

Edmonton City Centre Airport Lands

Master Plan Principles



The Vision

The ECCA lands will be home to 30,000 Edmontonians living, working and learning in a sustainable community that uses 100% renewable energy, is carbon neutral, significantly reduces its ecological footprint, and empowers residents to pursue a range of sustainable lifestyle choices.

This will be an inclusive, family-oriented, fully sustainable community. It will offer superior urban lifestyle opportunities, comprising a wide range of housing choices mixed with offices, restaurants, boutiques and services, primarily designed to serve the community's residents. A focus on the history and retention of the land's proud aviation legacy will be seen in the preservation of historic buildings and hangars, in a manner complementary to the development of a vibrant, transit-oriented, mixed-use community. It will, in many ways, be a microcosm of the greater community of Edmonton.

This community should demonstrate, in a real and measured way, what a sustainable future will look like. Targets set today will be the benchmark in 10 years.

The term sustainable development is defined in the UN Report “Our Common Future”¹:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Three dimensions of societal development must cooperate for sustainable

¹ Also known as the **Brundtland Report**, from the [United Nations World Commission on Environment and Development](#) (WCED), published in 1987.

development: The social, economic, and ecological dimensions.

In addition to environmental sustainability, the challenge is to address social and economic factors that encourage residents to adopt sustainable lifestyles. This means providing choices across a broad spectrum of living and work environments that will enable many lifestyle options while also addressing affordability for families, individuals, and businesses who will share a common purpose.

The City of Edmonton, as Developer, must put in place the foundations for this to happen. This will include energy efficient buildings, renewable energy sources, resource efficient infrastructure, and proximity to employment opportunities. It will also include access to education and health care, shopping, recreation, entertainment and public transportation.

The necessary next step is for the City of Edmonton to provide a clear illustration of the core values that it will use to determine whether a proposal is good enough to meet their expectations, and the criteria against which this can be measured. This document attempts to lay out the first principles in this process.

The Challenge

This vision cannot wait for the perfect solution to arrive. The approach has to be experimental in nature and employ diverse resources and methods. Different parts will require different solutions, and a large number of people to pull toward a common goal. That common goal will be defined by the following:

Design Excellence – Great cities are known for their unique beauty and character as defined by their geographical characteristics,

architecture, landscapes, public spaces, history, culture and quality of life. The proposed development must capture the spirit of its place, and showcase the best practices of exemplary world leading design. As it unfolds over time, this community must be seen as a model for local and global design excellence.

Empower People – The need for energy and clean water is boundless at a time of increasing world demand and diminishing resources. This community should meet its demands in ways that give it better control over what it consumes. This will be a model community that empowers individuals to change their collective habits to conserve, preserve, and mindfully consume what can be generated locally and within a net zero carbon footprint.

Reduce Consumption – This requires sustainable design principles which minimize immediate and long-term harm on the environment by reducing the need to consume products and services we may no longer need. Buildings must be designed for a long life cycle and be suited to flexibility and reuse without resorting to large-scale disposal. Waste should be seen as resource to be reprocessed into something useful, or treated to recover value or energy.

Offer Lifestyle Options – Creativity must result in attractive places for a full range of family needs, satisfying citizens and businesses alike. The community must demonstrate how a progressive environmental agenda pays off, not only from an ecological perspective but also from social and economic perspectives. This new community must be a place where people choose to live and work, and where it is easy for residents to adopt a sustainable lifestyle. Choices must be offered across all aspects of living and working and these choices need to be sustainable and affordable.

Innovate – Problems are questions in search of an answer, and this community must offer an opportunity to learn. It must include the

resources, the tools, and the technologies necessary to succeed and create an open and transparent environment where knowledge and the pursuit of right solutions are encouraged. The vision is predicated on innovation in *environmental practices* (land use, energy, transportation, water resources, solid waste management, urban ecology); *social experimentation* (health and well-being, livability, and community building); and in *economic opportunities* (housing affordability, employment, economic viability, infrastructure, and revenues for City).

Measure Achievements – Targets, timescales and milestones must be set and monitoring implemented to ensure an analysis-led approach to substantiating that the vision is being realized. A clear framework and appropriate metrics must be implemented to inform the ongoing process of design, construction and occupation. Continuous analysis and evaluation is the basis for continuous improvement and refinement of the vision.

Raising the Bar

A very high threshold of sustainability has already been achieved by a limited number of sustainable developments in other parts of the world. Edmonton's vision is to expand on the successes of these leading edge communities and raise the bar world wide for those communities who will follow us. By 2020, the list of sustainable communities will be much longer; however, by this time Edmonton should be hosting international visitors to see first hand the potency of their vision for the ECCA lands. Sweden is pursuing this challenge on a number of fronts. For example, Malmo, Sweden, a northern climate City, has set the following goals for their sustainable society:

- be climate neutral in 2020 and by 2030 the entire municipality will be run on 100% renewable energy, much it produced locally;
- decrease energy consumption by at least 20% per person by 2020 (compared to the 2001–2005 average), and a further 30% by 2030;

- The two examples below show just how far and how fast Sweden is moving forward with its commitments. The first is the redevelopment of a former industrial waterfront area on a scale that is comparable to the ECCA lands, and the second represents an integrated approach to harvesting and reusing resources.

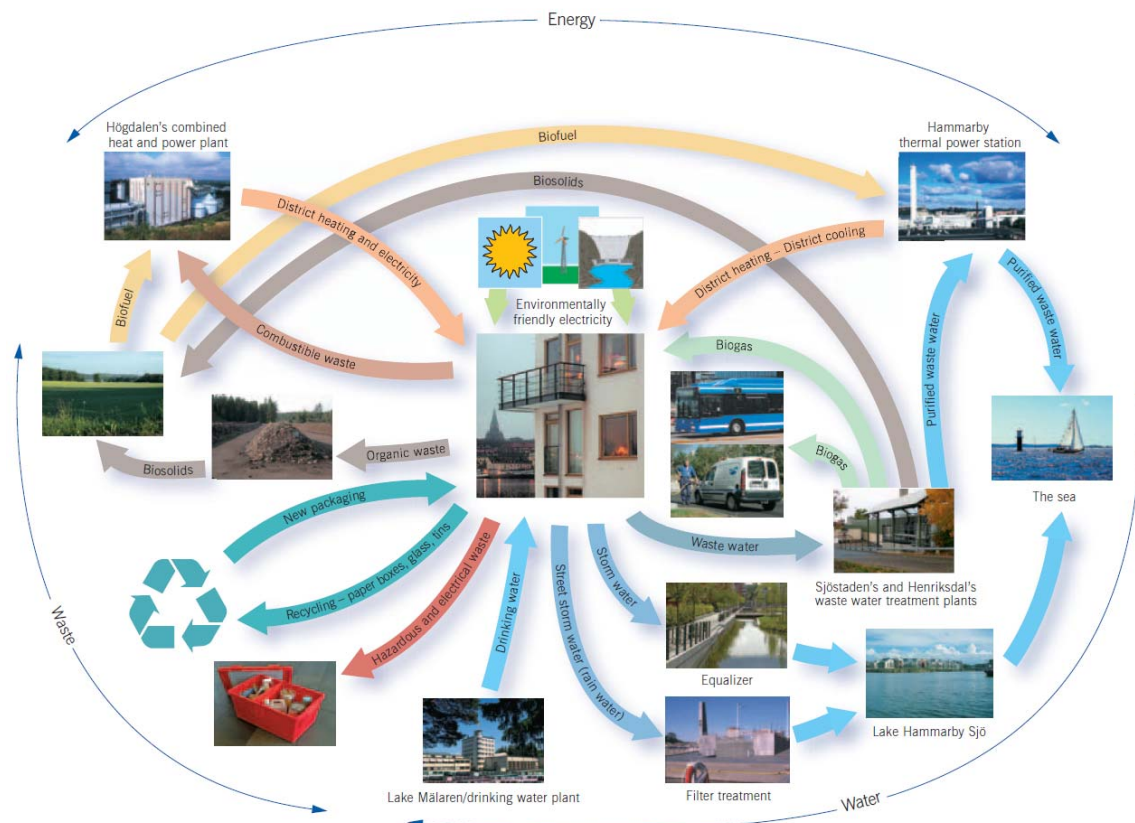
The image consists of three maps of the Backlund area in Malmö, Sweden. The top right map is a small-scale overview of the entire Backlund area, with a red circle highlighting the specific site of the Backlund School. The bottom left map is a detailed site plan of the Backlund School area, showing the layout of buildings, streets, and green spaces. The top right map is a small-scale overview of the entire Backlund area, with a red circle highlighting the specific site of the Backlund School. The bottom left map is a detailed site plan of the Backlund School area, showing the layout of buildings, streets, and green spaces.

6

outstanding sustainable urban development. The first phase was built as a demonstration project, becoming Sweden's first climate neutral city-district, as part of the *European Housing Exhibition in 2001: The City of Tomorrow*. The project now attracts visitors from throughout the globe.

Hammarby Sjostad, Stockholm, Sweden

Hammarby Sjostad, a neighborhood in Stockholm, Sweden, offers an example of a carefully crafted approach to reduction through the interaction of many functions and responsibilities. This is a new district on the waterfront in the centre of Stockholm that will include 10,000 apartments for some 25,000 residents. From the outset this development imposed tough environmental requirements on buildings, infrastructure solutions and the traffic environment. To attain its goals required integrated planning, innovative solutions and new technologies.



The core of the environmental and infrastructure planning at Hammarby Sjostad jointly developed by the Stockholm Water Company, Fortum, and the City of Stockholm Waste Management Administration can be summarized in an eco-model illustrated above and known as the Hammarby Model.

One Planet Communities

This organization dates back to one of the first demonstrations of an urban eco-village, created in 2002. As a non-profit organization, One Planet Communities has committed to bring the ecological footprint of residents down to a truly sustainable, one planet level by 2020. Sonoma Mountain Village, a 1,900-home neighborhood in Rohnert Park, California, is only the fourth project in the world to be endorsed as an official One Planet Community requiring real estate developers to meet ambitious goals by 2020 that include Zero Emissions from buildings and Zero Waste, and submit to annual performance monitoring by the independent environmental organization BioRegional, based in the UK.. The community has been carefully planned to make an 80% ecological footprint reduction practical (and even convenient) for residents to achieve – without sacrificing modern comforts. One Planet's principles for Sonoma include:

- **Zero carbon:** Zero use of fossil fuels for building energy with 100% of power coming from renewable energy by 2020. Zero GHG's from building energy.
- **Zero waste:** 98% reduction in solid landfill waste, along with the rethinking of waste altogether
- **Sustainable transport:** 82% reduction in CO₂ through programs, technology and transit with car sharing and bicycling programs, shuttles to the SMART train and other regional transportation options
- **Local and sustainable materials:** 20% of materials manufactured on site, with 40% sourced from within 500 miles

These examples illustrate that there is now a body of information and best practices available to serve as a platform upon which the City of

Edmonton can draw to assist in achieving its own vision for the ECCA lands. This journey is picking up speed and Edmonton can position itself at the forefront of spreading new knowledge and experience with a select group of global partners. Given the scope of what is required this will necessitate partnerships and dialogue with other cities, with its own citizens, and with industry, colleges and universities, as well as other key stakeholders. It will also require change in the way things are done.

What Must Change?

The common refrain among those cities across the globe who wish to place themselves at the cutting edge of sustainable urban development is the desire to build a denser, greener, and more diverse city. Edmonton is no different and this means:

- more densely populated residential neighbourhoods, green spaces, services and other activities situated close together;
- more efficient use of land and the reuse of existing industrial buildings;
- expansion of green spaces and safeguarding of their recreational and biological value;
- introduction of more greenery in buildings including vegetation growing on roofs and walls, and open storm water management;
- access to safe and secure homes with the ability of children to play outside in healthy and inspiring environments;
- an extended network of pedestrian and bicycle paths paired with readily accessible public transit;
- reducing greenhouse gas emissions and the ecological footprint;
- more efficient energy consumption on a per person basis;
- utilizing renewable energy including geothermal, solar, wind, hydro and biogas

- protecting water resources;
- recycling of waste;
- protecting the natural environment and maintaining biological diversity; and
- monitoring by quantitative and qualitative indicators

How Do We Do this?

Three things are necessary at this stage of the process.

- A commitment by the City to the vision and the principles. A strong leadership structure is essential to keep things simple, coherent and focused.
- A process of “creative dialogue” that will include collaboration with citizens, industry, colleges and universities, other cities and global experts, and other interested or affected stakeholders.
- A Master Plan that embodies the principles and lays down the framework. This must integrate all spatial components including transportation systems, housing, institutional uses, employment, services, green space and landscaping, and infrastructure

The Master Plan

The Master Plan represents the framework of the community and must reflect the high expectations of the City of Edmonton for these lands. Its creation should draw upon the very best international minds and experiences. It must permit adaptation to future market conditions and ever changing technological advancements which influence residential densities and family living, modes of transportation, and other land uses. The Master Plan must clearly demonstrate how this new community is to

be compact, mixed use in character, pedestrian and transit-oriented, and capable of minimizing the impacts of the automobile and reliance on fossil fuel technology. The Master Plan must convey to a broad audience a place where people may choose to live and work, and where it is easy for residents to adopt sustainable lifestyles.

It must be recognized that Edmonton has severe winter conditions, which bring their own challenges, but these need not stand in the way of achieving sustainable development. Winter design considerations that improve winter livability and quality of life must be factored into the principles of the Master Plan through design that:

- encourages people to go outdoors;
- addresses snow removal and storage, sunlight exposure, wind and darkness in the built environment;
- aids in creating comfortable micro-climatic conditions in open spaces through landscaping and building placement; and
- provides opportunities for year-round usability of open spaces and infrastructure.

The Master Plan principles are organized around the following basic components:

- planning and design including the mix of land uses and built form;
- ecological footprint, referring to those features that minimize the footprint;
- infrastructure both “hard” and “soft” that range from roads and transit to education and social services;
- housing types and forms, including affordable and family housing;
- parks, green space and natural areas;
- technology and innovations that contribute to sustainability; and
- recognition of the cultural and historical importance of the site.

It must be recognized, however, that these principles constitute a “living document”, that will evolve over the multi-year lifecycle of the community’s development.

A. Planning and Design

The community needs to be based on world leading exemplary place making, functional planning, architecture, landscape architecture and site engineering as the overarching principles that affect and define the settlement and its form. Planning, design and engineering should focus on delivering the sustainability criteria for this family-oriented community. This will involve working with the landscape, the climate, the environs and the resources particular to the site.

- Achieve LEED® Gold certification (or comparable) for all buildings and neighborhoods and reward projects which achieve LEED® Platinum.
- Design for future adaptation based on international climate change predictions and protocols.
- Connect new neighborhoods with surrounding communities and incorporate pedestrian-oriented systems that promote healthy living within neighborhoods situated within walking distance of local shops, parks, restaurants and schools.
- Create public parks, and set aside areas for conservation and restorative ecological initiatives. Create vegetated interconnected trails and bicycle paths linking the entire development to these areas. Incorporate opportunities for NAIT educational initiatives, as living laboratories for investigation and discovery.
- Match retail densities to community needs and ensure a diversity of well located local services that address local needs and provide employment opportunities.

- Create landmarks and memorable spaces through architectural design excellence and natural landscape features which celebrate the geographical characteristics and culture of Edmonton.
- Preserve and enhance buildings with historical significance and integrate and reuse existing structures and improvements to the greatest extent possible
- Enhance the presence of the existing Aviation Museum as a premier cultural institution, making it an integral part of the new community.
- Provide locations for public art to enhance the visual environment and reinforce way-finding within the community.
- Accommodate the long-range requirements of NAIT to expand its urban campus as an integrated part of the new community.
- Create a strong, healthy, socially-sustainable community that is inclusive in nature, providing a variety of housing and lifestyle choices for a wide array of people from a variety of backgrounds and income levels.
- Develop innovative designs that eliminate barriers for disabled persons in a highly visible manner, providing them with opportunities to fully participate in the community.

B. Ecological Footprint

A sustainable place is one that is designed to make it possible and easy for residents to reduce their ecological footprint and reduce their carbon dioxide emissions by specified amounts while improving their quality of life. This is what will make this community truly exemplary, going beyond excellent examples that already exist elsewhere in the world.

Carbon dioxide (CO₂) emissions are a major part of our ecological footprint. This community should be a place that is designed to make it possible and easy for residents to reduce their ecological footprint to

specified targets. This means addressing directly, or indirectly, the factors that influence (CO₂) emissions and the ecological footprint.

- **Housing, construction and maintenance** – includes the impacts of the construction industry, the building and maintenance of homes, and services relating to our homes.
- **Home energy** – includes all gas and electricity consumption in the home.
- **Transport** – impacts arise from fuel consumption, car ownership, public transport, flying and maintenance of the transport networks.
- **Food and drink** – includes food consumed at home or out at restaurants or other catering establishments.
- **Consumer goods** – means any products we purchase, including durable large household objects such as furniture and appliances and smaller products such as newspapers, clothing and electronics.
- **Government and business services and infrastructure** – includes the administration of central and local government, plus services that they manage such as social services, waste management, schools and universities.

The impacts in each must be split into two areas of responsibility: *personal responsibility* and *business and government responsibility*. As Developer, the City fits into the latter category. The City is in the best position to directly and simply enable ecological footprint and CO₂ reductions in the areas of housing construction and home energy. This can typically represent over 30% of a person's CO₂ emissions and over 25% of a person's ecological footprint. The community must also address infrastructure and services requirements for daily lifestyle choices around transportation, food, and the consumption of goods which in total can exceed 50% of the CO₂ emissions and the ecological footprint. Again, the City can play a key role in reducing this component. Government and business services and the infrastructure that support

their respective services represent the balance and reduction at this level requires City-wide initiatives.

The City should use the measures of the existing ecological footprint and estimates of CO₂ emissions for residents of Edmonton as an essential input to creating the Master Plan. Based on this data, sustainable objectives and targets should be established as the baseline for monitoring.

C. Infrastructure

This category includes energy, water, transportation, waste management, technology, communications and education as the cornerstones of sustainability. In order to ensure a sustainable development a comprehensive series of interrelated plans are required to revolutionize the way we design our communities. The Master Plan should incorporate the following.

- a) **Renewable Energy Plan** – A central grid to connect “green energy” from a variety of renewable sources at multiple locations, maximizing efficiencies and capitalizing on symbiotic relationships that may include:
 - a Zero Carbon District Energy System (ZCDES) to serve the community and NAIT;
 - waste treatment energy plant;
 - geothermal energy, solar energy, and wind energy designed to occupy best suited, highest yield sites;
 - small scale hydro energy combined with storm water management;
 - individual citizenry site specific projects which create on-site green energy;

- infrastructure to LEED–ND Gold standard (minimum); and
 - community supported technologies and practices on ECCA lands that foster sustainable development objectives.
- b) **Comprehensive Stormwater and Wastewater Plan** – The Airport lands have readily available trunk systems for both stormwater and wastewater servicing. However, the general principle should be reduction and on–site retention of stormwater through innovative technologies such as Low Impact Development (LID) and reduction of wastewater through aggressive water conservation, rainwater harvesting, and gray water reuse.

Stormwater Management Plan –The stormwater management plan should be developed incorporating LID best management practices using the following guidelines:

- mimic pre–development hydrologic conditions as much as possible in terms of ground infiltration and stormwater discharges;
 - utilize stormwater for irrigation to minimize the reliance on potable water;
 - reduce pollutant loadings in stormwater through channeling all runoff to appropriate stormwater management facilities such as engineered wetlands for treatment prior to reuse; and,
 - provide permeable pavements and green roofs where required to reduce runoff effect.
- c) **Wastewater Servicing Plan** –An existing combined trunk located in the Airport lands can accommodate the redevelopment. The wastewater servicing plan should consider innovative systems to reduce sewage generation from the redevelopment. Edmonton is already considered a world leader in this field and the airport lands offer an ideal opportunity to further the development of wastewater

reuse technology within the context of sustainable community development. The plan should:

- develop dedicated sanitary sewers system to be built on-site and connect to the combined trunk off-site.
- specify appropriate service level and design parameters to ensure adequate flood protection from sewage backups.
- reduce wastewater generation on-site as much as possible.
- consider the establishment of a “scavenging plant” to reuse wastewater within the development area (and perhaps also for adjacent developments); and
- incorporate environmentally responsible energy recovery in the “scavenging plant” through production of biogas.

d) Waste Management Plan

- construction waste should be sorted on-site and then hauled to specialized recycling centres; and
- management of solid waste streams should be in accordance with Edmonton’s leading integrated waste management system.

e) Transportation Design Plan – Integrating land-use and building design with a hierarchical road system design and public transit stops including the LRT. The plan should incorporate:

- positioning the LRT to ensure a wide catchment area, along with connecting bus routes servicing the community;
- locating support services and activities within walking distance of transit stops;

- positioning bike paths and multi-use trails to provide fully connected routes to all destinations and to encourage bicycle and pedestrian use year round;
- designs to discourage high speed traffic;
- efficient rights-of-way for vehicular circulation, establish parking policies to discourage private vehicle travel and encourage transit use; and
- mixed use residential and commercial high density development at LRT stops and along arterial roads, mid-rise development along collector roads, and main streets, low-rise development at secondary avenues and residential side streets.
- options such as car sharing and bike sharing

D. Family Housing

This community must focus on family housing needs in a range of medium density housing types including townhouses, stacked townhouse and 4–6 storey apartments. Housing must accommodate a range of living style options and tenure preferences. In addition to families, the housing needs associated with NAIT, new households that will be attracted to the convenience of the LRT, and pet-owners must also be addressed. Overall, built form will be predominately low-rise multi-family with opportunity for higher densities adjacent to the LRT.

Housing design must contribute to a vibrant street life and offer mixed-use combinations (residential, retail and office) where appropriate. It is essential that family-oriented units have grade access to outdoor privacy areas and play space. Wherever possible, private entries should front directly on the street. At least 20% of the units must be affordable housing, both ownership and rental. The plan should:

- Promote mixed-use development and achieve an overall density of 25 units per acre minimum (gross), equaling approximately 12,500 residential units (minimum).
- Utilize medium density street-oriented, walk-up building forms to minimize the building footprint and maximize open space.
- Allow for higher density development at LRT stops and at arterial road intersections and create the critical mass necessary to sustain public spaces, cultural and business uses, and the economic viability of pedestrian-oriented street life on main streets.
- Create strong neighborhood environments with distinctive qualities and yet achieve overall cohesiveness.
- Mix affordable housing with market-rate housing throughout the community.
- Handle the automobile in a manner that minimizes its visual and environmental impacts on the community.
- Provide schools and child care facilities in close proximity to residences.

E. Open Space

High value will be placed upon the creation of open spaces and their effectiveness in contributing to sustainability requirements. Open space must be fully integrated into the community and represent a network of high-quality green spaces and corridors linked to school and playgrounds. A high proportion of the “living” area should be green and green spaces should deliver wide environmental benefits.

- Create public parks, and set aside areas for conservation and restorative ecological initiatives.
- Create vegetated interconnected trails and bicycle paths linking the entire development to these areas.

- Incorporate opportunities for NAIT educational initiatives, as living laboratories for investigation and discovery.
- Create community gardens/greenhouses where residents can grow their own produce.
- Provide off-leash areas for dog owners

An interconnected network of streets and open spaces should provide a variety of opportunities for recreation and locations for residences, offices and businesses.

Alternative forms of open space, such as plazas and squares, will also be highly valued. Open spaces should provide the opportunity for children to play safely, while generous tree planting and pedestrian seating will make public spaces more desirable places for people to go.

F. Technology

New technologies are part of the search for sustainable solutions and range from solar panels to water treatment. Many of these technologies are just beginning to be commercial viable as the costs of conventional approaches continue to escalate. These technologies may enable new solutions but may also impose requirements on the Master Plan whether as easements, dedicated land, or integration with other land uses or building forms.

A key to success in adapting new technologies will be the engagement of three major local players: EPCOR, the University of Alberta and NAIT.

- EPCOR now focuses exclusively on water, wastewater, distribution and transmission of electricity, energy services and transportation services. A new entity, called Capital Power Corporation, focuses exclusively on power generation, including building and operating power plants. EPCOR brings a level of experience and applied

knowledge that will be essential to meeting many of the sustainability challenges.

- The University of Alberta has just completed a ULI Advisory Panel (October 2009) for the South Campus and the recommendations parallel the objectives for the ECCA lands in almost every dimension. The university seeks sustainability for the South Campus in the three dimensions of social, economic and environmental sustainability with a performance based plan and metrics to track progress; they propose to establish a Zero Carbon district; and to reduce their ecological footprint through initiatives in food, transportation, nature conservation, water and waste. There is a sound basis for partnership with the University of Alberta on what appears to be a common agenda.
- NAIT will be an integral part of the ECCA sustainable community both through expansion of its campus on ECCA lands and its educational programs, research and enterprise development in environmental sustainability. The ECCA community will integrate the opportunities realized by NAIT's Research and Innovation in Green Building Technology to develop leading edge building practices and forms. As development progresses it can provide a rich array of experiences for NAIT students pursuing education and training in environmental sustainability. The presence of NAIT provides ample partnership possibilities that must be explored.

G. History

The ECCA lands are not a “greyfield”² site in the traditional sense. This site ranks with the Rossdale site and the provincial government precinct as among the three most significant historical locations in the City of

² Greyfield land, in contrast with brownfield land which may be partially contaminated, usually does not require environmental remediation before it can be redeveloped.

Edmonton. There is a rich history attached to this site that dates back to 1909 when Edmonton carpenter Reginald Hunt flew his self-designed and hand-built aircraft over the provincial capital. The history of this site must be embodied in the Master Plan through various initiatives that include preservation, naming, interpretation, and designation, to serve as a reminder and recognition of its rich legacy and of the pioneering aviators it served.

- Identify opportunities to re-use existing hangars as recreation facilities or other community facilities (e.g. farmers market).
- Explore the idea of a “mall of museums” that would acknowledge the historical significance of structures such as Hangers 8 and 11 that are on the Inventory of Historic Resources in Edmonton.
- Acknowledge the history of the site through naming opportunities for parks, thoroughfares, places and buildings that are associated with the past.