Vancouver's Context

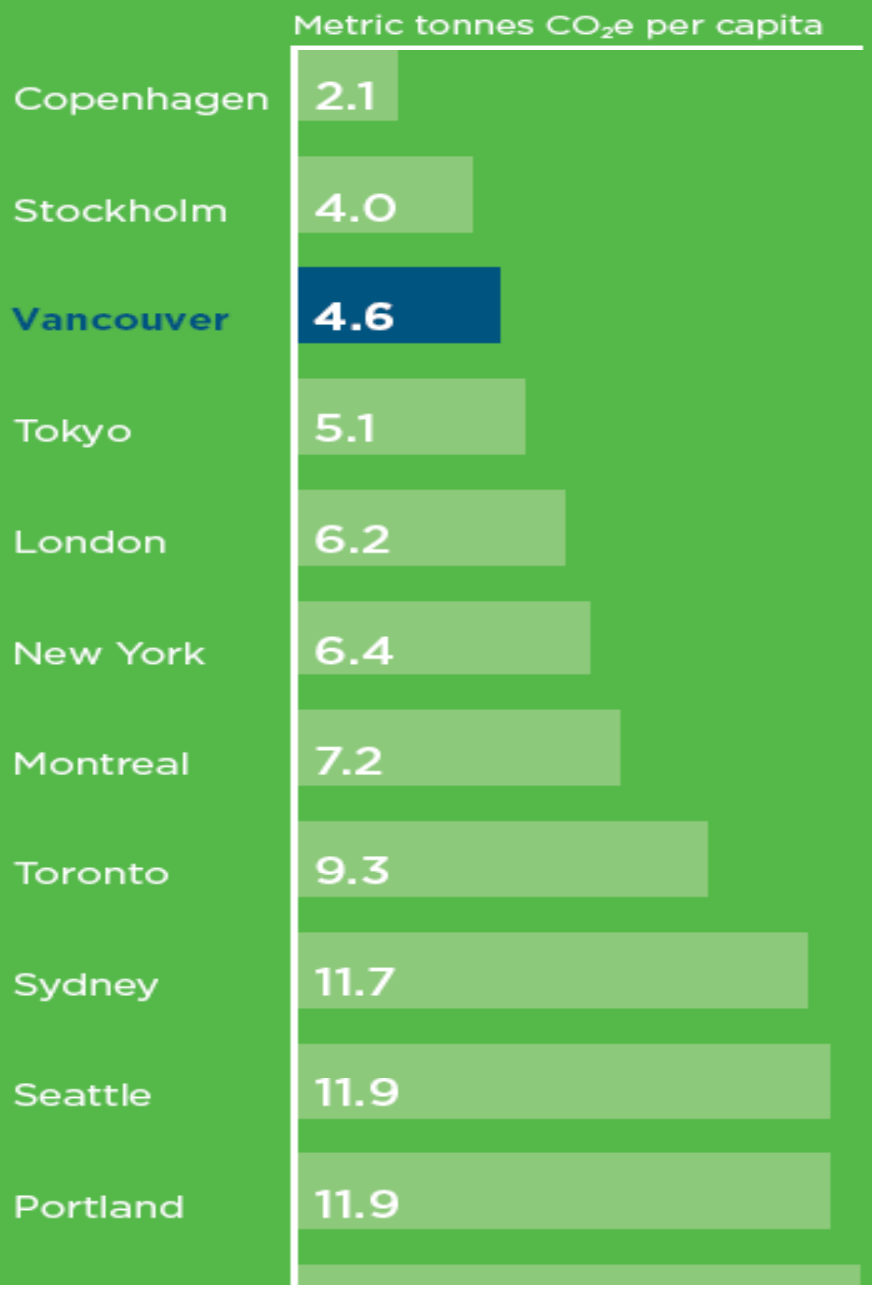
Despite a population increase of 27% and job increase of 18%,

Vancouver has **REDUCED** GHG emissions to 1990 levels,

and is on track to reducing GHG emissions by **6%** below 1990 levels by 2012.

Achieving the **LOWEST PER CAPITA**

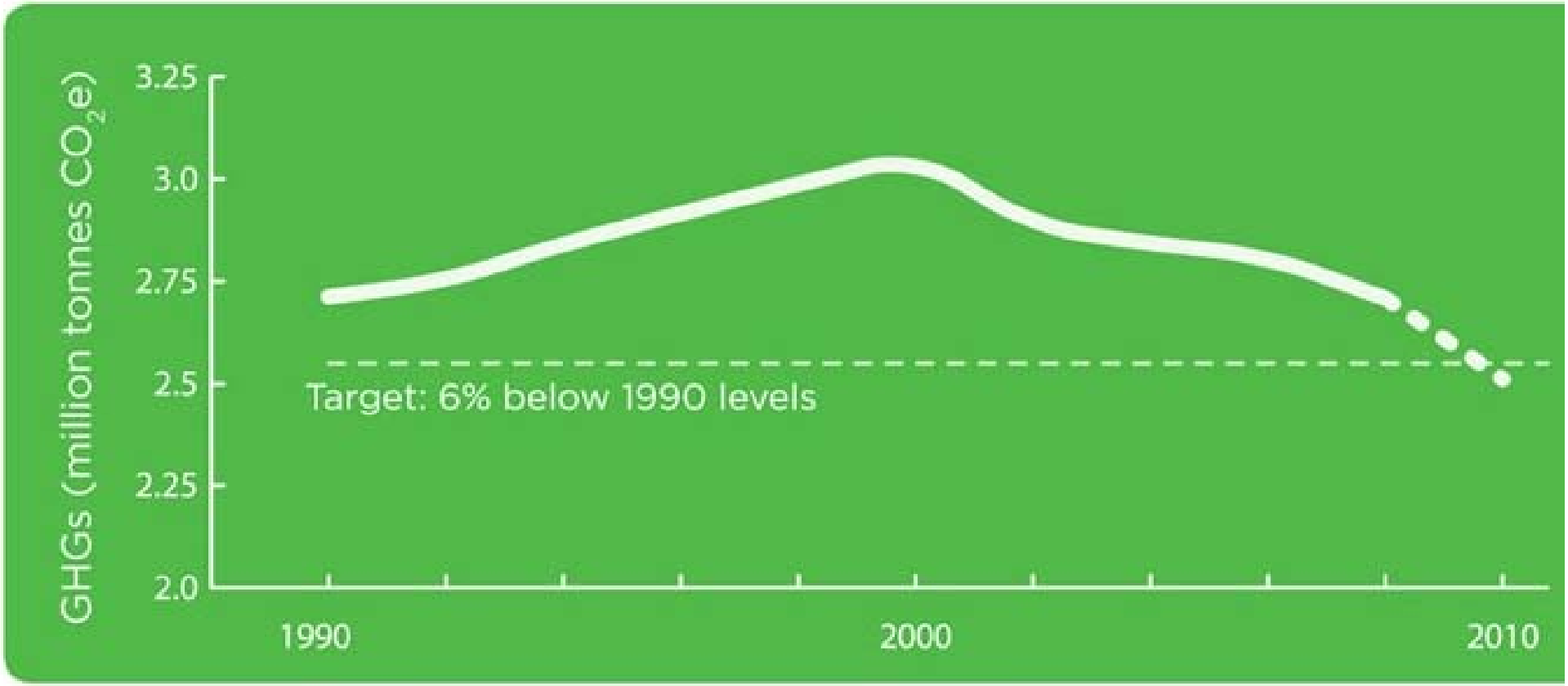
Greenhouse Gas Emissions Per Capita



Change in Emissions from 1990-2008

	Total	Per Capita
All Emissions	0%	↓ 21%
Buildings	0%	↓ 21%
Light Duty Vehicles	↑ 15%	↓ 9%
Heavy Duty Vehicles	↑ 45%	↑ 15%
Solid Waste	↓ 43%	↓ 55%

Vancouver's GHG emissions are already at 1990 levels



At the same time **population** has increased by **27%** and **jobs** by **18%**.

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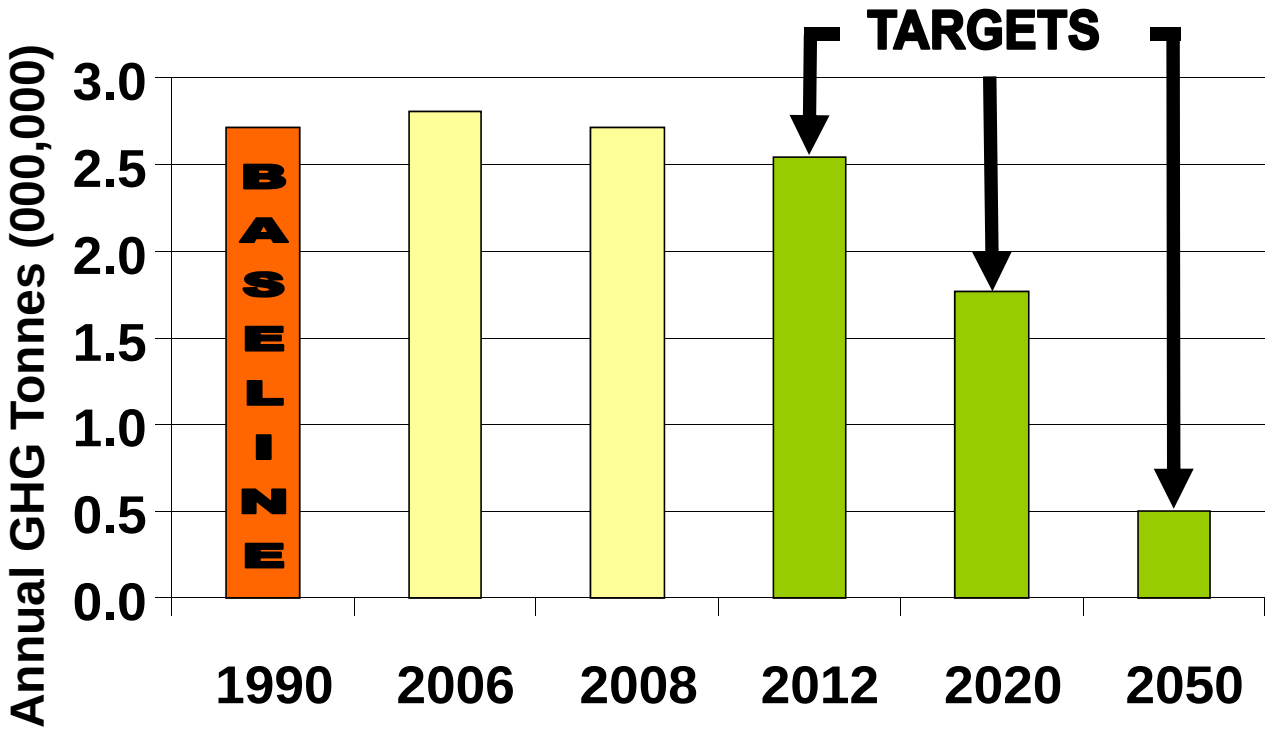
VANCOUVER GREEN CAPITAL

Canada and Vancouver GHG trends

Community GHG Emissions and Targets

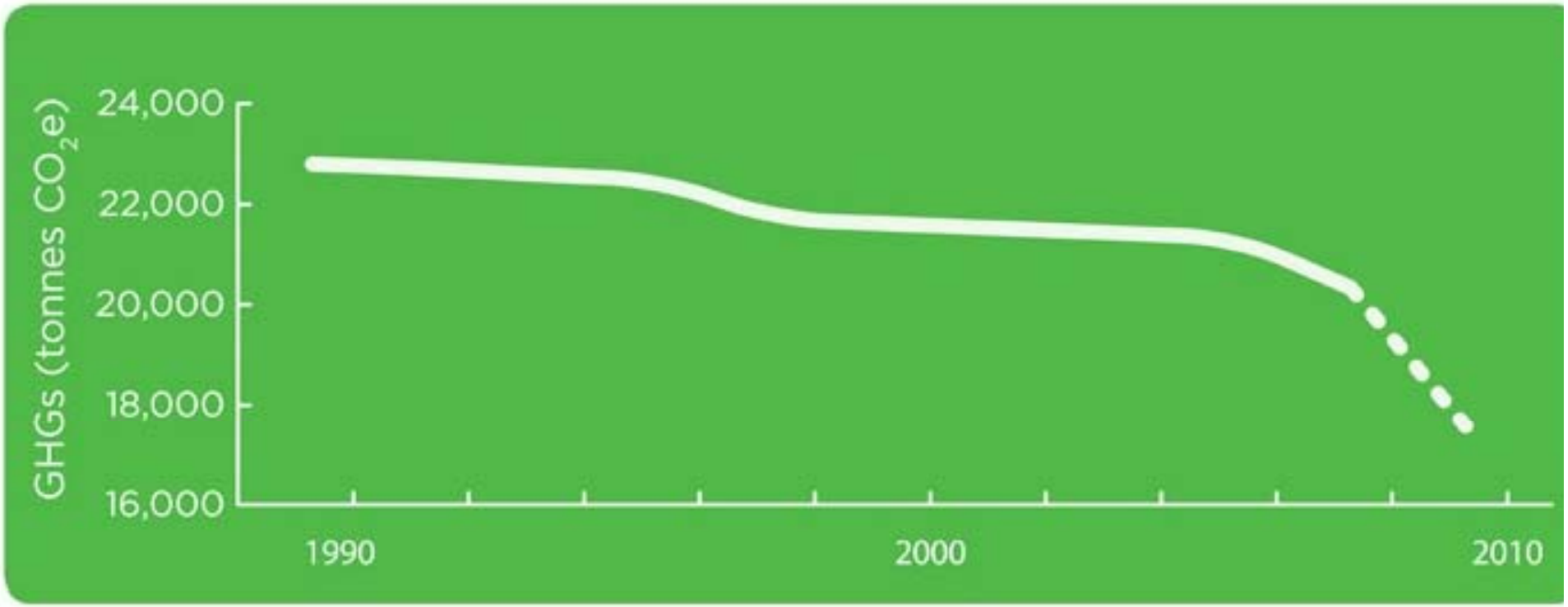
- Since 1990, Vancouver population +27%, jobs +18%
- 2008 community GHG emissions = 1990 levels
- On track to meet Kyoto → 6% below 1990 levels by 2012



Vancouver Council GHG Targets

- 6% below 1990 by 2012
- 33% below 2007 by 2020
- 80% below 1990 by 2050
- Carbon neutral new buildings by 2030

GHG from municipal buildings will be 22% below 1990 levels by 2010



... while floor space has increased by **24%**.

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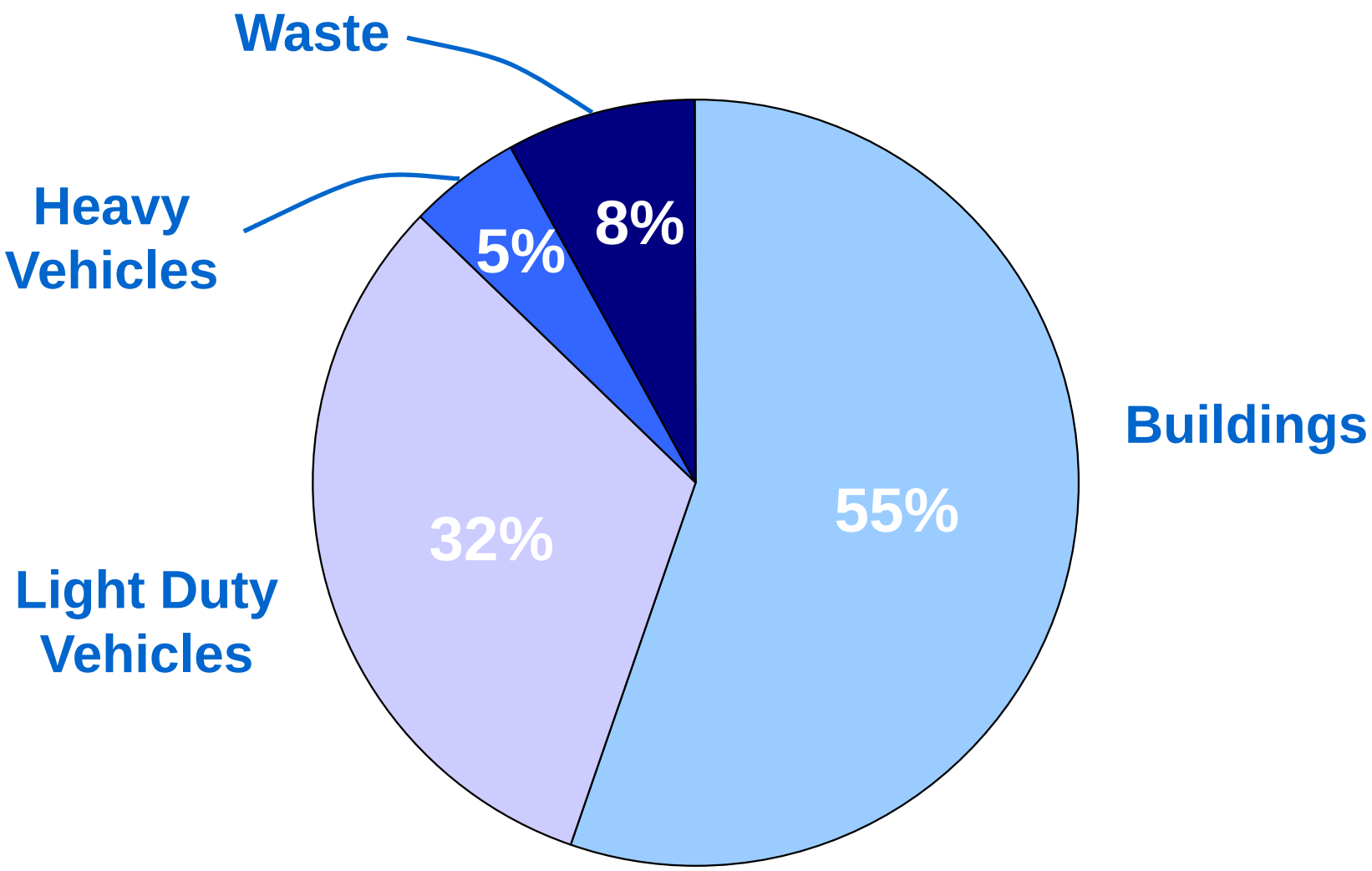
Source of Vancouver's 2008 Community GHG Emissions



Transportation

Share of All Emissions	Total Change Since 1990	Per Capita Change since 1990
37%	+ 18%	- 7%

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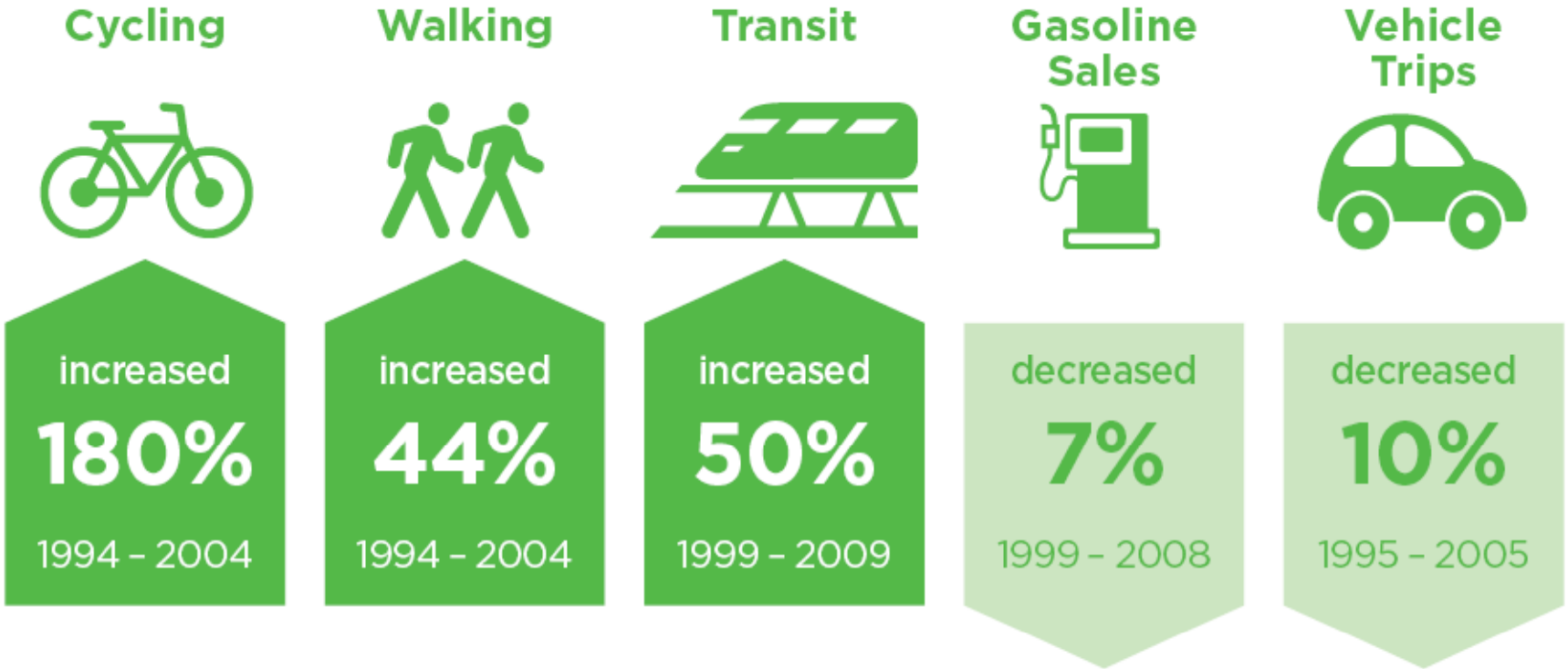
Green Transportation

Compact mixed-use communities with Easy access to work, shopping & recreation



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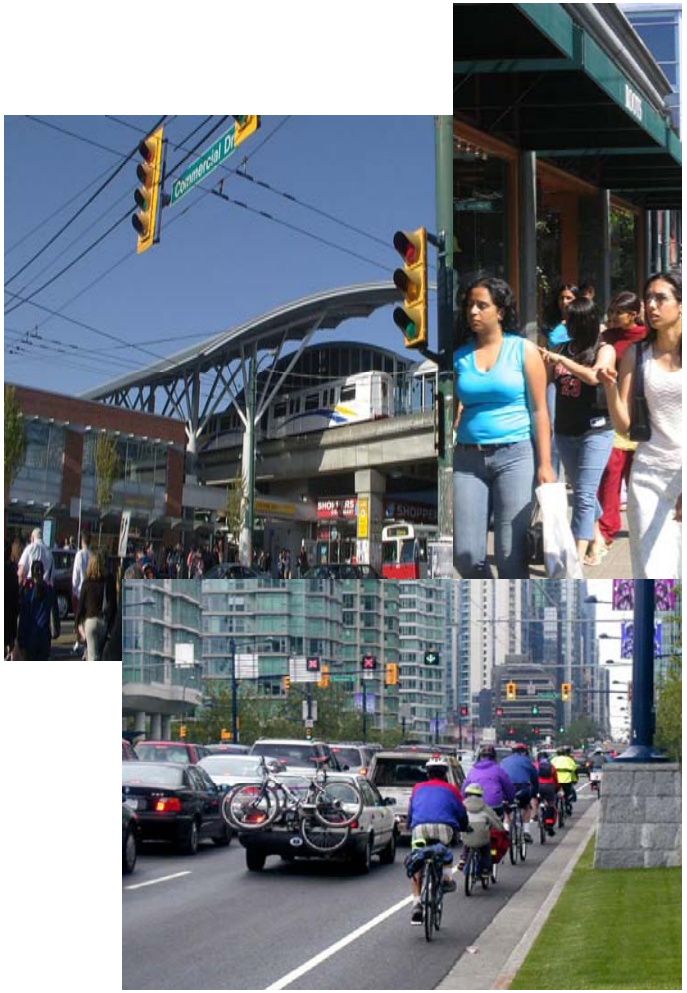
Land Use and Transportation

Sustainable Transportation

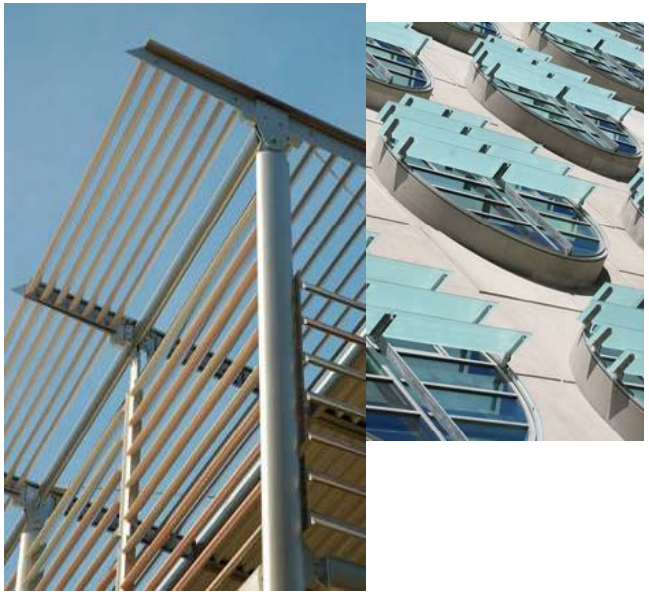
- Since 1994:
  - Walking trips up 44%
  - Cycling trips up 180%
  - Transit trips up 20%
  - Vehicle trips down 10%
- Policy approach:
  - Integrated land use and transportation planning
  - Transportation hierarchy (walking, cycling, transit, goods movement, private automobile)
  - No expansion to vehicle capacity



Land Use and Transportation

EcoDensity

- LEED™ silver equivalent for all rezonings
- For rezonings on sites greater than 2 acres:
  - District Energy Feasibility Study
  - Stormwater Management Plan
  - Low-carbon TDM Strategy
- Priority permitting for ultra-green developments
- New housing types including laneway houses and suites within apartments



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Land Use and Transportation

Clean Vehicles

- Requiring electric vehicle (EV) charging infrastructure for 20% of parking stalls in multi-family homes
- Launching public parking charging program to support EV owners
- Forming agreements with leading automakers to deploy their EVs sooner in this region
- Working closely with BC Hydro and BC Gov't to accelerate actions

CLEAN ENERGY
CITY OF VANCOUVER
Going Electric

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Buildings

Share of All Emissions	Total Change Since 1990	Per Capita Change since 1990
55%	0%	- 21%

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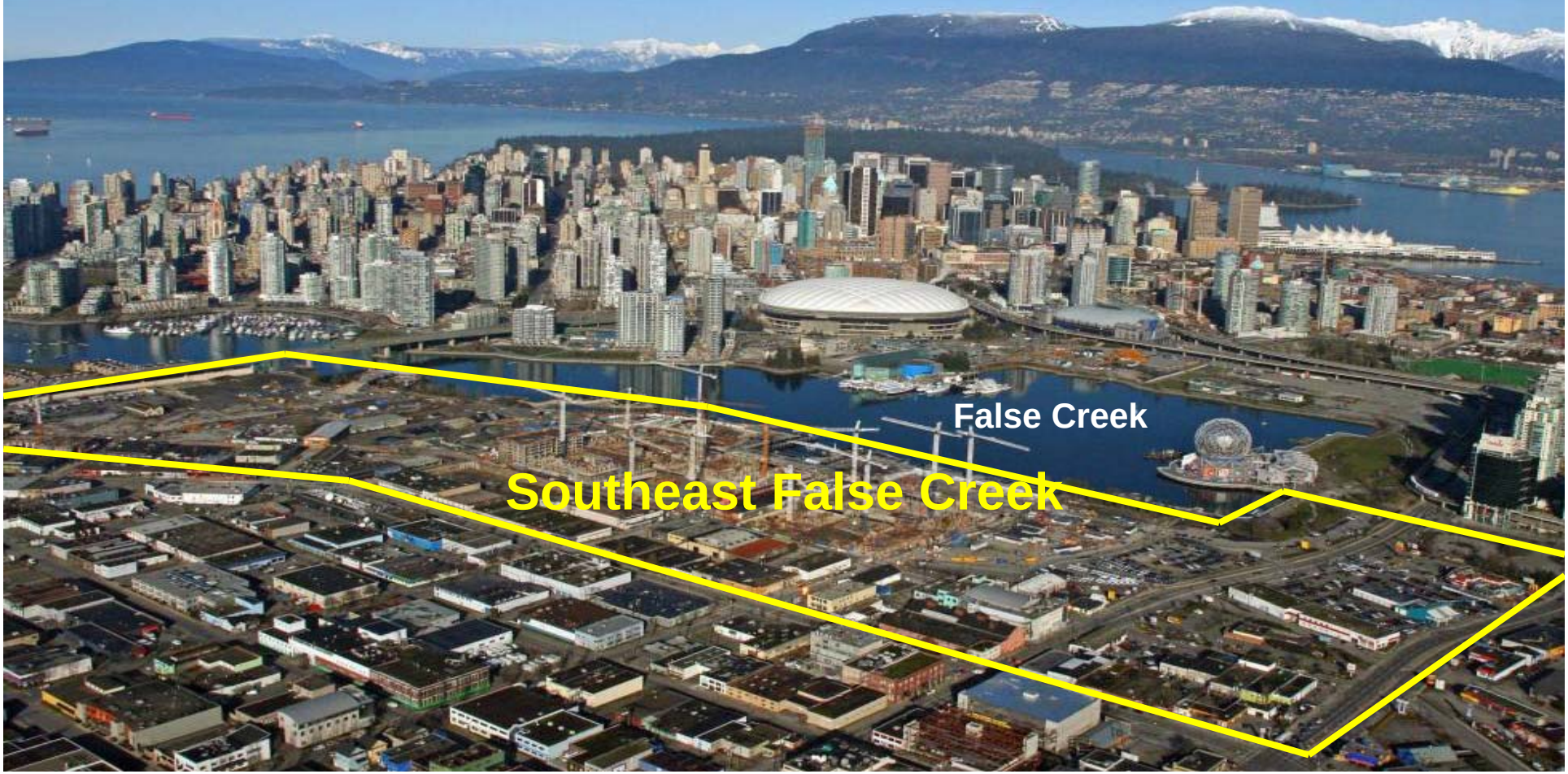
South East False Creek
Vancouver's 2010 Olympic Village

6 million sq ft of residential, commercial, institutional development with 16,000 new residents by 2018



Green Buildings

Southeast False Creek Neighborhood

- LEED Platinum ND
- Olympic Village Canada's first Net Zero Building that generates as much energy as it consumes
- LEED Platinum Community Centre
- Green roofs
- Solar hot water systems
- Rainwater capture and reuse
- Low parking and car-sharing
- Neighbourhood Energy Utility based on sewer heat recovery, the first of its kind in North America

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District Energy in South East False Creek

Neighbourhood Energy Utility

- Heat distributed via network of hot water pipes to in-building heat exchangers
- Sewer Heat Recovery- 70% Energy from Sewage
- Supplementary:
  Solar Thermal
- Peaking & Back-up:
  Conventional Gas Boilers
- Over 50% less GHG

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Expansion of District Energy Systems

- 2020 Goal: GHG emissions reduced by 930,000 tonnes.
- 12% achieved with renewables-based district energy
- Entire target could be met by fuel switching the existing legacy steam heat systems that serve the downtown core and hospital precincts
- All new rezoning sites greater than 2 acres must do a green energy study.
- Economic feasibility is dependant on energy demand density, scale and rate of development and availability of low cost heat sources.

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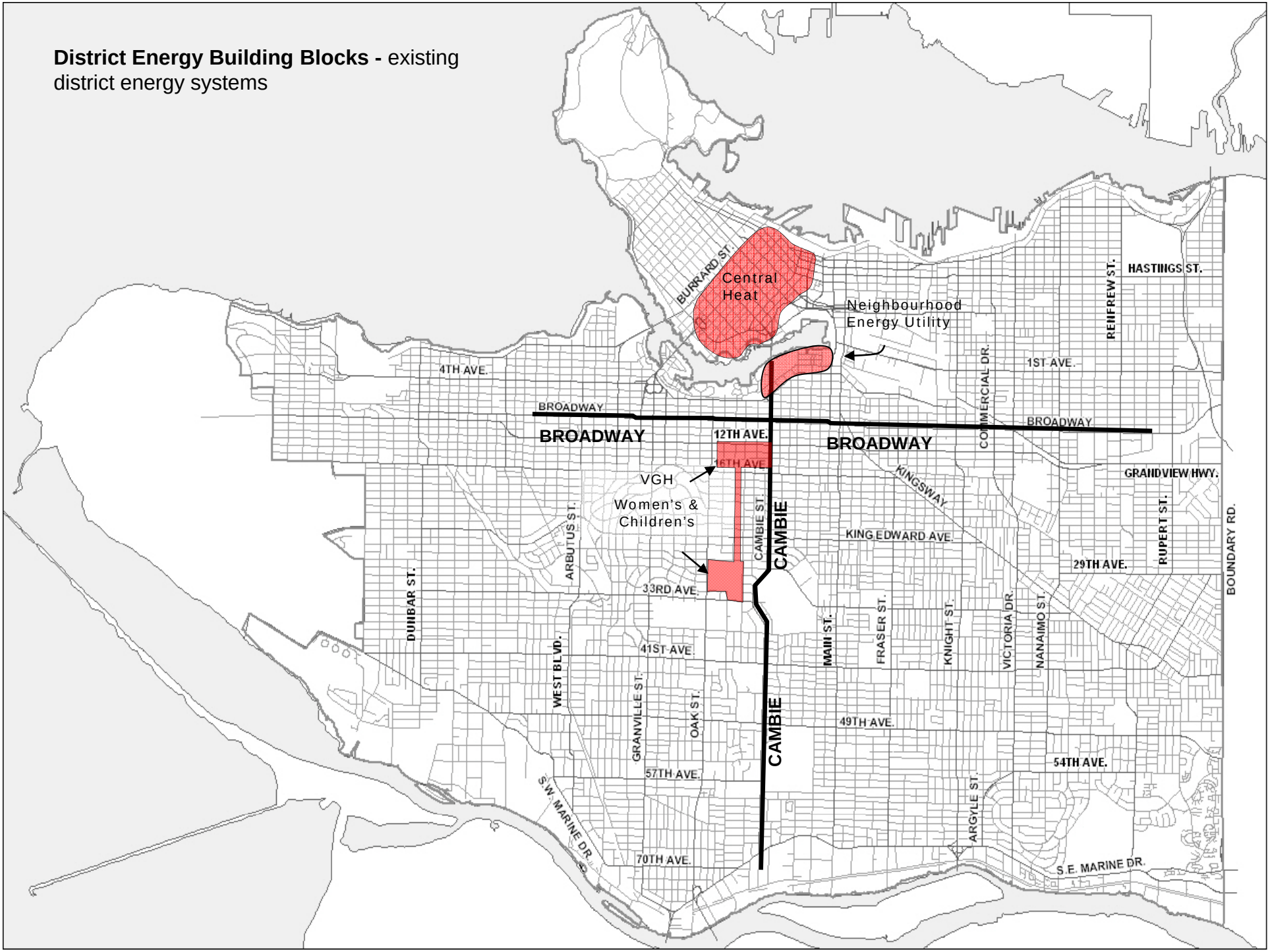
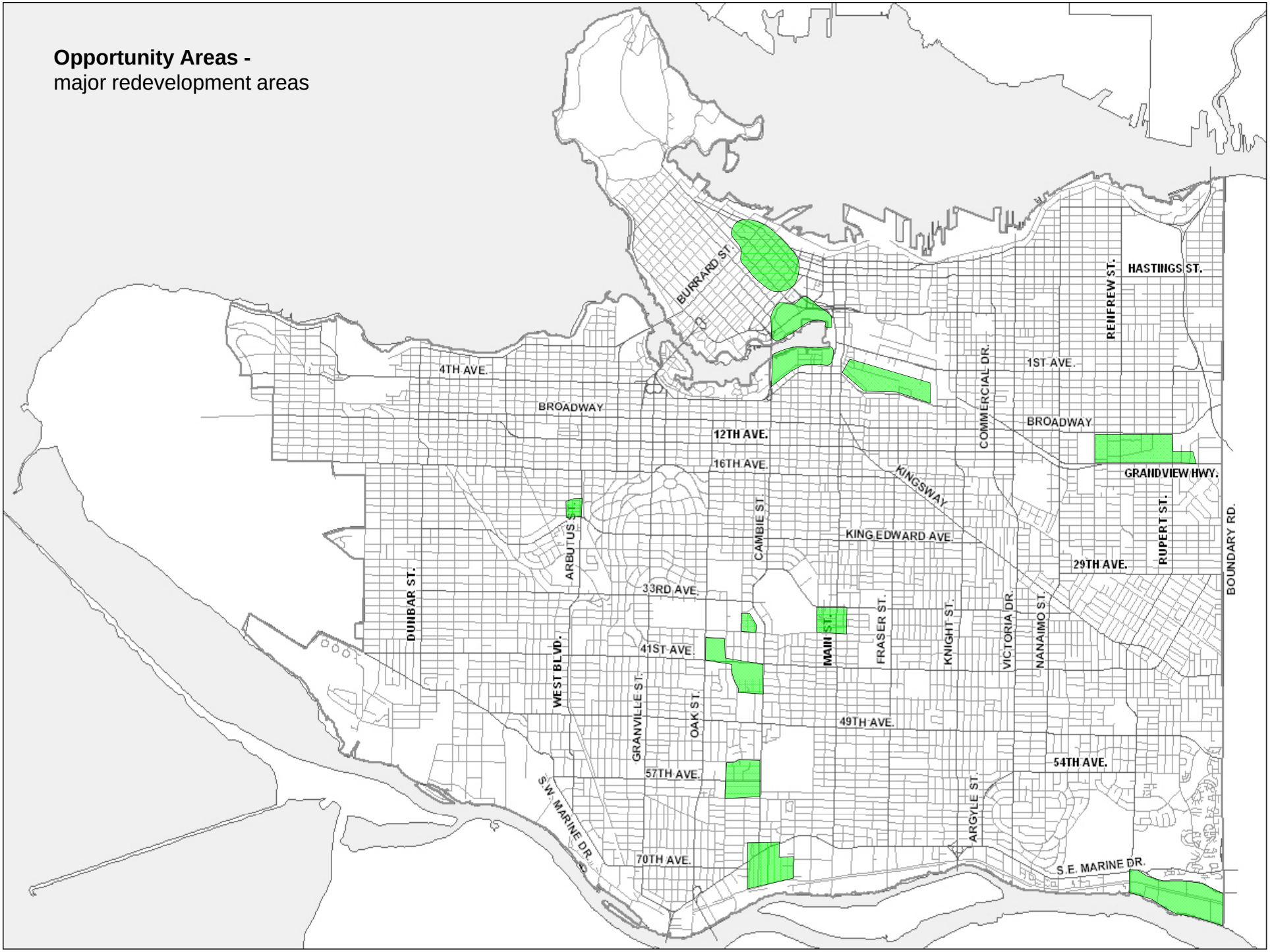
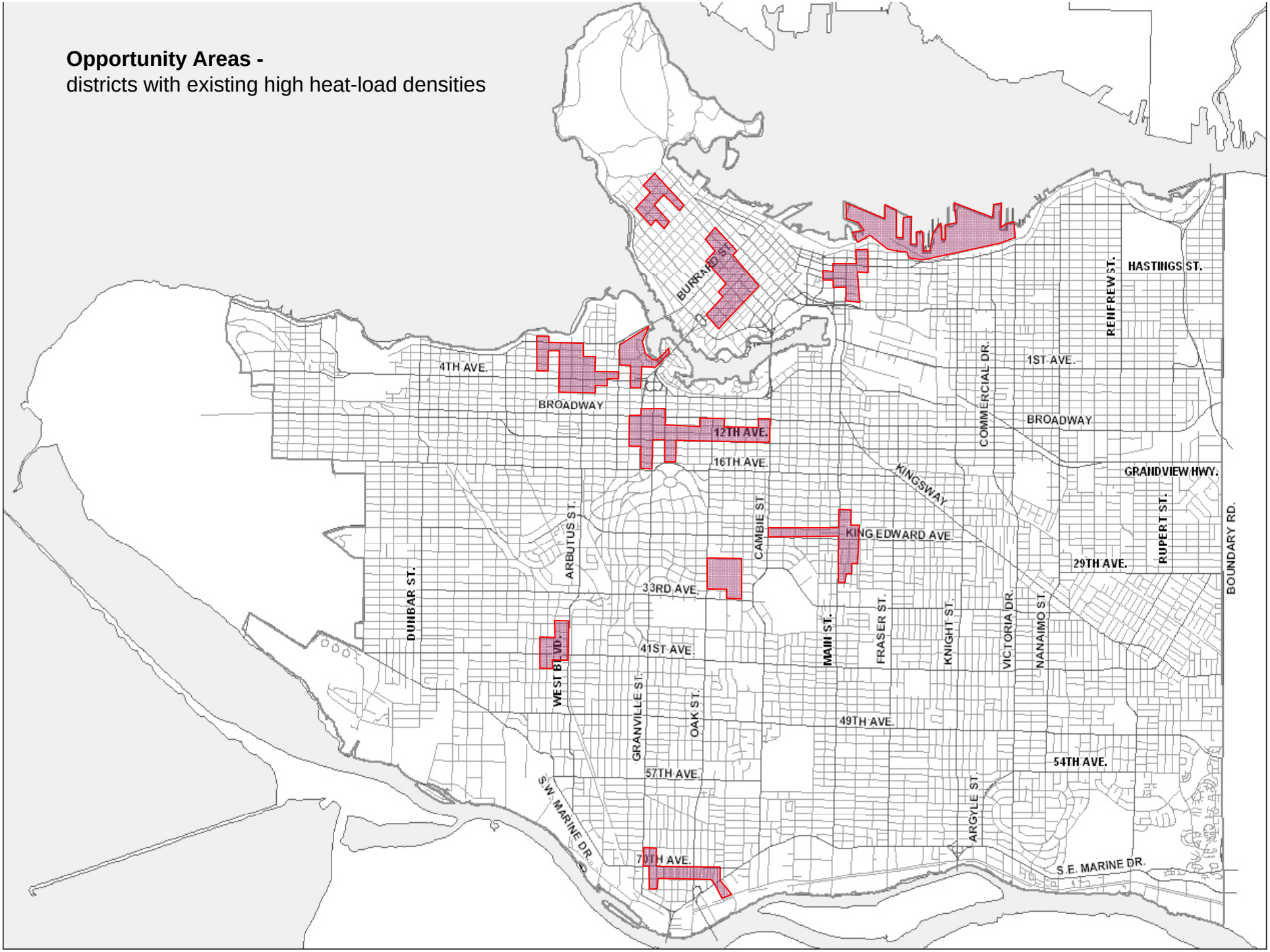
District Energy Building Blocks - existing district energy systems



Opportunity Areas -
major redevelopment areas

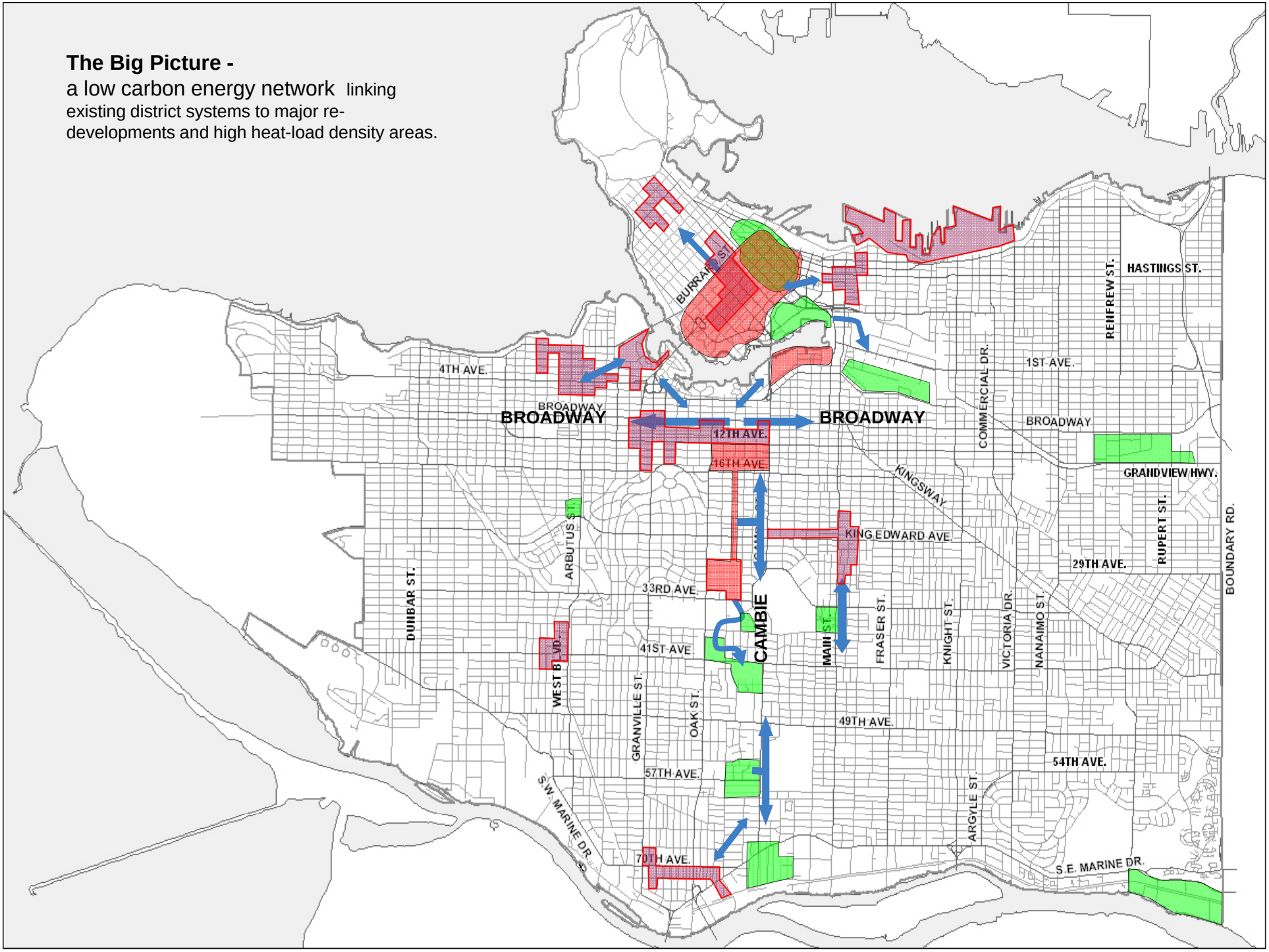


Opportunity Areas -
districts with existing high heat-load densities



The Big Picture -

a low carbon energy network linking existing district systems to major re-developments and high heat-load density areas.



Planned District Energy Systems

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Planned District Energy Systems

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Wood Waste Potential in Vancouver

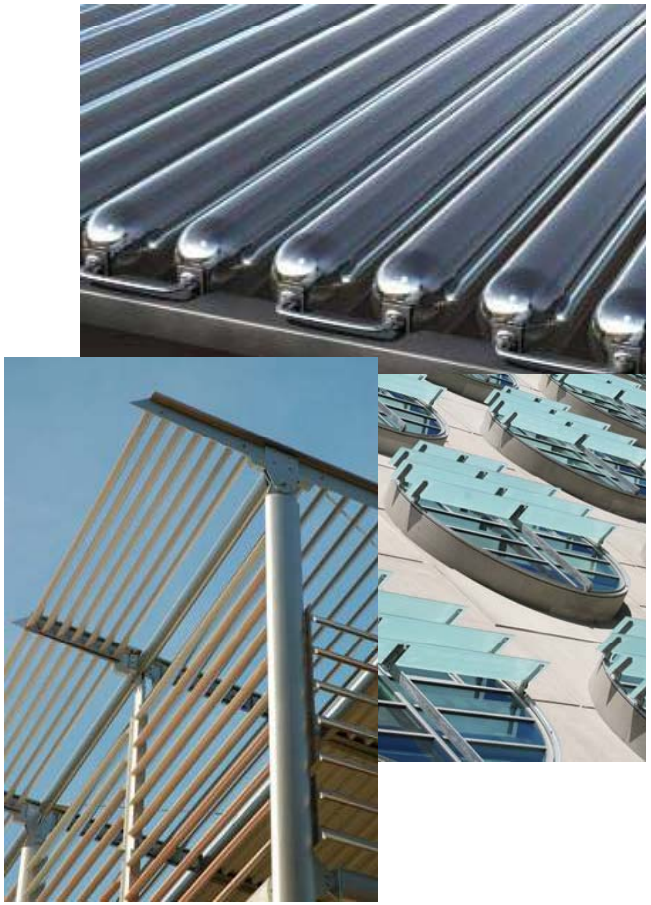
Significant Urban Wood Resources Exist

- 97,172 Wet tonnes/yr of undiverted or unrecycled wood biomass available in Vancouver
- 40,000 tonnes/yr of this material is already being recycled or diverted from landfill.
- Much greater potential in Metro Vancouver

Green Buildings

Retrofitting Existing Buildings

- Moving toward requiring energy performance for retrofit permits
- Work with utilities to develop new financing tools for energy retrofits and renewable energy technologies (e.g. on-bill financing)
- With financing tools, City can regulate improvements more aggressively



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Green Buildings

Green Homes Program (for one and two family dwellings)

"The best code on the continent"

- R-20 Insulation in walls
- In-suite energy use displays
- Energy Star Windows
- Insulated hot water tanks and pipes
- 40% non-incandescent light fixtures
- Direct vent gas fireplaces
- Heat Recovery Ventilation
- Mandatory Energuide audit
- Pre-piping for renewable energy
- Dual flush toilets
- Electric vehicle Charging

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Waste and Renewable Energy

Share of All Emissions	Total Change Since 1990	Per Capita Change since 1990
8%	-43%	- 55%

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Methane from Organic Waste

- Vancouver Landfill emits an estimated 350,000 GJ of methane annually
- Vancouver landfill gas (LFG) recovery project is largest GHG reduction in the region
- Recovered LFG (approximately 70% of total) is sent to a combined heat and power facility at nearby greenhouses
- City is starting to separate organic waste & explore biogas digestion as an energy source and waste treatment option
- Questions: How to enhance LFG recovery? What is the best application for recovered gas?

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Next Steps for Vancouver

- Retrofitting existing buildings to improve energy performance by min. 20%
- Carbon neutral new buildings by 2020
- Expanding district and on-site renewable energy systems
- Working with large emitters and enabling businesses to develop GHG inventories and reduction plans
- Integrating land use-transportation-energy planning
- Expanding rapid transit, walking and cycling and supporting vehicle electrification

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Final Thought…

“We overestimate what we can achieve in one year and underestimate what can be done in five …”

1980s

2000s