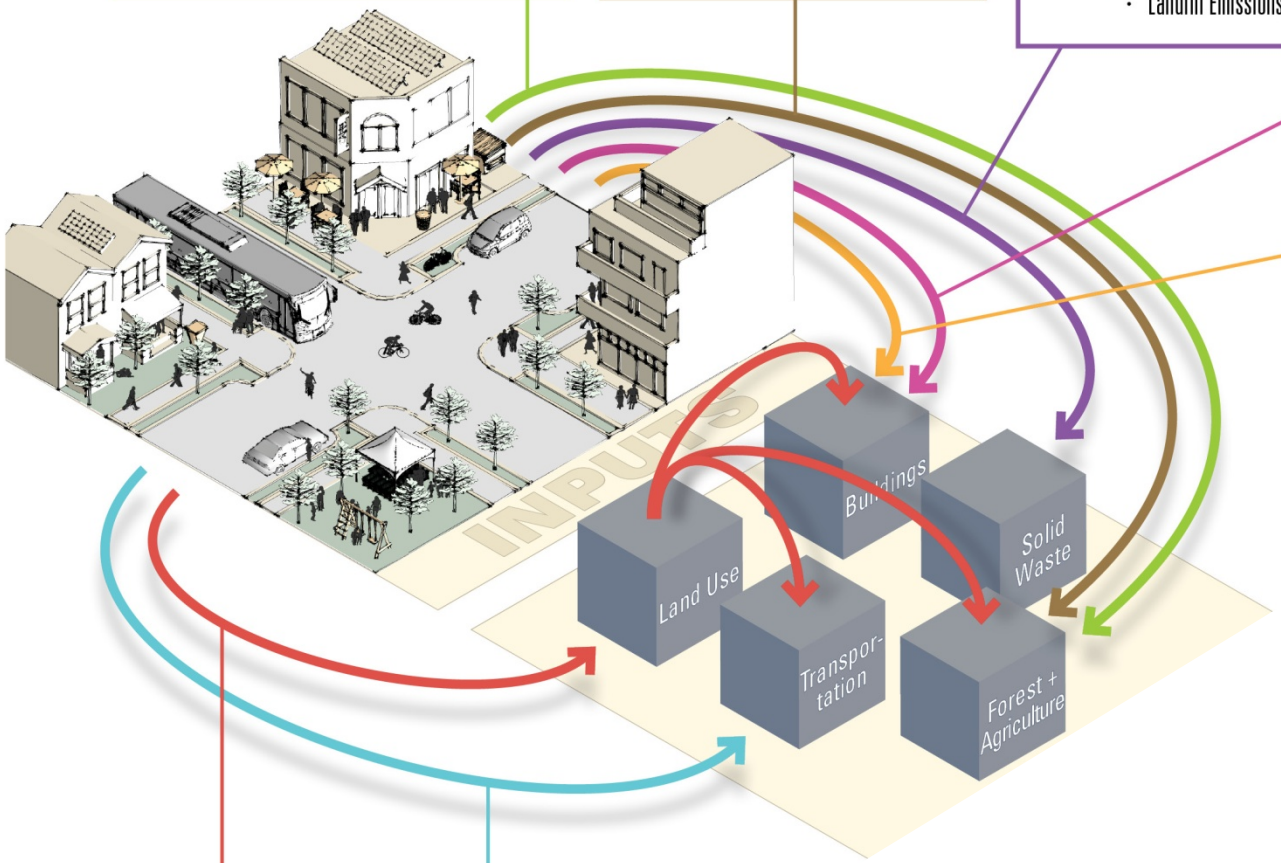

Forestry + Land Use Change

- Forest + Farm Area
- Land-Use Change Emissions

Agriculture

- Animal Number + Type
- Digestion + Manure Emissions

Solid Waste

- Generation
- Diversion Rate
- Landfill Emissions Factor

Buildings

- Building Type + Size
- Building Code Projection
- Building Performance Standards
- Building Retrofit Types + Rates

Energy Supply

- Fuel Mix for Buildings
- Electricity from Grid
- District Energy Sources

Land Use (Urban)

- Demographics
- Land Use Mix
- Employment Centres
- Density
- Neighbourhood Amenities

Transportation

- Multi-Modal Network Connectivity
- Transit Service + Frequency
- Street Density + Lane KMs
- Ride Sharing

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British Columbia Context

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Partners for Climate Protection

About Climate Change
Adaptation
Get Involved
Milestone Framework
Members

Alberta
British Columbia
Manitoba
New Brunswick
Newfoundland and Labrador
Northwest Territories
Nova Scotia
Nunavut
Ontario
Prince Edward Island
Quebec
Saskatchewan
Yukon

National Measures Report
Program Resources

Members

Province/Territory		Number of Participants
	Alberta	18
	British Columbia	69
	Manitoba	30
	New Brunswick	17
	Newfoundland & Labrador	7
	Northwest Territories	3
	Nova Scotia	14
	Nunavut	1
	Ontario	57

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BC: CEEP Drivers

- Provincial Policy
  - Legislative Requirement:
    - GHG Reduction Targets, Policies & Actions
  - Community Energy & Emission Inventory
- Utility Context
  - BC Hydro + FortisBC Community Energy Programs
- Geographic
  - Mountains, Rivers, Forests
  - *Coastal* Temperate Rainforest
  - *Agricultural Land Reserve*

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LIVING CITY
Climate Action Starts Here

City of North Vancouver:
Community Energy & Emission Plan

March 27, 2013

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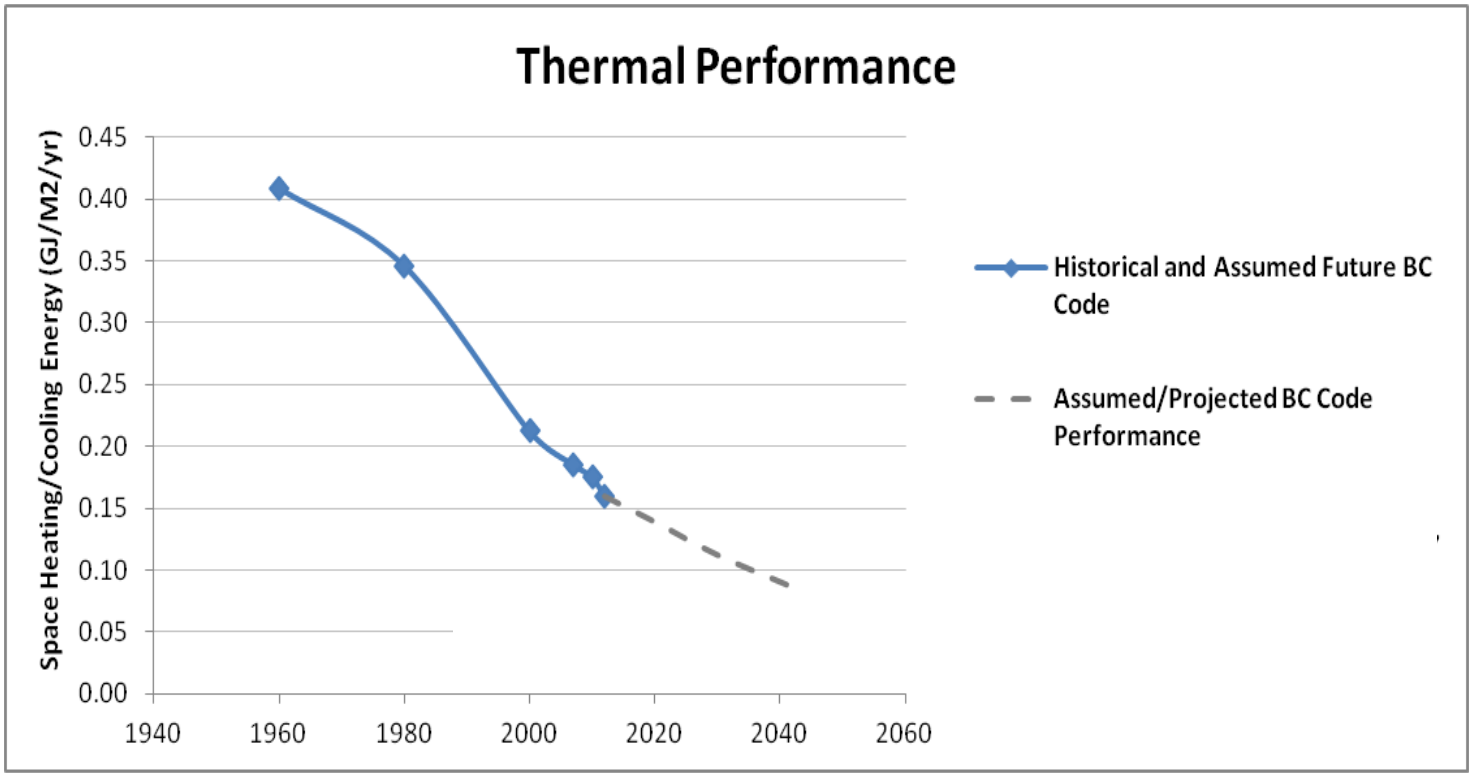
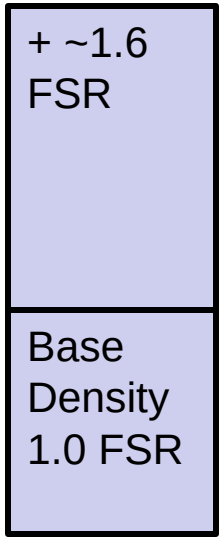
Building Performance Improvement

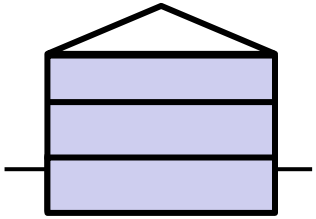


Density Bonusing for Advanced Efficiency

- **Part 3 Buildings**
  - 1.0 FSR Base Density
  - + ~1.6 FSR for going beyond ASHRAE 90.1 2004 to ASHRAE 90.1 2007
  - 1% Performance Bond



- **Part 9 Buildings**
  - Cellar floorspace exclusion for going beyond EnerGuide 77 to EnerGuide 80
  - 1% Performance Bond



City of Surrey: Community ENERGYShift Plan

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Population Growth + Carbon: Future Scenarios

Base Yr Population: 500,000

200,000 @ 7 t/c/yr
200,000 @ 6 t/c/yr
100,000 @ 5 t/c/yr

Per Capita Per Yr: 6.2 t
Total GHG Per Yr: 3.1 Mt

Future Population: 700,000 (+40%)

Focussed Growth Future

200,000 @ 3 t/c/yr
250,000 @ 4 t/c/yr
150,000 @ 5 t/c/yr
100,000 @ 6 t/c/yr

Per Capita: 3.6 t (-41%)
Total GHG: 2.6 Mt (-18%)

Distributed Growth Future

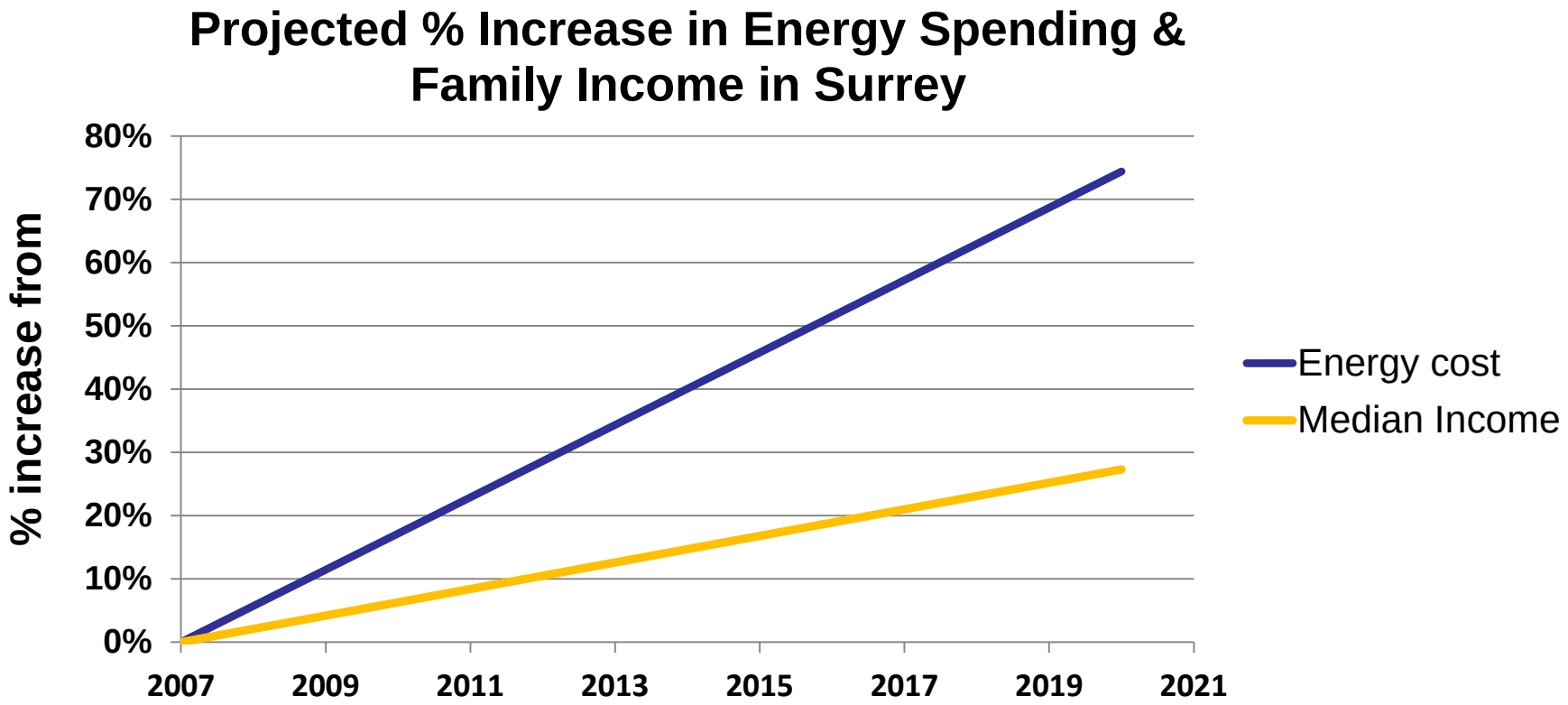
100,000 @ 3 t/c/yr
150,000 @ 4 t/c/yr
200,000 @ 5 t/c/yr
250,000 @ 6 t/c/yr

Per Capita: 4.9 t (-21%)
Total GHG: 3.4 Mt (+10%)

Energy Spending

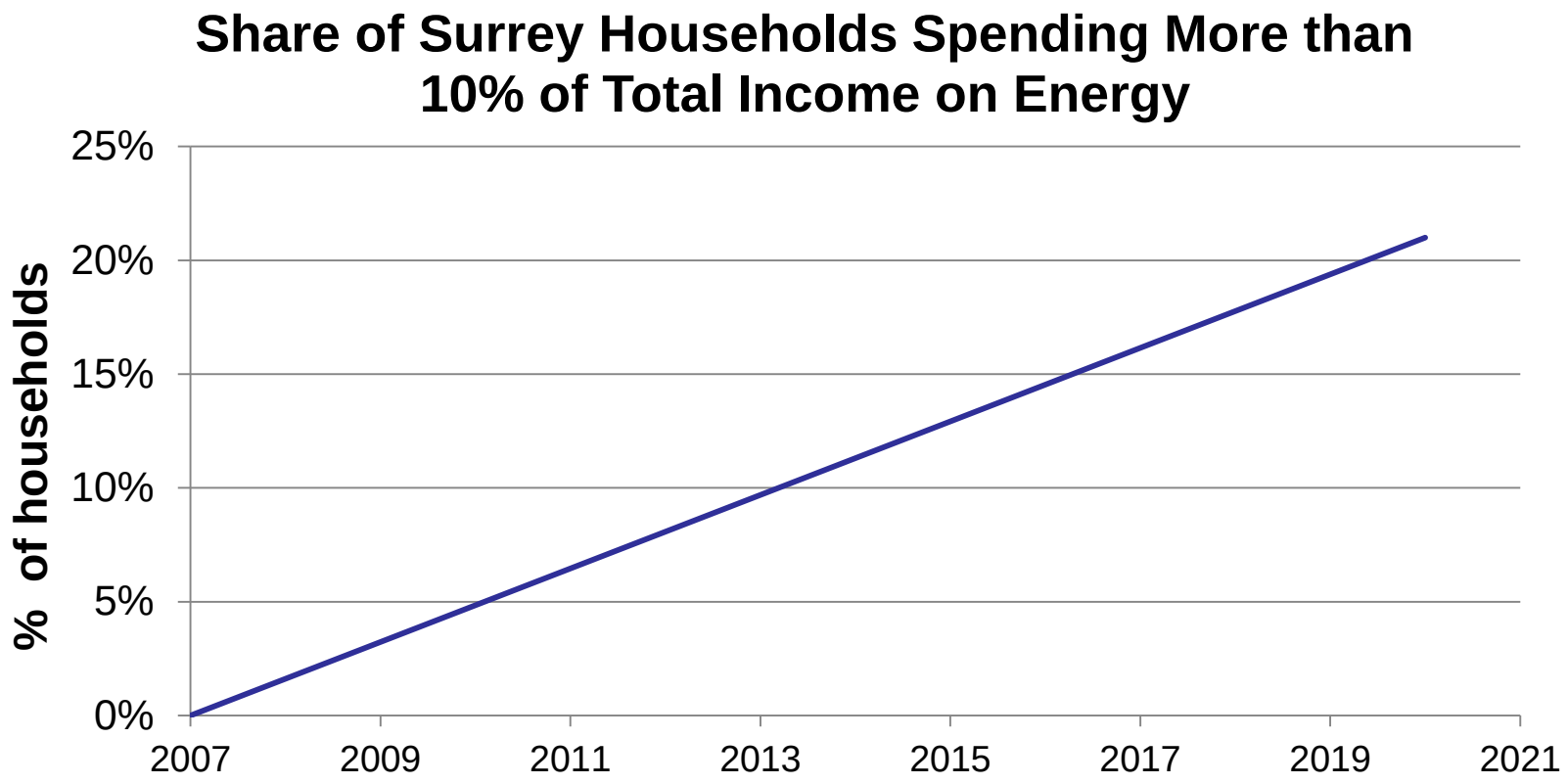
	2007
Residential buildings	$ 251 million
ICI Buildings	$ 118 million
Personal Transportation	$ 402 million
Public Transportation	$ 43 million
Commercial Trans.	$ 217 million
Total All	**$ 1,031** million

Emerging Energy Vulnerability



Nominal (non-inflation adjusted)
Median incomes are only staying pace with inflation

Emerging Energy Vulnerability



Nominal (non-inflation adjusted)

	2007	By 2020	change
Average Energy Spending per Household	$ 4,300	$ 6,000	+40%
Avg Share of Existing HH Spending >=10%	0.2%	21%	+19.9%

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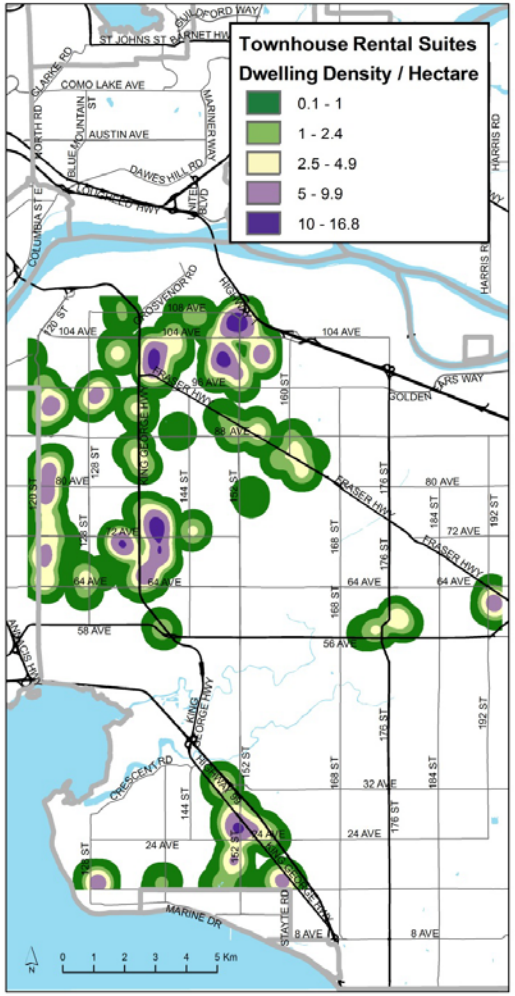
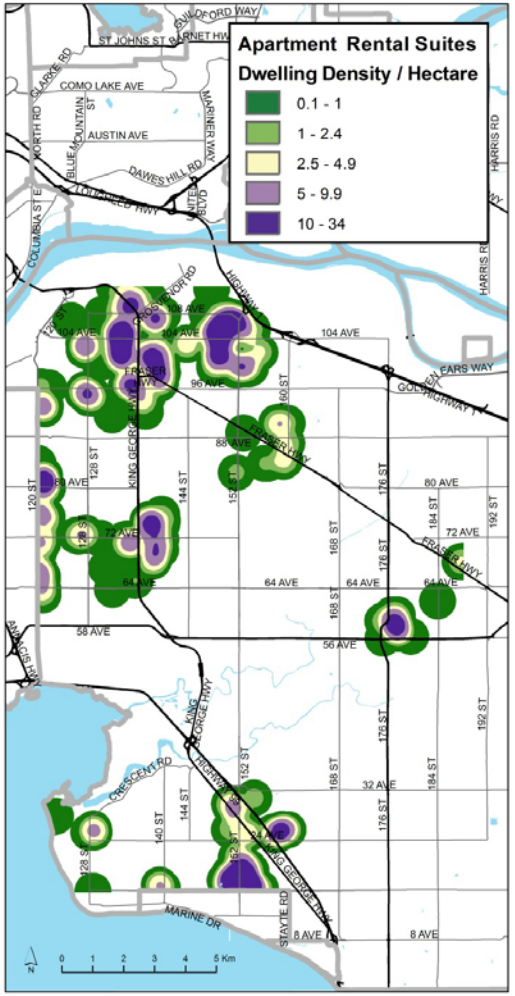
Affordable Housing Retrofit Strategy





- Market Rental Focused
  - *Proposed* Strategy
  - Metro's largest affordable housing type
  - Significant portion in danger of redevelopment
  - Leverage emerging On Bill Financing

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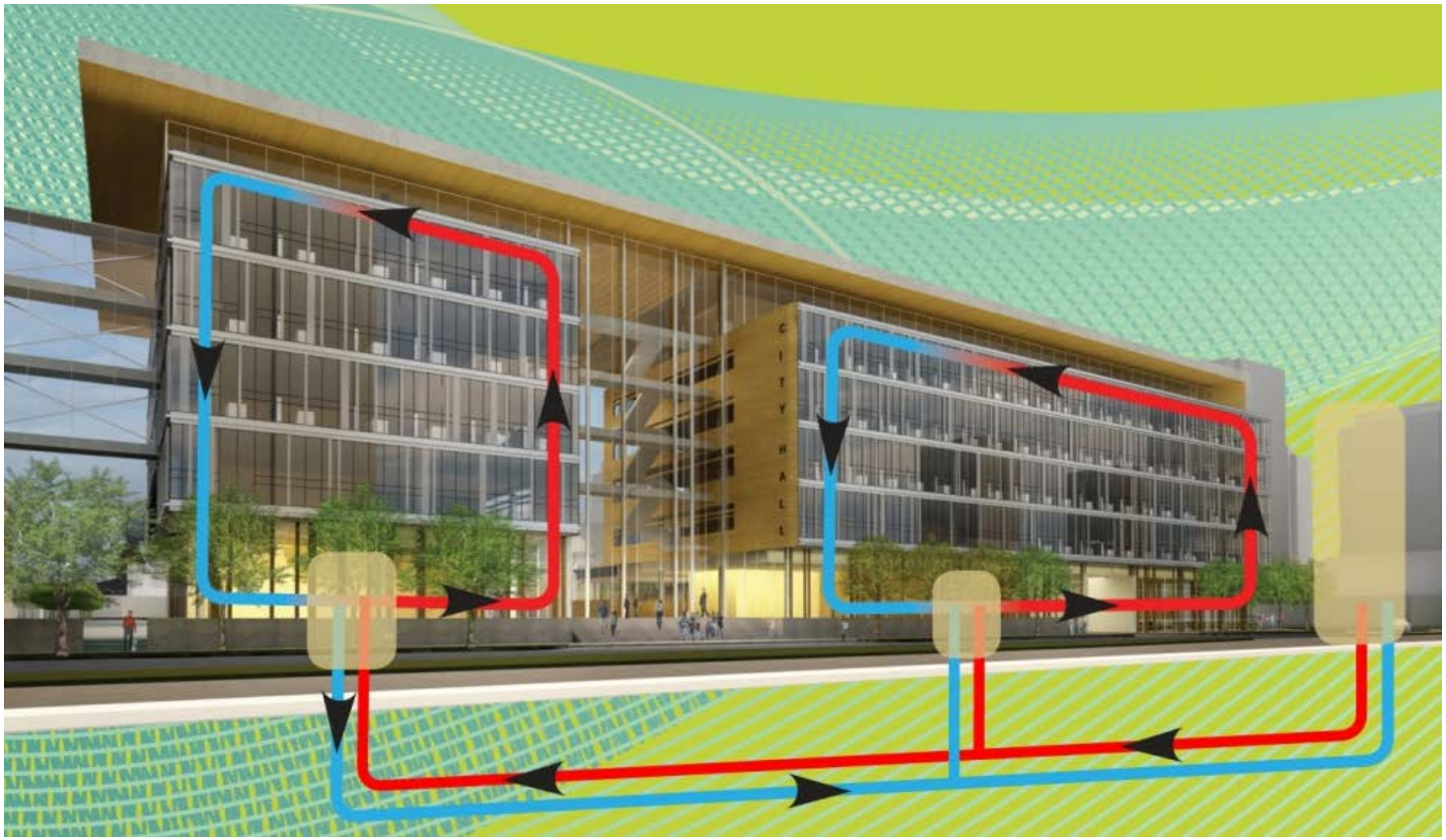
District Energy



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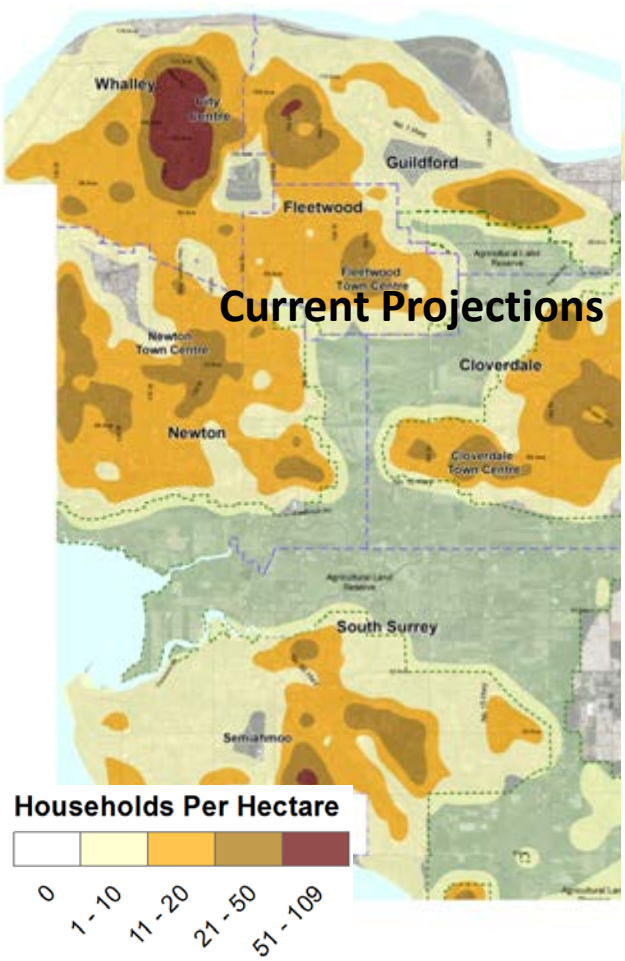
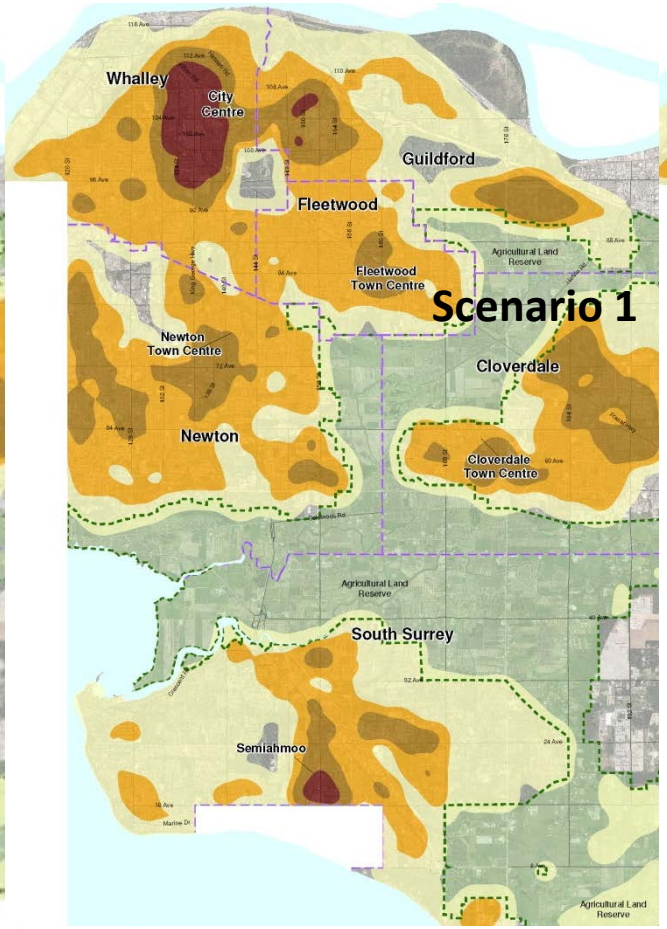
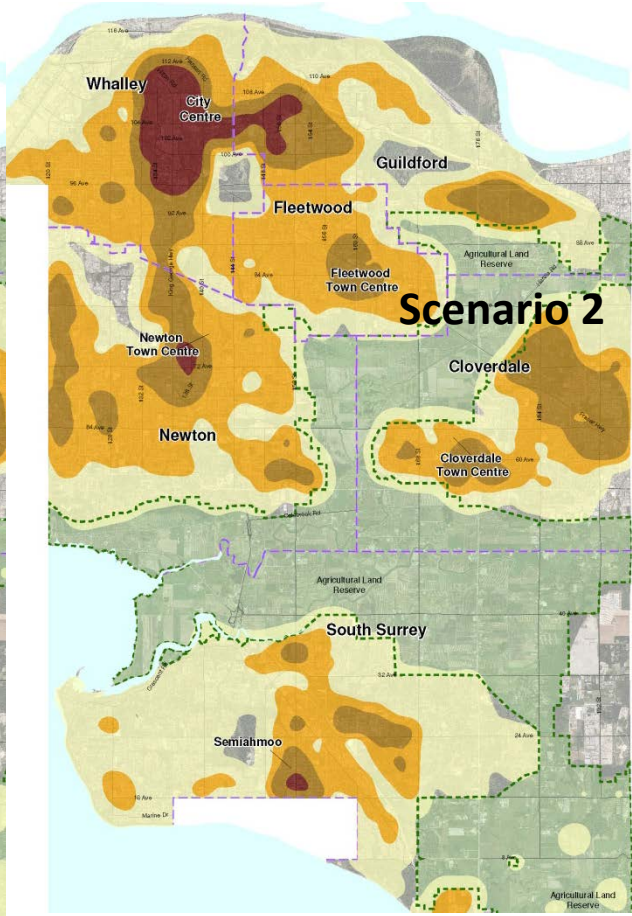
Land Use Futures







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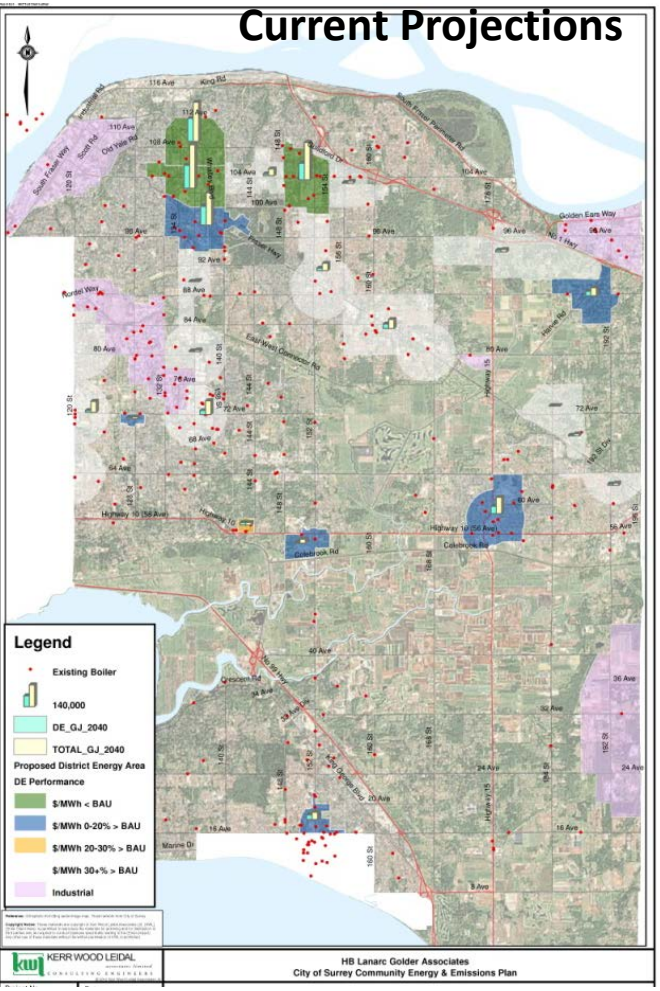
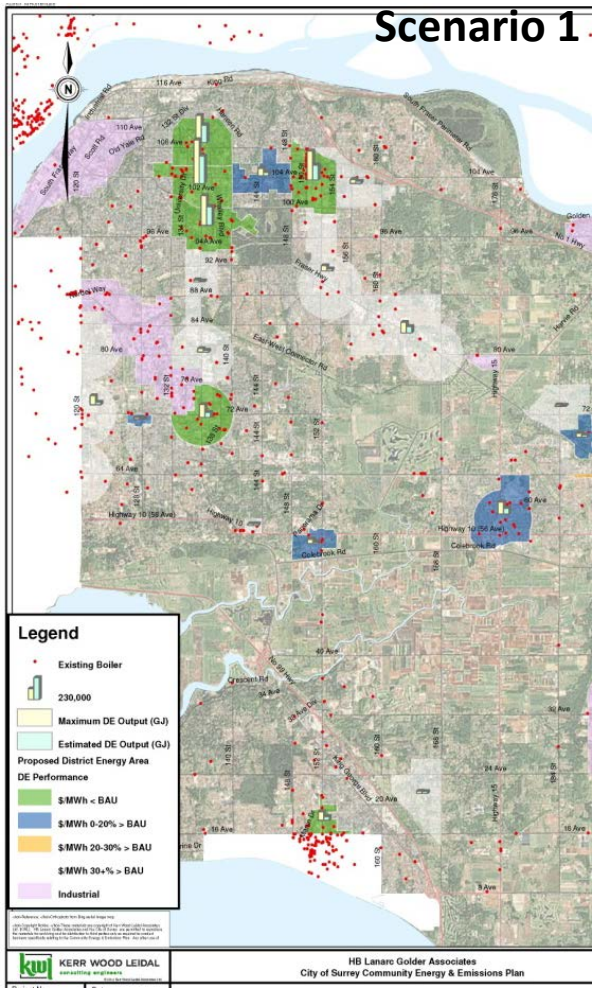
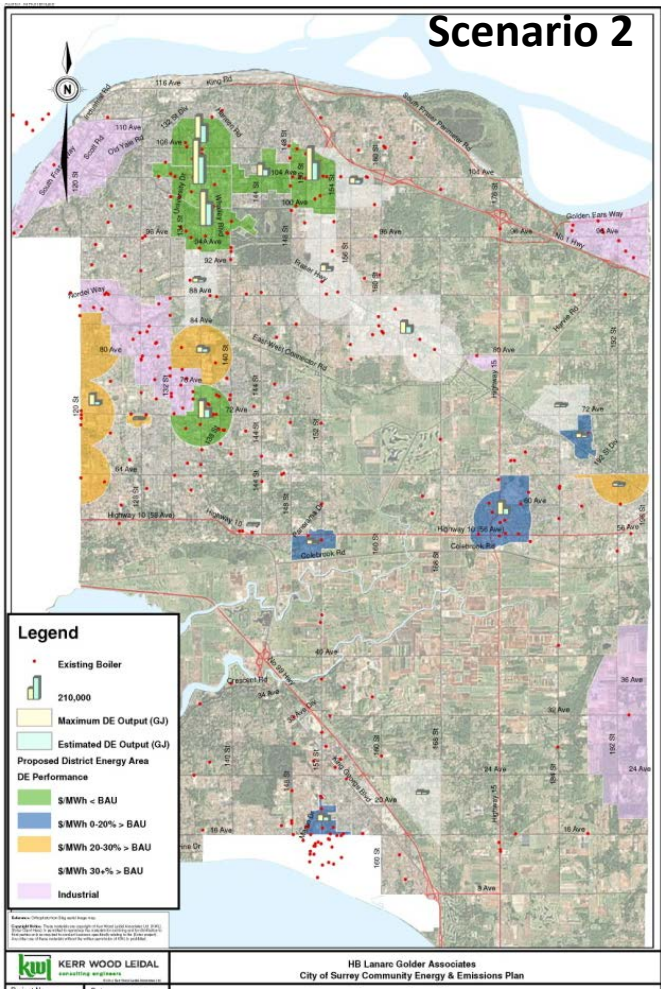
Land Use Driven DE Potential







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Rapid Transit Corridors

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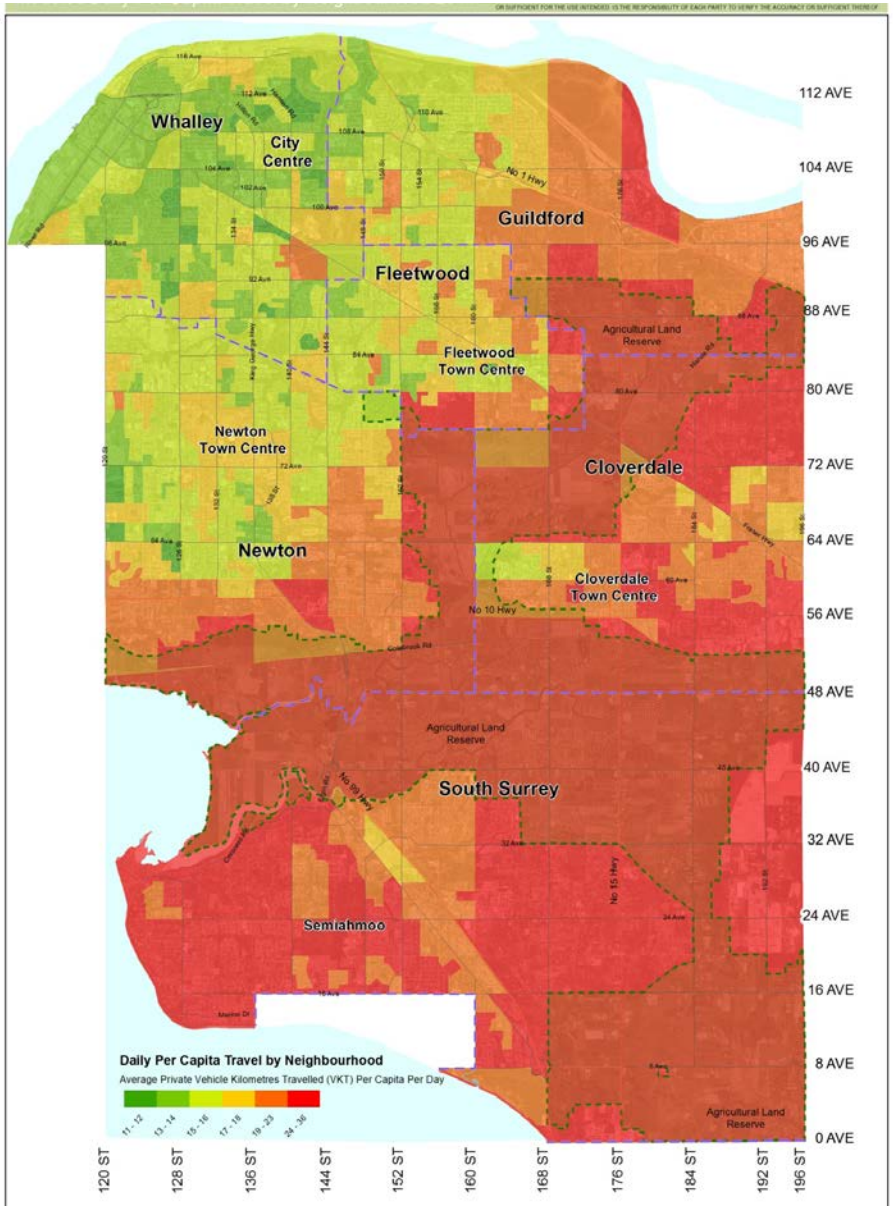

Daily per capita daily driving distance distance by neighbourhood

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Rapid Transit Corridors

Township of Langley,
Carvolth Neighbourhood Energy Strategy

March 27, 2013

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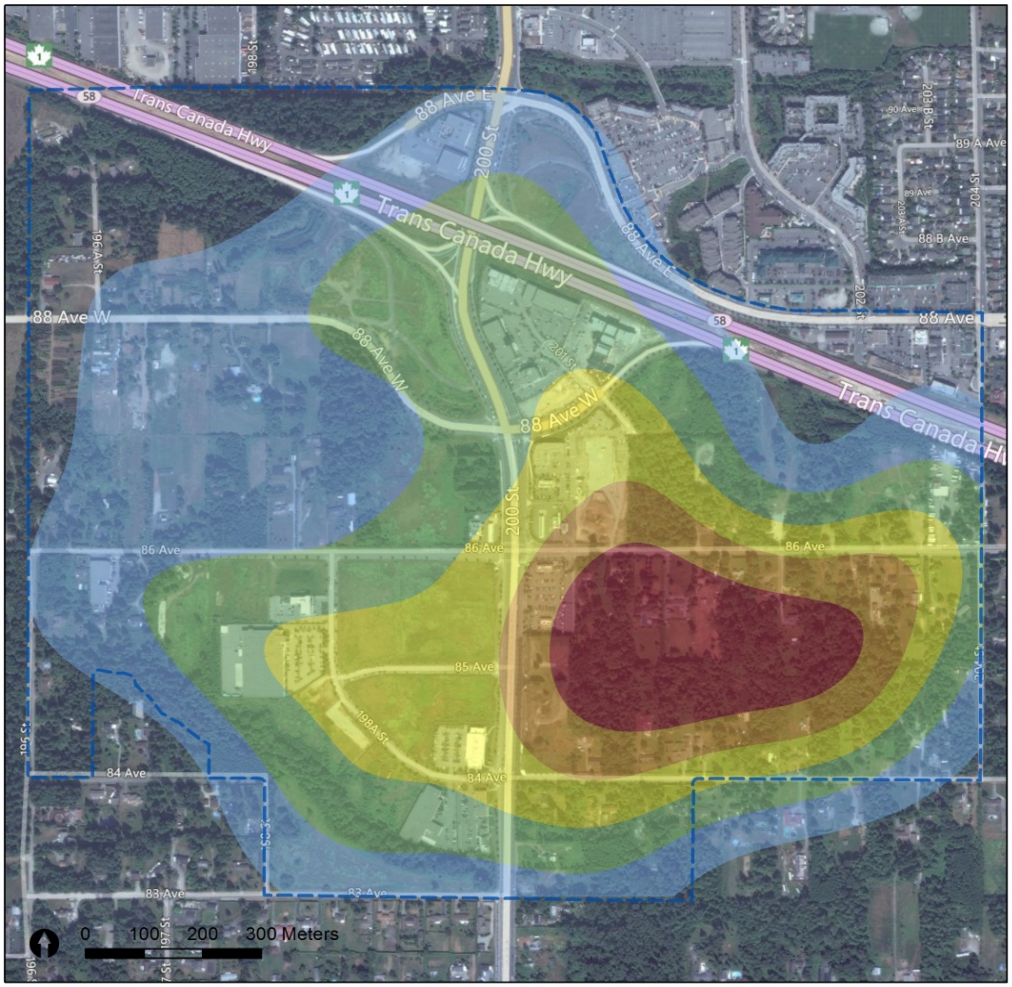
District Energy



Carvolth Projected Heat Demand in 2040

Thermal Density

Annual GJ / Hectare
(Annual MWh / Hectare)

- 0 - 499 (0 - 139)
- 500 - 999 (140 - 277)
- 1,000 - 1,499 (278 - 417)
- 1,500 - 1,999 (417 - 554)
- 2,000 - 2,499 (555 - 694)
- 2,500-3,282 (695 - 912)
- Planning Area

Note: This heat density surface was calculated using a kernel interpolation operation wtih a 300m spatial filter.

Date: December 4, 2012

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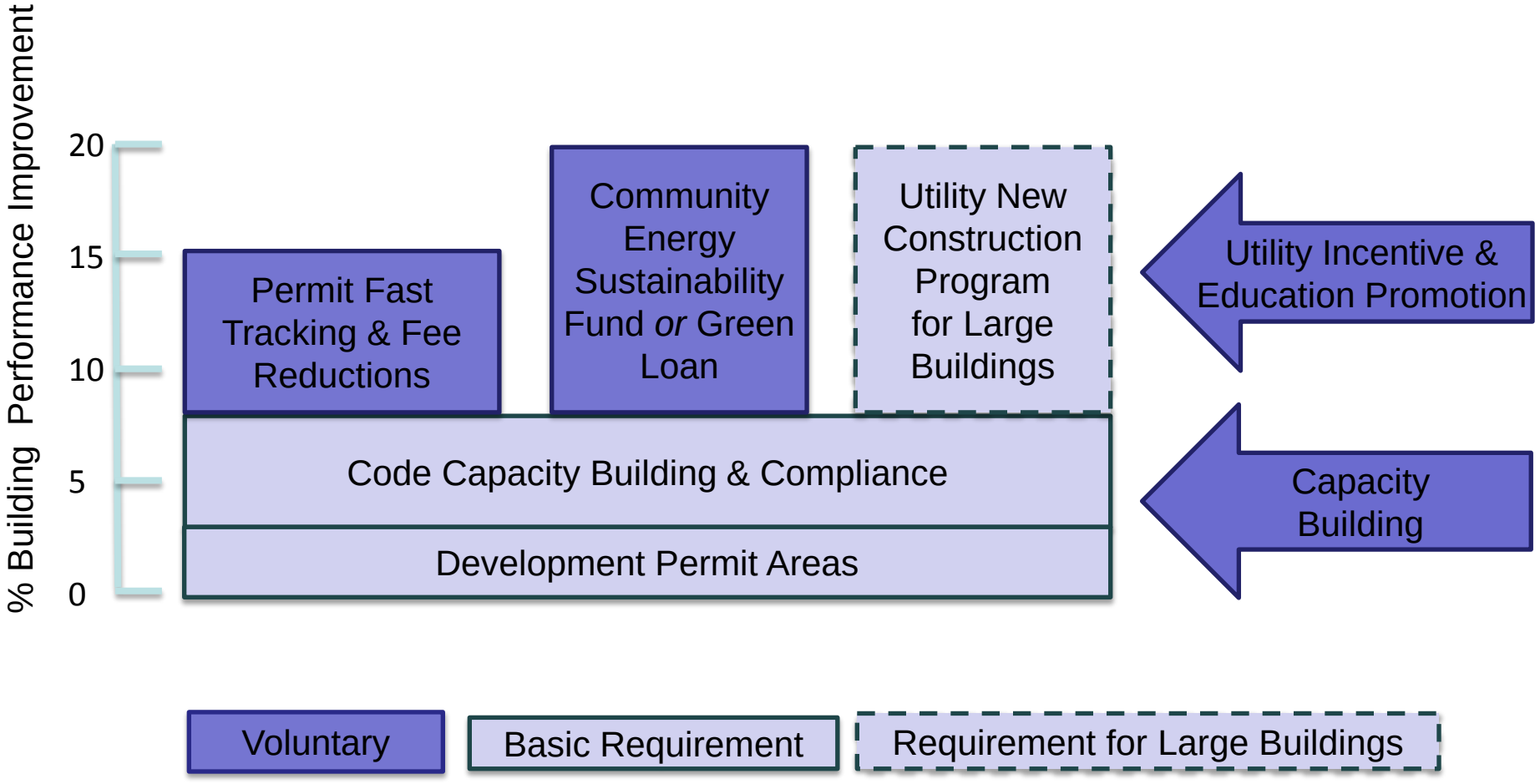
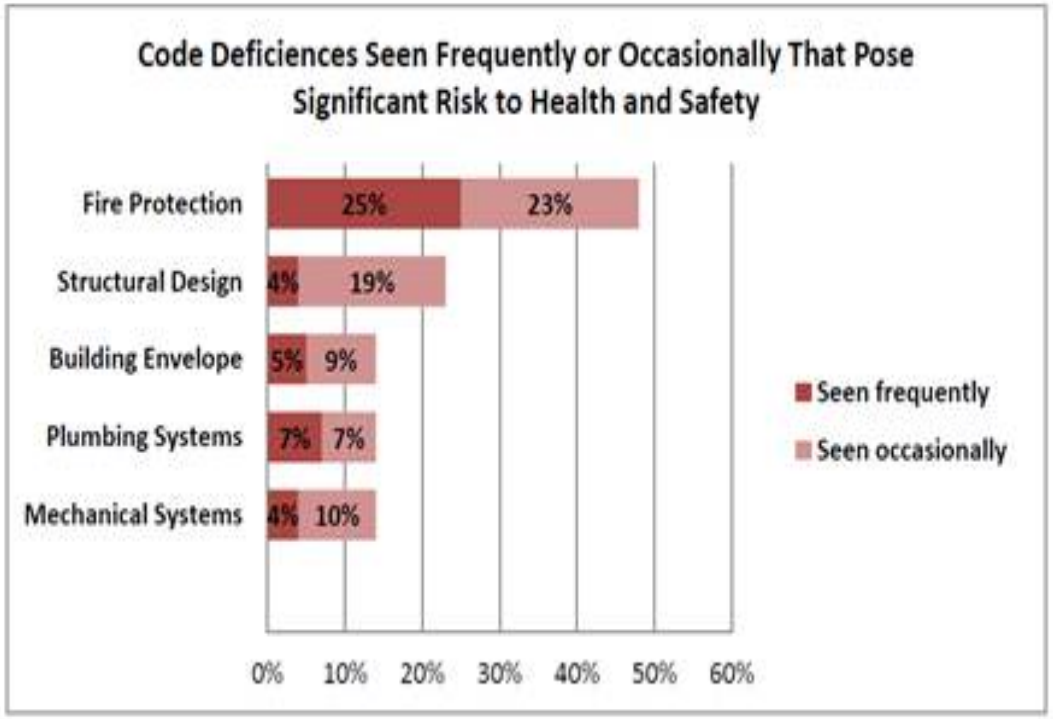
Neighbourhood Energy Strategy: NC Efficiency



Code Capacity Building & Compliance



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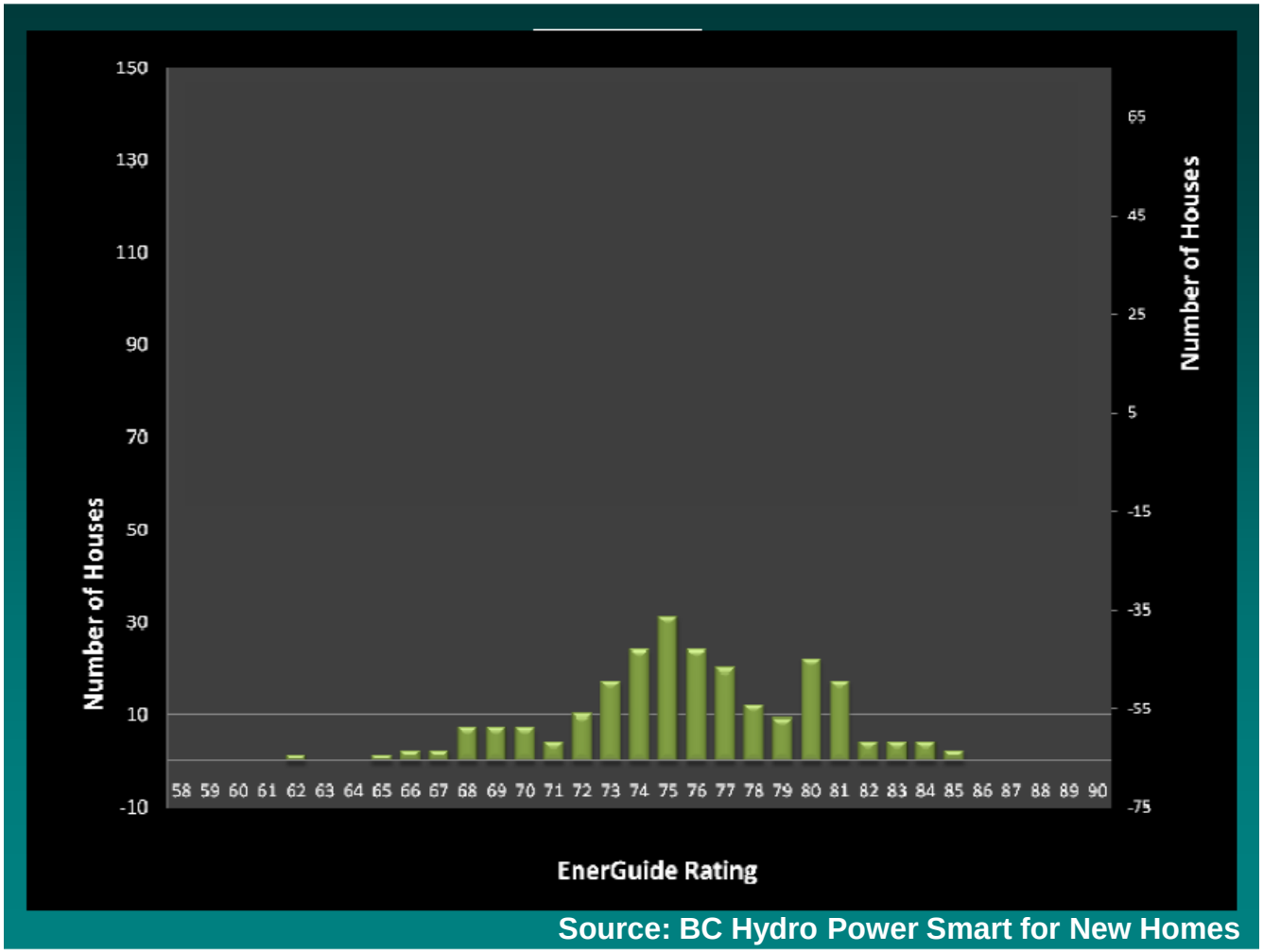
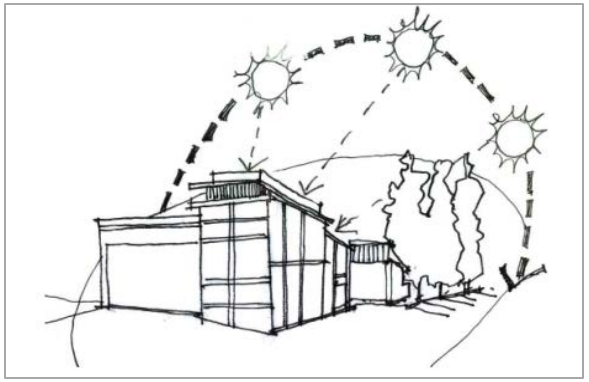


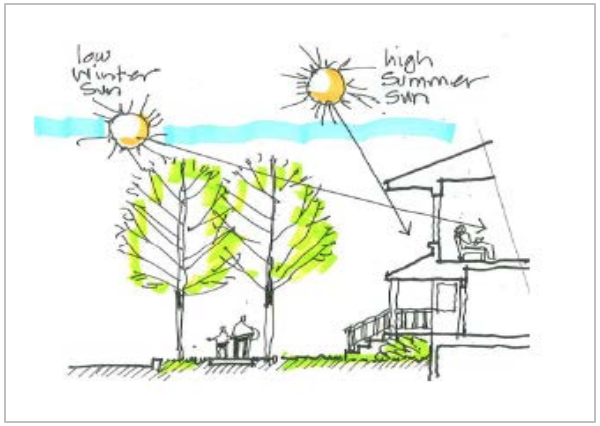
Source: BC Hydro Power Smart for New Homes

Development Permit Area: Carbon & Energy GL

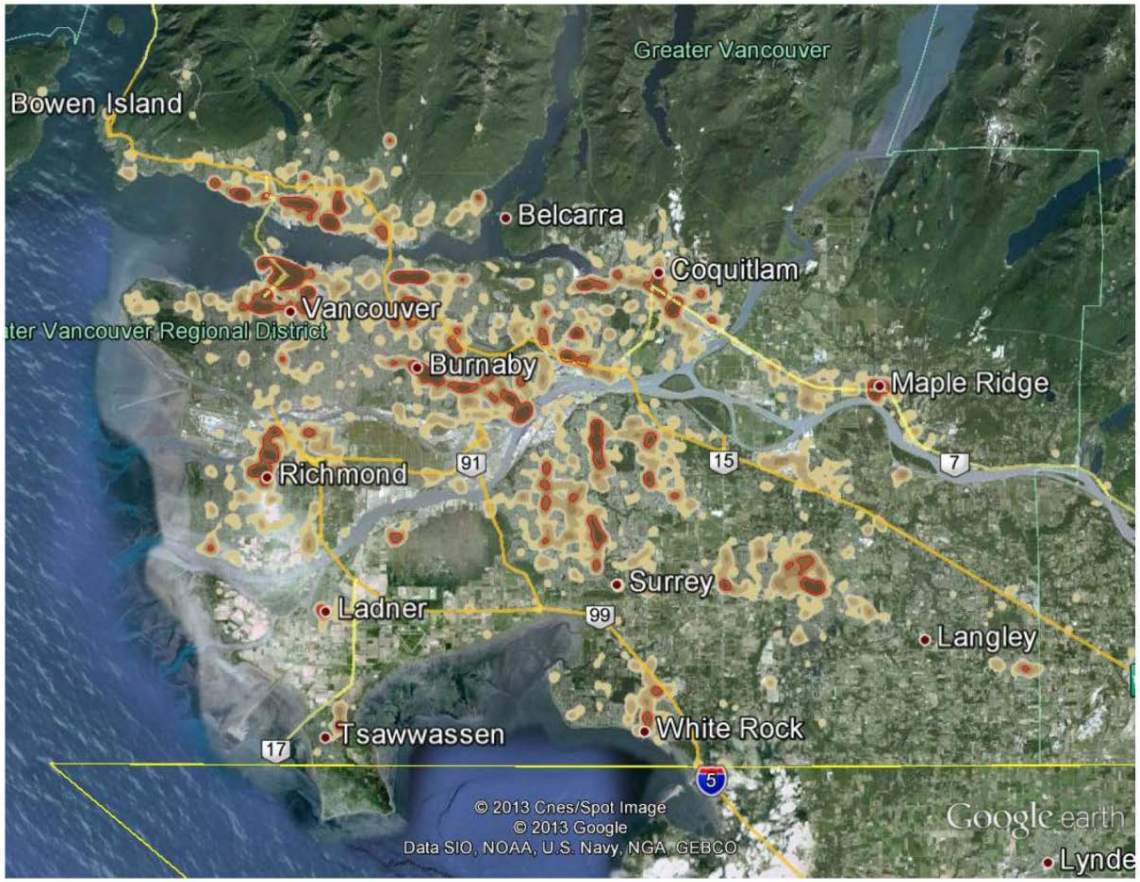
- DPAs can be designated to address carbon and energy purposes.
- The objectives would be articulated and guidelines would need to considered for a DP to be issued.



Orient buildings to maximize solar access for heating and lighting.



Use shading and deciduous trees to maximize solar access for lighting and heating in winter and minimize in the summer.



Metro Vancouver: EV Charging Station Planning

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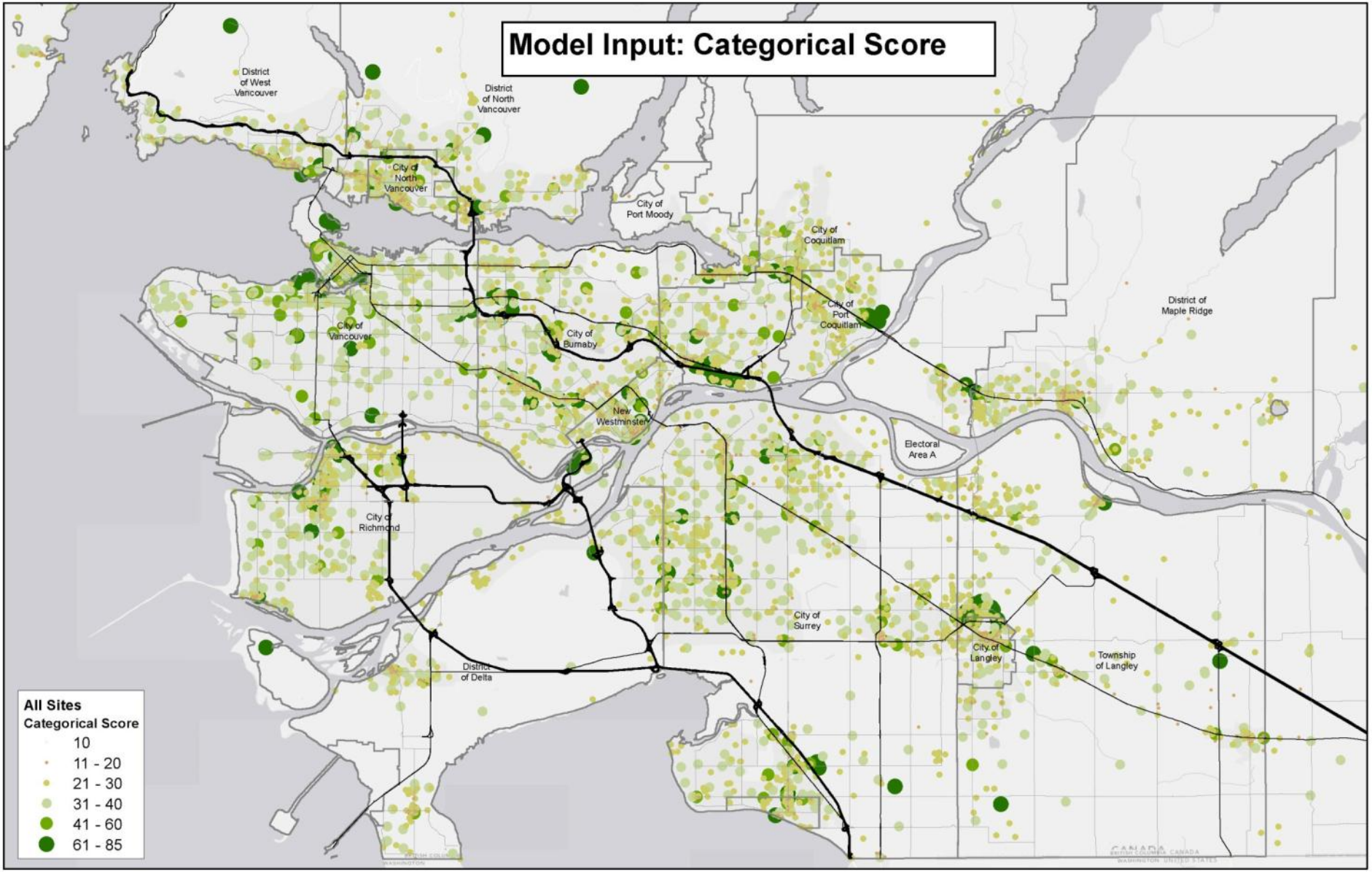
Location Optimization



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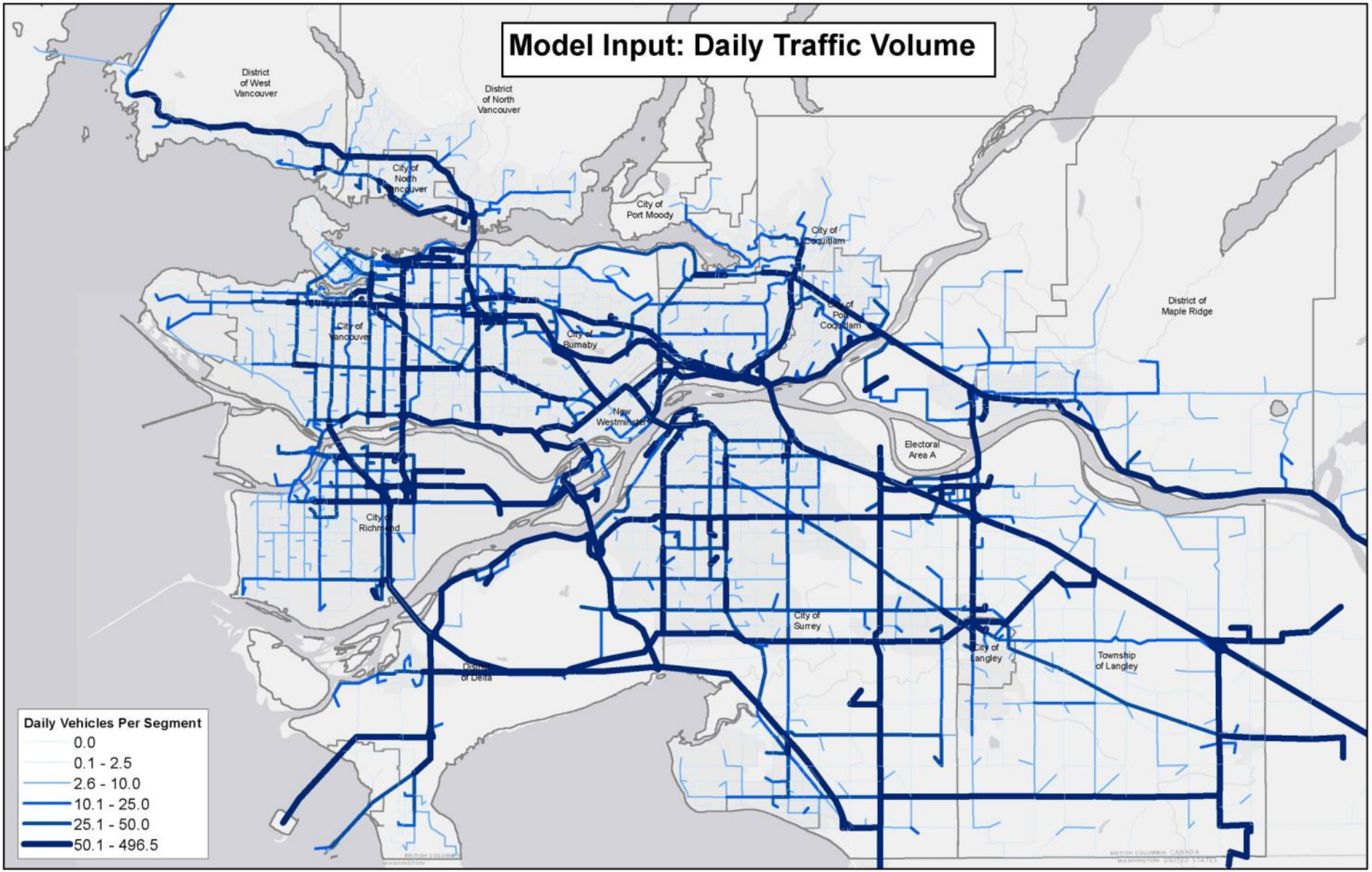

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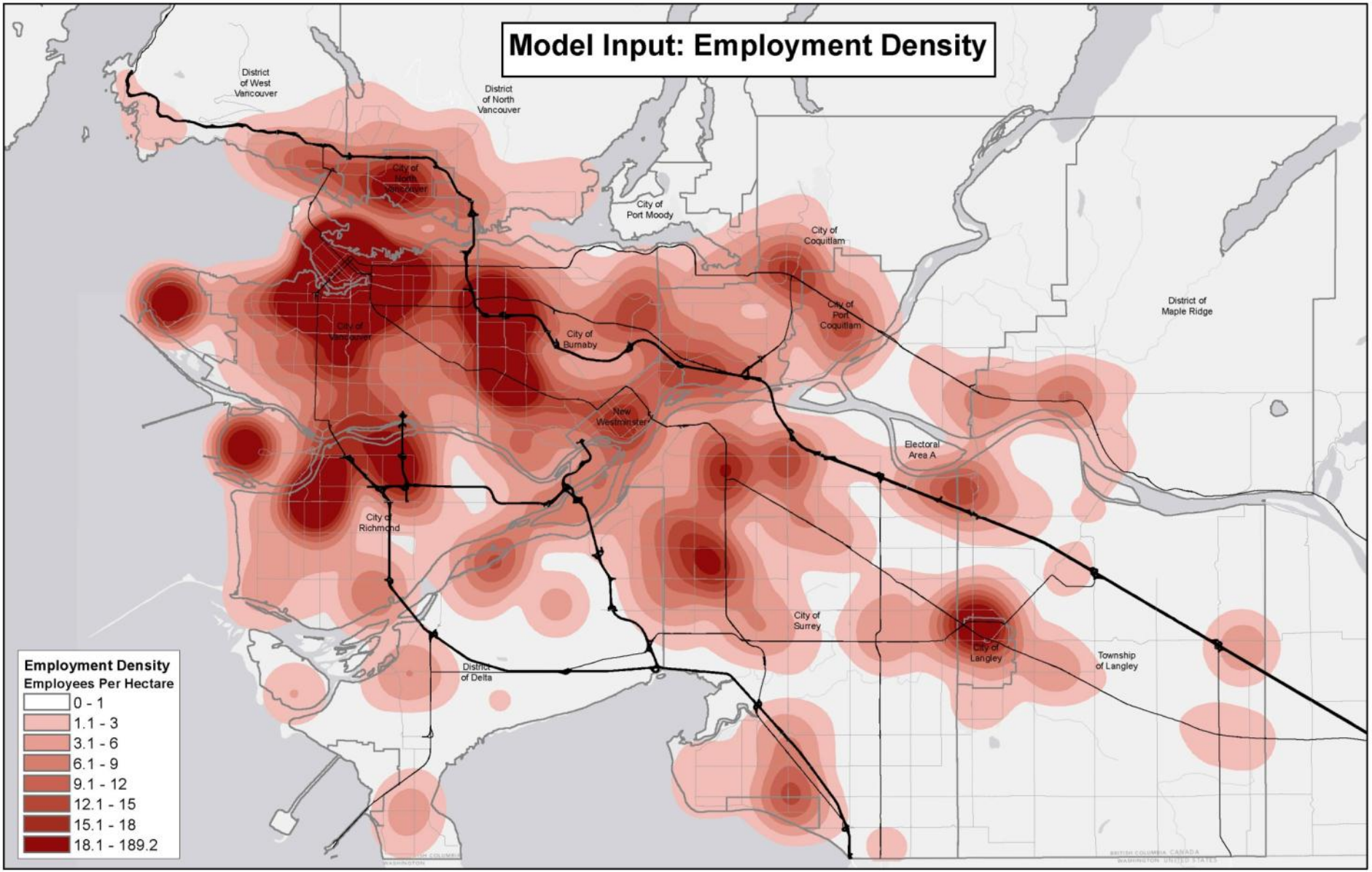

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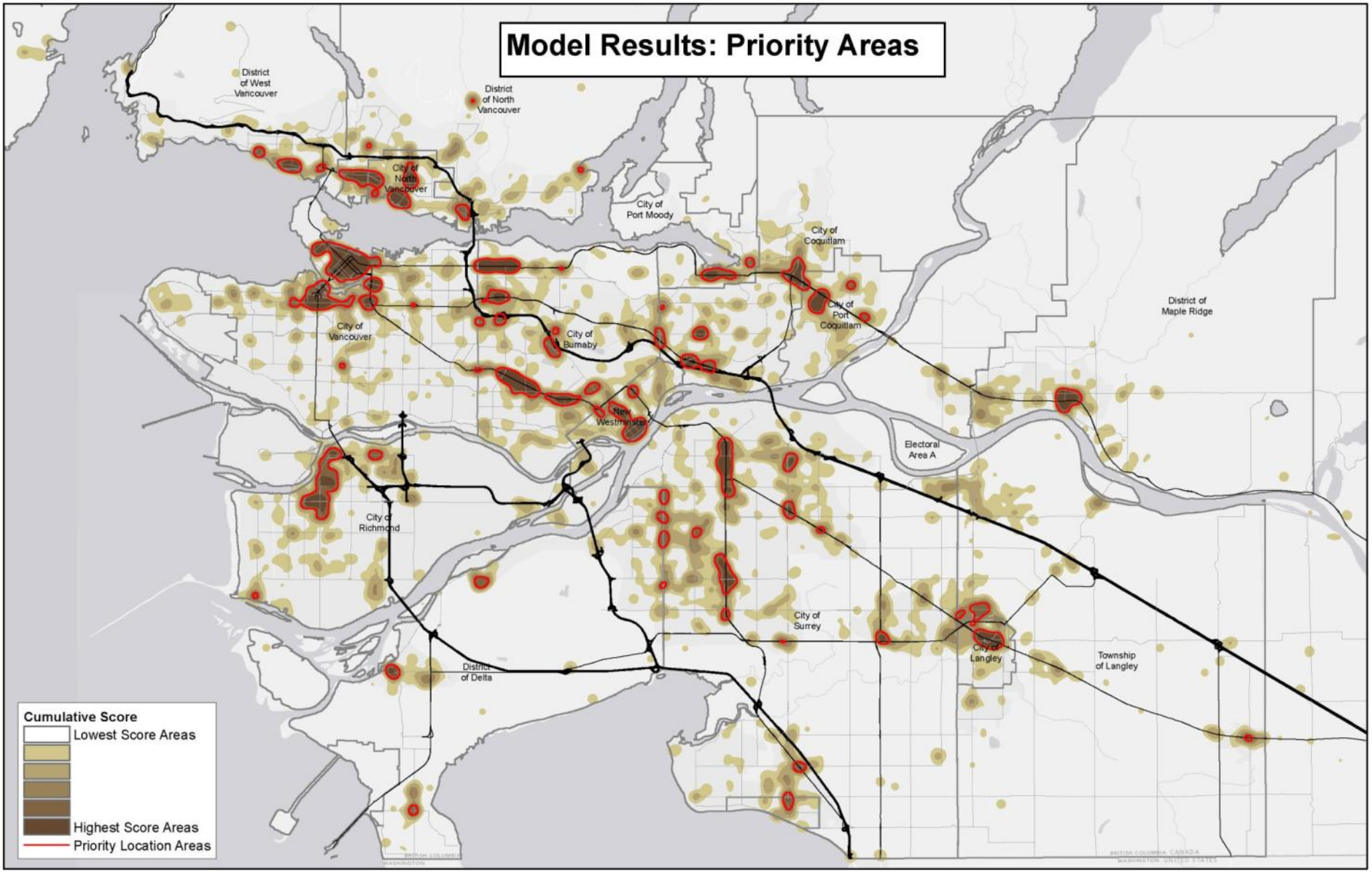

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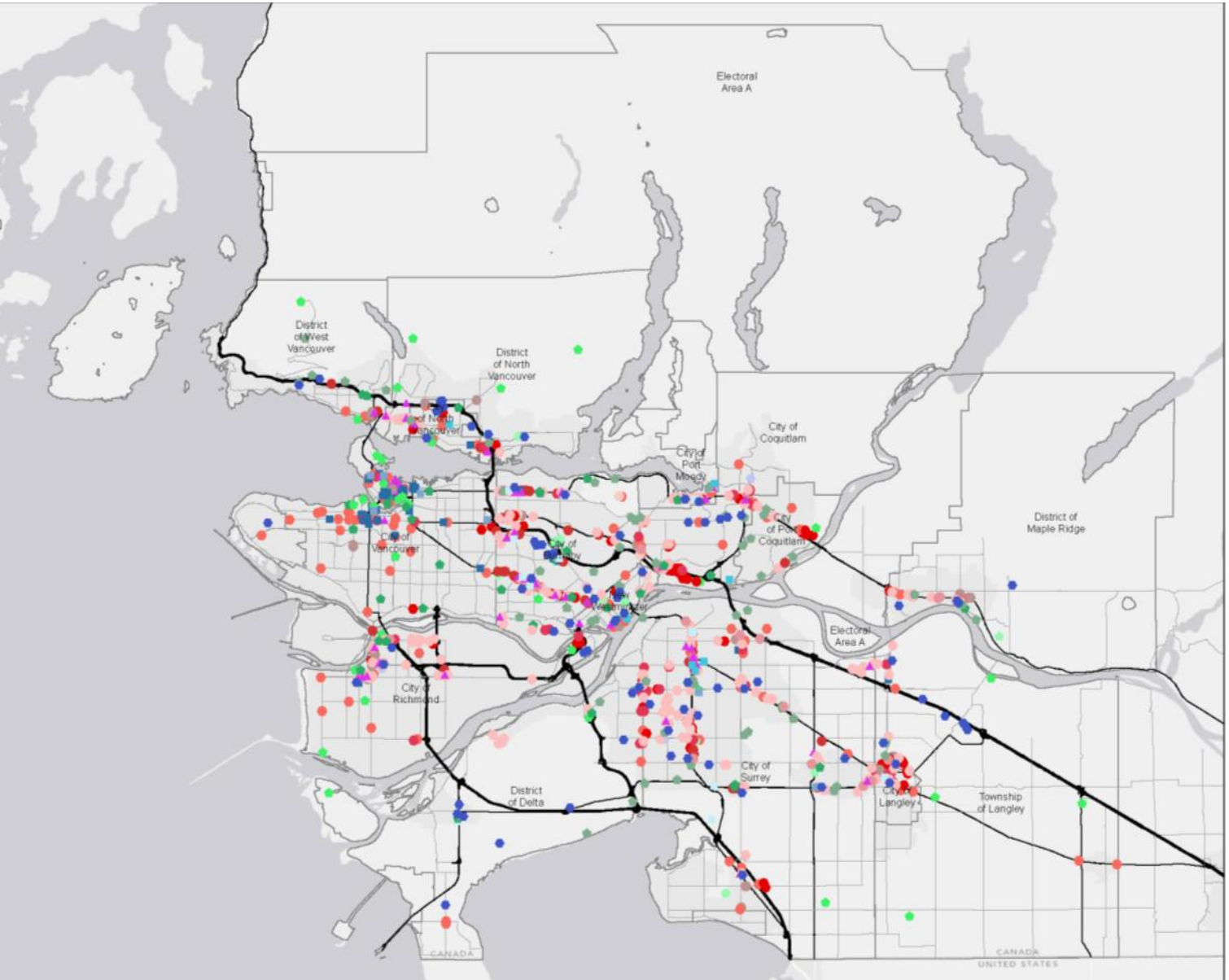
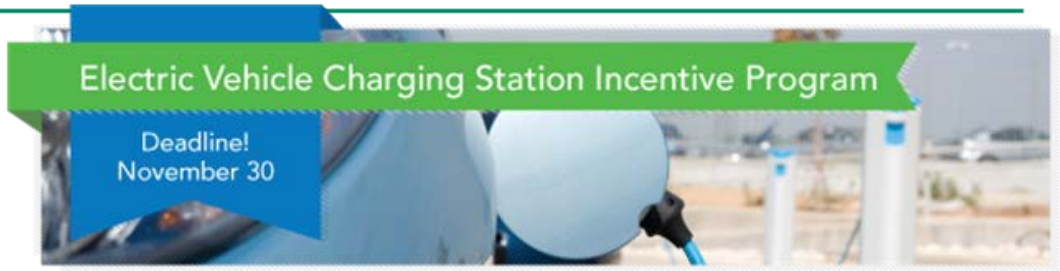


EV Site Selection Long List for Metro Vancouver:	
Community Centre:	13
Cultural:	65
Government Buildings:	14
Hospital:	9
Hotel:	18
Office Buildings:	52
Food Market:	2
Retail Strip:	189
Small Commercial:	61
Large Commercial:	132
Big Box Retailer:	64
Shopping Centre:	41
Shopping Centre Regional:	34
Park and Ride:	1
Parkade:	63
Parks Playing Fields:	60
Tourist Destination:	41
Recreation:	46
Arena:	11
School:	80

- Community Centre
- Cultural
- Government Buildings
- Hospital
- Hotel
- Office Buildings
- Food Market
- Retail Strip
- Small Commercial
- Large Commercial
- Big Box Retailer
- Shopping Centre
- Shopping Centre - Regional
- Park and Ride
- Parkade
- Parks & Playing Fields
- Tourist Destination
- Recreation
- Arena
- School
- University/College

Host Recruitment

The Pitch



- Show you're a **forward-thinking community leader**
- Attract **trend-setting, values-driven customers**
- Take advantage of **time-limited incentives** and **technical support**

- **Siting & Cost Estimate Tool**

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Nelson: Low Carbon Path to 2040

March 27, 2013

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On Bill Financing Retrofit Strategy

ecosave
Save Energy. Save Money.

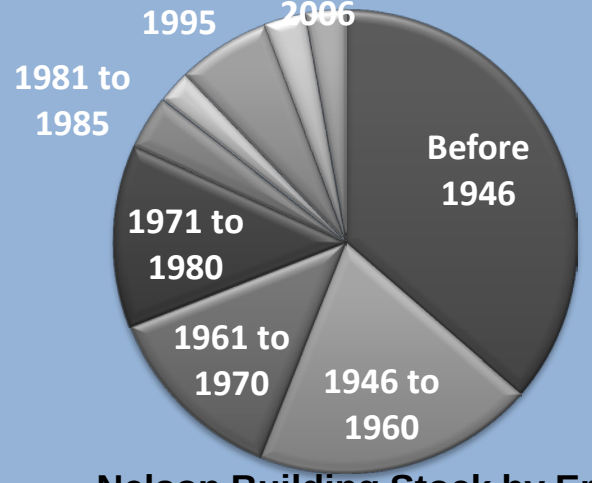
NELSON HYDRO

Registration Form [PDF - 222 KB]

EcoSave Energy Retrofits Program

EcoSave is an energy retrofits program that offers on-bill financing. Energy retrofits are upgrades that can help to reduce energy consumption and save you money. Upgrades include improving insulation, reducing air leakage, and installing more efficient space and water heating systems.

This program has been established as a key strategy in the City of Nelson's Low Carbon Path to 2040, Community Energy and Emissions Action Plan. This program has been designed to simplify the process for homes and businesses to reduce energy consumption and lower greenhouse gases within the community.



Nelson Building Stock by Era

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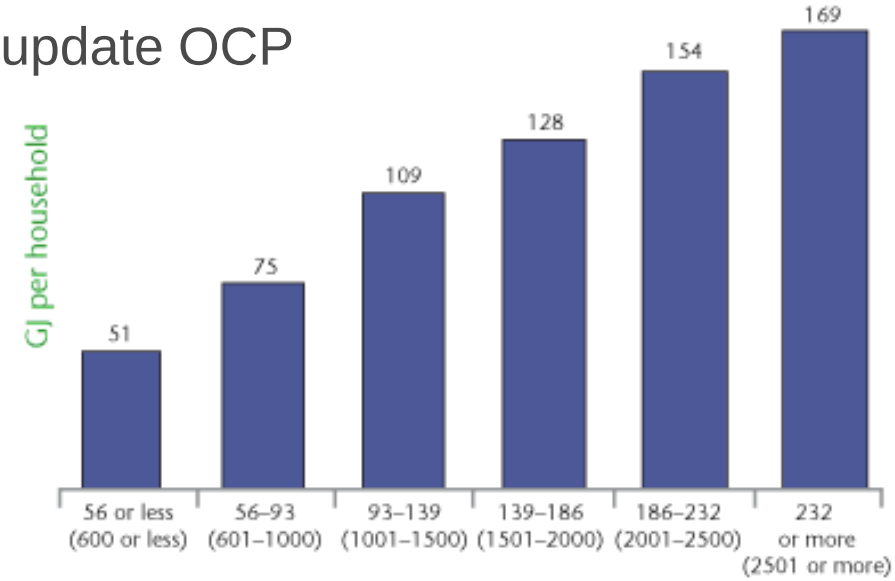
Laneway Cottage & Cabin Strategy

- **Infill Home Pilot**
  - Corner lot
  - 500 meters from commercial activity
  - New & building conversions
  - Wave BP & DP fees
  - Study impact of 10 homes and update OCP



NRCan, 2007: Energy Consumption by Building Size

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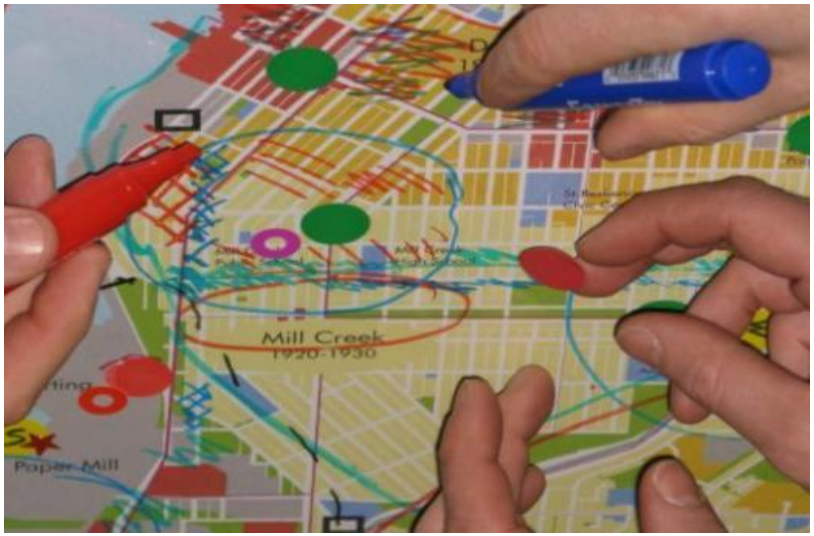
Community Energy Planning *Best Processes*

- Think Local. Act Local.
  - Carbon & Energy Profile, Trends & Drivers
  - Understand Core Community Priorities
  - Community Typology Matters
  - Recognize Your Power
- Right-Size Analysis
- Integrate over Initiate
- Strategic Engagement
- Pragmatic, Policy Innovation
- Focus on Implementation
  - Prioritization
  - Monitoring
  - Implementation Costing
- Senior Government & Utility Collaboration
- Cross Border Collaboration



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