

PERKINS+WILL | CIVITAS | GROUP2

Edmonton City Council – July 17th 2012



Overall Vision

Connect-i-city – Seven Principles

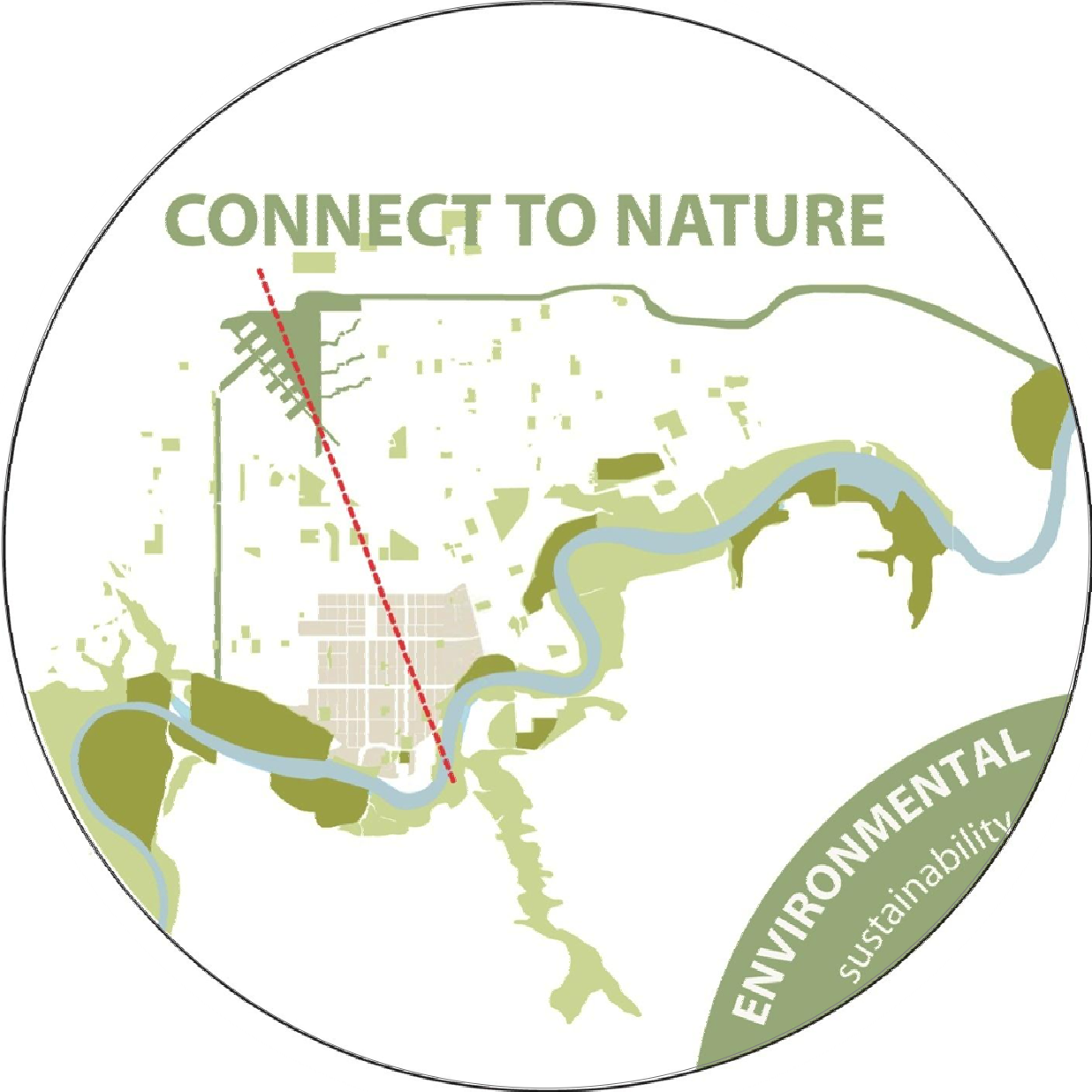
- Planning and Design
- Ecological Footprint
- Infrastructure
- Family Housing
- Open Space
- Technology
- History



Four Big Ideas: 1. Connect Communities



Four Big Ideas: 2. Connect to Nature



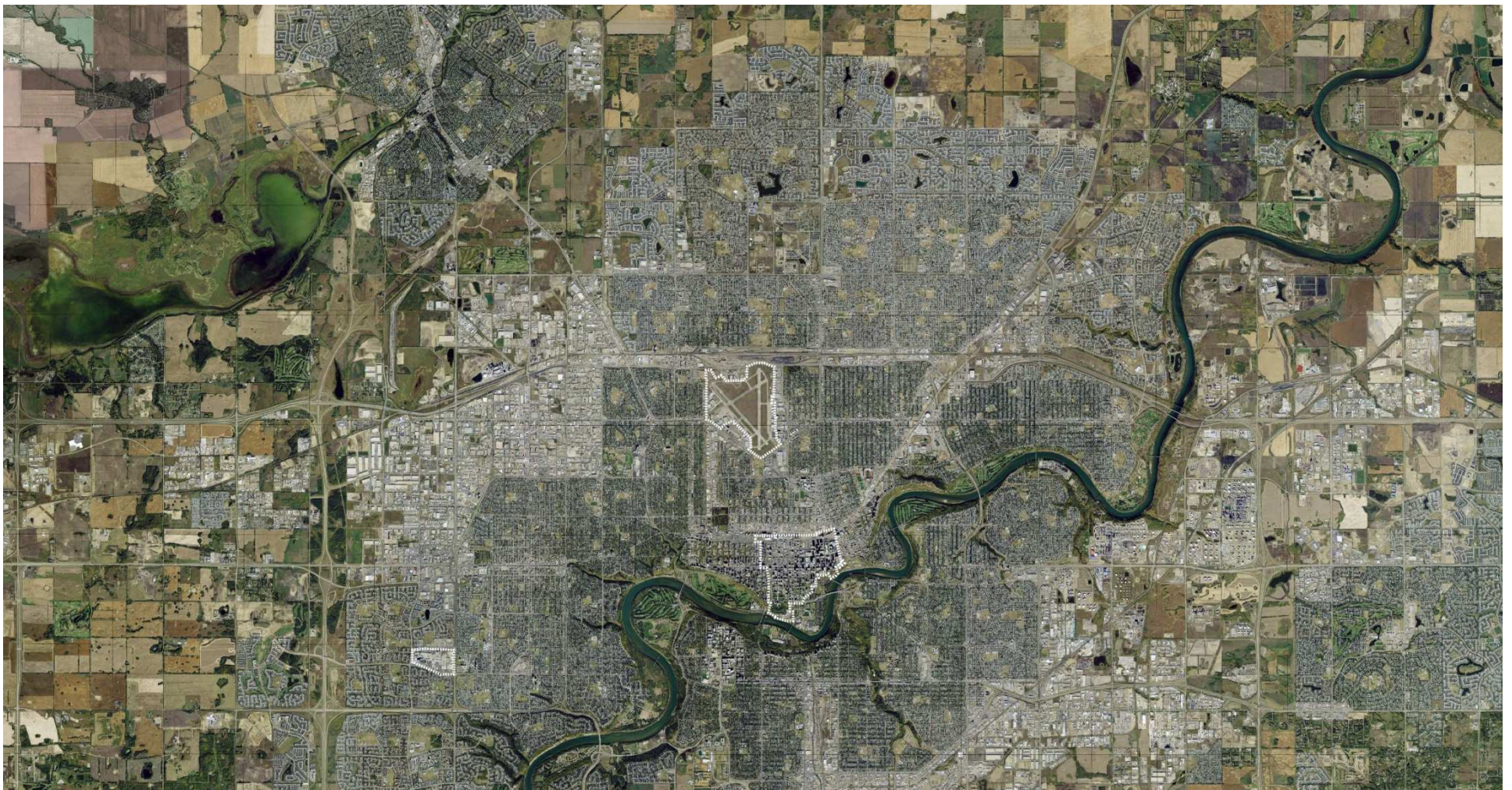
Four Big Ideas: 3. Connect to Growth



Four Big Ideas: 4. Connect to History



Context



Neighbourhoods



Leading Edge Infrastructure

A Call To Action

Tonnes of CO2
per person

Houston  26.0


Edmonton  24.0

Austin  16.7

Boston  14.0

Portland  13.7

Seattle  12.4

Toronto  9.3

Vancouver  6.0

London  5.2

Stockholm  3.0

The Earth can sustain a stable human population of 8 billion at 2.2 tonnes/person

Council's Vision for CCR: Carbon Neutral

6.0

5.2

3.0

How do we get there?

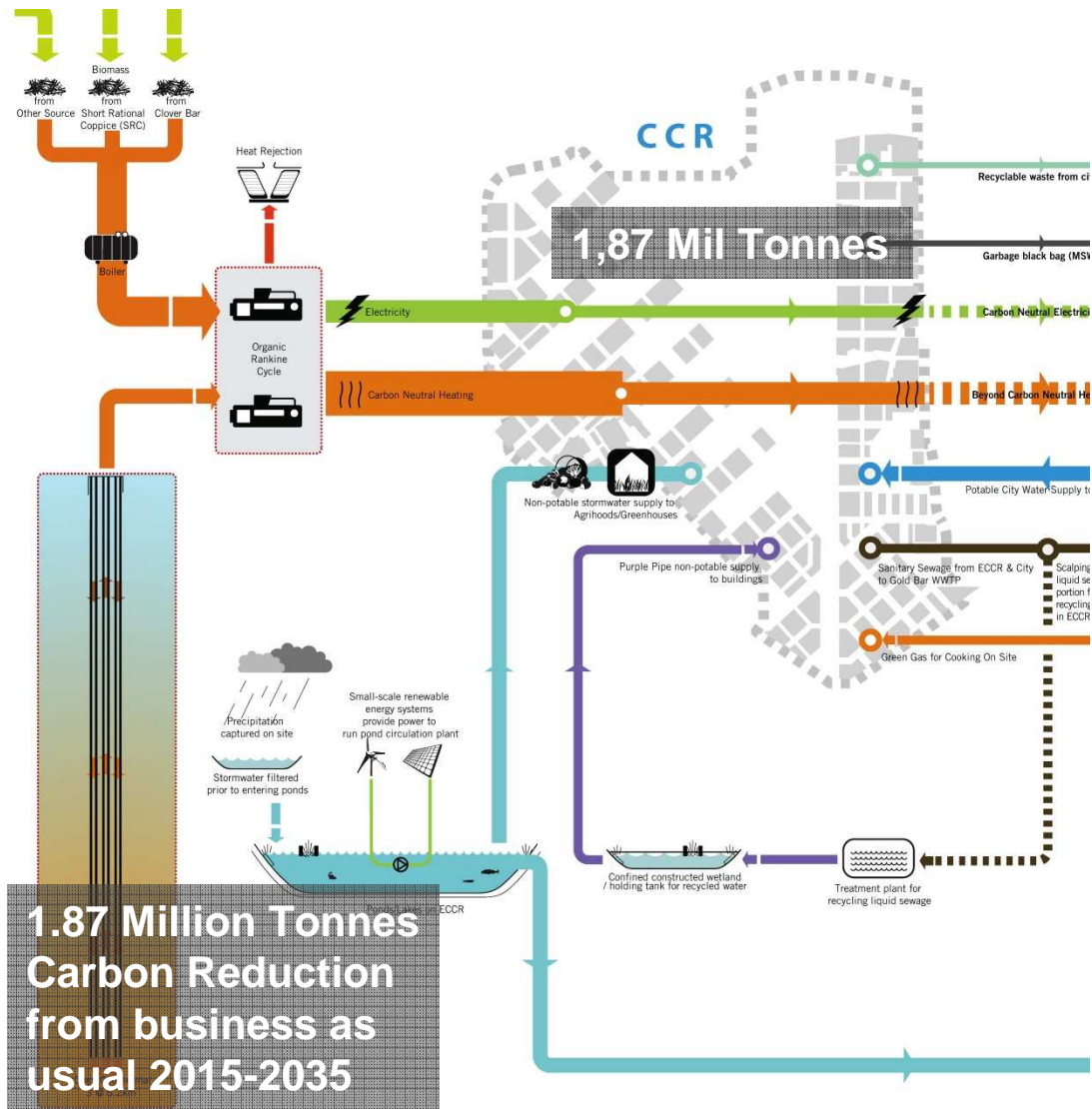
Edmonton Carbon Footprint tonnes/ person/ year

| | | |
|----------------------------|---|-----------|
| Edmonton Existing Estimate | | 24 |
| Electricity (coal fired) | | 16 |
| •Transportation | | 4 |
| •Heating (natural gas) | 3 | |
| •Other | | 1 |
| CCR Estimate | | 4 |
| •Electricity (renewable) | 0 | |
| •Transportation | | 3 |
| •Heating (renewable) | 0 | |
| •Other | | 1 |

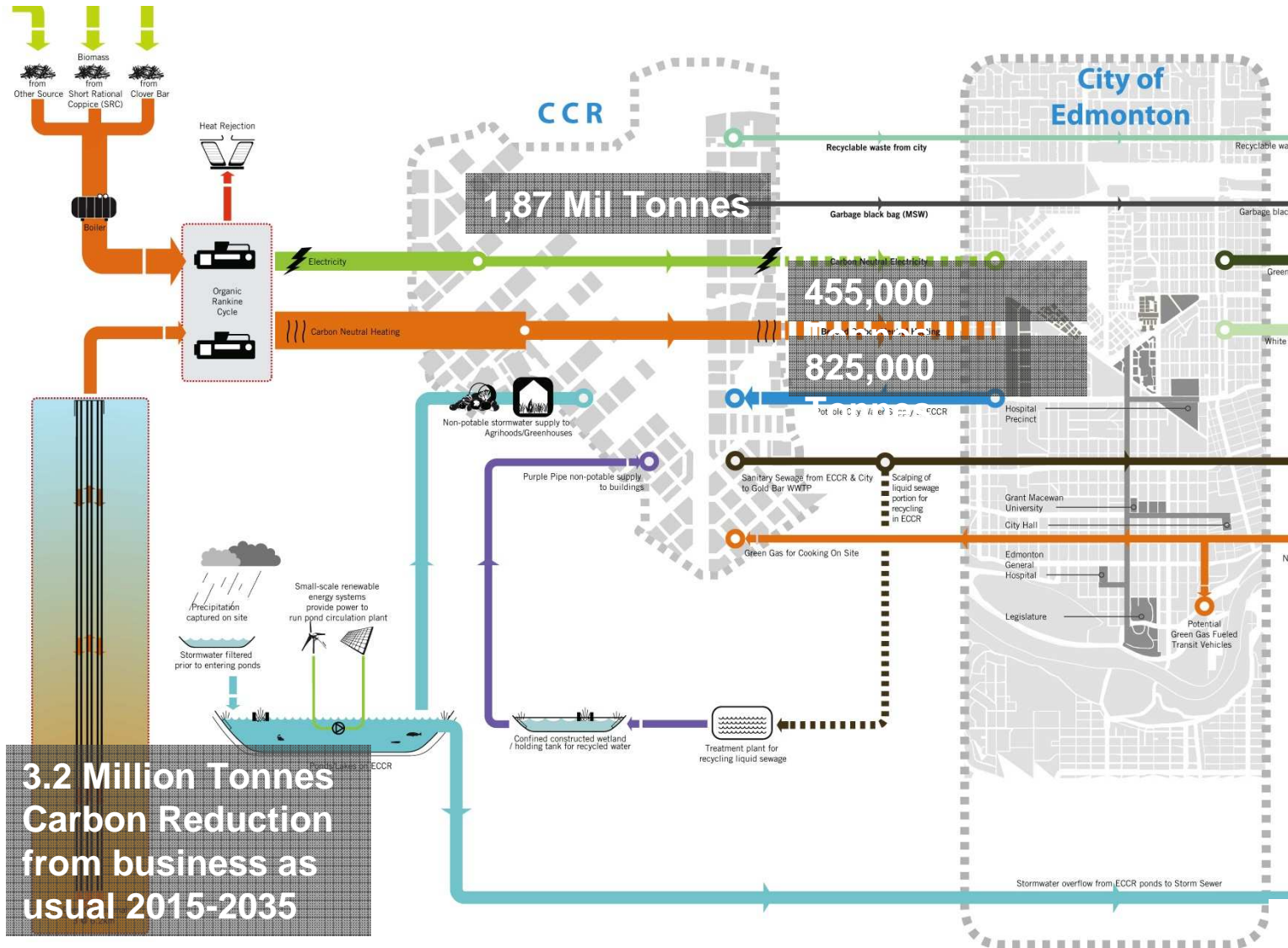


Selling Heat and Power offsite moves us to beyond carbon neutral.

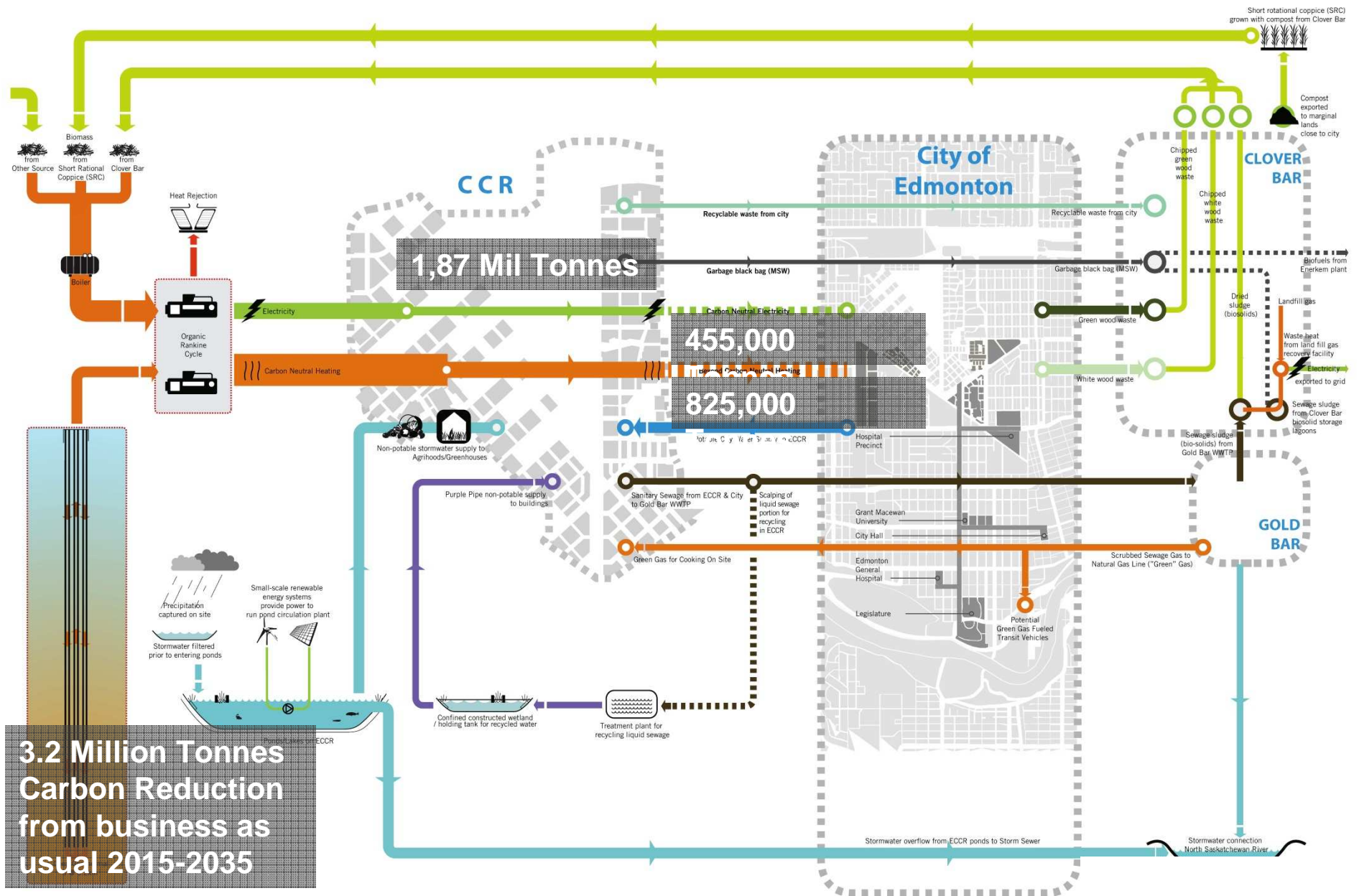
Carbon Neutral



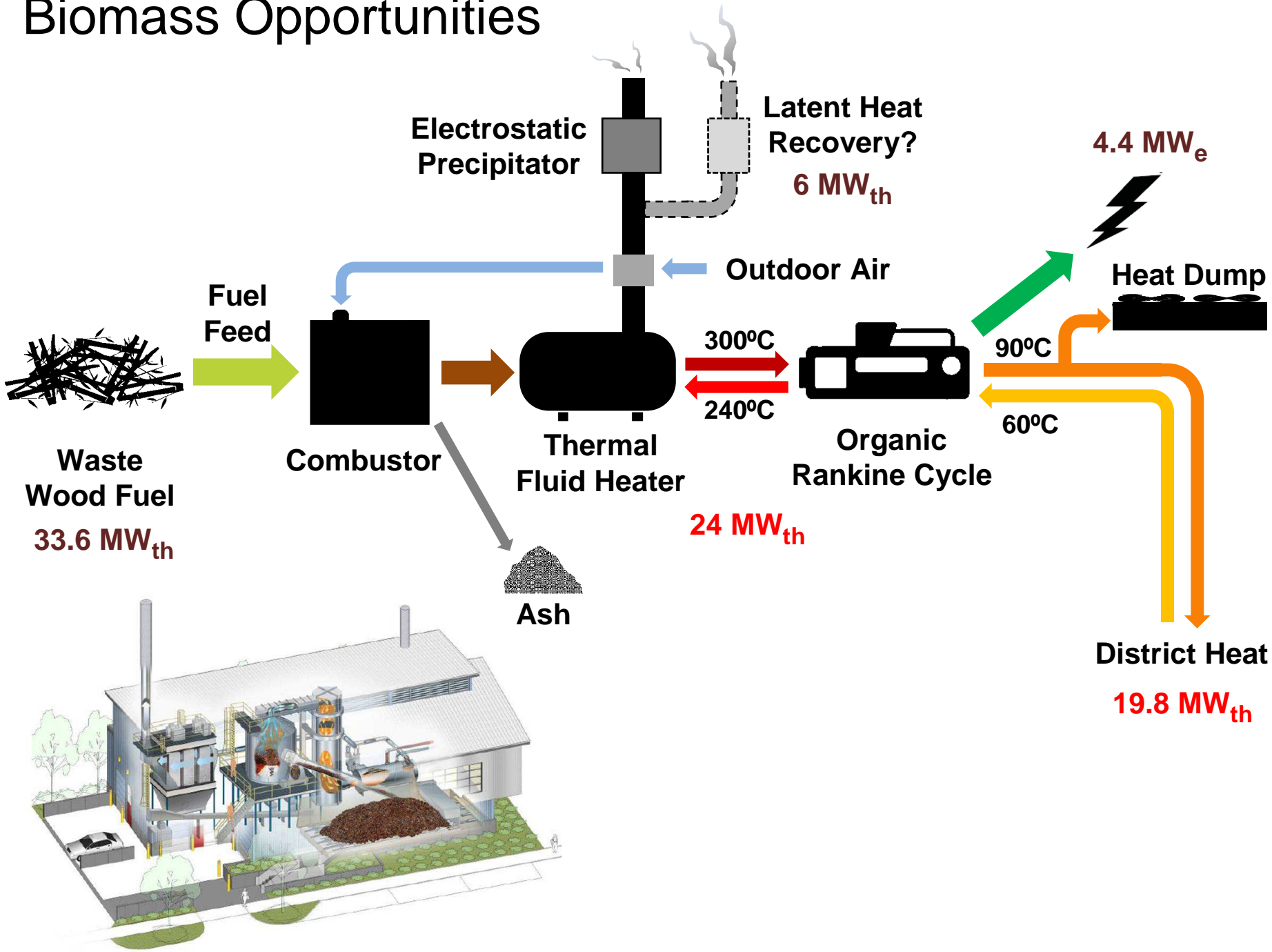
Beyond Carbon Neutral



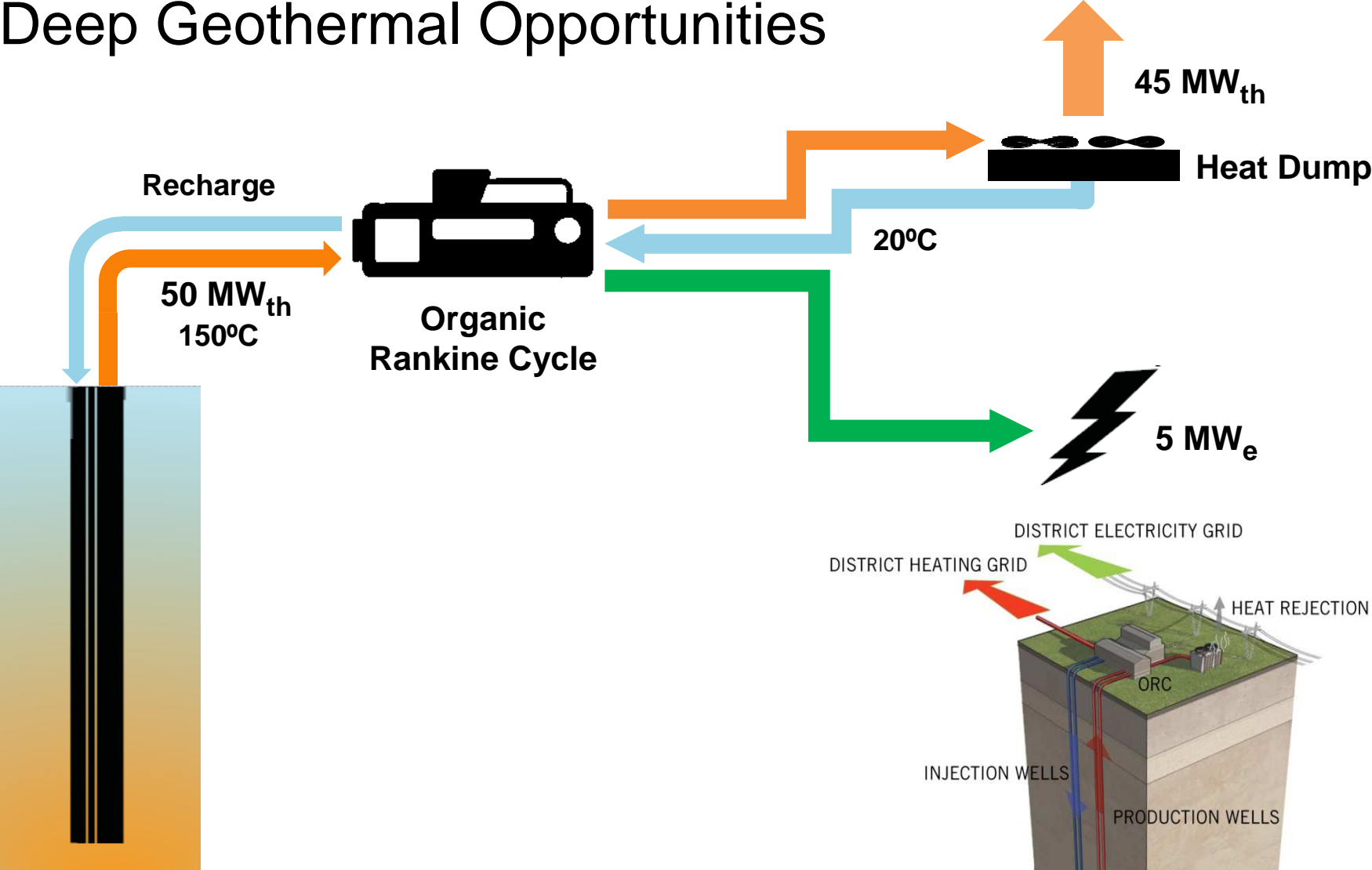
Beyond Carbon Neutral with City Waste Reuse



Biomass Opportunities

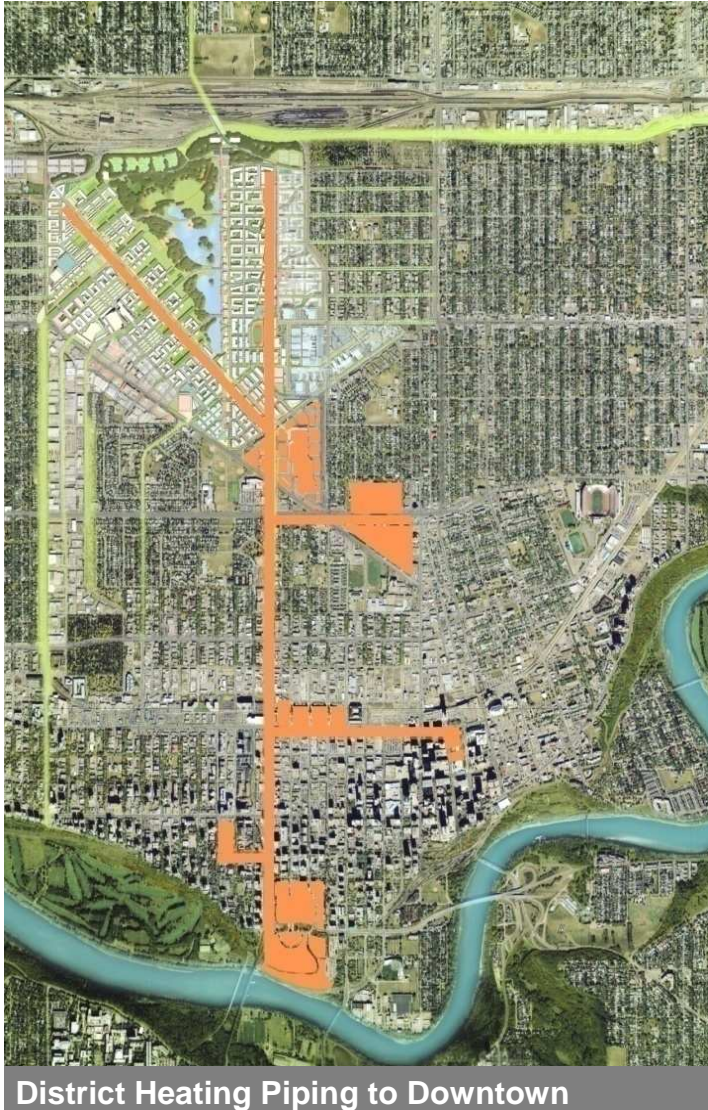


Deep Geothermal Opportunities



- Deep Geothermal 5-6km 50MW
- Shallower Geothermal 3.5 km Option
- ~ 80°C Ground Water Aquifer
- 100% Used for District Heating

Utility Infrastructure Beyond Carbon Neutral



On-site Electrical and Heat Energy Generation:

Biomass Thermal Plant Fueled By

- Industry Waste Wood
- Clean Wood from Waste Plant
- Dried Sewage Sludge From Wastewater Plant

Deep Geothermal, 5 – 6 km Deep

Heat From Thermal Plant:

Heat Development

District Heating Loop to Downtown

Scrubbed Sewage Plant Flare Gas/Biogas:

Cooking Gas for On-Site Cooking

Fuel for Transit Vehicles

On-site Water Mining from Sewage:

Reduce Potable Water Use from 209 l/per day to 138 l/day

=Regenerative Design

Waste Plants – Energy Sources for CCR



Gold Bar - Sewage:

- Dry sludge: 20,000 t/yr, 36 GWh/yr
- Methane: 32 GWh/yr



Clover Bar - Waste:

- Wood waste: 50,000 t/yr
- Organics: 10,000 t/yr
- Waste to Ethanol Plant = 10% MSW to Landfill
- Compost for a Sustainable Forest

Pneumatic Waste Management

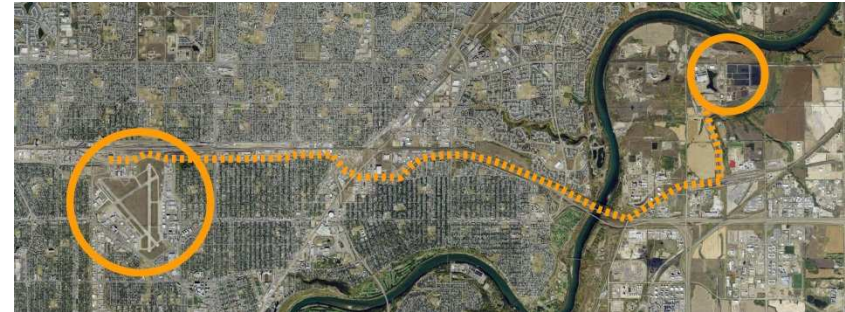
Pneumatic Waste Collection System

Reduces or eliminates:

- Waste trucks on site
- Lane Maintenance within CCR
- Outside large garbage bins for each building

2 Fractions accepted at Clover Bar

- General Waste
- Recycled and Organic Material



- 30,000 people living on site
- ~1.2 kg/person/day
- 36 tonnes/day
- 9 @ 40ft semi trailers/day to Clover Bar



Underground Vacuum Collector

Tried and True Industrial Components



Wellons Biomass Thermal Fluid Heater
•30 Years in Business in Western Canada
•Hundreds of Industrial Installations



Turboden Organic Rankine Cycle Generator
•Installations in 27 Countries 243 Plants
•211 Biomass fueled Plants

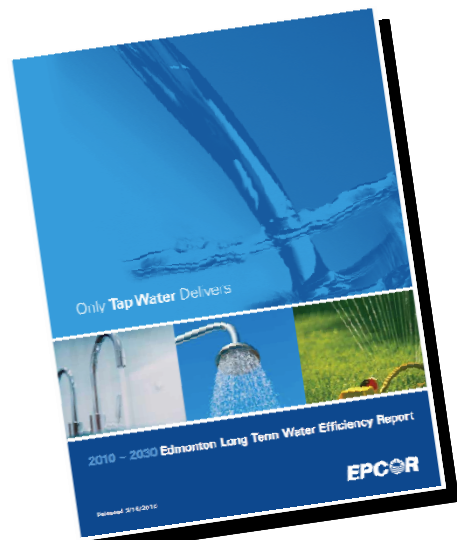
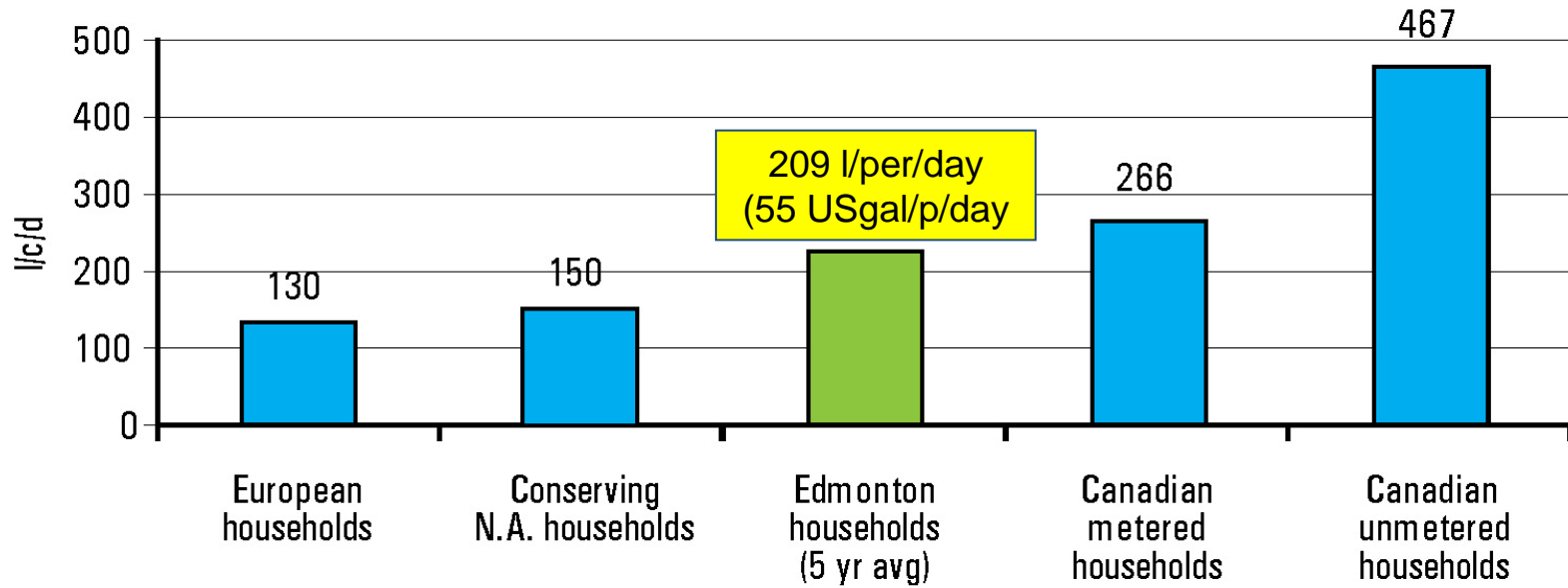


District Energy System St. Paul
•Bio-Mass Fueled
•Hot Water District Heating 31.8 million sqft



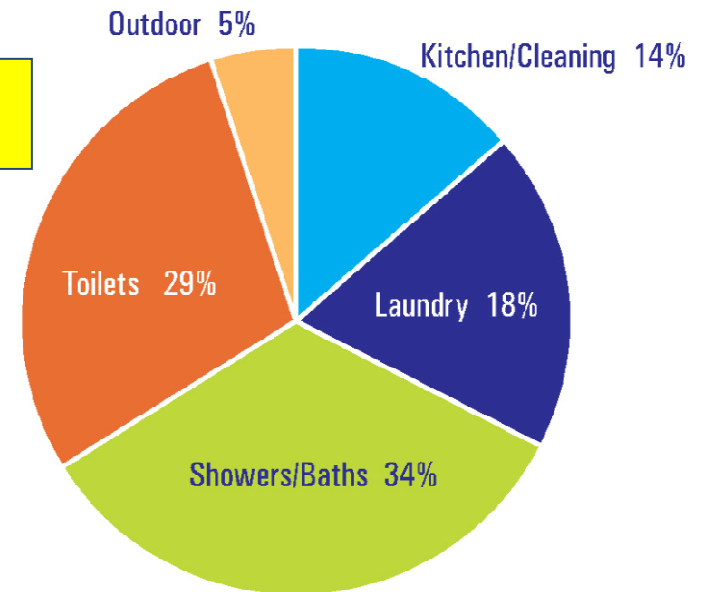
Pneumatic Waste System
•Over 600 installations in 20 countries
•Quartier des Spectacles Montreal
•La Cite Verte, Quebec

Current City of Edmonton Water Use



2010 – 2030 Edmonton Long Term Water Efficiency Report

Non-potable:
29% + 5% = 34%



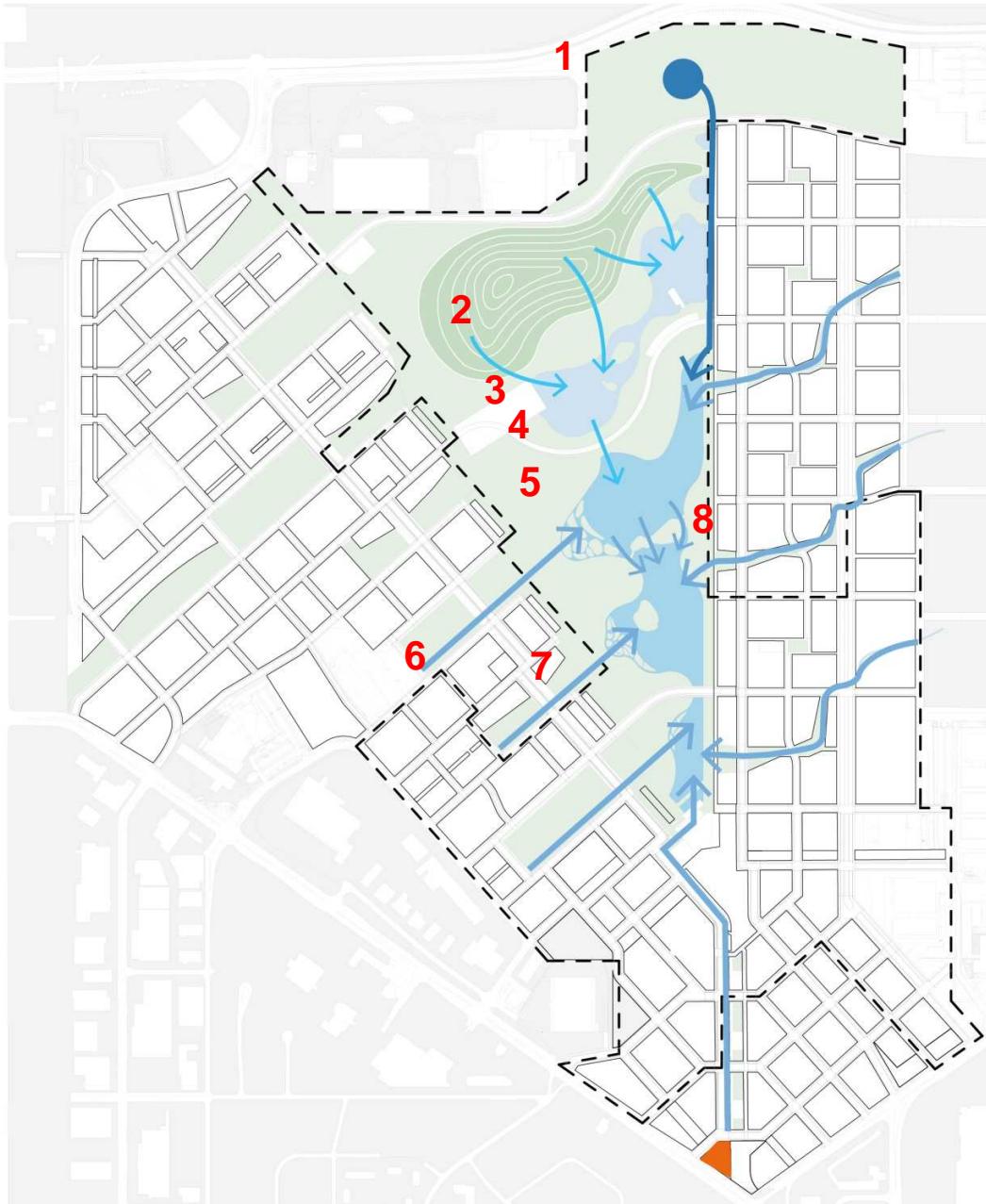
World Leading on Water

| | |
|---|------------------------|
| EPCOR Current Baseline: | 209 l/per/day |
| Reduction for irrigation (storm water reuse) | - 11 |
| Reduction for toilet flushing (reclaimed water) | - 60 |
| <u>Projected Water Use litres/person/day</u> | <u>= 138 l/per/day</u> |



Purple pipe supply treated non-potable water for WC flush & landscape

Storm Water Strategy

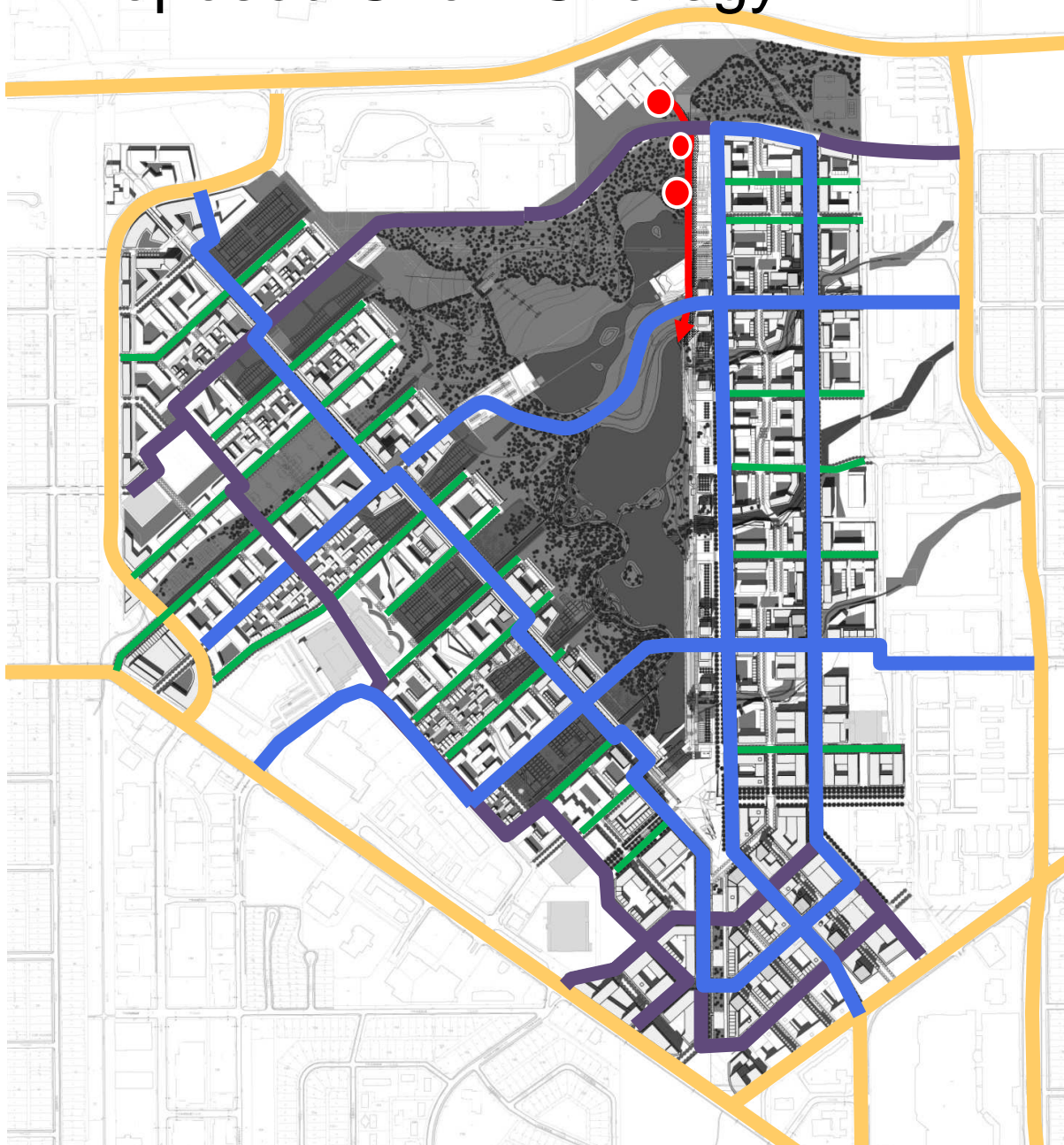


- 1 Primary Snow Melt Zone
- 2 Recreation Pond
- 3 Upper Stormwater Lake
- 4 Weir
- 5 Lower Stormwater Lake
- 6 Stormwater Channels
- 7 City Centre Canal
- 8 Stormwater Rills

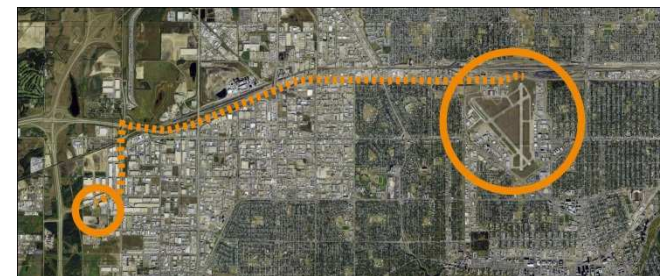
**Stormwater capture and retention lake:
73% reused for irrigation
(typical year)**

**All water bodies sloped to
drain or circulated to prevent
mosquito breeding**

Proposed Snow Strategy

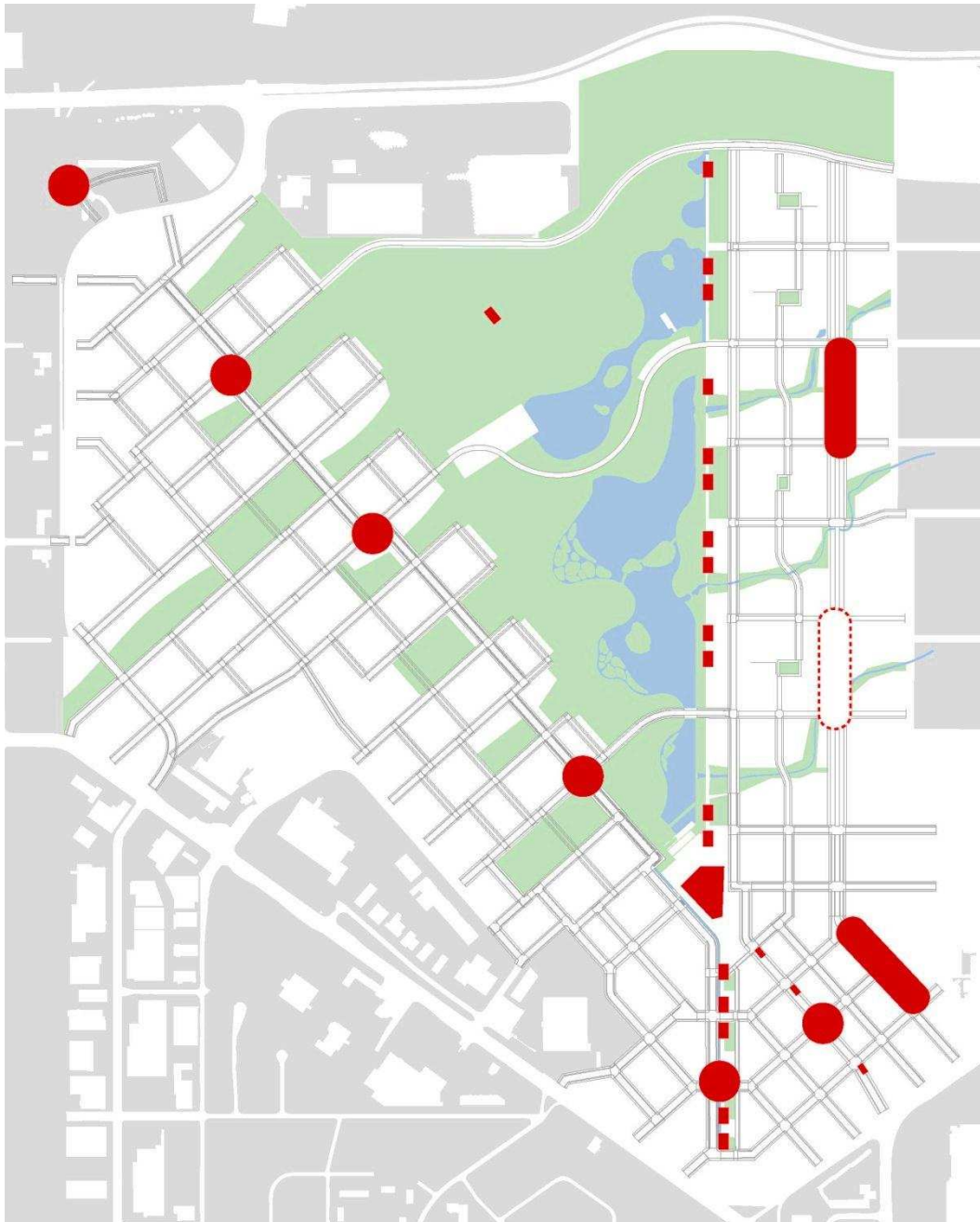






- Key Arterials
- Priority Streets
- Main Residential Removal
- Boulevard Storage
- Snow Melt & Storage



On-site snow collection strategies reduce trip lengths for snow removal by 90%

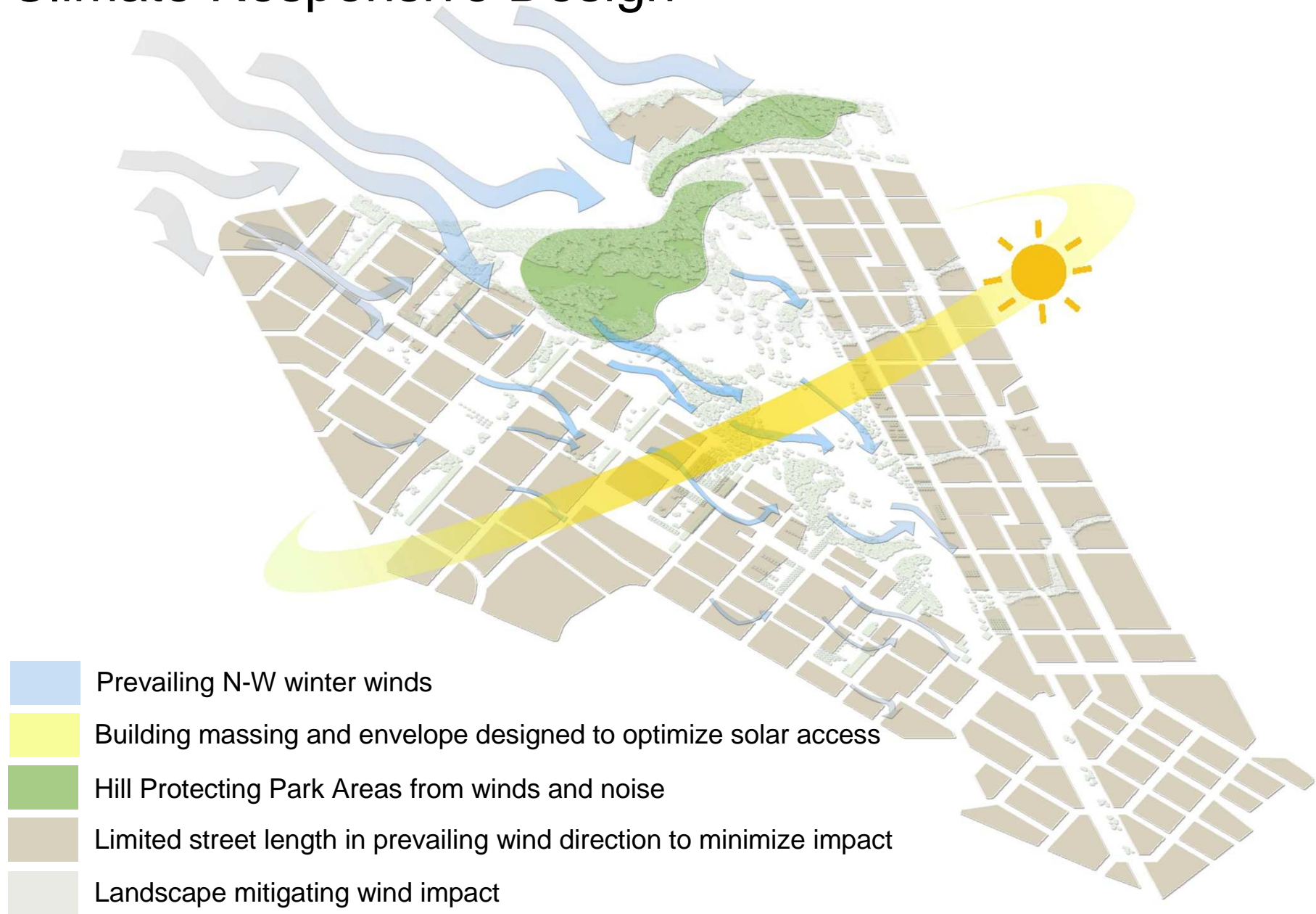
Winter City



-  LRT Station
-  Bus Stops
-  Pavillions
-  Wop May Plaza

Excess Heat from the District Energy System will be used to provide heated shelter at key public spaces

Climate Responsive Design



Green Buildings

To achieve Net Annual Site Power Generation (not Peak Demand)

- Good current design would result in a power plant with an output of ~ 26 MWe
- Lower energy design meeting ASHRAE 90.1 2013 less 20% would result in a power plant with an output of ~18 MWe.

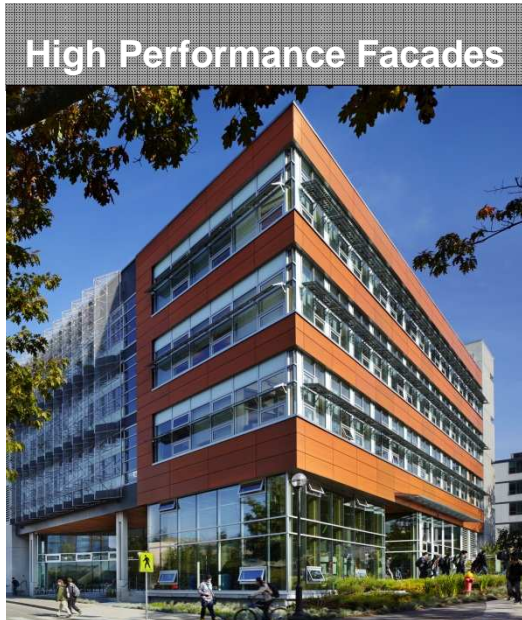


High Performance Glazing

Green Roofs



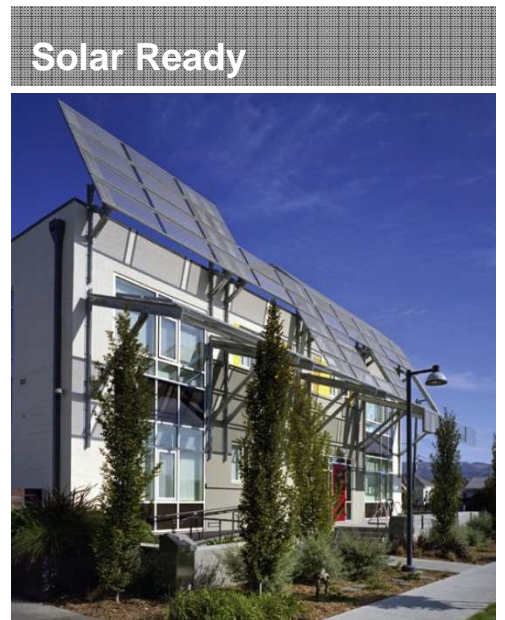
Solar Shading



High Performance Facades



Passive Design



Solar Ready

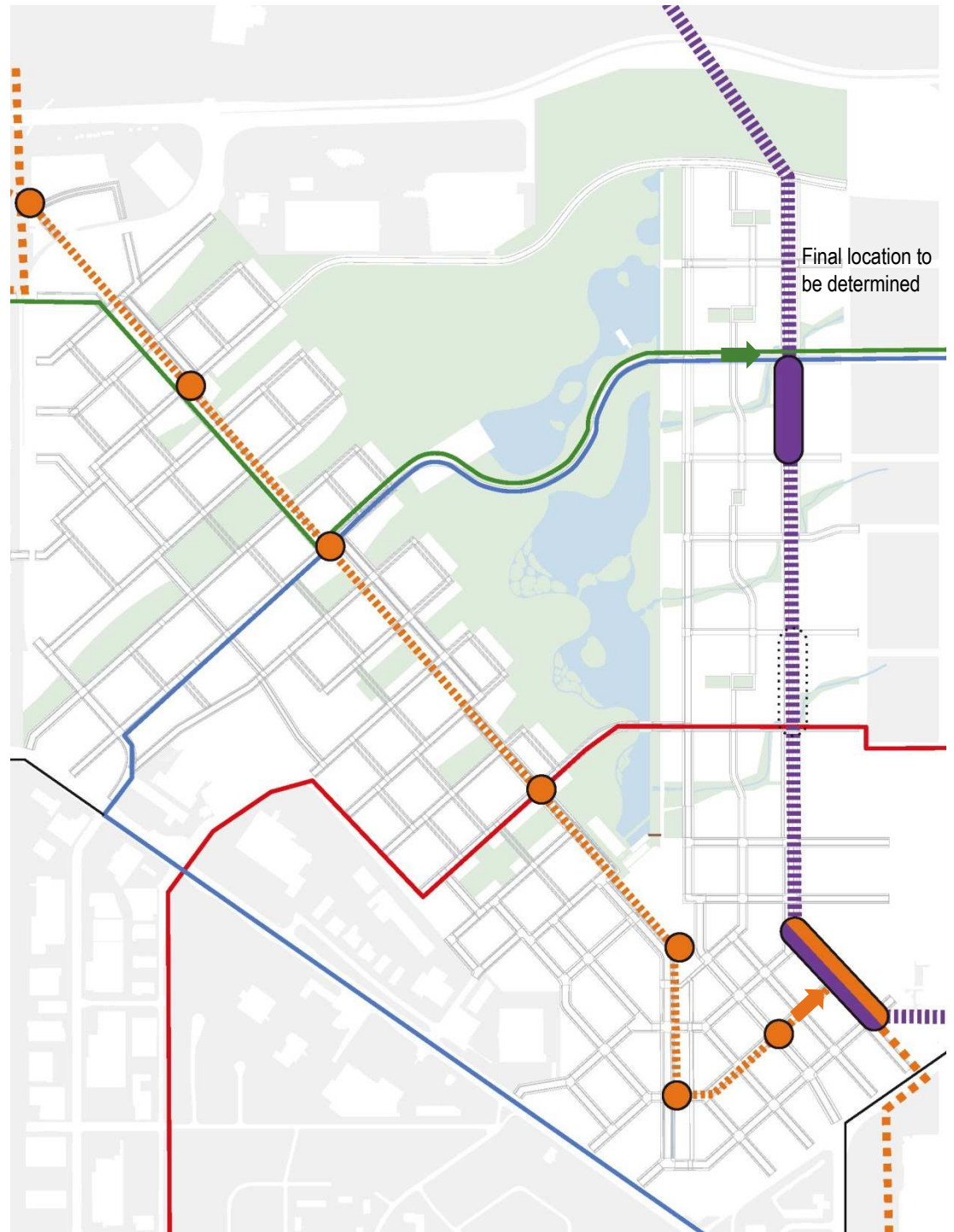
Transportation

Street Network

- Active Home Street
 - Connective Home Street
 - Connective Parkland
 - Central Work Street
 - Active Work Street
 - Connective Work Street
 - Boulevard
 - Through Street
 - Active LRT
 - Passive LRT
 - Active Community St
 - Passive Community St
- Max. block dimension of 150m providing connectivity and walkability.

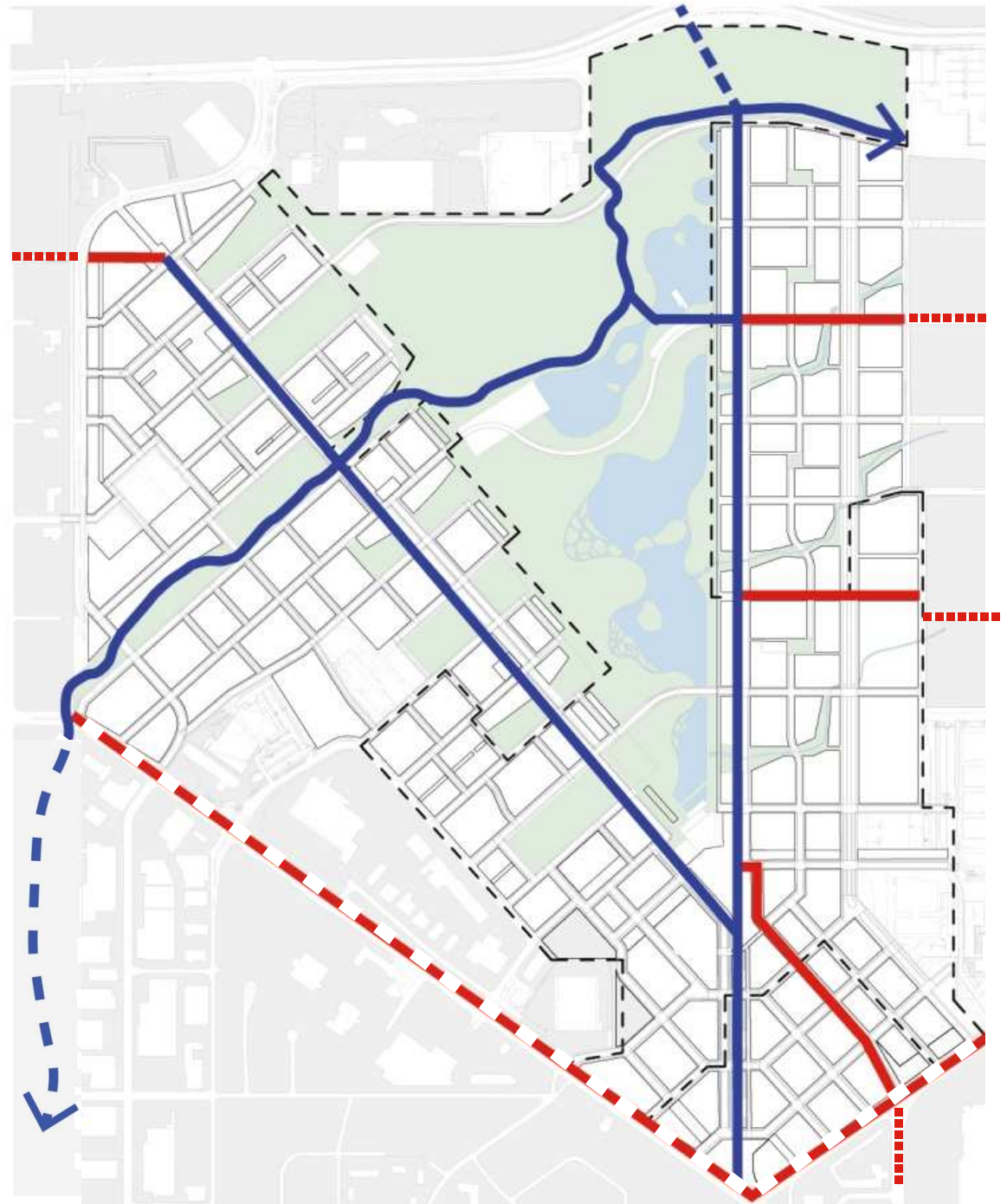





Transit Network



- ||||| LRT
- ||||| Proposed Transit Connection
- Proposed Bus Route
- Proposed Bus Route
- Proposed Bus Route
- Existing Bus Routes

Bicycle Network

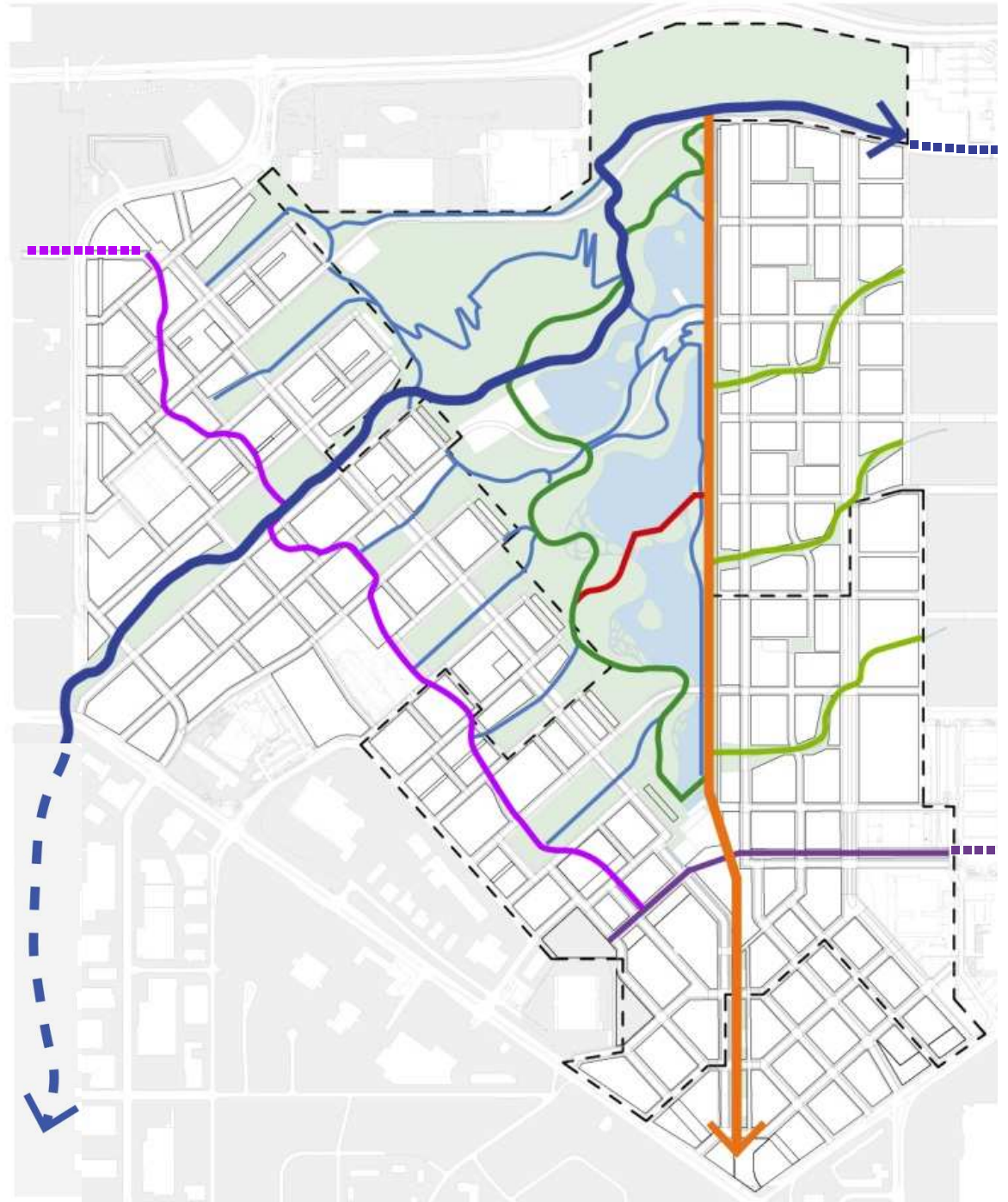


-  Dedicated on Street Bicycle Lanes
-  Off Street Bicycle Lanes
-  Possible Extension

Pedestrian Network

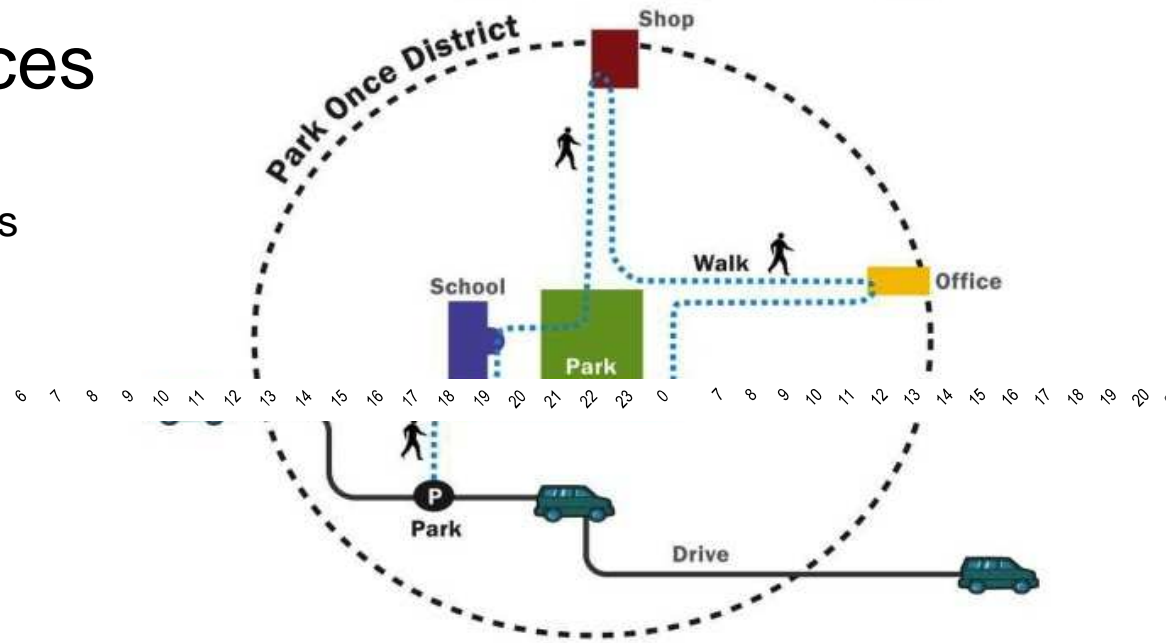


-  River to River Loop
-  Lake Trail
-  Northern Lights
-  Rills
-  Agrihood Path
-  Park Trails

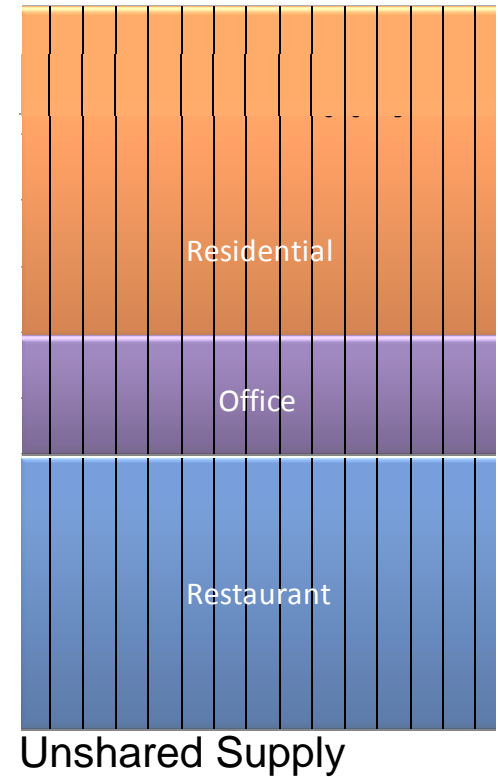
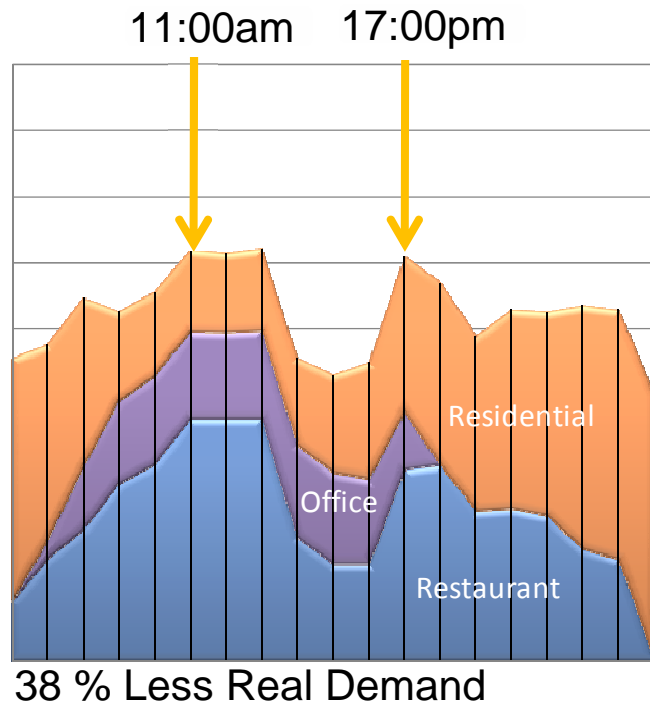


Parking Best Practices

- Shared Parking Arrangements
- Car-Sharing
- Parking Maximum Standards
- Unbundled Cost of Parking
- Bike Parking Standards
- A “Park Once” District









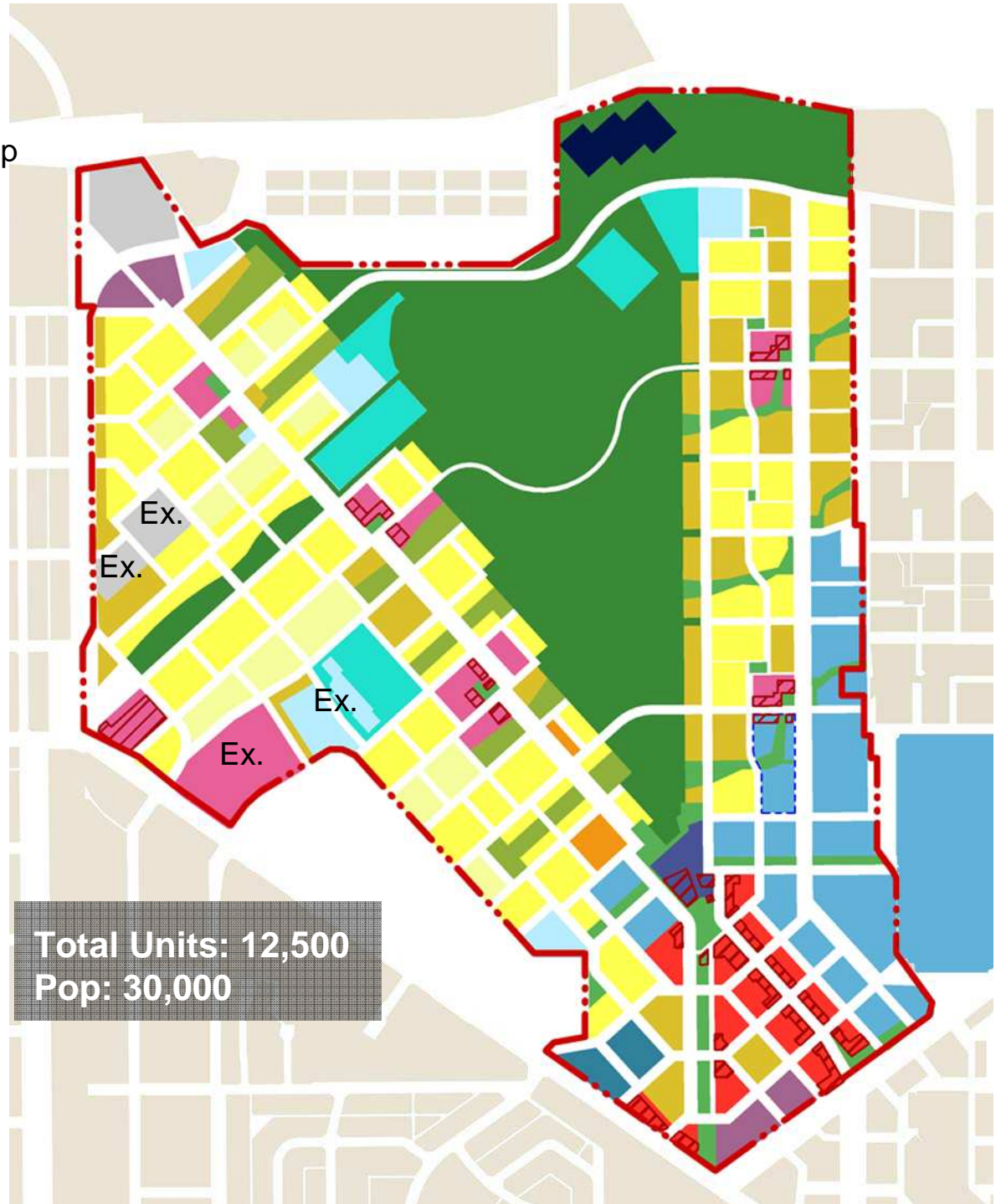
Public shared parking is expected to reduce real demand by nearly 40% compared to unshared supply.



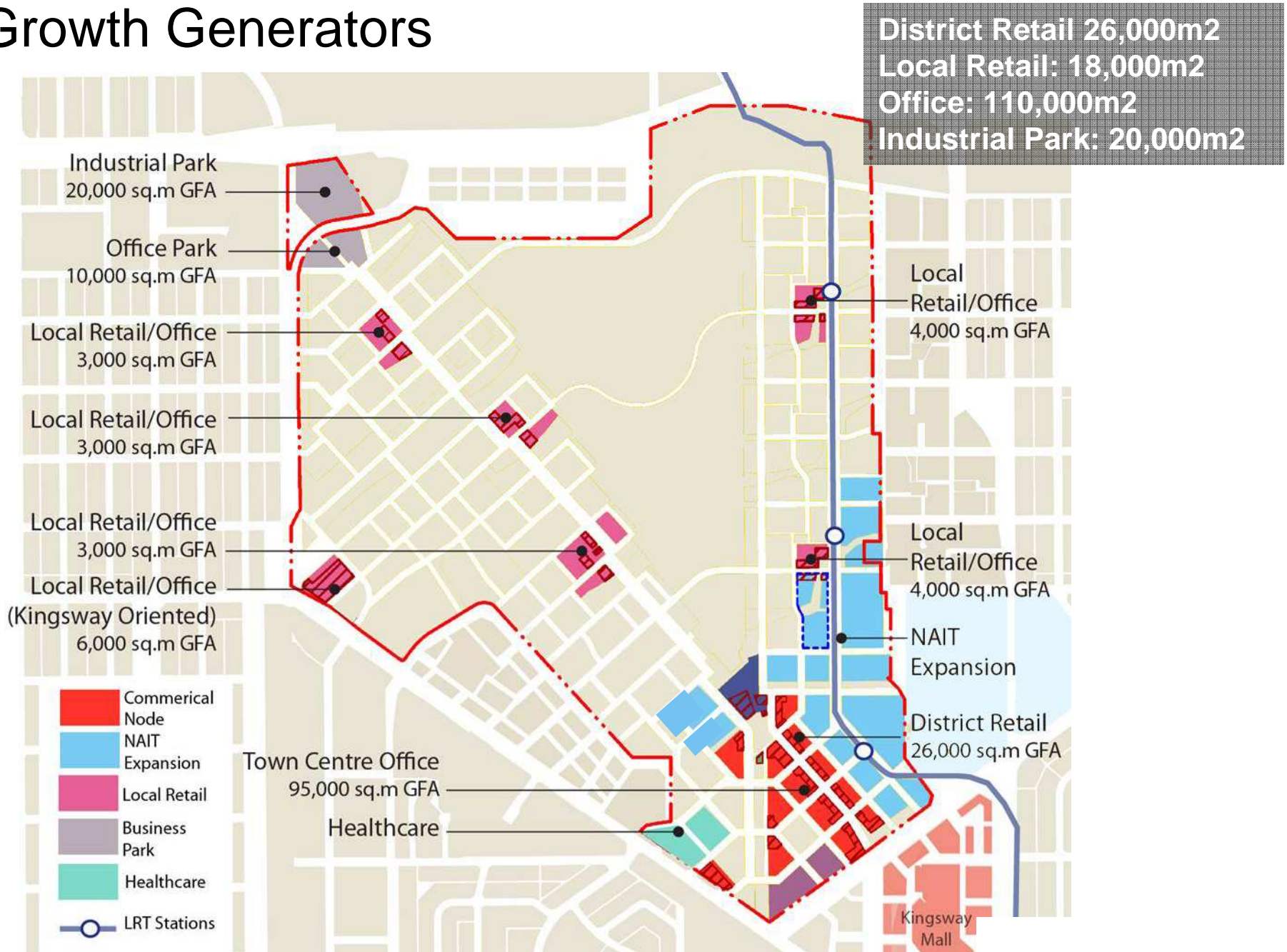
Density and Housing

Land Use

-  Amenity/Cultural/NAIT Partnership
-  Healthcare
-  NAIT
-  Civic
-  Mixed Use District Center
-  Mixed Use Neighbourhood
-  Office / Residential
-  Residential High
-  Residential Medium High
-  Residential Medium Low
-  Residential Low
-  Regional Park
-  Agriculture
-  Local Park
-  Utilities
-  Business Park
-  Retail
-  Swing Site NAIT/Residential

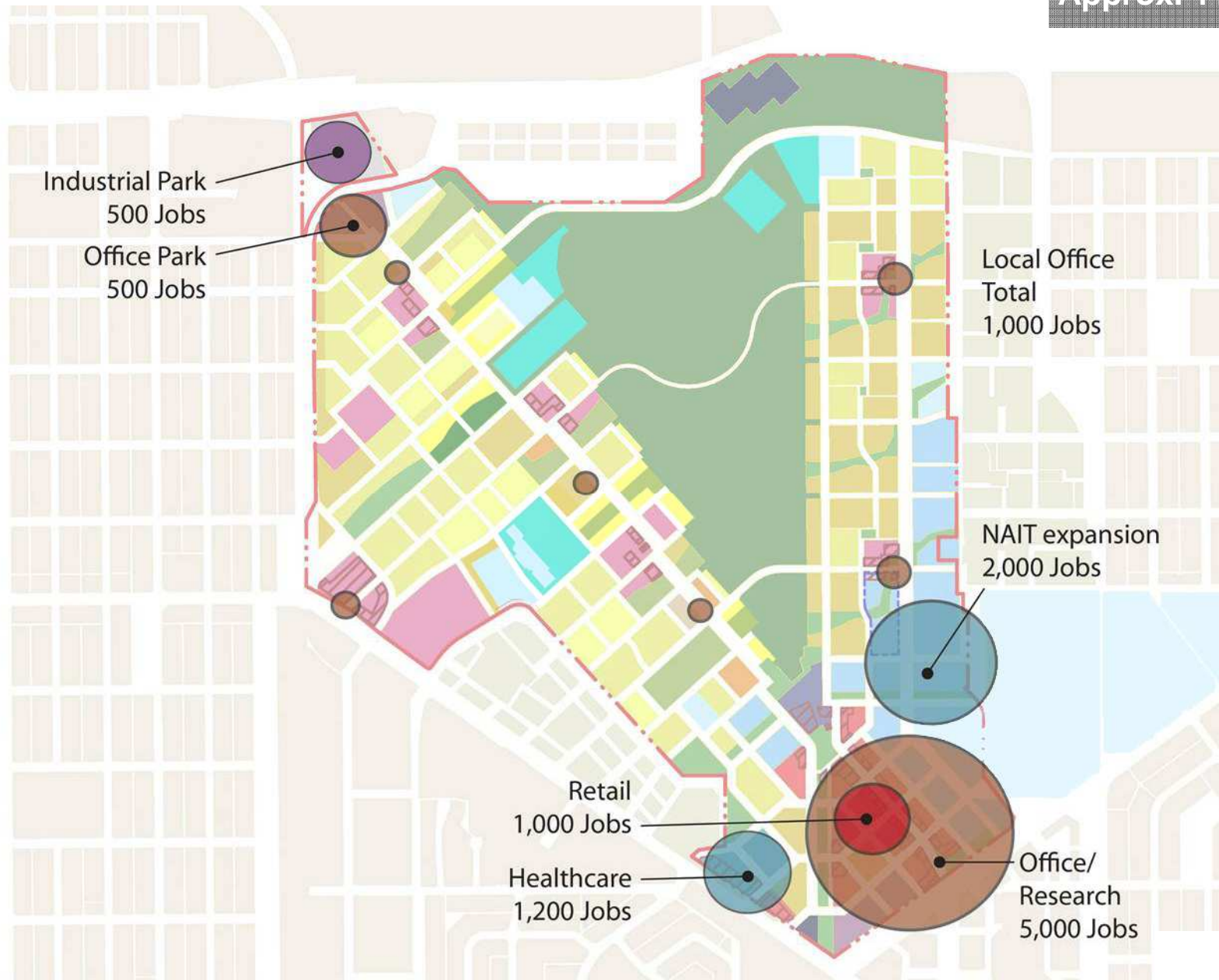


Growth Generators



Jobs

Approx. 11,000 Jobs



Surrounding and Proposed Land Use



CCR:

Population: **30,000**
 Total Streets: 46Ha
 Total Area: 217 Ha
 Total Open Space: 76Ha

Existing Neighbourhoods:

Population : 29,000
 Total Streets: 340Ha
 Total Area: 1,363 Ha
 Total M. Reserve: 69Ha



'Business as usual'

Population **4,480**
 Total Streets: 55Ha
 Open Space: 17Ha

Low - Medium Density (majority woodframe)



Zero-Energy Homes



(Stacked) Townhouses



4 STY Apartments



Medium – High Density



4-6 STY Apartments



6-8 STY Apartments



High Density



12-18 STY Towers



8-12 STY Apartments



Mixed Use



Student and Affordable Housing

- Diversity of Residences for a variety of NAIT students close to the vibrant town centre
- Short and Long Term Housing
- 20% Integrated, Affordable Housing
- 2,500 Beds / 25,000 Full-time learning equivalents



Cross Generational Wellness

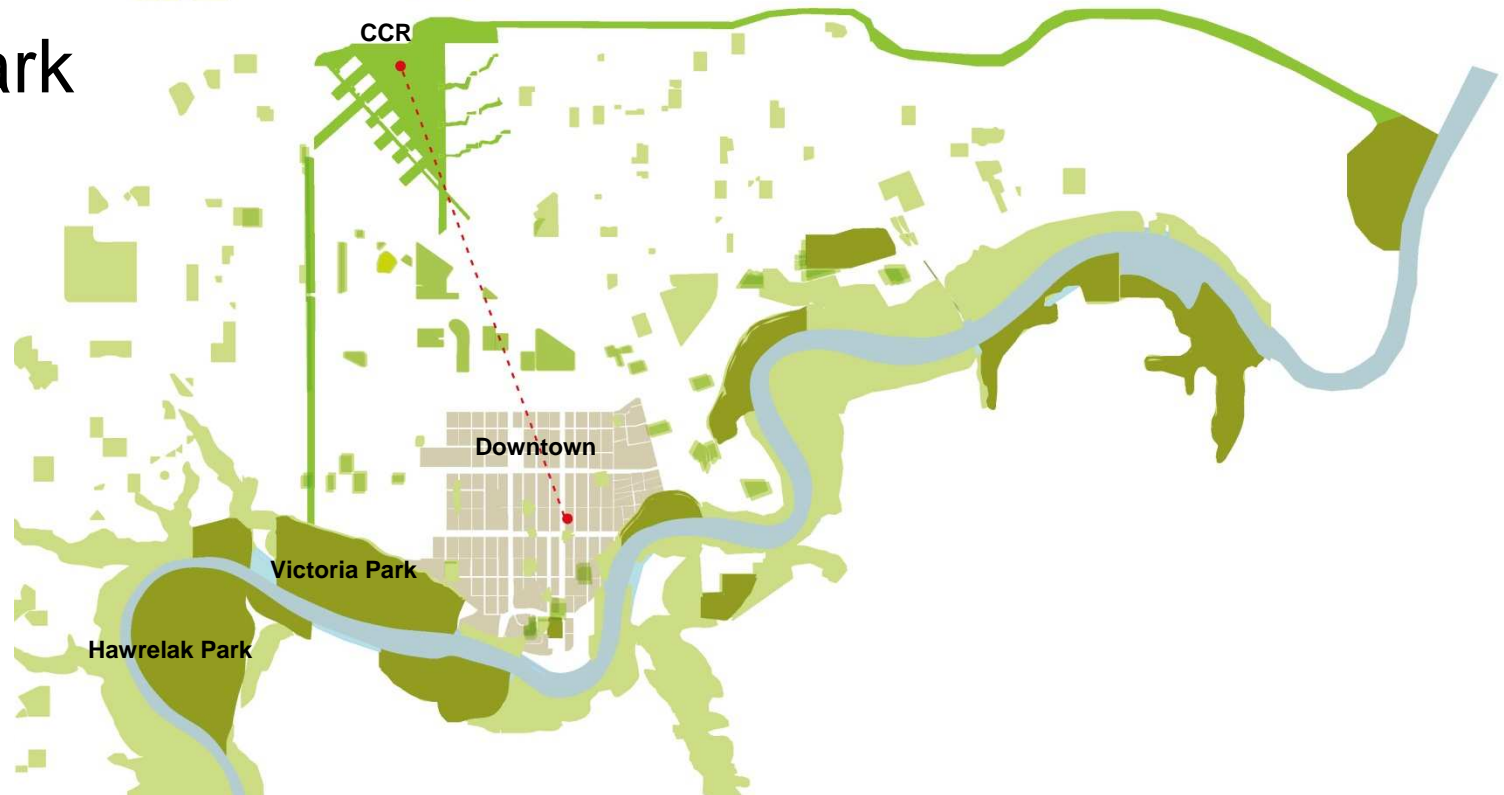


- Common Play Areas
- Street Access
- Min. 2 Bedrooms / Flexible
- Sufficient storage
- Walking distance to amenities
- Safety / Eyes on the street
- Excellent Health Services

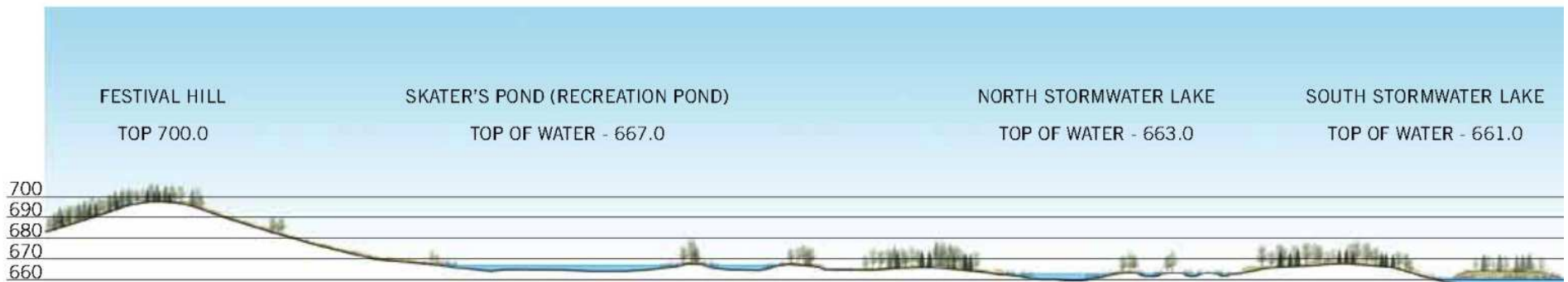
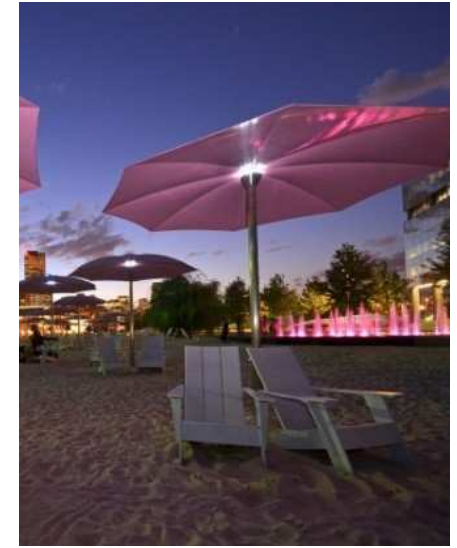


Parks and Open Space

Flyway Park



Park Amenities – Hill / Skater's Pond / Lake / Urban Beach



Walkable Nature

Current:

5 minutes = 27%

10 minutes = 47%

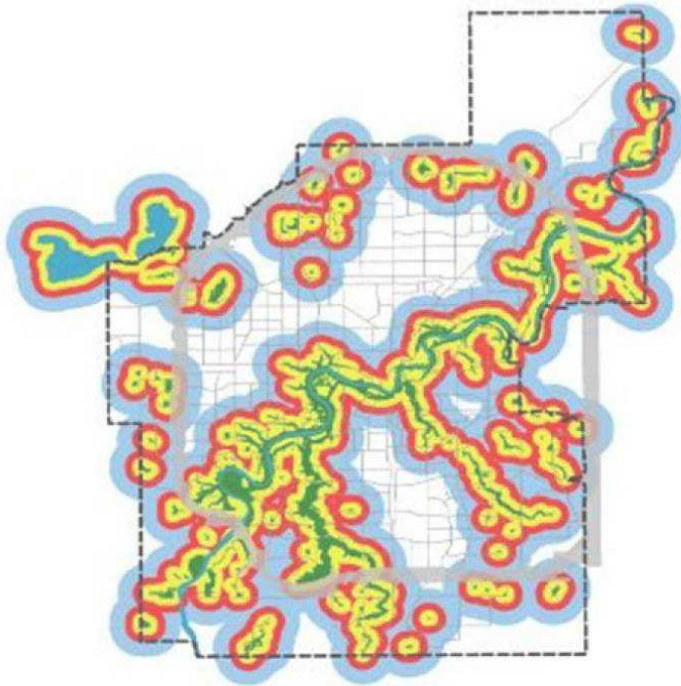
20 minutes = 74%

Ongoing City Program:

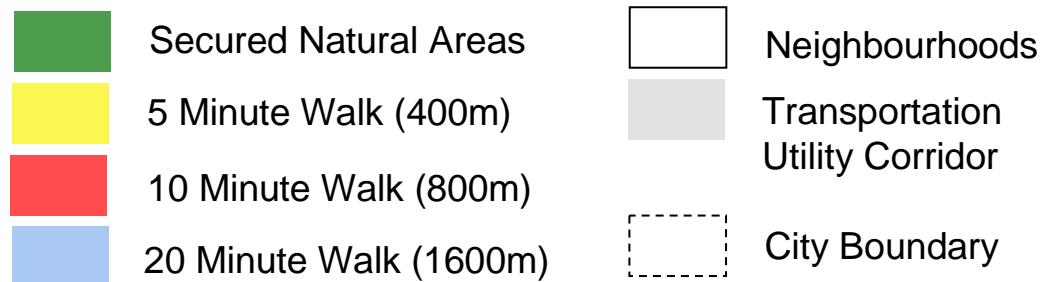
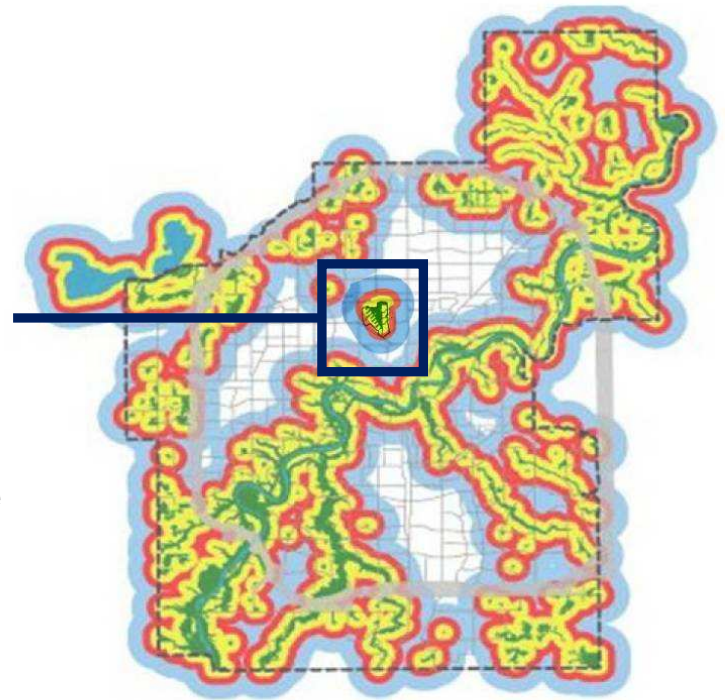
5 minutes = **43%**

10 minutes = **66%**

20 minutes = **87%**



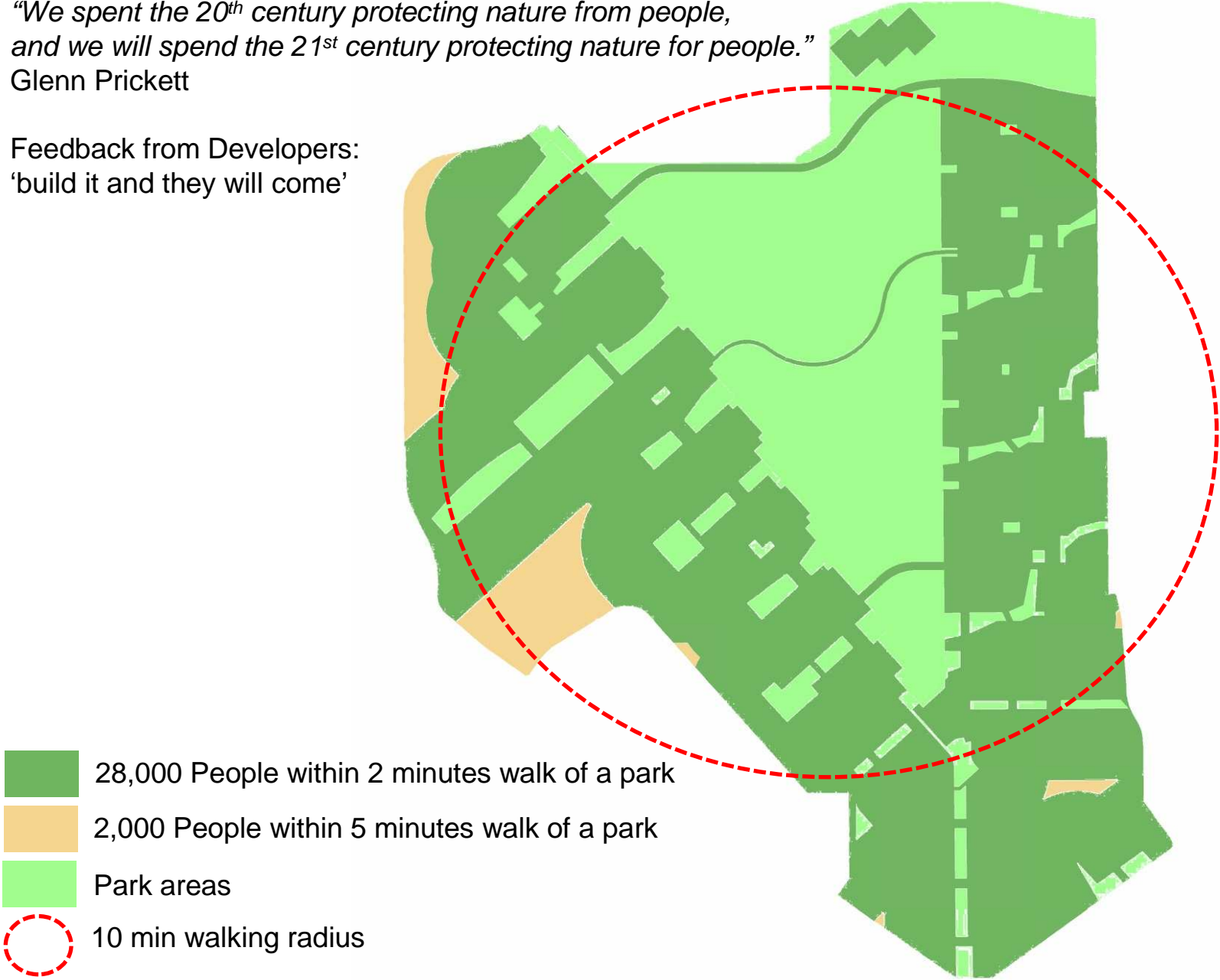
Edmonton's walkable nature with addition of a City Level Park with great accessibility in Edmonton City Centre Redevelopment



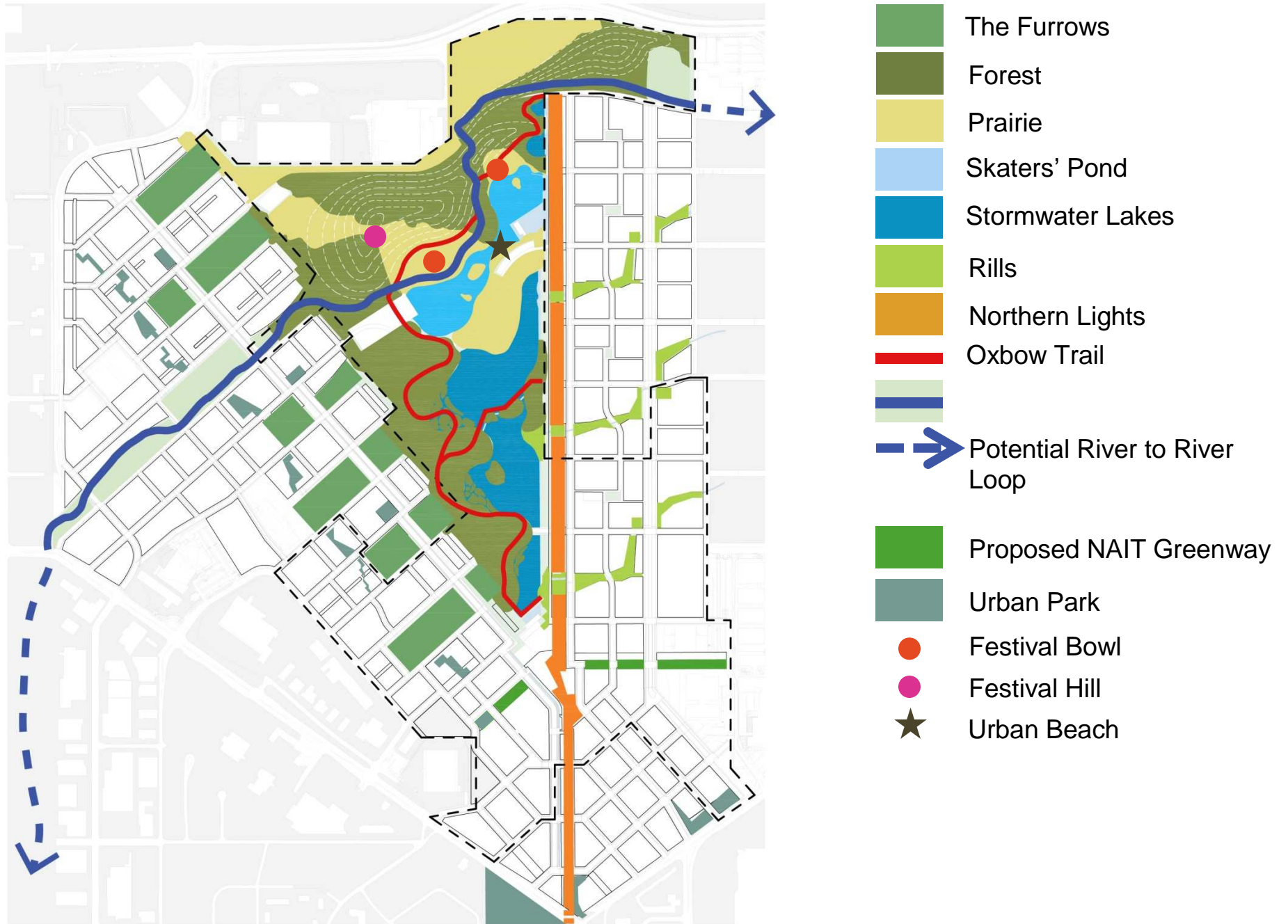
Residences with direct Park Access

"We spent the 20th century protecting nature from people, and we will spend the 21st century protecting nature for people."
Glenn Prickett

Feedback from Developers:
'build it and they will come'



Parks and Amenities



Landscape Types



Aspen Parkland



Meadows



Riparian Corridor



Pond

Landscape Types



Wetland

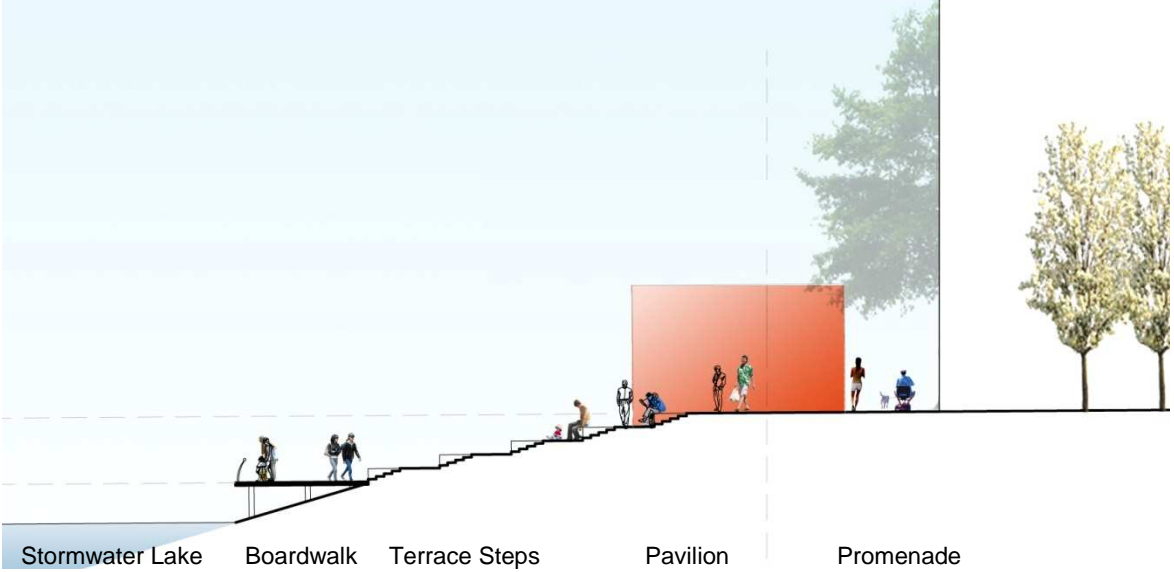
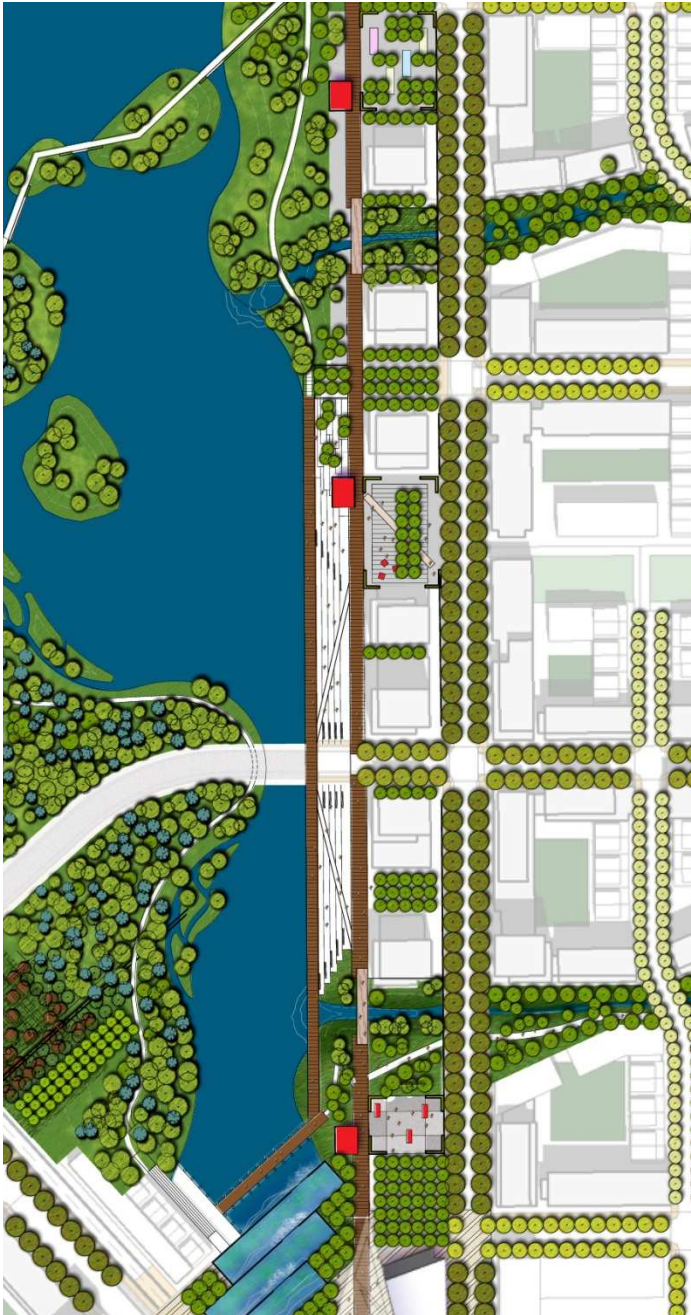


Agrarian Landscape

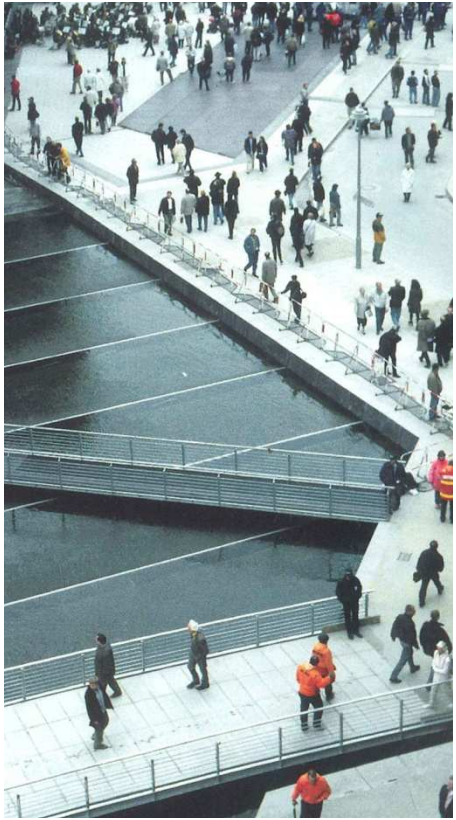
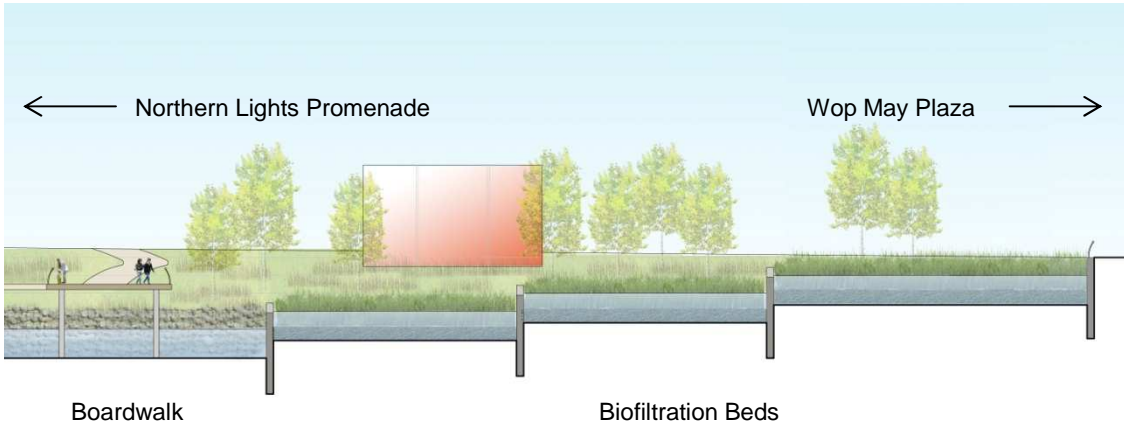
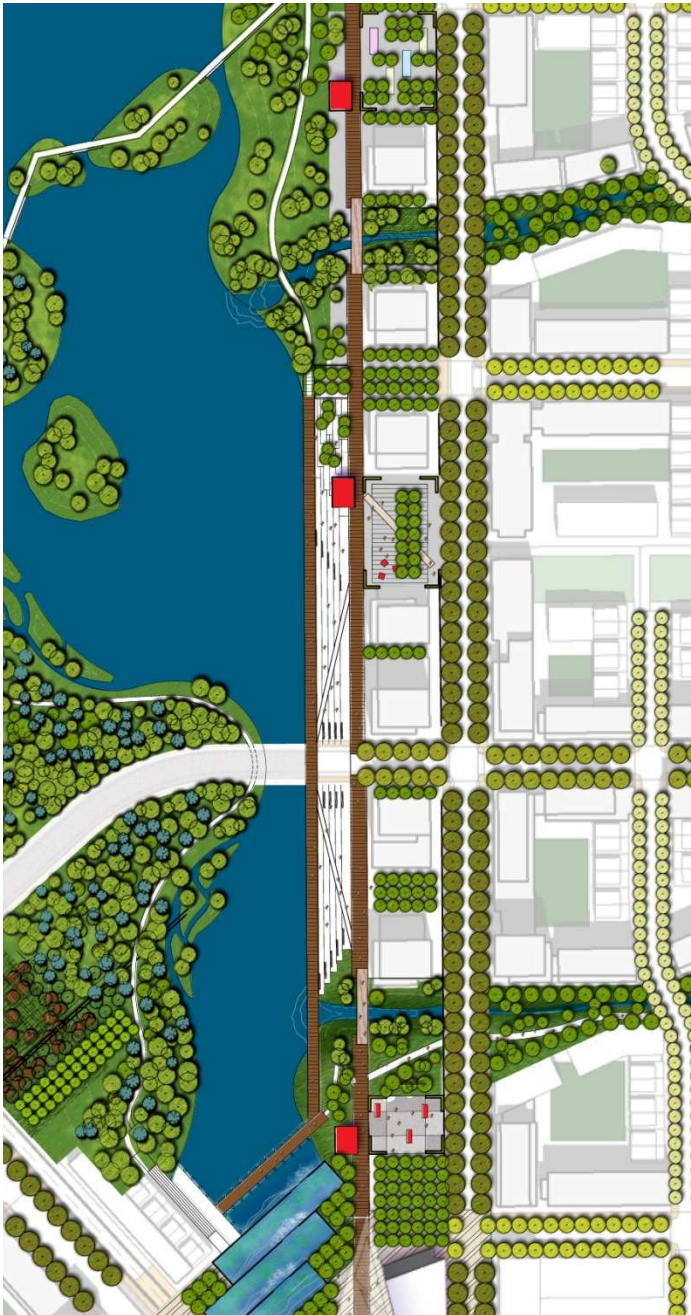


Urban Park

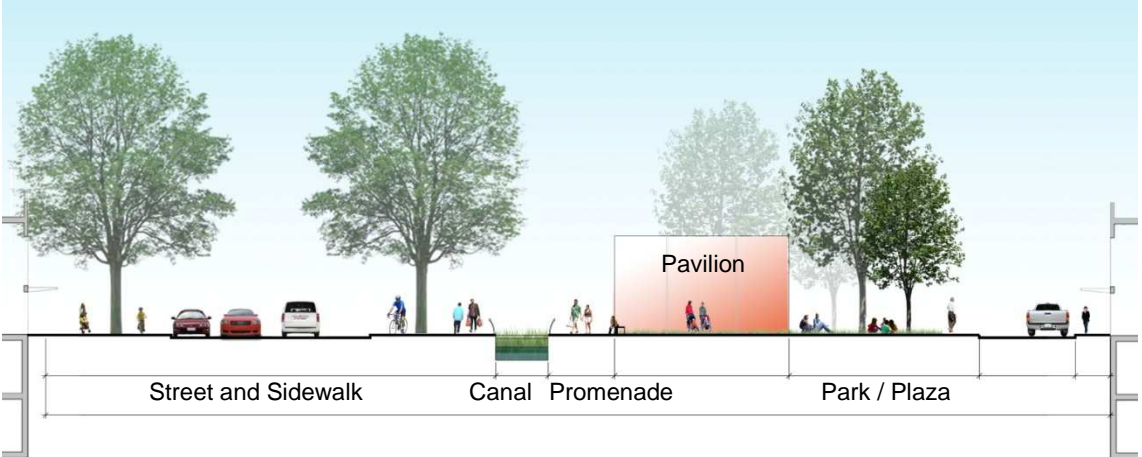
The Northern Lights – North of Wop May Plaza



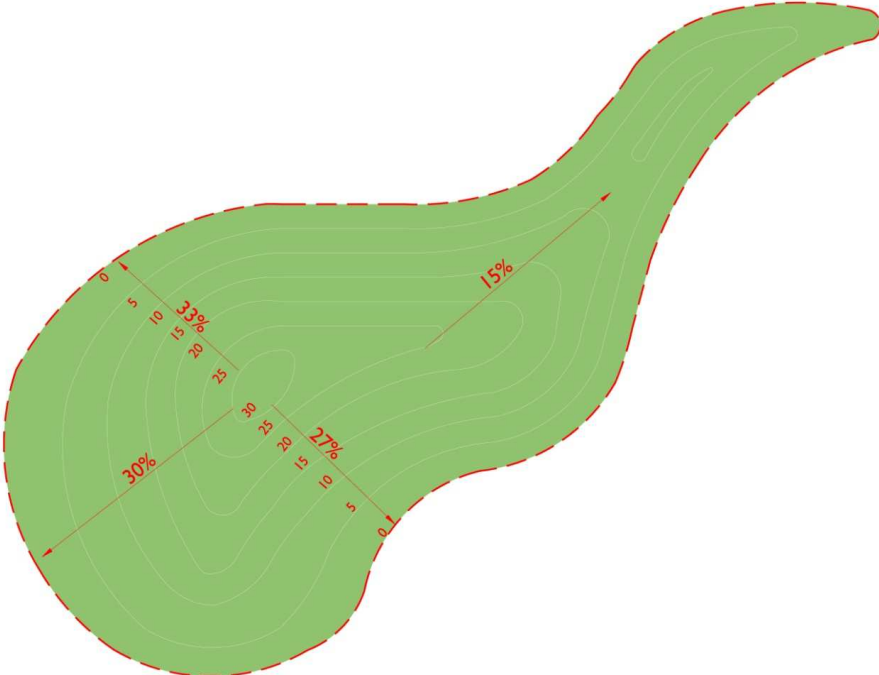
The Northern Lights – Wop May Plaza



The Northern Lights – South of Wop May Plaza



Festival Hill and Gallagher Park Hill Comparison



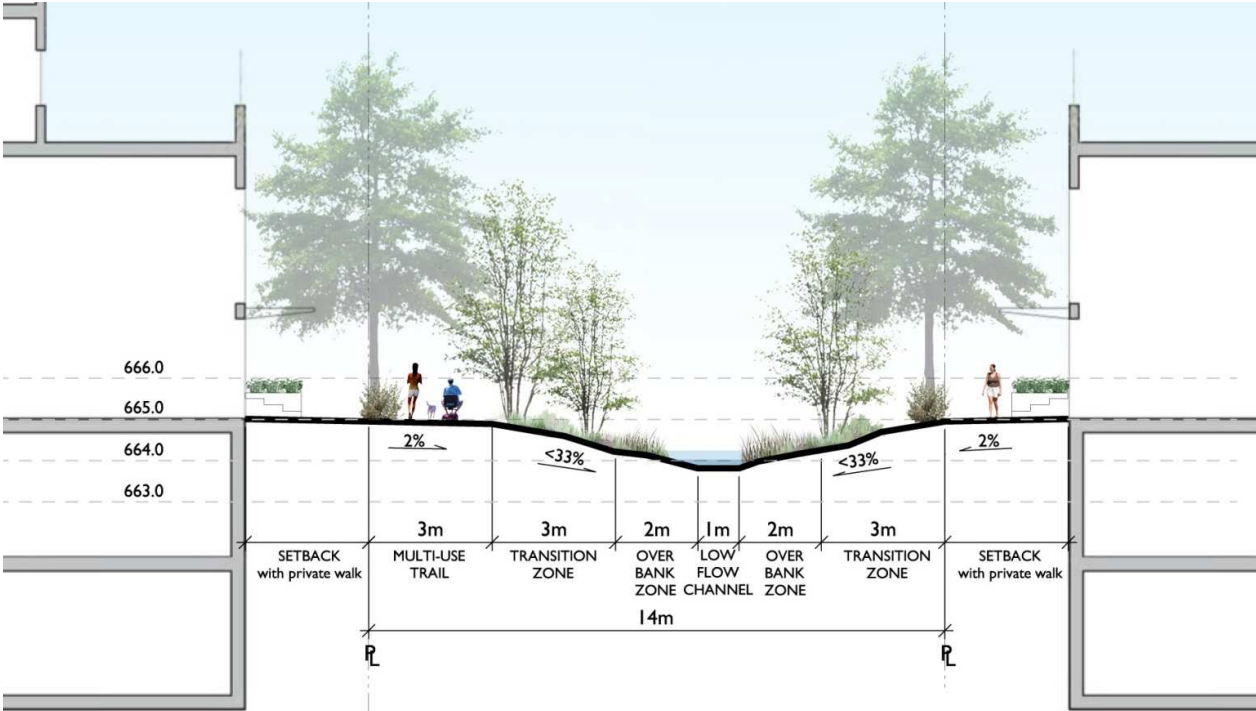
Festival Hill:
Site Area: 9.2 Ha
Hill Height: 30 meters
Slopes: approx. 15%-33%

Gallagher Park Hill:
8.0 Ha
25-35 meters
15%-33%



Note: Measurements are approximate based on best information available

The Rills

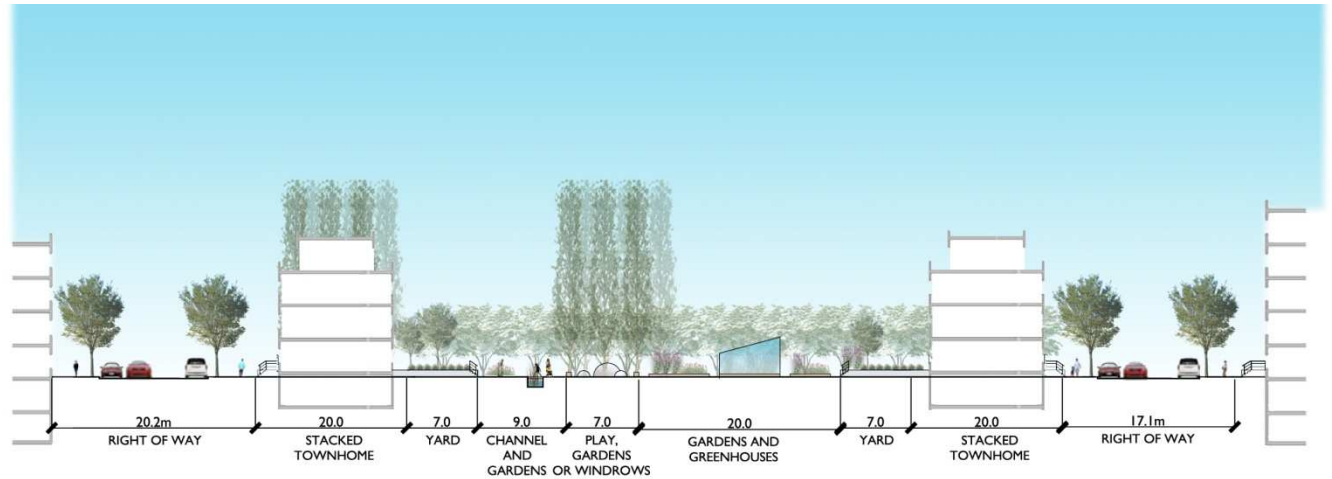


Urban Agriculture – The Furrows



Approximately 600
community garden
plots, 2.2 Ha

Currently in
Edmonton:
ca. 1000 community
garden plots
1.6Ha



Urban Agriculture



Community,
Past and

Connecting the Past and the Future



Wop May and Gladys Walker



Wop May Central Plaza



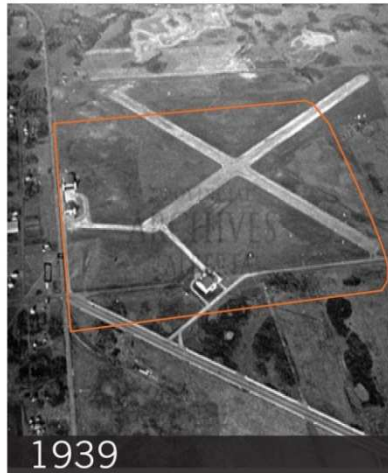
Margaret Littlewood



Margaret Littlewood Tower



1930



1939

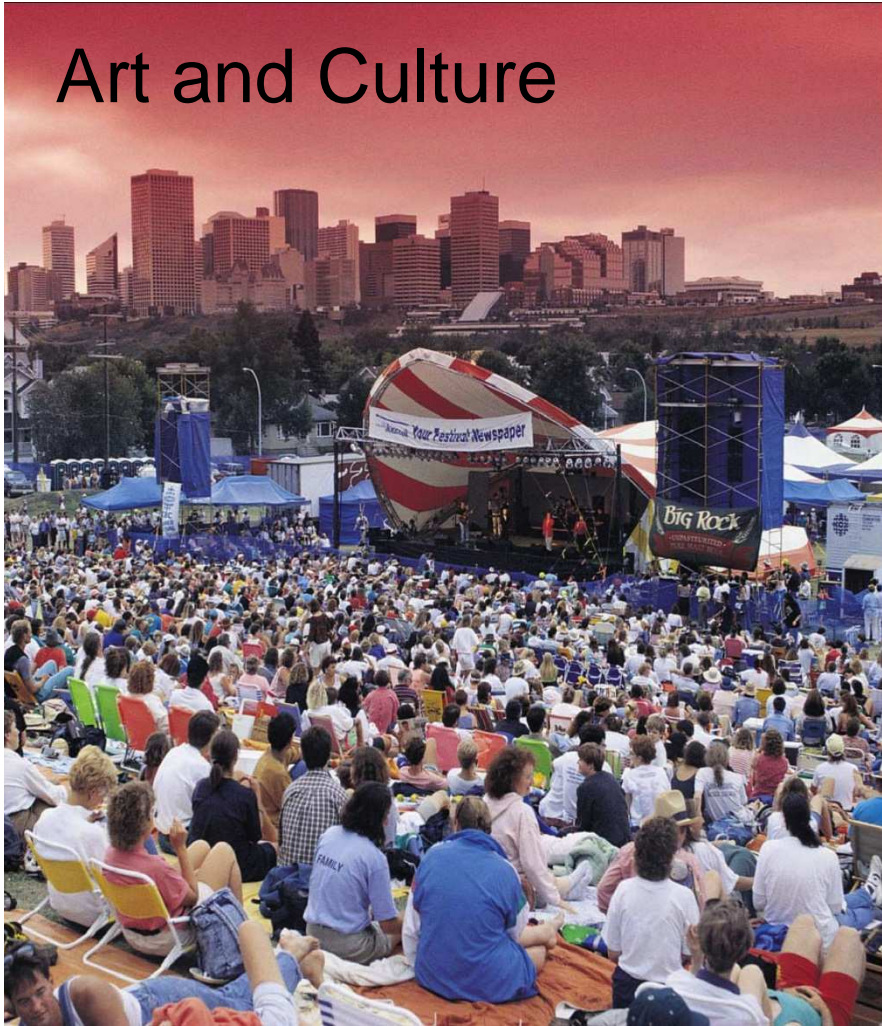


2010

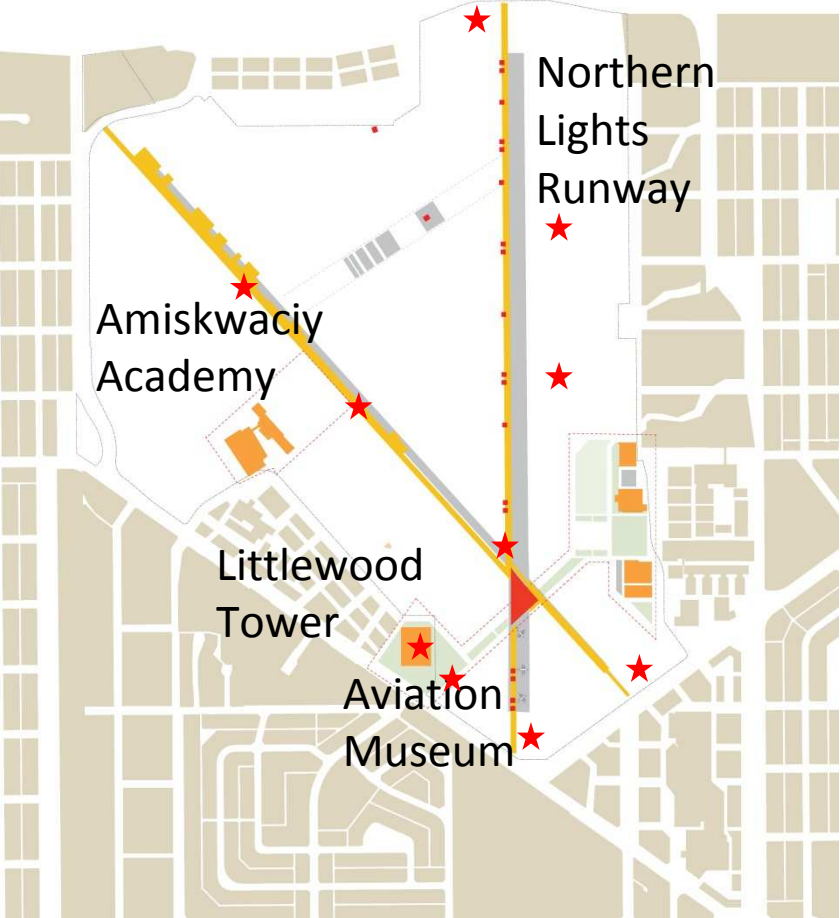


2040

Art and Culture

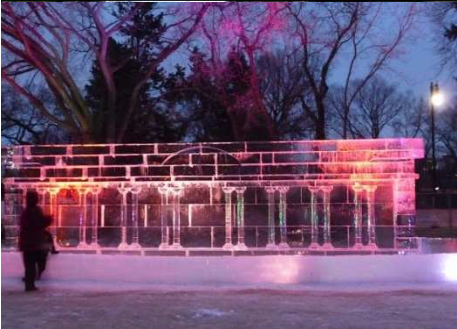


Art and Culture



Reuse of Airport Runways

- Existing Buildings
- Runways
- Civic and Community Armatures
- Proposed Community Places and Public Art



Consultation Feedback Headlines

“Stay the Course” ... ‘Hold fast to your vision and ignore the forces that may want to see the plan watered down’

“Amenities are critical. If you build the park they will come.”

Acknowledgement that younger people will actively seek the lifestyle offered here

Encouragement to achieve a ‘triple bottom line’ that will see community, economy and environment thrive equally

An urgency to develop the type of city that will keep and attract the best and brightest of all ages.

3 Sets of 3 Public Consultations (9)

56 meetings

over 90 groups of stakeholders



The Plan

Home to approx.
30,000
Edmontonians

Living, working
learning and playing

Sustainable
community

100% renewable
energy

Carbon neutral

Significantly
reduced ecological
footprint

Range of
sustainable lifestyle
choices

World leading



Consultation Feedback Summary

Who Have We Talked With?

- Includes but not limited to:
 - 3 sets of 3 of Public Consultations (9)
 - Stakeholder Advisory Group
 - Local businesses through BRZ's; neighbouring communities
 - Builders and developers
 - Affordable Housing experts
 - Agencies serving seniors, newcomers, people with disabilities
 - Aboriginal and Metis
 - Urban Agriculturalists and Sustainable Community Associations
 - Health and Education
 - Faith community
 - Chamber of Commerce, EEDC
 - Under age 40 demographic (NexGen, etc.)

Consistent Messages

- Stay the Course
 - Hold fast to your vision and ignore the forces that may want to see the plan watered down.
- Financial Considerations
 - Business as unusual needs to create the financial formulas that will allow the site to have world leading guidelines and requirements while at the same time being affordable. Get creative.
- Traffic
 - Current problems must be resolved or the future development will gridlock the surrounding communities.

Builders....

- Extremely excited and on board. This Project...
 - ‘Is exciting because it can put small Edmonton on the global map. This city is leading in many ways.’
 - ‘Demonstrates urban design in a forward thinking kind of way.’
 - ‘Mirror’s our company’s corporate vision of sustainability.’
 - ‘This can revolutionize the building industry and we are excited to be a part’.
 - ‘Consider us on board and champions. We would like to continue to meet.’
 - ‘We---and it is all about ‘we’ need to band together to make sure this happens. It is a once in a lifetime opportunity.’

Builders....and their advice...

- Be sensitive to cost
 - “You are absolutely right to have more wood frame in the first phase”
- Amenities are critical

“There is opportunity to leverage what is going on here. The amenities work in your favour. This park can be competitive with Hawrelak as a regional park. This project can be packaged as an attractive, usable park for the whole community. The park, the “Town Centre—these are attractive amenities that will draw people. They have to be there on day one.”
- Development guidelines must create a beautiful community at a competitive price point.

Messages Going Forward....

Much of the commentary was very enlightening, and included:

- Acknowledgement that younger people will actively seek the lifestyle offered here
- Enthusiasm for the overall plan and its importance to Edmonton's future
- Encouragement to achieve a 'triple bottom line' that will see community, economy and environment thrive equally
- An urgency to develop the type of city that will keep and attract the best and brightest of all ages.
- The need to exercise ingenuity to demonstrate that a world leading development of this nature can be financially viable, affordable and profitable.

Festival Hill Construction Strategy

STEP 1

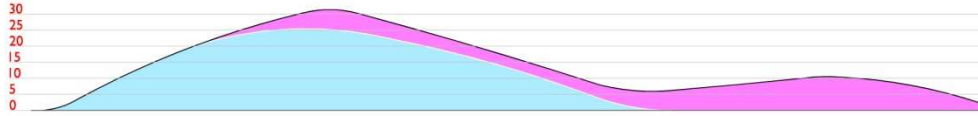
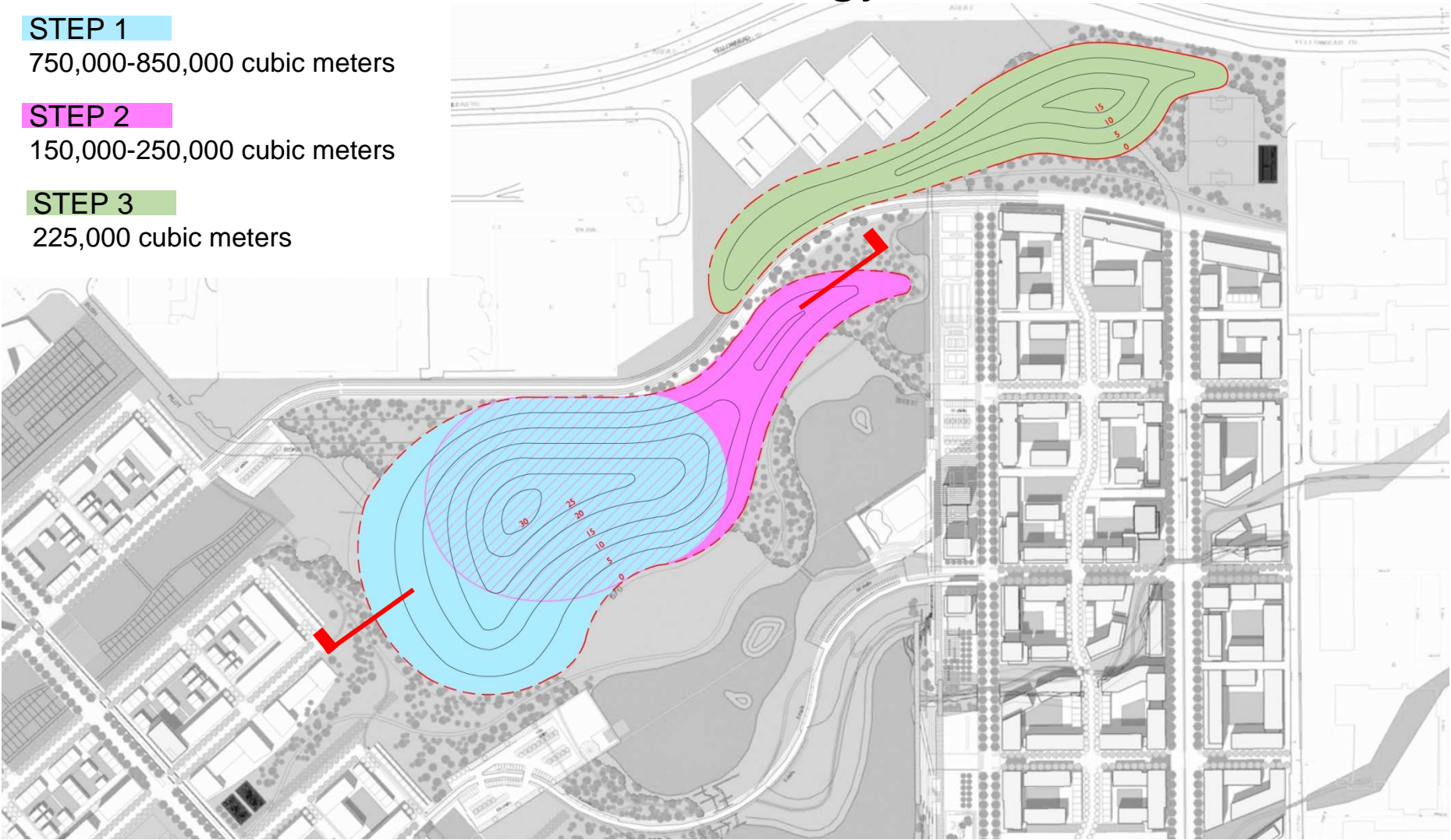
750,000-850,000 cubic meters

STEP 2

150,000-250,000 cubic meters

STEP 3

225,000 cubic meters



STEP 1 AND 2 SECTION

Note: Construction of the hill using excavation material from lake, open spaces and buildings