Designing Edmonton

a visual chronology of edmonton's suburban form

Designing Edmonton: A Visual Chronology of Edmonton's Suburban Form

by

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People know their neighbourhoods. They experience them on a daily basis, from the corner where cars come around too fast to the best street for a Sunday stroll. At the same time, people do not necessarily realize the impact urban design has on neighbourhoods. They don't often consider how a curb radius affects traffic speed or building setbacks might influence their propensity to walk.

I believe this discrepancy is not a lack of thought but rather of vocabulary. Having a basic design language opens up possibilities for discovering why neighbourhoods function the way they do and enables a deeper understanding of the tradeoffs between different design ideas.

This project is my attempt to make design ideas accessible to Edmontonians who, to varying extents, may not have a framework to understand how design affects their day to day lives.

I have compiled a visual inventory of eight Edmonton neighbourhoods, including street networks, land use, housing density and massing, building typologies and street uses. By pulling apart different aspects of neighbourhood design, I hope to offer a new perspective on the places where we live.

Introduction

Overview

This project catalogues and compares the urban design of eight Edmonton neighbourhoods, ranging from some of the city's earliest communities to those still under development.

Six drawings illustrate different aspects of the urban form of each neighbourhood. I begin with larger scale drawings at the neighbourhood level, successively zooming in to blocks, streets and individual buildings. For each drawing, a corresponding metric is included to visually quantify a key element illustrated by the drawing.

My purpose is to create comparable drawings in order to highlight the differences in neighbourhood design. Although I provide some background at the beginning and some analysis at the end, I want readers to make their own comparisons and draw their own conclusions.

Content and Format

The project is presented in the following sections.

Introduction. Provides background on why drawings were chosen, what they tell us about a given community and how they were produced.

Literature Review. A overview of current planning and urban design perspectives on design elements that shape the quality of urban and suburban communities.

Neighbourhoods. The eight neighbourhoods are presented in chronological order based on the time of their original development as highlighted on the map of Edmonton to the right.

Each neighbourhood includes six sections that feature an aspect of the urban design: connectivity, land use, density, massing, housing typologies and street sections.

Analysis. Provides a side-by-side comparison of each drawing and corresponding metric as well as a brief written commentary of the changing urban form.

Discussion. A summary of the results with a brief commentary.

References. Provides a complete bibliography of all in-text citaions.

The neighbourhoods section forms the bulk of the project. Six elements of the urban design are presented on their own page, each with a drawing and corresponding visual metric that quantifies a related aspect of design. These elements are listed in the table below.

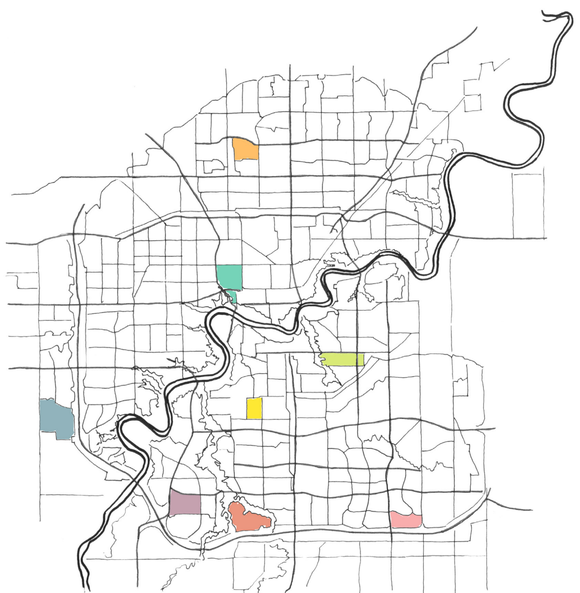
Additionally, each neighbourhood opens with a context page which shows its location within the city and provides some background on the development history. At the bottom of the page are the six visual metrics for the neighbourhood.

Design Element	Drawing	Metric
Connectivity	Road Network	Percent Connectivity (Gamma Index)
Land Use	Land Use	Percent Open Space
Density	Figure-Ground	Dwelling Unit Density
Massing	3D massing	Floor Area Ratio
Housing Typologies	House Elevation and Perspectives	Living Area
Street Section	Street Section	Street Use Proportion

Note on Drawing Accuracy. The information I have compiled for this project was taken almost entirely from publicly available data and images. I have tried to be as accurate as possible, making several site visits to verify my drawing matched reality. However, without official documentation, the accuracy of the drawings is limited by the information I could gather through publicly available aerial photos, and my own site visits and photographs.

Site Selection

Neighbourhoods were chosen primarily based on the era of their development to show the changing urban form of Edmonton. As such, I selected neighbourhoods readily recognizable by their time of development. A secondary factor was distribution; neighbourhoods were selected from throughout the city instead of a localized area.



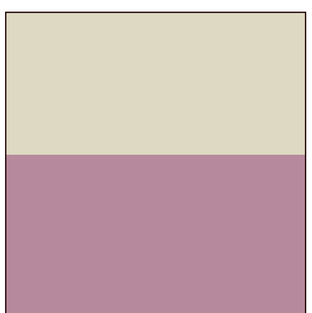
Additionally, in some cases I chose areas for their planning importance: Westmount, for its large proportion of historic houses; Crawford Plains, for its location in the larger Mill Woods community, considered a cutting-edge planning model at its inception; and Terwillegar Towne, because of adherence to New Urbanist and neo-traditional planning principles.

Within each neighbourhood I have chosen sites, blocks, street sections and building typologies based on what I thought typified the experience of the neighbourhood. They do not provide a comprehensive description of the community, nor do they aim to be scientifically representative samples.

Each drawing shows different aspects of neighbourhood design, and tells something of how they function. The following pages provide a brief explanation of what the drawings show, why they are important and how they were produced.

Connectivity

Road Network. Shows the street edges of the neighbourhood.



Connectivity. Connectivity is shown in purple as percent of the maximum possible connectivity.

Description. The road network drawing shows the street edges of the neighbourhoods. The drawings are presented at a 1:4000 scale and they show an area approximately 1000 m by 600 m. They are oriented such that north is at the top of the page.

The connectivity metric shows the connectivity in purple, as percent of the maximum possible connectivity.

Background. The road network is important because the degree of road connectivity shapes traffic flows and land accessibility, in addition to influencing transportation mode splits. Road networks range from highly connected grids to curvilinear, dendritic patterns.

Traditional street networks, such as the gridiron, were highly connected with short blocks and many intersecting and parallel roads. The philosophy of connected streets was countered by the hierarchical road network in postwar decades. With the rise of the private automobile, traffic was concentrated on high capacity, through roads. Local streets were truncated or looped to maximize privacy and keep out undesired traffic.

Today planners advocate for a return to connected streets which offer more resilience. Greater connectivity creates more route options for travelling by foot, bicycle or car. Consequently, highly connected streets require less detouring and provide more direct paths. Multiple parallel streets disperse traffic rather than concentrating it to major roads and also improve access for emergency vehicles. Additionally, well-connected streets can slow down traffic, increasing pedestrian safety. Together these outcomes support active transport which is an important component in achieving both public health and environmental objectives (VTPI, 2010a).

Methodology. The road network drawing was created by tracing a Google Earth image in AutoCAD. Some road widths were measured on site to ensure accuracy. Once the drawing was complete in CAD it was traced by hand.

The percent connectivity was calculated for a 800 m by 500 m area within the road network drawing using a measure known as the gamma index. This index is a ratio of the number of links in a network to the maximum number of possible links between nodes. It is calculated by the formula connectivity = (links) / (3 * (nodes - 2)). Nodes include intersections and the end of dead-end streets. Links are what connect nodes. A fully connected network has a gamma index of 1.0 or 100% (Dill, 2004, p. 6). It should be noted that the gamma index does not fully describe connectivity. It does not account for density of intersections or the length of links: it only considers the connectivity between existing nodes.

Note: While the road network drawings do not show pedestrian-only links, they were included in the calculation of the connectivity metric.

Land Use

Description. The land use drawings show simplified zoning categories. Residential uses are shown in yellow, commercial uses in red, and open space in green. Undeveloped areas are shown in grey. The land use drawings are at a 1:4000 scale and they show an area approximately 1000 m by 600 m. They are oriented such that north is at the top of the page.

The land use metric shows the park/open space in green as a percent of the total neighbourhood area.

Background. In early cities, land uses were mixed; daily amenities were located within walking distance of homes due to the high costs/lack of other transportation modes. However, the unregulated mix of uses became problematic in Canada in the early 1900s, due to rapid urbanization. People lived in unsafe conditions next to polluting industries. At that time, municipalities had little power to regulate building-siting and uses which could improve the health and safety of its citizens (Hodge, 2003.)

Eventually, zoning bylaws were enacted and became a powerful tool to avoid incompatible uses. Zoning enabled municipalities to dictate allowable land uses as well as building type, size and placement.

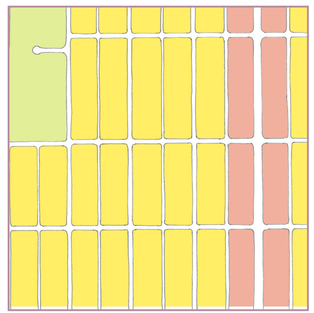
Although zoning origins were helpful, critics argue the pendulum swung too far. Zoning today is often criticized for stifling diversity by being inflexible, exclusionary, and separating compatible uses. The negative effects of zoning are also exacerbated by the rise of automobiles. With readily available transportation, land uses are separated even further. Additionally, high volume roads cut through communities creating physical barriers to amenities that may be relatively close-by.

Planners today believe mixing uses creates richer, more diverse communities that are less car-dependent. Placing different uses together increases the viability of walking to amenities and supports better transit service. Mixing uses can also improve safety, while creating vibrant street life throughout the day (Smart Growth, n.d. b).

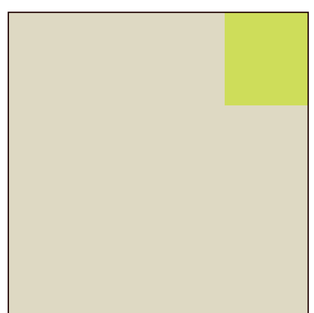
Methodology. The land use drawings were created using the road network drawings as a base. The land uses shown are simplified into three categories: residential, commercial (retail and office), and park/open space. They are based on actual use; and not necessarily the City's zoning bylaw.

The percent open space was calculated for the entire neighbourhood (not just the area shown in the land use drawing). The area of park and open space was obtained from directly from City staff where it was pulled from a geodatabase. The neighbourhood area was also obtained from the City.

Note: Parks and open space include schools, playgrounds, sports fields, trails, recreation facilities, meeting places, stormwater management facilities, cemeteries, walkways and utility rights-of-way road islands and boulevards in road rights-of-way.



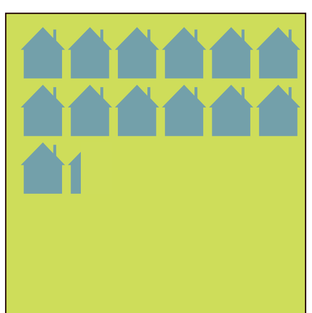
Land Use. Shows simplified land uses.



Open Space. Park and open space is shown in green as a percentage of the entire neighbourhood area.

Density

Figure-Ground. Shows building footprints.



Density. Number of blue house icons represent the dwelling unit density per hectare.

Description. The figure-ground drawings show building footprints on a neighbourhood block. They are presented at a 1:1500 scale and oriented such that north is at the top of the page.

The density metric shows the number of dwelling units per hectare; each unit is represented by a blue house icon.

Background. The figure-ground drawings give a sense of how buildings are arranged on a block. They show lot coverage, setback from the road, and side and back yards. They also show how many buildings are on a block, which in the case of single-family detached homes gives a sense of the unit density.

Density is important because it dictates what amenities a community can support as well as the capacity of infrastructure required to service the area. Similar to zoning bylaws, low-density suburbs were created in response to problems in the cities: overcrowding, unsanitary conditions, and a lack of open space. The first suburbs were made possible with the advent of the street car, but their proliferation came following World War II. At that time, the federal government developed a large-scale housing program to meet the backlog of demand created by the Depression and the war. Houses were mass-produced in suburbs, and the availability of automobiles made access to these communities possible. To own a house in the suburbs became a 1950s ideal.

In recent years, planners have called for a return to higher densities due to the burden low-density suburbs place on city infrastructure. High density living is more efficient and can support a mix of uses, leading to reduced car dependence and more complete communities.

Note: Density can be calculated in many ways: by population, dwelling units, or built area for a given land area.

Methodology. The figure ground drawings were created by tracing a Google Earth image in AutoCAD. Site visits were made to improve the accuracy of the drawings. Once the drawing was complete in CAD it was traced by hand.

The dwelling unit density was calculated for the block shown in the figure-ground drawing. The number of houses were counted and divided by the total residential area of the block which was calculated by adding the residential lot areas as per the City's 2010 property assessment, available from the City's online interactive map. This was then scaled to give the number of dwelling units per hectare.

Note: All of the blocks included in this study are single family homes and calculations were based on the assumption that there is only one residence per lot (thus does not take into account basement suits or lane housing). Because it does not account for multi-family units, this density is not necessarily representative of the entire neighbourhood.

Massing

Description. The massing drawings show the simplified shapes of buildings: their height, footprint and basic roof structure.

The floor area ratio metric shows the building area in blue, as a percent of the lot area.

Background. Massing or bulk refers to the volume of buildings including site coverage and height. The massing drawing gives a sense of how buildings are sited and the extent to which an area is built up. Massing can also be indicative of use: commercial and industrial buildings generally have larger floorplates while tall narrow buildings tend to support high density residential uses and offices. (Hodge, 2003, p. 133).

Building massing affects aesthetic and feel of places. A building with a volume significantly greater than its neighbours usually feels out of place. This incongruity in massing is often a reason why people are opposed to higher density housing in their communities. Furthermore, buildings with large bulk have a greater impact on their surroundings. Tall buildings create shade and can produce wind tunnels; buildings that are overly wide may hinder ventilation and both can block views.

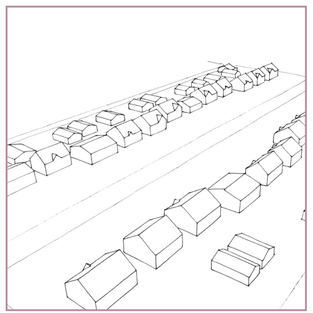
Floor Area Ratio (FAR) or Floor Space Index (FSI) is a measure of massing. It is a ratio of the built area (floor plate area multiplied by the number of floors) to the land area (Hodge, 2003, p. 136). It can be an indicator of density, but it is also dependent on unit size particularly when applied to residential uses.

FAR can also be used to gauge how efficiently land is used. However, it does not indicate the shape of the building. A one-storey building, for example, has the same FAR as four-storey building with a quarter of the site coverage.

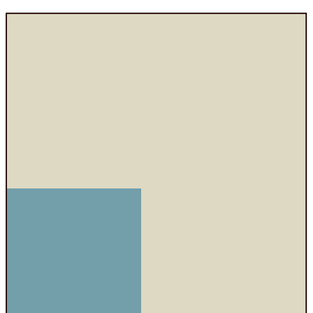
Methodology. The massing drawings were created based on a Sketch up model of the same block shown in the figure-ground drawings. The model shows simplified building forms: number of storeys (One storey was approximated to be 3 m), and primary roof structures. Small building articulations and small dormers, etc were not included as the main purpose was to show the overall form and mass of the buildings and not the character. Once the 3D-model was completed, it was traced by hand.

The FAR was calculated for the block shown in the figure-ground and massing drawings. Building and lot areas were taken from property assessment information available from the City's online interactive map.

Note: The city's values for building area only included living space (not garages or sheds) and does not include basements or third storeys of split level houses.



Massing. Shows simplified building shapes.



Floor Area Ratio. Shows built area in blue as a percent of the total lot area.

Housing Typologies

Housing Typologies (Elevation). Shows a typical house.

Living Area. Size of blue house icon shows amount of average living area per house in proportion to other neighbourhoods.

Description. Three drawings illustrate different styles of houses in the neighbourhood: one front elevation and two perspective vignettes.

The living area metric shows a blue house icon whose size represents the average living area in houses in proportion to other neighbourhoods.

Background. The housing drawings aim to give a sense of the character and style of the neighbourhoods.

They also illustrate changing social habits and household preferences. In particular, the drawings show how suburban homes have been re-oriented. In older neighbourhoods, the front facade tended to have porches or verandas. Newer homes have prominent attached garages which cover most of the front facade. Life inside the house is directed inward, towards the privacy of the back yard (Ward, 1999, pp. 135-139).

Another major change in housing is size. This can be seen both in drawings as well as the metric for living area. Average house sizes have increased in recent decades. In the 1940s the average house was 800 square feet, growing to 1,000 square feet in the mid 1950s and almost 2,000 square feet by the mid 1980s. The expanding house size occurred at the same time as household sizes decreased. From 1961 to 2001 the average Canadian household fell from 3.9 members to 2.6 members.(Friedman, 2005, p. 8).

In addition to telling us about cultural shifts, house size is important because it generally correlates to resource and energy consumption during both construction and use of the house.

Methodology. Building elevations were drawn based on photographs taken during site visits. Building perspective vignettes were traced from photographs taken during site visits.

The average house size was calculated for the block shown in the figure-ground and massing drawings. The square footage for each house was taken from property assessment information available from the City's online interactive map and averaged for the entire block.

Note: The City's values for building area only included living space (not garages or sheds) and does not include basements or third storeys of split level houses.

Street Section

Description. The street drawings show a cross-section of a typical residential street. They highlight the width of the roadway, planted boulevards (where they exist), and sidewalks as well as the setback of the building. The drawings are presented at a 1:2000 scale.

The street use metric illustrates the proportion of space dedicated to vehicles (roadway) in grey, pedestrians (sidewalk) in purple and greenery (boulevard) in green.

Background. Streets are public spaces; for years, streets were locations of social and economic exchanges. However, the proliferation of the automobile often displaced the traditional uses of streets and changed their design. Wide streets with large curb radii facilitate high volume, high speed traffic, while narrow streets with tight corners favour pedestrian and other active transport modes.

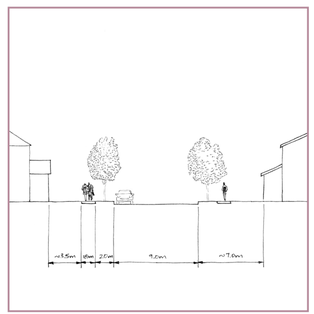
Recently there has been a call to create complete streets: streets that accommodate all users and all modes of transport. Complete streets re-prioritize users, from pedestrians to cyclists to transit and emergency vehicles, to private vehicles. They tend to have narrower roadways, bicycle lanes and wide sidewalks (national Complete Streets Coalition, 2005).

Another component of people-friendly streets are green features: boulevard trees and plantings that separate pedestrians from vehicles, bioswales that reduce and treat stormwater while adding greenery and planted curb bulbs and traffic circles which help slow traffic.

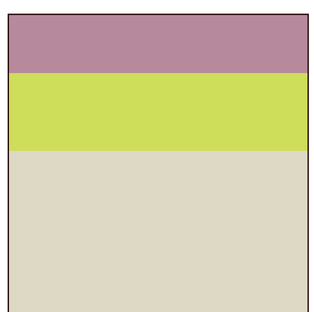
Finally, interesting streets are often framed with interesting buildings: stores, restaurants and cafes that are built to the property line and spill onto the sidewalk to create vibrancy and provide a sense of enclosure. (Jacobs, A., 1993

Methodology. Street sections were drawn based on road, sidewalk and boulevard measurements taken during site visits. Building setbacks were measured from Google Earth images as well as the figure ground drawings. For some neighbourhoods, the setbacks varied in distance (particularly in the older subdivisions); consequently the value shown is one that appeared to be the most typical in the block that was studied.

The width of roadway, planted boulevard and sidewalks were used to calculate the proportion of their corresponding uses which were categorized as roadway, boulevard and pedestrian, respectively.
Note: for this metric the street was measured from the outer edges of the sidewalks and not necessarily the road right-of-way.



Street Section. Shows a cross section of a typical street.



Street Use. Shows proportion of street dedicated to different uses: vehicles (grey), greenery (green) pedestrians (purple).

Literature Review

Re-thinking Suburbs

There is no shortage of criticism of suburbs. Pop-culture critic James Howard Kunstler (1993) decries them as "depressing, brutal, ugly, unhealthy, and spiritually degrading" (p10). Others describe them with adjectives like sprawling, auto-oriented, low-density, homogeneous and unsustainable (Hayden, 2004).

Despite the critics, cities still build suburbs and people still choose to live in them. In fact, by the 1970s, US suburban population surpassed that of central cities and non-metropolitan areas (Baldassare, 1992, p. 475), and in Canada almost half of residents in metropolitan areas currently live in low-density neighbourhoods (Turcotte, 2008). So what are the elements of suburban design that make them liveable or unliveable? What's so wrong with them? And what could make them better?

This section starts by describing typical characteristics of suburbs. I then examine what planning critics say about key design elements that affect quality of life, in both urban and suburban settings. Among these are transportation networks, land use mix, density and massing and building and street design.

Suburbs. There is no single definition of suburbs. Statistics Canada offers a few alternatives (Turcotte, 2008):

- Municipalities of a metropolitan area that are not the central city (i.e. the city the area is named after). This is perhaps the simplest definition, but it is problematic for Canadian cities like Edmonton, where suburban-type development is prevalent within the city limits.
- Zones outside the city's central core or central business district.
- Areas at a specified distance from the core.

Because of their geographic ambiguity, it is perhaps easiest to define suburbs by typical characteristics.

Re-thinking Suburbs

While the design and quality of suburban development can vary widely there are some key characteristics. Suburbs tend to be made up primarily of single family homes removed from the city core. Post-war suburbs are usually car-oriented; wide, often treeless streets are built to accommodate vehicles and are arranged in looping, disconnected patterns. Houses tend to be near-identical, and in recent decades often feature attached front garages. If non-residential uses are present, they are often located at the edge of a community for easy vehicle access and are flanked with vast parking lots. Suburbs tend to emphasize the individual: privacy and home ownership are prioritized. They have a tendency to "turn households in on themselves" (Short, 1989, p.16). Lewis Mumford described this tendency more scathingly as a "collective attempt to lead a private life" (Coupland, 1997, p.11).

While many malign these characteristics of suburbs, "[b]anket dismissals of suburbia are too easy and too wrong" (Short, 1989, p. 16). Certainly many people live contentedly in suburbs. One study shows that American suburbanites are more satisfied with their communities than those living in cities or small towns (Morin & Taylor, 2009).

Nevertheless, the gains made by suburbs have their costs – ones that many aren't even aware of such as declining public and community life and loss of social capital, loss of physical fitness and health, and increasing ecological impact. Additionally, suburbs can affect their larger community; they have negative consequences that are not self contained. Suburbs eat up agricultural land, forests and wetlands (Kellet & Girling, 2005, p.7) and can lead to the deterioration of city cores (Coupland, 1997, p. 11).

Consequently, planners and urban designers have come to promote designs that foster diversity, improve the public realm, and encourage active transport. These objectives can be achieved in part through well connected streets, mixed land uses, higher density and buildings and streets scaled and designed for people.

Road Networks. Streets are the backbones of communities; they are public spaces and they link destinations. The importance for good road network design is underscored by its place at the beginning of the development process. Roads have the power to shape an entire development; "every aspect of city building follows its lead" (Hebbert, 2005, p.41).

Road networks can take on a variety of patterns from the grid to radial, web, curvilinear or irregular. However, according to the American Planning Association design standards (2006, p. 229), regardless of the pattern, the quality of a road network is dependent primarily on its connectivity and legibility.

The connectivity of a road network is dependent on the number of intersections and the directness of the links that join them. Highly connected road networks have many parallel routes and cross connections which result in high intersections density, many short links and minimal dead-ends.

Increased connectivity provides multiple travel options and decrease travel distances (VTPI 2010a). These outcomes have many potential benefits. Access to direct routes can encourage non-motorized transportation, increasing public health while removing vehicles from the road. This, in turn, reduces congestion as well as the emission of harmful air pollutants and greenhouse gases. Multiple routes can also ease traffic congestion as traffic is dispersed on many roads. Connected streets also offer more resilience: if one road is shut down or congested, other options are available. Connected streets also improve accessibility for emergency vehicles.

Some design guidelines for connectivity include the following.

- Limiting block lengths: Various sources have different guidelines for maximum block lengths, but they typically lie between 300 to 600 feet (APA, 2006, p. 231). the Neighbourhood Streets Project Stakeholders group (2000, p. 20) also notes that as block lengths increase over 300 feet, the importance of street width and other design features increases.
- Limiting closed-end streets to where barriers/natural features prevent connection to adjacent streets (VTPI, 2010a).
- Limiting the length of closed-end streets (VTPI, 2010a).
- Ensuring all sidewalks and bike lanes are direct and continuous (London Department for Transport, 2008, p.10).
- Requiring minimum number of connections between local and arterial streets (VTPI, 2010a).
- Additionally, various indices can be used (either on their own or in some combination) to set minimum standards connectivity. These indices include intersection density, link-node ratios, connected node ratios (ratio of real nodes (intersections) to all nodes (intersection and dead-ends), the gamma index (ratio of actual connectivity to maximum possible connectivity), etc. (Dill, 2004, and APA, 2006, p. 231).

In addition to connectivity and legibility, some planners advocate for road patterns that are respectful of the topography and natural features. They propose that street alignments should follow natural contours and land features, whenever possible, and not cut through waterways and other natural features (NSPS, 2000, p. 20).

Land Use Mix. While well connected streets are an essential ingredient to vibrant communities, their success largely depends on available amenities and uses. A connected street network that lacks destinations does not make a vibrant community.

Jane Jacobs (1993) notes that for "successful city streets, people must appear at different times" (p. 198). These successful streets have implications for safety, vibrancy, and business. Safe streets are well-used streets (Jacobs, J,. 1993, p.44); streets are activated by the presence of people (Jacobs, A., 1993, p. 282), and people attract other people (Jacobs, J,. 1993, p. 47); and busy streets support retail uses (Smart Growth Network, n.d. b).

In order to have people on the streets at different times, there must be a mix of day and night uses. Jane Jacobs (1993, p. 209) further notes that these different uses must be primary: uses that are destinations such as residences, offices, and factories, and not those that are simply a matter of convenience. Furthermore, in order for mixed uses to be effective, there must be an actually a mixing of people: people using the streets at different times must actually use the same streets, they should be able to or want to frequent the same facilities and these groups should be somewhat proportional in size (Jacobs, 1993, p. 213).

Another factor in mixing uses is scale. Mixing can occur within a building, within a parcel or throughout a larger area. Generally speaking, a finer-grained mix supports greater diversity and better street life. Some neighbourhood plans claim to be mixed use, for example, because they feature a parcel of commercial use at one edge of their otherwise residential community. This hardly supports the same sort of street life as storefronts with residences above.

Finally mixing land uses should also include a diversity of housing types. Different housing types have the potential to attract residents of various ages and backgrounds and socio-economic status, a key component in building community (Smart Growth, n.d. a; Jacobs, A.,

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1993, p. 297). Conversely, Emily Talen (2005) argues that "social divisions are manifested and reinforced in spaces and landscapes that reflect separation." Furthermore, she notes that a lack of diversity has serious consequences such as concentrations of poverty in inner cities. (Talen, 2008, p. 4).

Density and Massing. Density is a sensitive topic: low-density housing is a hallmark of suburban communities and proposals suggesting increasing density often elicit vehement public opposition. Yet density is championed by many planners for various reasons. Michael Larice (2007) summarizes various planning views on density:

Smart Growth proponents see denser cities as a component in controlling sprawl, stemming vehicle congestion, promoting public transport, and rationalizing infrastructure. Sustainability advocates champion the need for denser and more compact cities as a means of more efficient land use, resource conservation, and environmental stewardship. Traditional urbanists (in addition to the 'New' ones) see moderately higher densities as crucial to promoting mixed-use and walkable neighborhoods, while replicating older and seemingly more humane urban form patterns (p. 99).

Larice adds a final "quality of life" consideration, suggesting density is necessary for "creating greater housing and retail choice, fostering richer cultural opportunities, and encouraging social interaction" (p. 99).

Some claim that the discrepancy between planning theory and public demand is due to misconception and a lack of public education (Urban Land Institute, 2008, p. 4-5). A common misconception is that high density buildings appear out of place or lack aesthetic quality. Julie Campoli and Alexis MacLean (2007) address this perception with aerial photography to demonstrate how equivalent densities can be achieved through different forms.

However, in his critique of Campoli and MacLean, Larice (2007, p. 100) points out more complex reasons that people are averse to density: crime and safety concerns, noise, parking access, and historic associations of density with public housing. Others fear reduced property values and the potential degradation of community amenities and infrastructure (Pendall, 1999, p. 114).

While there are many arguments for increasing density, a more practical concern is optimum density. According to Jane Jacobs (1993, p. 272), the right density for a community is one that fosters diversity instead of suppressing it. When density is too low it can't support amenities such as local retail, libraries, schools or transit. The consequence is less land use diversity and rising per capita infrastructure costs.

At the other end of the spectrum, too much density leads to standardization. If efficiency is the sole mantra, then the most efficient building form will always prevail. As an example, Jacobs (1993, p. 277) points to the monotony of Le Corbusier's skyscrapers in the park.

Others argue that density should be contextual. For example, a high-rise tower may be perfectly acceptable in a downtown core. However, in a neighbourhood made up of predominately single family housing, it would literally stick out. Other alternatives might blend more smoothly such as mid- or low-rise apartments, stacked townhouses, row-houses, houses that have been converted into multiple units, duplexes, basement suites or laneway houses. Similarly, proponents of Transit-Oriented Development propose high densities around rapid transit stations that progressively get lower as we move beyond comfortable walking distances from the centre (VTPI, 2010b).

Building and Street Design. Another essential ingredient for creating vibrant, walkable communities is the design of the buildings and streets themselves.

Tensions often arise when it comes to designing streets: planners versus engineers and streets for people versus streets for cars. While streets were once the place of social and commercial interactions, engineered road systems developed in reaction to motorized movement. The ensuing logic was that people should be separated from cars (Hebbert, 2005, p.3).

Auto-oriented streets emphasize mobility. They are made for speed with wide lanes, large curb radii, and long sightlines. Unfortunately, these roads do not foster community or create a sense of place.

Streets designed for people emphasize accessibility. Pedestrians are prioritized over motorized vehicles and they are designed at a human scale. According to Friedman (2005, p. 94) scale, the proportions of building heights, street lights and road widths gives us a sense of comfort or discomfort in our surroundings.

While specific dimensions for streets are dependent on a variety of factors such as building use, parking needs, transit and truck access, and location within the wider community, (APA, 2006, p. 242), human scaled streets tend to have wide sidewalks and narrow traffic lanes and small curb radii. Other features might include bike lanes, planted strips, street trees and bioswales (planted drainage basins that filter and absorb stormwater runoff).

The solutions to creating great pedestrian streets, however, are not solely the domain of planners and urban designers. While they provide ideas that help create memorable places, engineers provide much needed solutions to promote safety and accessibility.

Allan Jacobs (1993) offers many urban design insights for creating "great streets." Among these elements are physical comfort, definition, transparency, "complementarity," and trees.
Streets should be comfortable for walking. They should offer some respite from the weather and certainly not exacerbate it. Trees can provide shade and awnings offer rain protection. Conversely, uncomfortable streets might produce wind tunnels and tree-less streets can heat up paving materials creating uncomfortable temperatures (Jacobs, A., 1993, pp. 274 – 276).

Additionally, people should not feel threatened by vehicles. The roadway might be separated from the sidewalk by a planted strip, or parked cars, or the roadway might be narrowed to ensure traffic is slow (Jacobs, A., 1993, p. 273).

Jacobs uses the term definition in reference to the boundaries of the street and how well they are demarcated. Definition is usually provided by the street wall, the facade of buildings which line the street, but can also be created with street trees. Ideally, streets provide a feeling of being in an outdoor room. While the actual dimensions vary, generally this feeling of enclosure can be achieved with a vertical to horizontal ratio of about 1:4 or higher. (Jacobs, A., 1993, pp. 277-281).

Another element that affects definition is the spacing between buildings. Although Jacobs (1993, p. 281) offers no specific guideline, generally the smaller the spacing the greater the sense of definition

Transparency is related to active building fronts. Windows and doors invite you to imagine, if not see what's inside. Storefronts draw people in and sometimes even blur the line between public and private space

Re-thinking Suburbs

with cafes and patios that spill onto the sidewalk. On the other hand, backs of buildings and opaque glass create blank walls that shut people out and provide little visual interest (Jacobs, A., 1993, pp. 285-287).

Transparency is not limited to retail streets. Single family homes can offer a similar transition between public and private space though front porches, verandas and even windows and doors. Conversely, garage doors can also act as blank walls that fail to acknowledge the street (Ward, 1999, p. 136-137).

Jacobs "complementarity" refers to building design and massing and how they relate to each other. While buildings should not be identical they should be contextual. This is especially true for heights – wide ranges in height should generally be avoided, but also applies to colour, materials, window sizes and other architectural detailing. Generally, only buildings of significance, such as a church or civic building, should stand out architecturally (Jacobs, A., 1993, pp. 287-289).

Finally, trees, although not necessary, provide multiple functions. In addition to providing oxygen and shade they provide a barrier between pedestrians and vehicles.

Jacobs provides some guidelines for street tree design: local deciduous species are preferred. Deciduous trees provide shade in the summer while allowing sunlight through in the winter and their leaves provide interesting movement. He recommends that trees be spaced evenly and closely together if they are to create definition. (Jacobs, A., 1993, pp. 293-295).

Pedestrian-friendly streets can also make use of engineered solutions that improve safety and accessibility. For example, traffic calming measures such as raised crosswalks, curb extensions and traffic circles can minimize short-cutting through communities as well as reduce traffic speeds. (Institute of Transportation Engineers, 1999 and APA, 2006, p. 238). Notably, the use of traffic calming measures in pedestrian environments has been demonstrated to reduce frequency and severity of pedestrian and vehicle accidents (APA, 2006, p. 242).

Other solutions that improve general safety and maximize accessibility for individuals with physical disabilities and reduced mobility include curb ramps, cross walks with lights and audible signals and paving materials that provide visual and tactile clues at potentially dangerous areas such as mid block curb-cuts and crosswalks.

Summary. Suburbs became the norm at a time when the conveniences of personal mobility and single family home ownership were idealized. However, as populations grow, infrastructure costs rise and we face social and environmental crises, many local governments are struggling to shift the types of development that occur within their boundaries.

Higher density, mixed-use, walkable developments that are served by efficient transit are now seen as a more sustainable form of urban design. As we attempt to shift towards this model it is important to recognize that not all suburban developments are the same and that perhaps some exhibit some of the characteristics of desirable urban design that planners are attempting to implement.

Westmount

Context

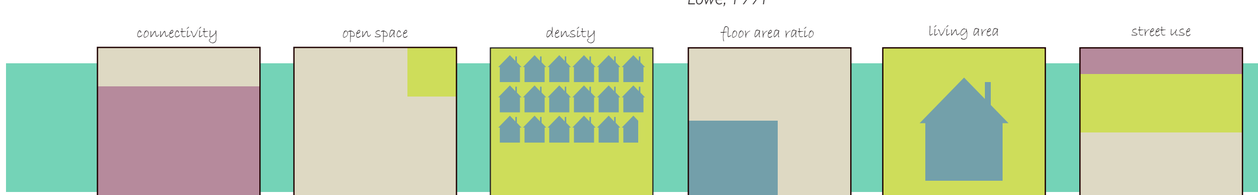
Before it was sold to real estate developers in 1903, Westmount was part of the homestead of Hudson Bay employee Malcolm Groat. A portion of this land was then annexed by the City of Edmonton in 1904 and the rest in 1910. Because of its proximity to downtown, Westmount developed early despite an oversupply of lots in the city. It developed into a wealthy residential neighbourhood that attracted professionals. In 1910 the downtown connection was strengthened with extension of the streetcar along 124 Street between Jasper Avenue and 110th Avenue. The streetcar line also brought with it the establishment of a new commercial district.

The commercial area survived the depression years and remained a thriving local-serving retail corridor until the opening of Edmonton's first mall, the Westmount Shopping Plaza. In 1988 the 124th Avenue Business Revitalization Zone was created to revitalize the area.

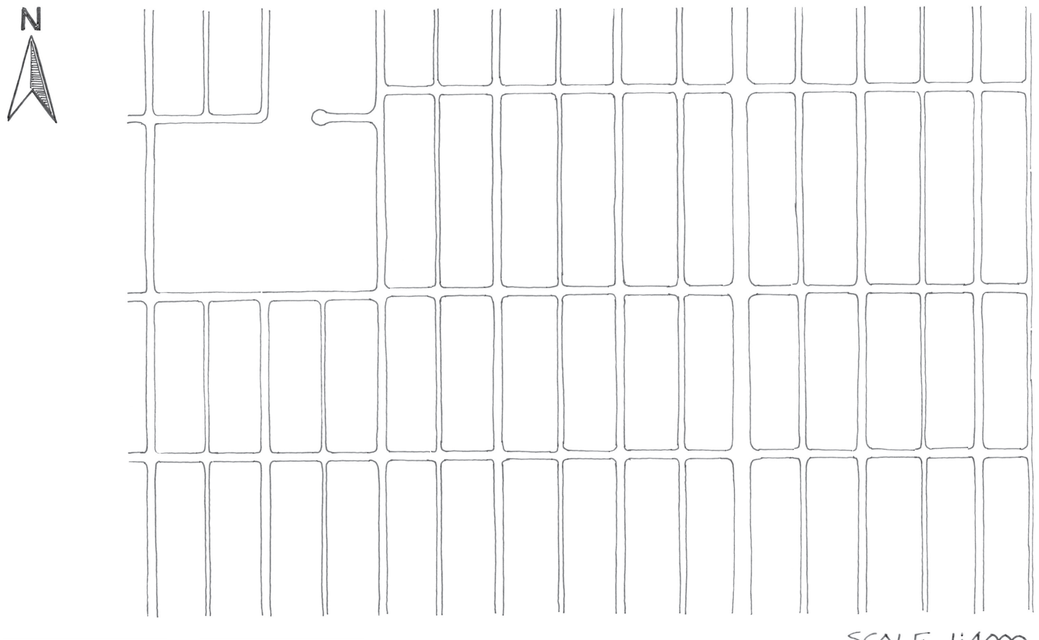
Many of the original homes from the early 1900s still exist in Westmount, resulting in the creation of a heritage district encompassing 15 neighbourhood blocks. The 1950s saw a shift from detached single family homes to low-rise apartment buildings, many of which are concentrated along major corridors. Today apartments account for 52% of homes.

Westmount has an elementary school, a park area and is adjacent to the Groat ravine. The east edge has a dedicated pedestrian and cycling path which was once the train right-of-way.

Sources: City of Edmonton, 2006j, and n.d. b; 124 Street and Area n.d.; Yanish & Lowe, 1991



Connectivity

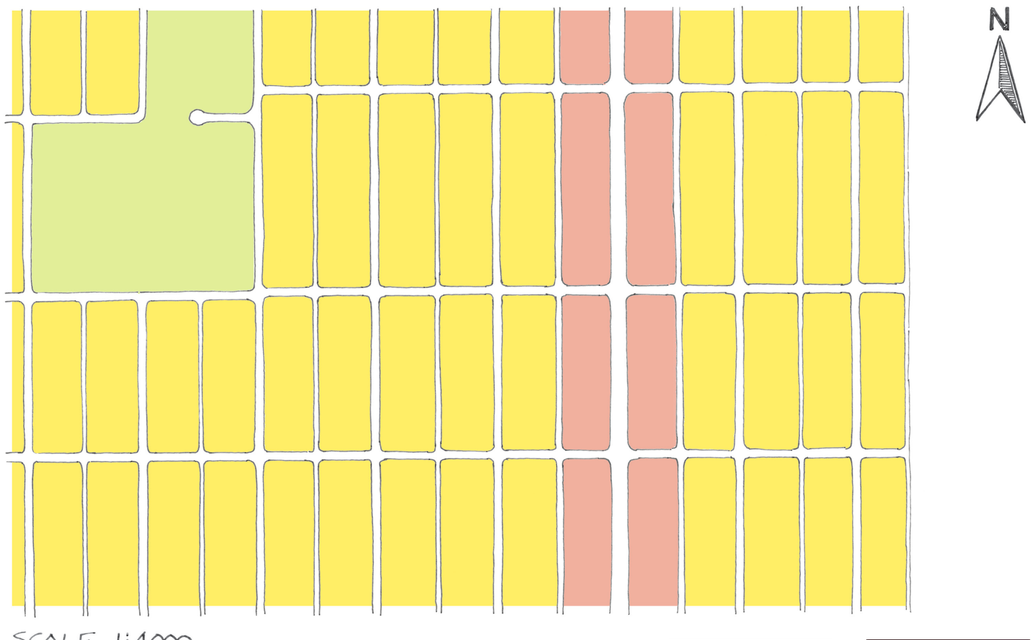


connectivity

76

percent

Land Use

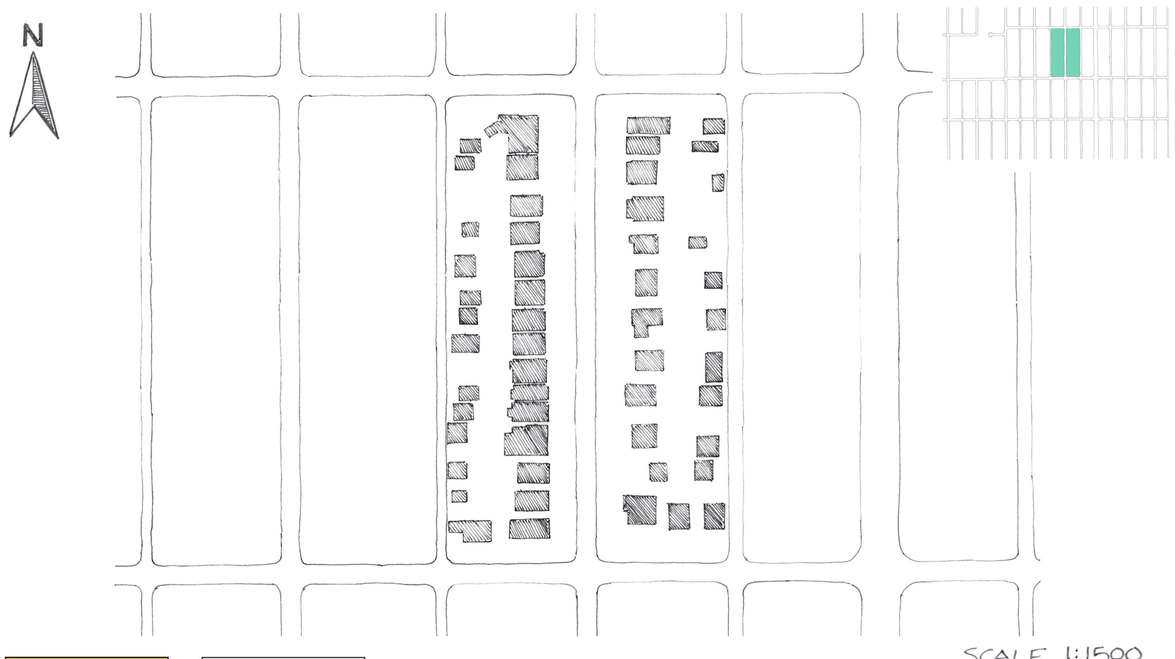


open space

9.1

percent

Density

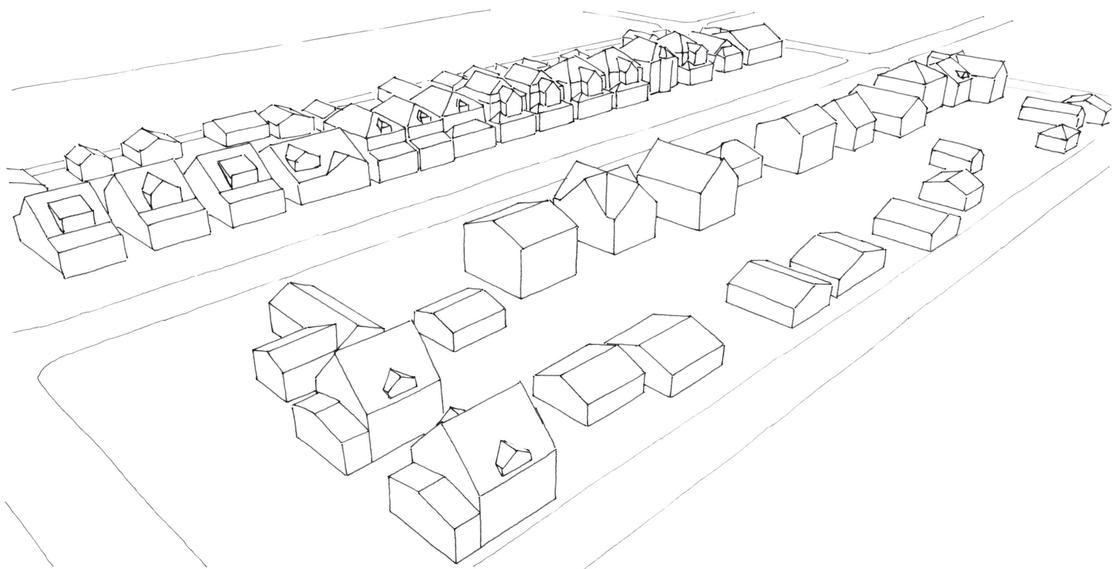


density

17.7

units/ha

Massing



floor area ratio

0.28

FAR

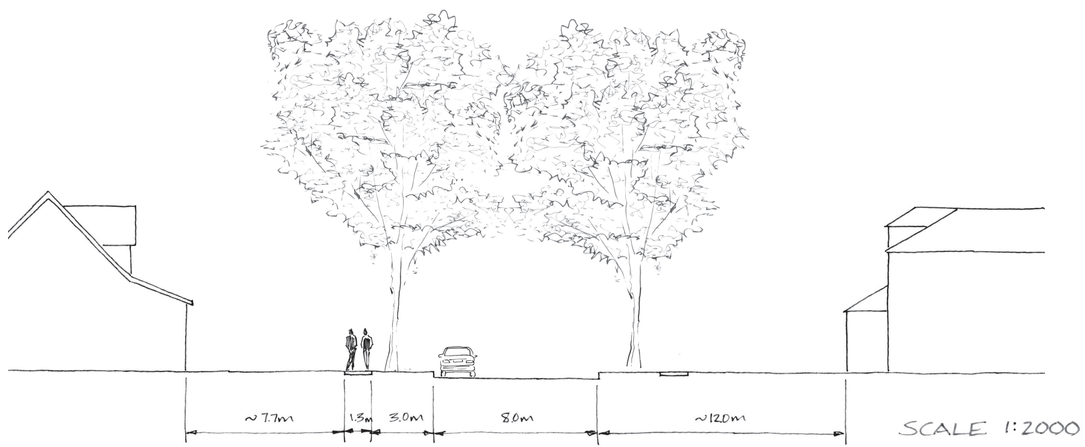
Housing Typologies

living area

1,610

saaure feet

Street Section



street use

48|36|16

road|blvd|ped

King Edward Park

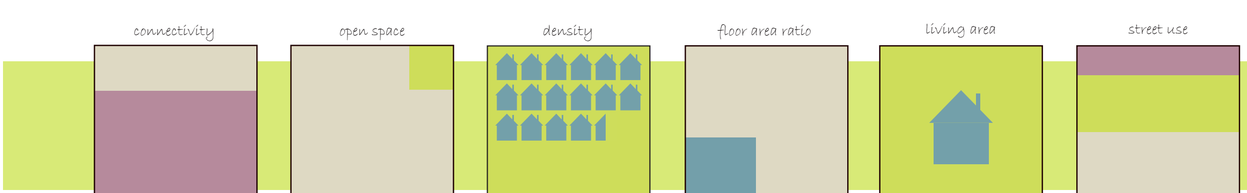
Context

King Edward Park generally developed from west to east. Records show the land was being farmed by the 1870s. In 1907 a portion (land west of 91 Street) was annexed by the City of Strathcona, which merged with the City of Edmonton in 1912. One year later, the land from 91 Street to 75 Street was also incorporated. The majority of the neighbourhood, however, was only developed in the 1950s. In 1960 the area east of 75 Street was added to the city, completing the current neighbourhood.

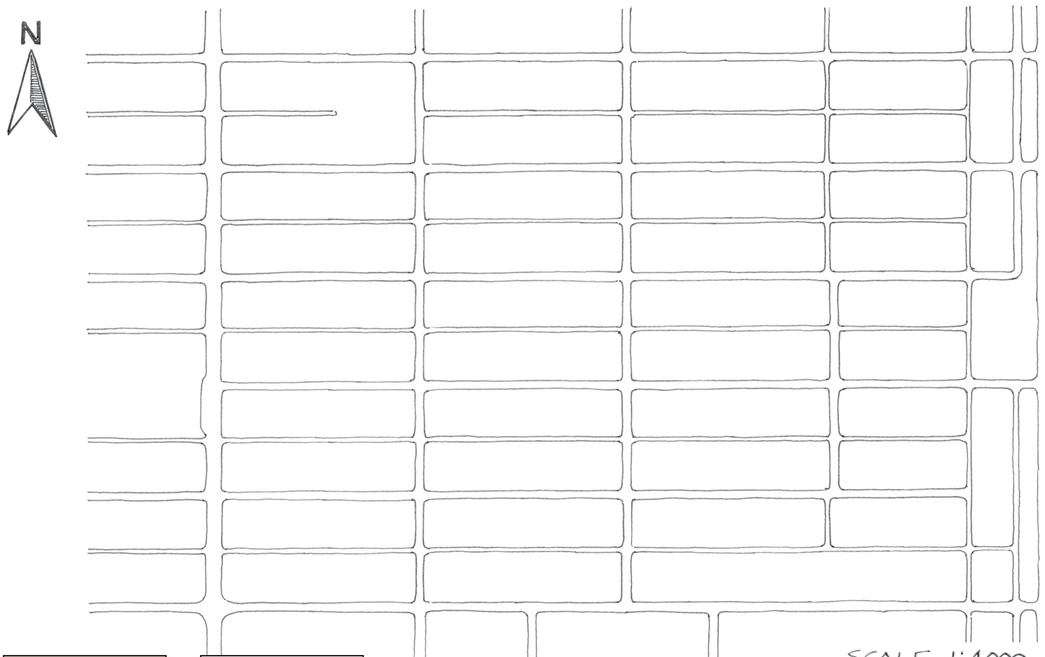
The Mill Creek Ravine lies immediately west of the community. It is there the Edmonton, Yukon and Pacific Railway carried passengers between Strathcona and Edmonton from 1902 to 1929. The tracks were later converted to walking paths, including the historic trestle bridge crossing the ravine.

The north edge of the neighbourhood is bounded by Whyte Avenue, which was the main street and commercial hub of the City of Strathcona. The western portion of the Whyte Avenue area (on the other side of Mill Creek Ravine) is home to the largest collection of historic buildings in the city and in 2007 it was declared a provincial historic site. Today it continues to be a vibrant retail district with independent shops, restaurants and bars and is the site of several summer festivals.

Sources: City of Edmonton, 2006e; Wyatt, n.d.



Connectivity

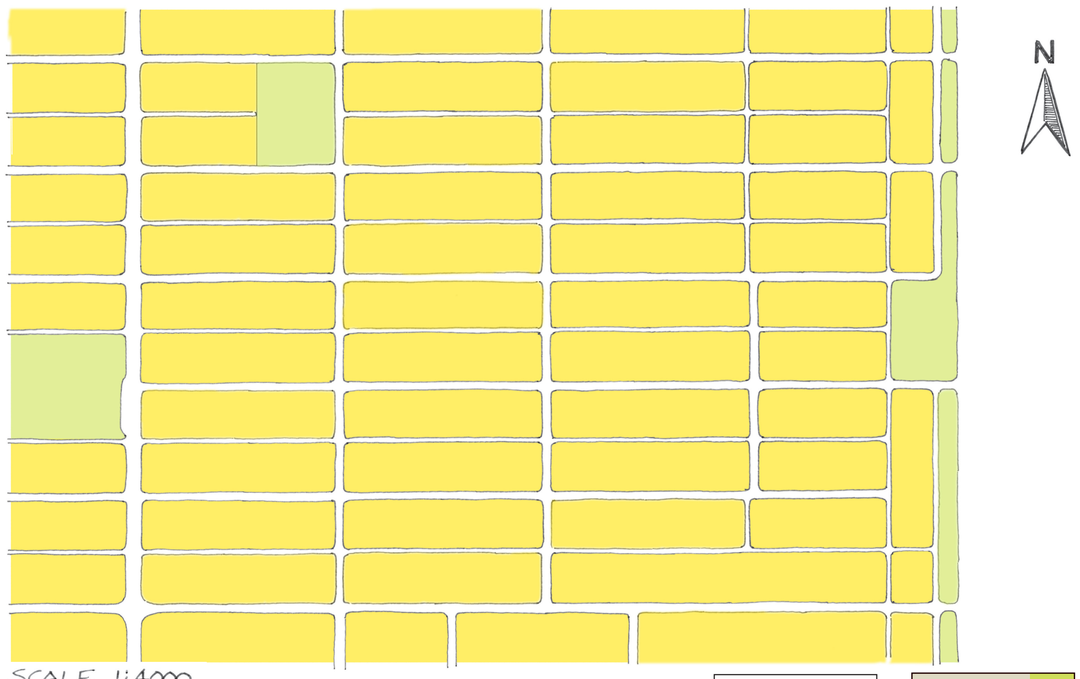


connectivity

72

percent

Land Use

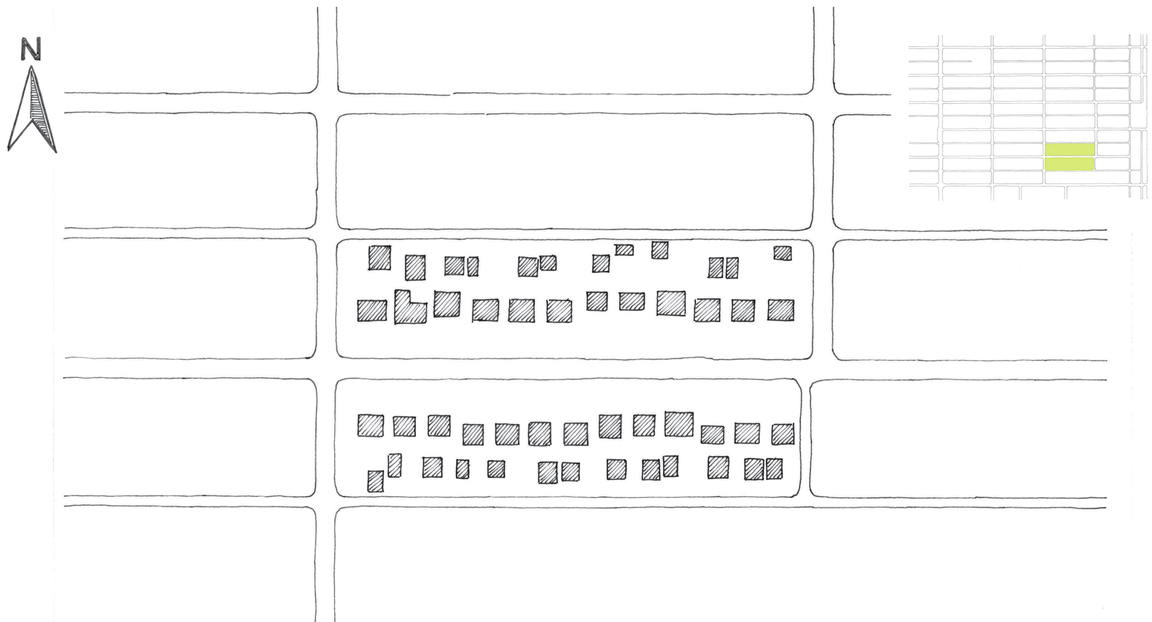


open space

7.4

percent

Density

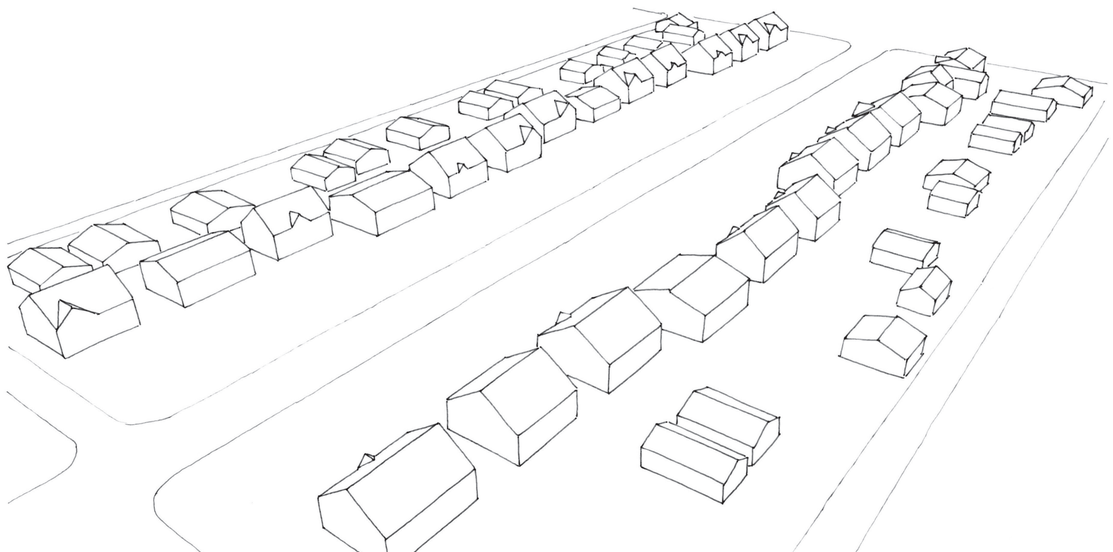


density

16.5

units/ha

Massing



floor area ratio

0.19

FAR

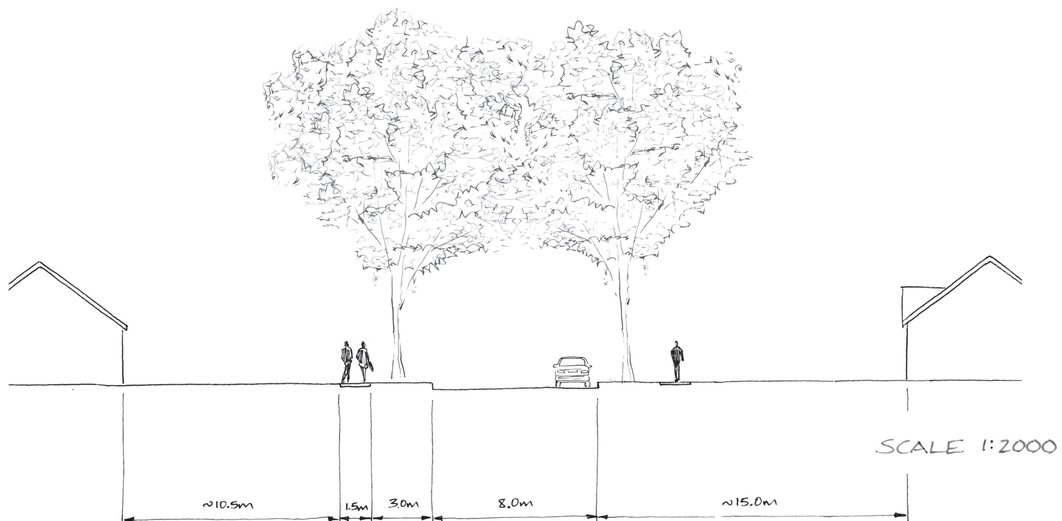
Housing Typologies

living area

1,170

saqure feet

Street Section



street use

47|35|18

road|blvd|ped

Lendrum Place

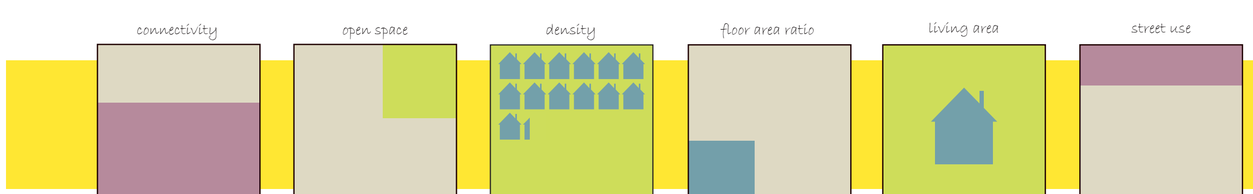
Context

The Lendrum area was once a slough known as Third Lake. In the 1940s it was drained by creating irrigation ditches that ran along the University of Alberta's farmland.

The streets are laid out in a modified grid pattern (at the time, winning an urban design award). The majority of housing in Lendrum was developed in the 1960s.

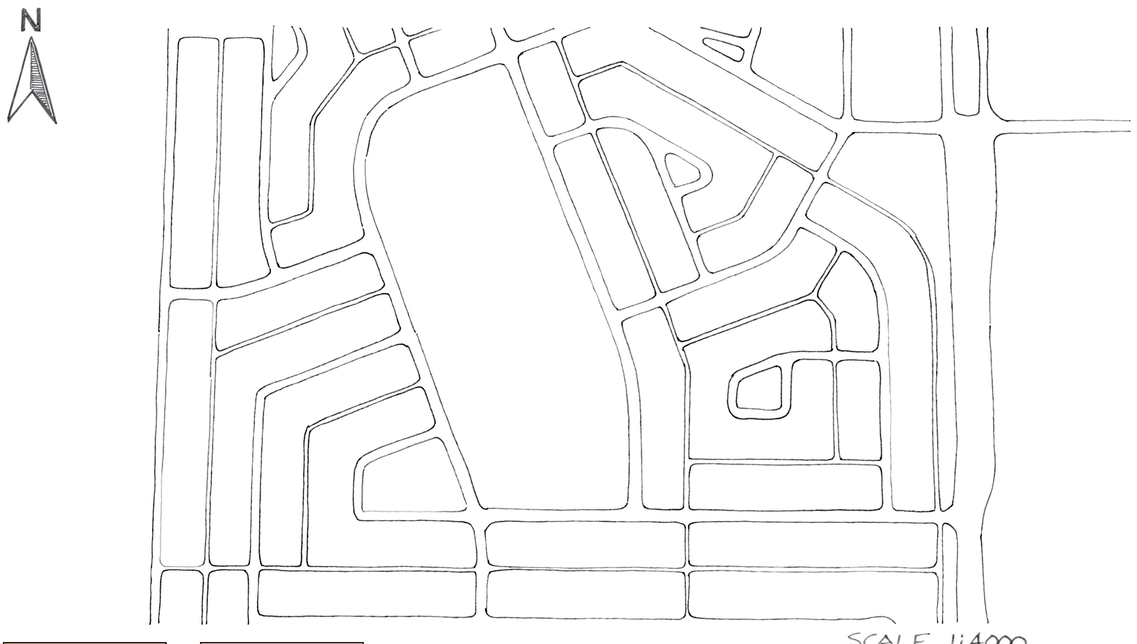
Today the neighbourhood still sits adjacent to the University farm. It is served by a local strip mall and has school and community facilities located in a central green area.

Sources: City of Edmonton, 2006f, and n.d. a, Faurschou, 2010



Lendrum Place

Connectivity



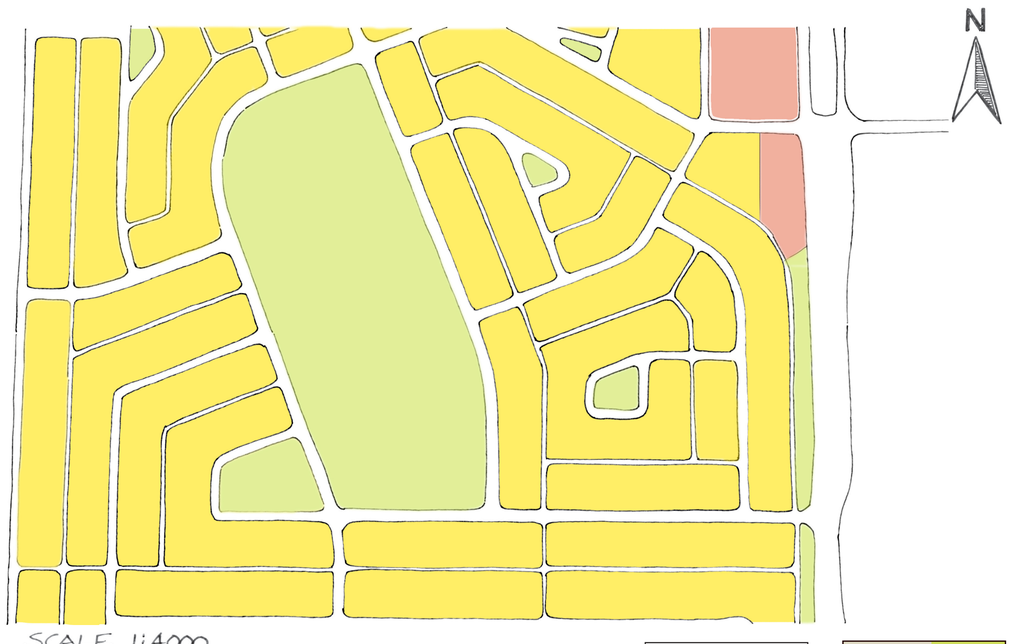
connectivity

64

percent

Lendrum Place

Land Use



open space

20.5

percent

Lendrum Place

Density

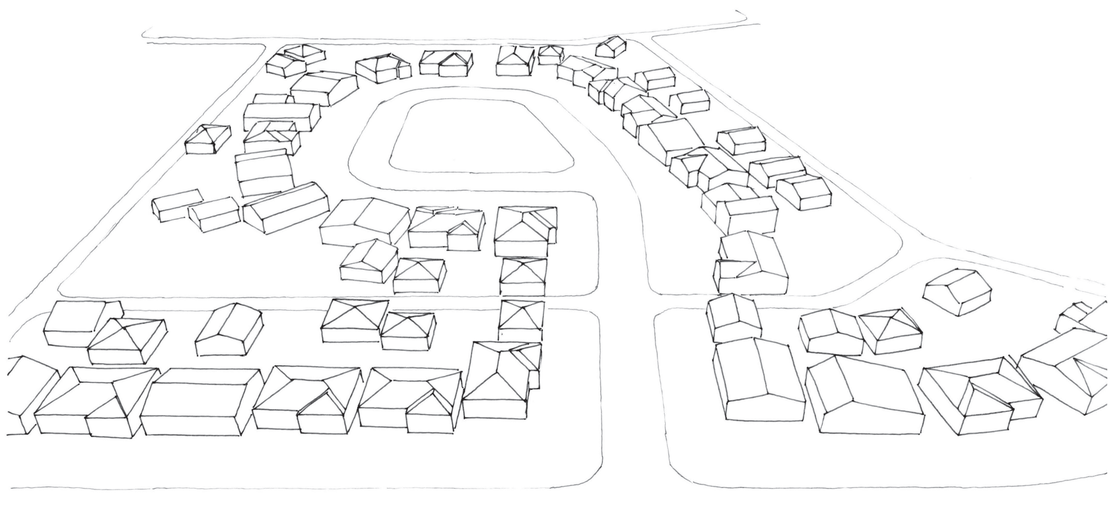
density

13.3

units/ha

Lendrum Place

Massing



floor area ratio

0.16

FAR

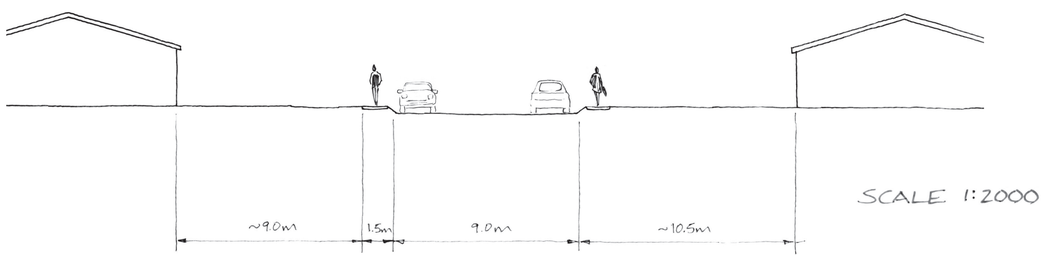
Housing Typologies

living area

1,220

sqaure feet

Street Section



street use

75|0|25

road|blvd|ped

Caernarvon

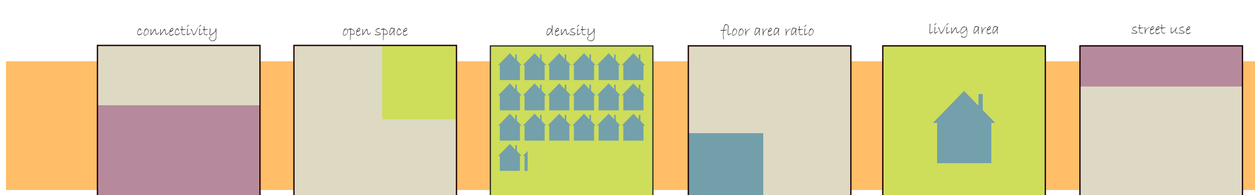
Context

Before being annexed in 1971, Caernarvon was made up of rural and semi-rural land used mostly for agriculture. Caernarvon was developed as part of the larger Castle Downs community, beginning in the early 1970s (73 percent of current homes remain from this era) and continuing into the 1980s.

The streets are laid out in a hierarchy, separating local roads from collector and distributor roads. The collector roads can generally be accessed within 305 m of local roads. As per the Castle Downs Outline Plan, neighbourhood amenities (including schools, churches, commercial and multi-family residential uses) are centrally located and are adjacent to a collector road.

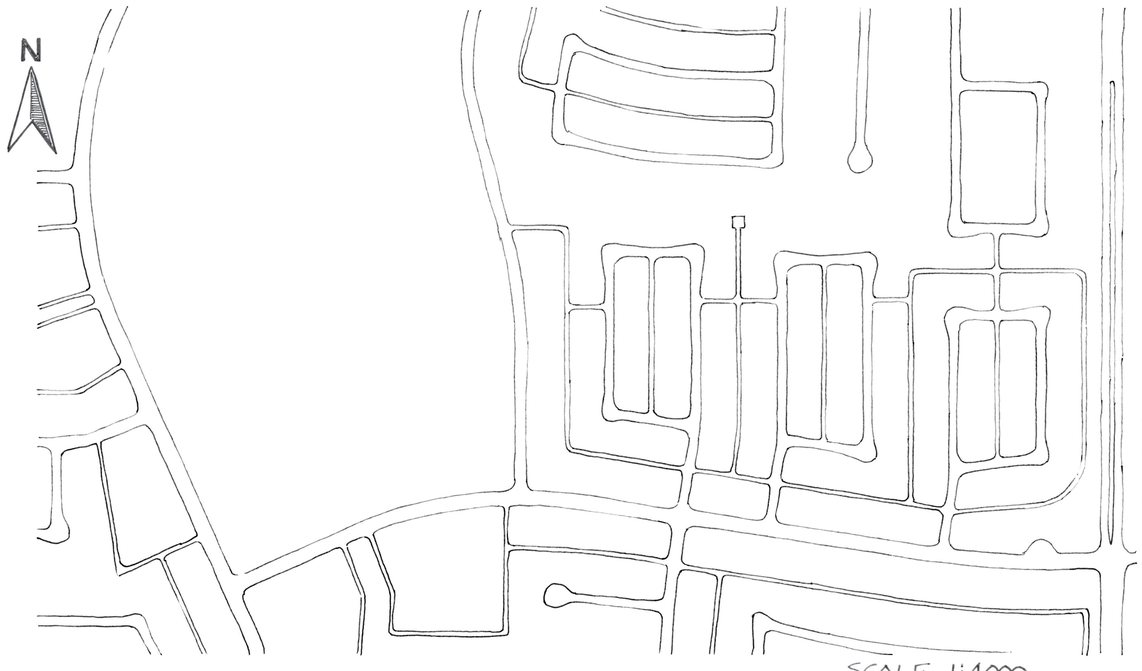
The plan also ensured all areas had access to bus routes within 400 m, with bus stops located next to community amenities. However, the original plan recognized that ridership potential was low due to the lengthy trip times to the city core.

Sources: City of Edmonton, 2006a, and 2006b



Caernarvon

Connectivity



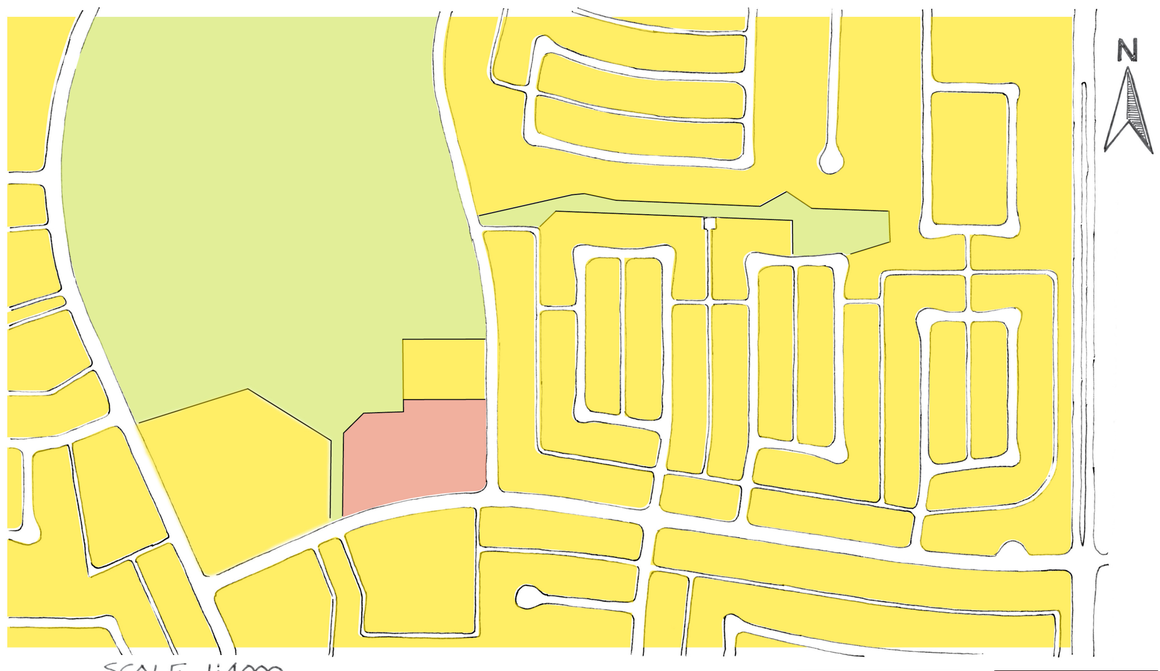
connectivity

63

percent

Caernarvon

Land Use



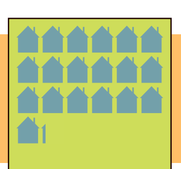
open space

20.7

percent

Density

SCALE 1:1500

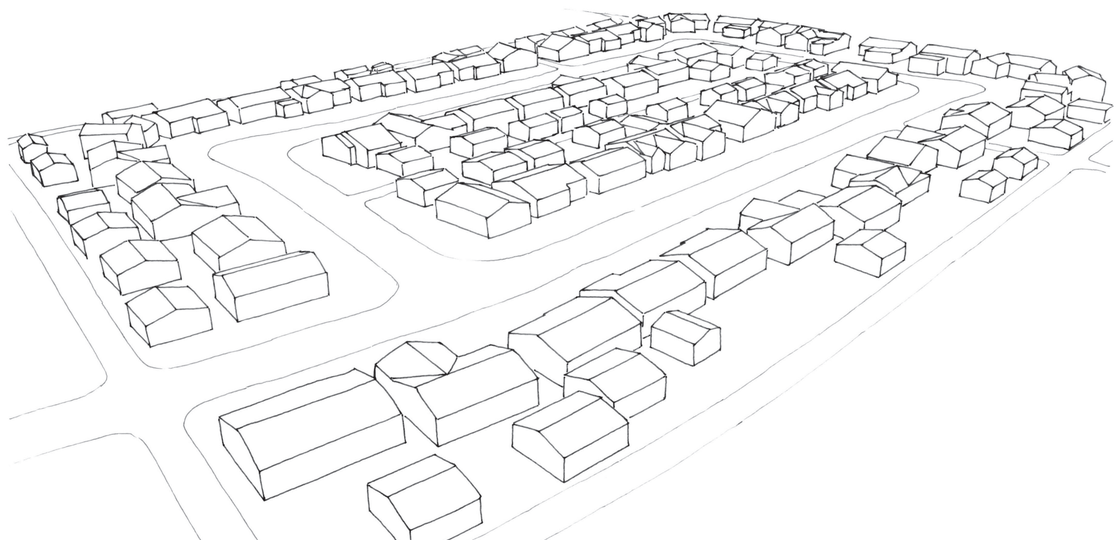


density

19.2

units/ha

Massing

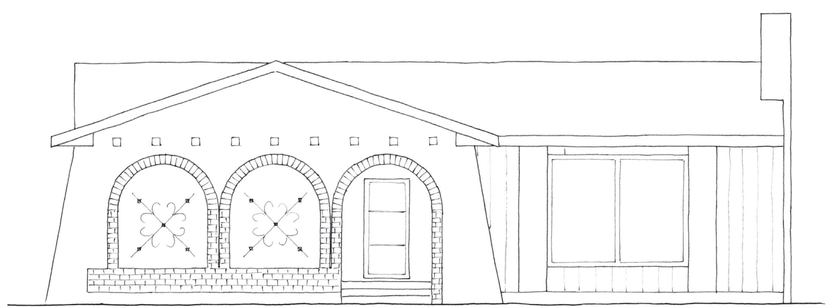


floor area ratio

0.21

FAR

Housing Typologies

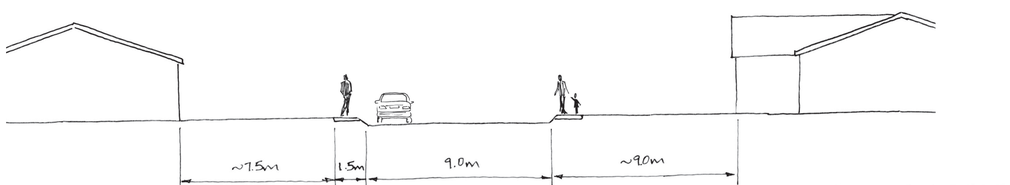


living area

1,130

sqaure feet

Street Section



street use

75|0|25

road|blvd|ped

Crawford Plains

Context

Crawford Plains was developed in the 1980s as part of the larger Mill Woods community. According to the 1971 Mill Woods plan, it would be "in its own right – a city in a suburban environment" and had "the potential...of becoming a showpiece of new urban growth" (City of Edmonton, 2009).

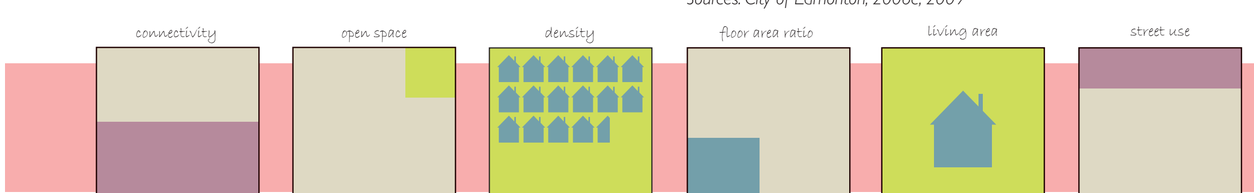
Mill Woods is a unique community that was assembled as a land bank by the Province and the City of Edmonton in an attempt to counter rising land prices and provide affordable housing. Additionally, it secured land for one of the City's major transportation corridors.

Before it was developed, Mill Woods was mainly a rural area. Its development was a departure for the city which, up to this point, had mainly developed along the North Saskatchewan River.

The original plan was developed by the City's planning department, which purported that "Many successful elements of new town philosophies were evaluated, and adapted before they were incorporated into the Mill Woods Development Concept" (City of Edmonton, 2009).

The plan recognized the relative isolation of this new development and therefore included "an intense urban core incorporating high density developments. (City of Edmonton, 2009)." This core developed into the Mill Woods Town Centre mall. The community is served by a hierarchy of roadways: arterials to move in and out of Mill Woods, looping collectors to connect the sub-neighbourhoods and town centre as well as local roads.

Sources: City of Edmonton, 2006c, 2009



Crawford Plains

Connectivity

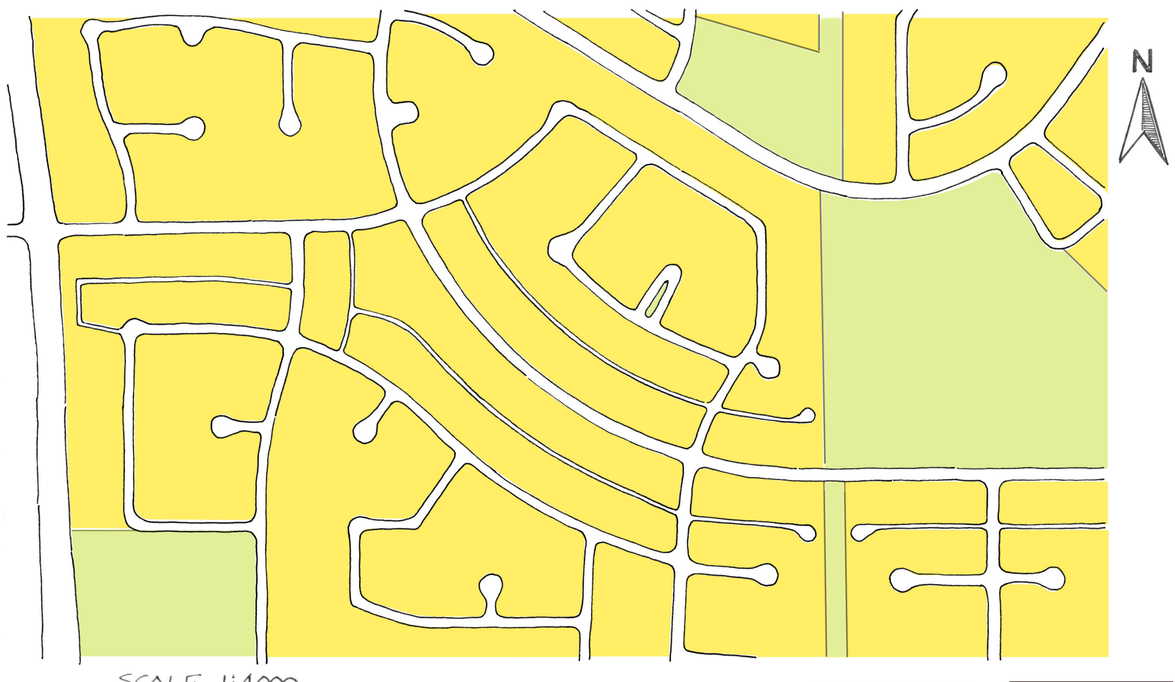
connectivity

54

percent

Crawford Plains

Land Use



open space

9.5

percent

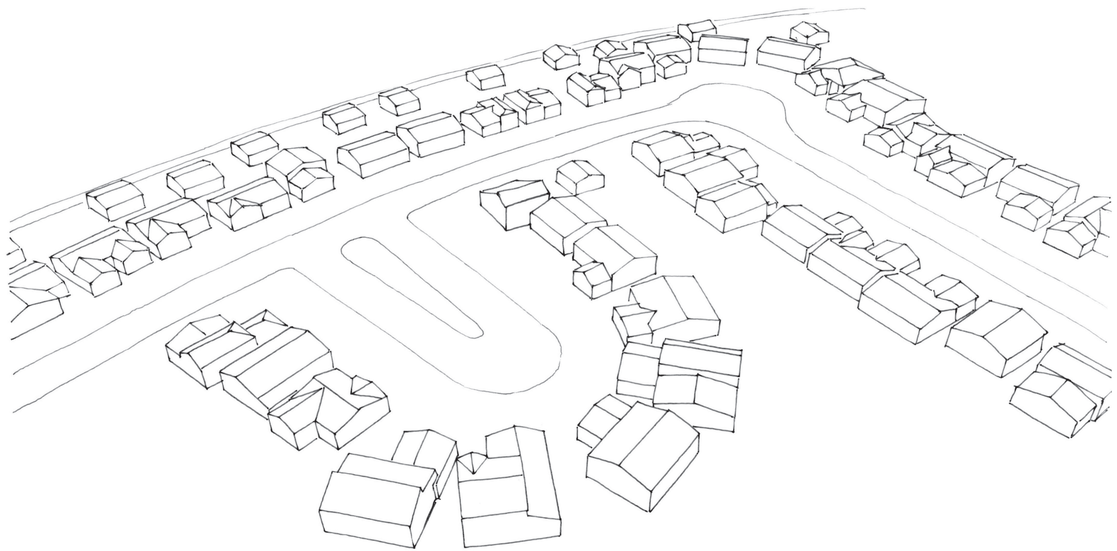
Density

density

16.6

units/ha

Massing



floor area ratio

0.20

FAR

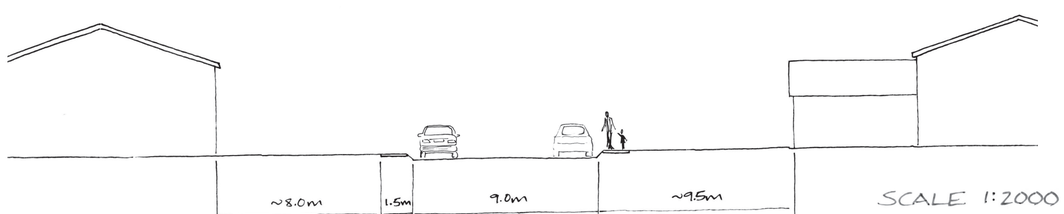
Housing Typologies

living area

1,210

saaure feet

Street Section



street use

75|0|25

road|blvd|ped

Twin Brooks

Context

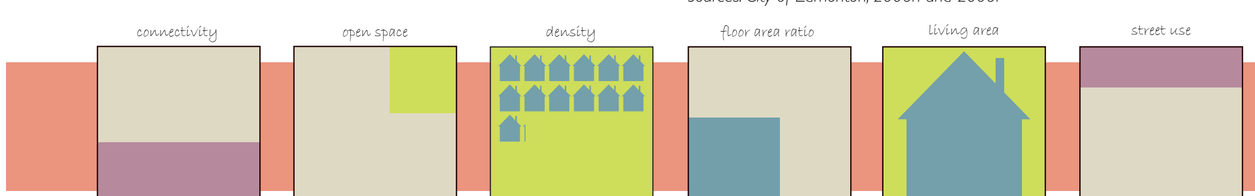
A wedge-shaped area between Blackmud Creek and Whitemud Creek ravines, the Twin Brooks area was annexed into the City in 1980. While development began in the 1980s, most houses were constructed in the 1990s.

Twin Brooks is primarily a single-family home neighbourhood; 85% of units are single-detached houses. According to the NASP, this area was purposely developed with low-density housing due to consumer preference for detached housing and low demand for multi-family housing in south Edmonton.

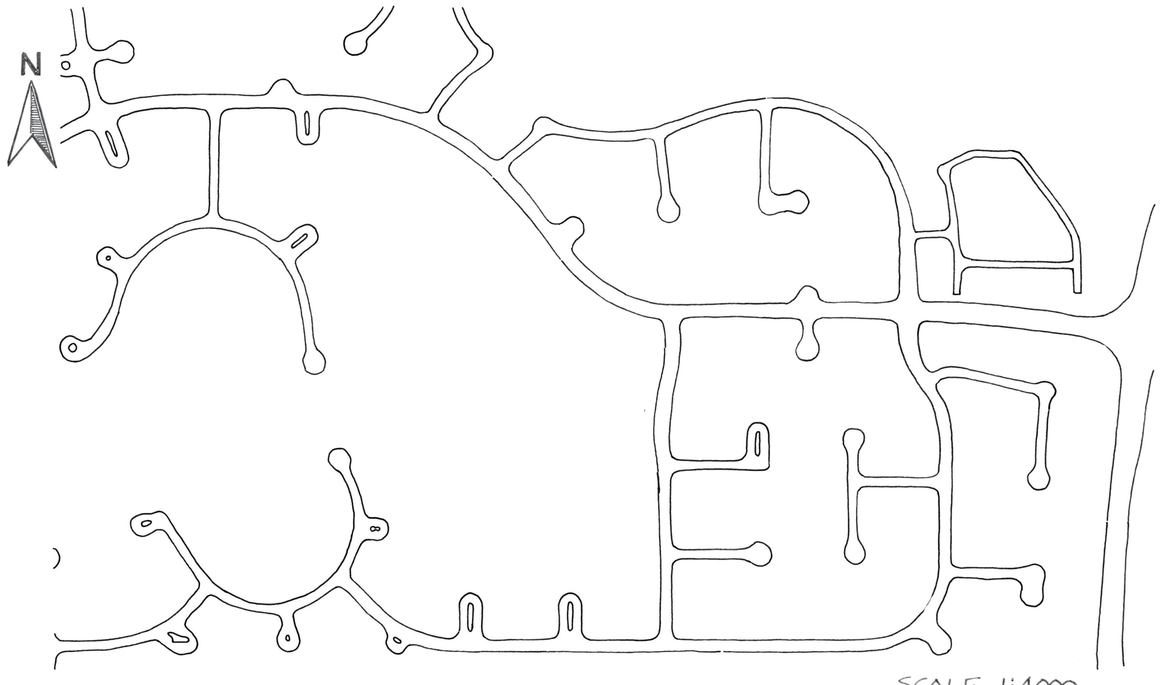
The road layout is based on a hierarchy of local, collector and arterial roads. Within the neighbourhood, streets are patterned so through-traffic is concentrated on major roadways and off local roads. To further minimize "unwanted" traffic on local streets, the neighbourhood commercial area was placed at the east edge of the community. It is adjacent to the arterial road, providing the only point of vehicle access.

Twin Brooks has generous open spaces in addition to ravine areas framing the neighbourhood. A joint school park site is centrally located to minimize walking distances. Originally, two schools were planned for the site, but only one has been developed. The neighbourhood also has a stormwater pond with a small passive park, and a linear park corridor which lies over a gas line right of way. Top of bank walkways and a district park were also created with the development of Twin Brooks.

Sources: City of Edmonton, 2006h and 2006i



Connectivity

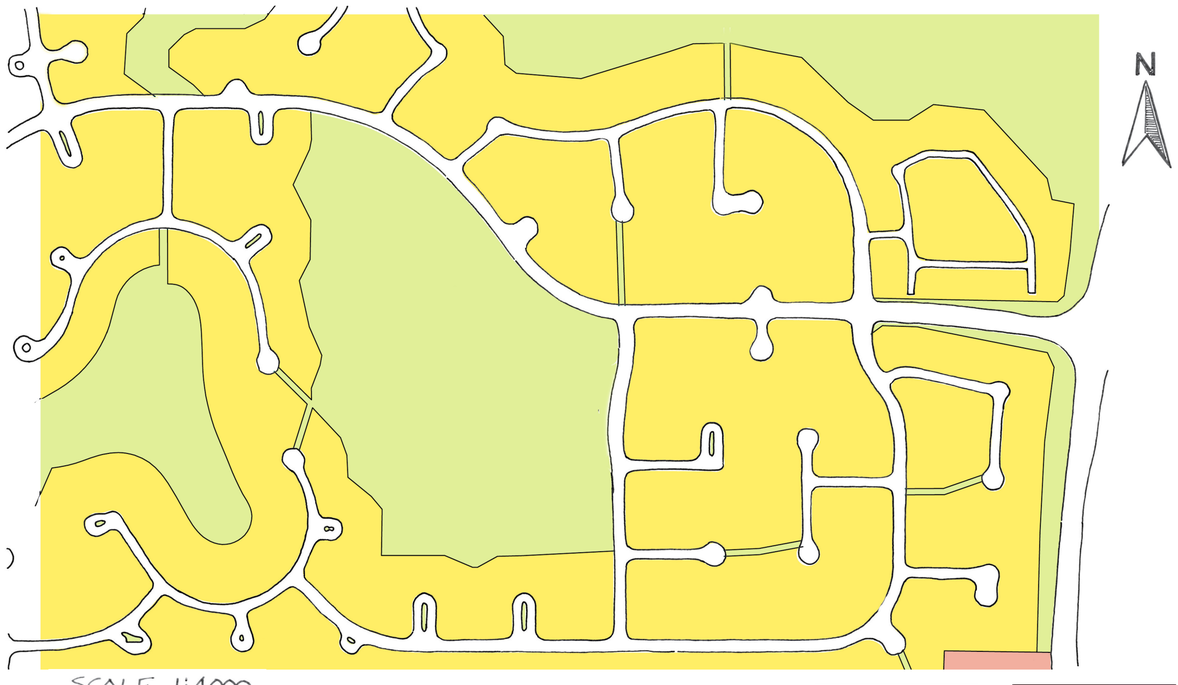


connectivity

41

percent

Land Use



open space

16.9

percent

Density

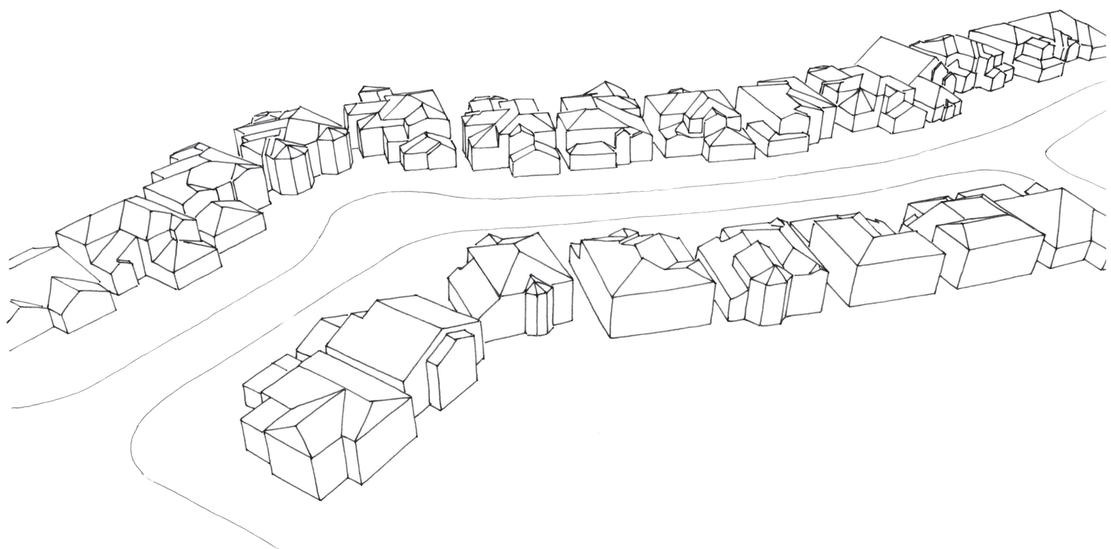
SCALE 1:1500

density

13.1

units/ha

Massing



floor area ratio

0.31

FAR

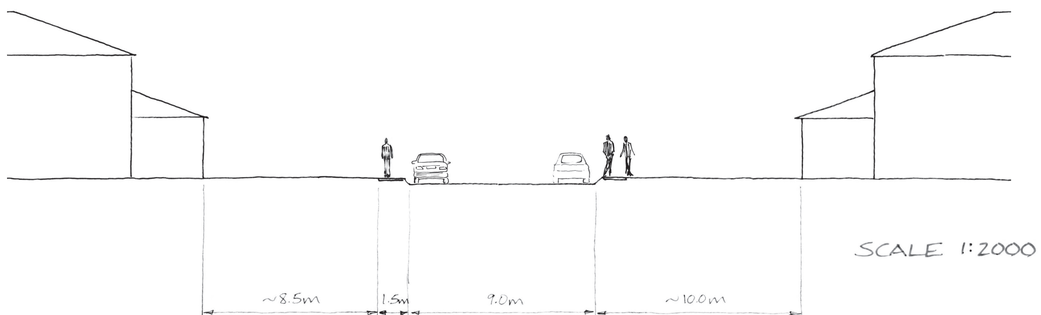
Housing Typologies

living area

2,410

sqaure feet

Street Section



street use

75|0|25

road|blvd|ped

Terwillegar Towne

Context

Developed in the 1990s, Terwillegar Towne was planned as Edmonton's first New Urbanist/neo-traditional neighbourhood. One of the primary goals of this plan was a "focus on ways to return to town planning design principles that reintroduce the people back to the streets."

Compared to typical suburban developments from this era, the streets are patterned to disperse traffic, roads are narrower and curb radii are decreased. Additionally, back lanes and planted boulevards within the road right-of-way have been reintroduced to the road network. Houses are placed closer to the street, garages are de-emphasized or placed at the back, and all the buildings are required to follow an "Olde Towne" themed architectural guideline. The neighbourhood also offers a wider range of low and medium density housing types.

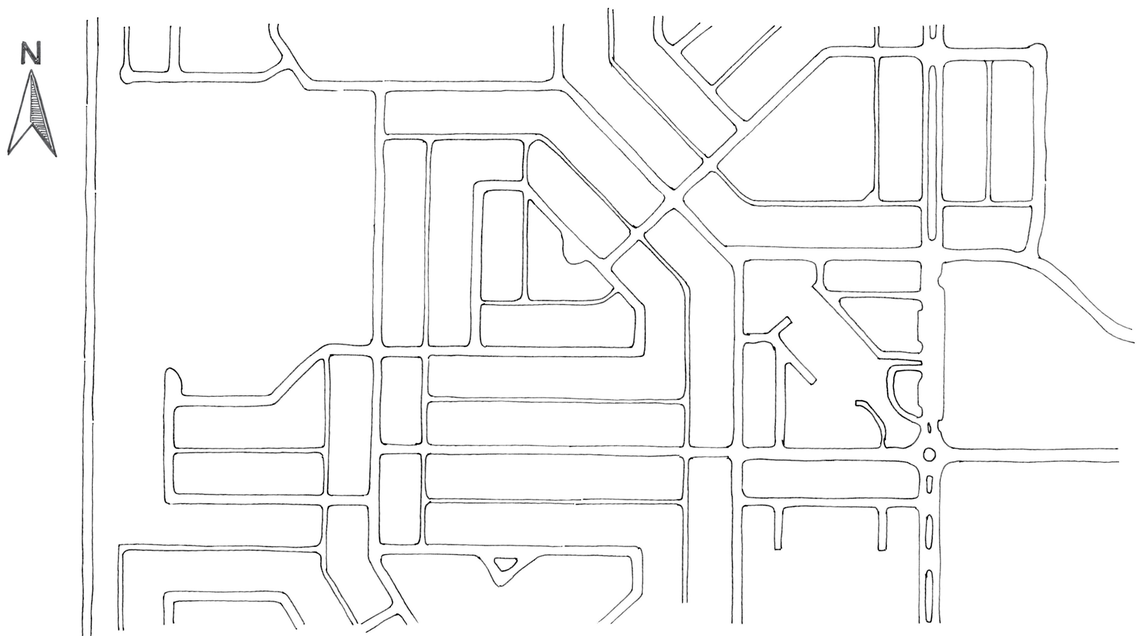
Overall the roads are oriented towards a "Towne Square" and other neighbourhood nodes. The Towne Square is zoned as mixed-use and is located to maximize accessibility for non-motorized traffic and transit.

A variety of smaller open spaces are also dispersed throughout the neighbourhood in addition to a school/park site and a stormwater pond.

Sources: City of Edmonton, 2004 and 2006g

Terwillegar Towne

Connectivity



SCALE 1:4000

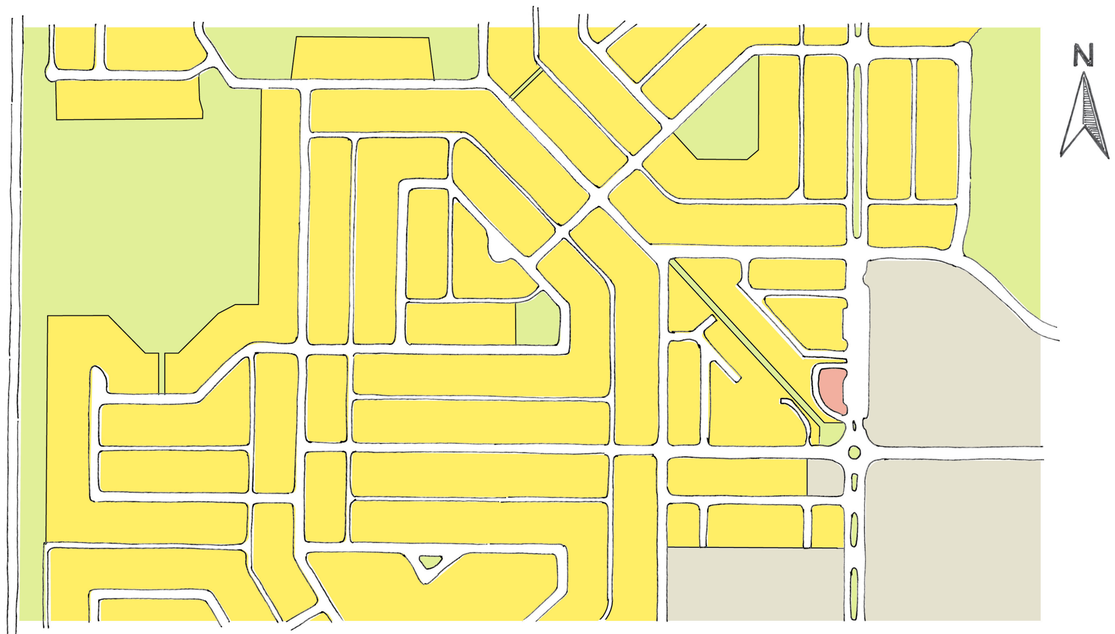
connectivity

56

percent

Terwillegar Towne

Land Use



SCALE 1:4000

open space

21.7

percent

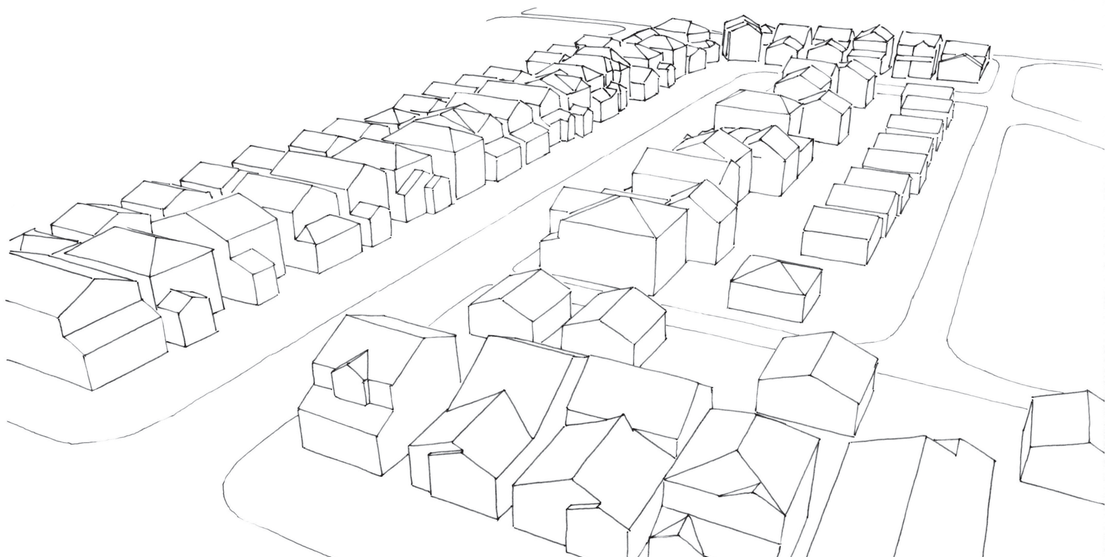
Density

density

27.4

units/ha

Massing



floor area ratio

0.34

FAR

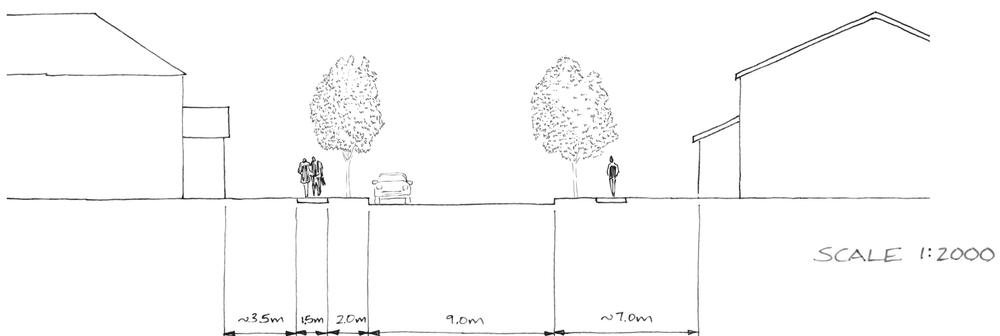
Housing Typologies

living area

1,270

saqure feet

Street Section



street use

56|25|19

road|blvd|ped

The Hamptons

Context

Prior to development, The Hamptons area was used primarily for agriculture. Development began in the early 2000s.

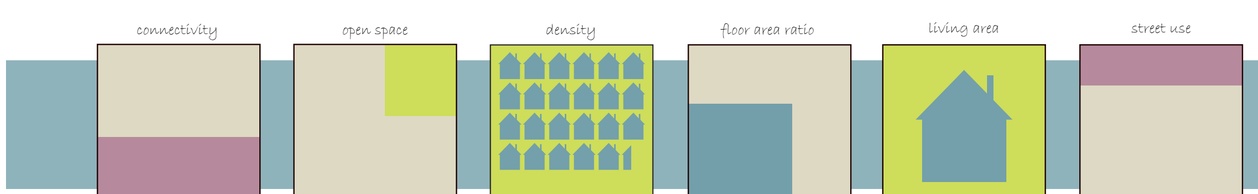
The Hamptons is bounded on all sides by arterial roads. It sits in between the Enoch Cree Nation Reservation to the west and the City's Transportation Utility Corridor to the east.

The neighbourhood is served by looping collector and local roads.

There are large open spaces within the community, including both wet and dry stormwater ponds.

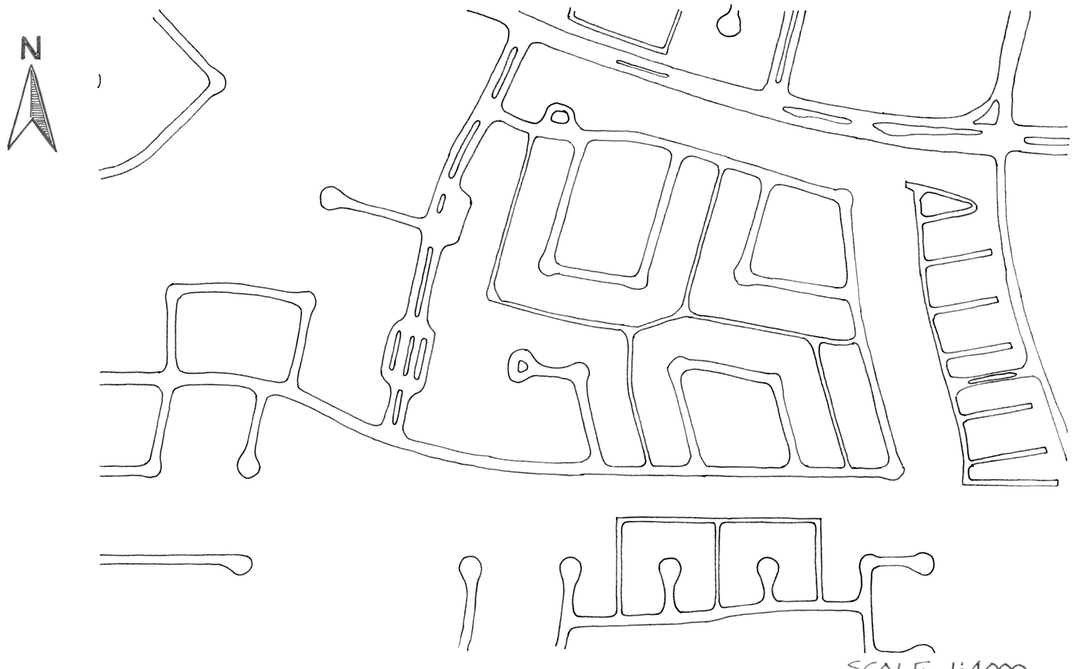
A small commercial area sits at one entrance to the neighbourhood, and a larger one is located in the adjacent neighbourhood to the north.

Sources: City of Edmonton, 2006d and 2007



The Hamptons

Connectivity



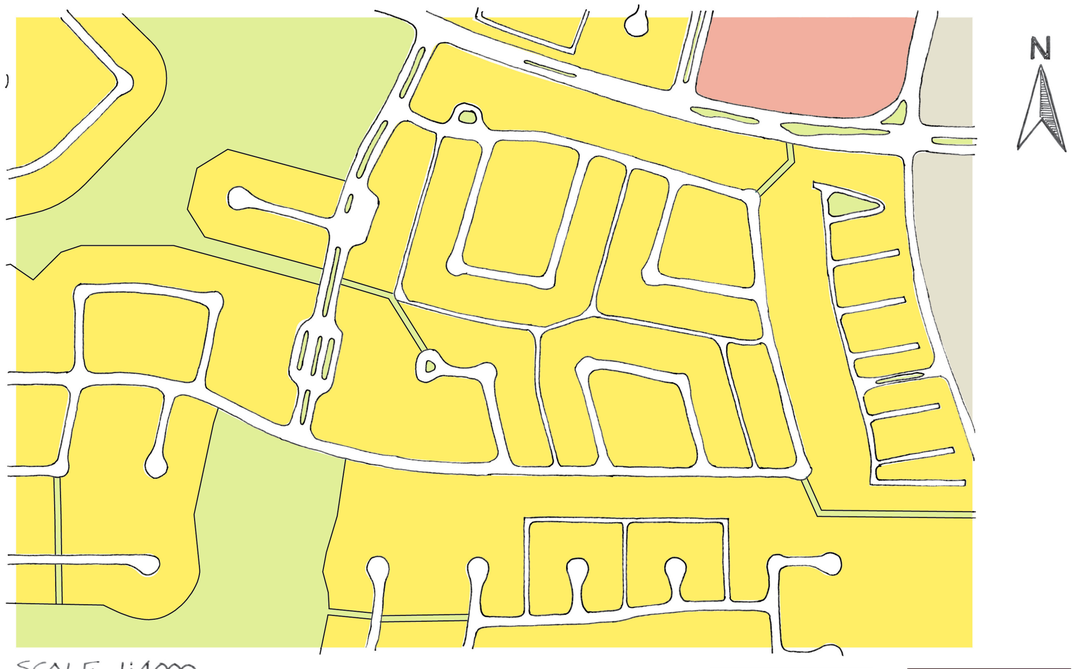
connectivity

43

percent

The Hamptons

Land Use

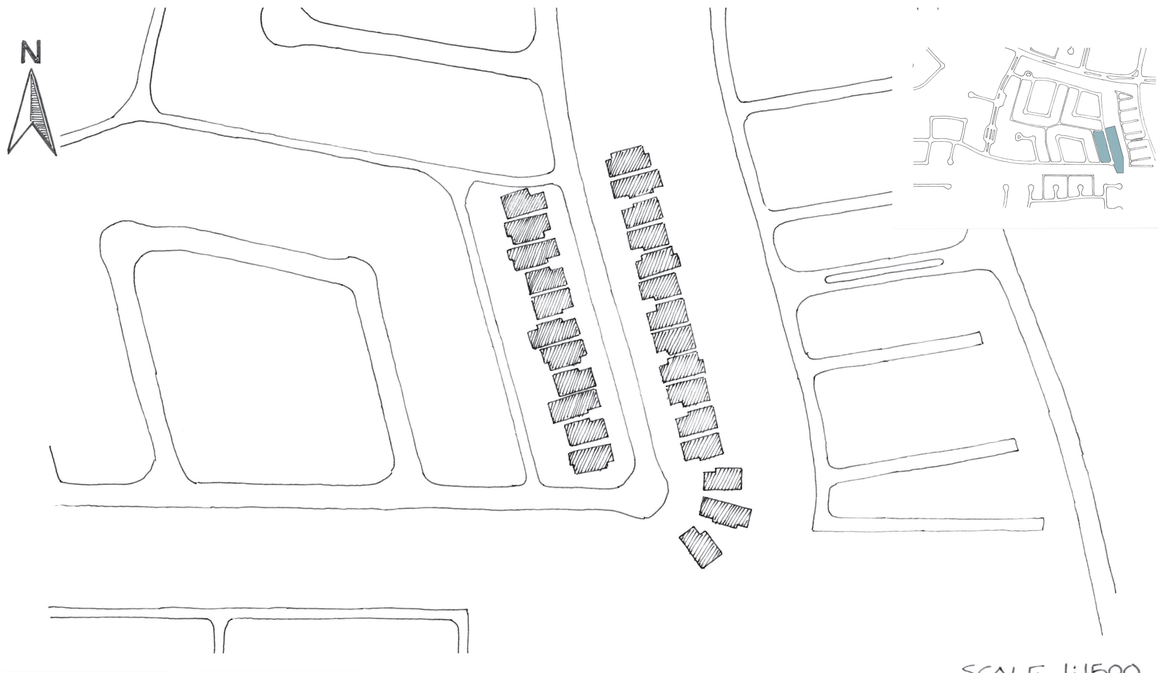


open space

19.5

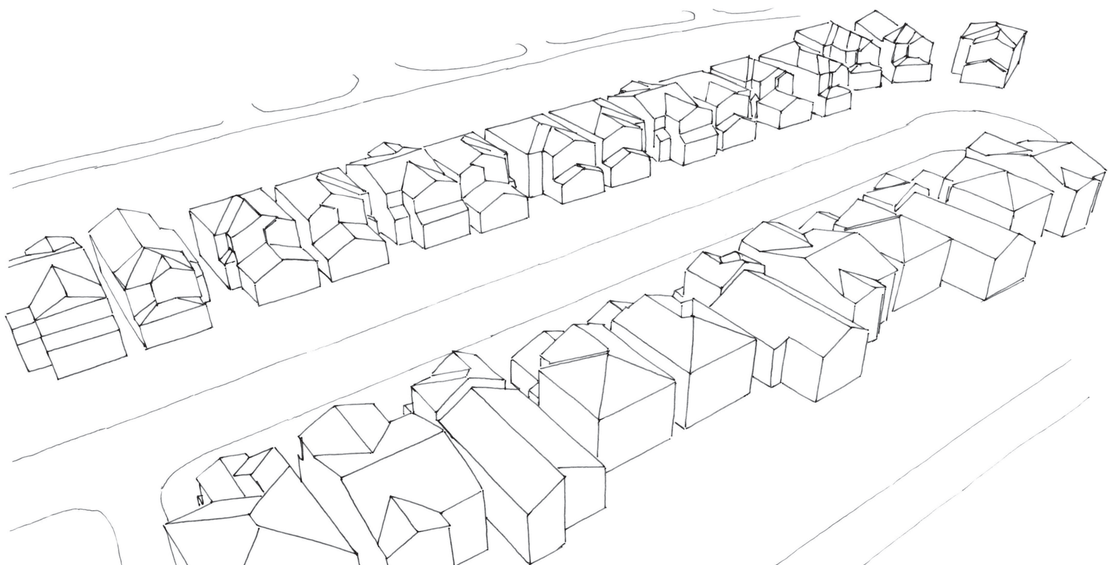
percent

Density



density
23.4
units/ha

Massing



floor area ratio
0.41
FAR

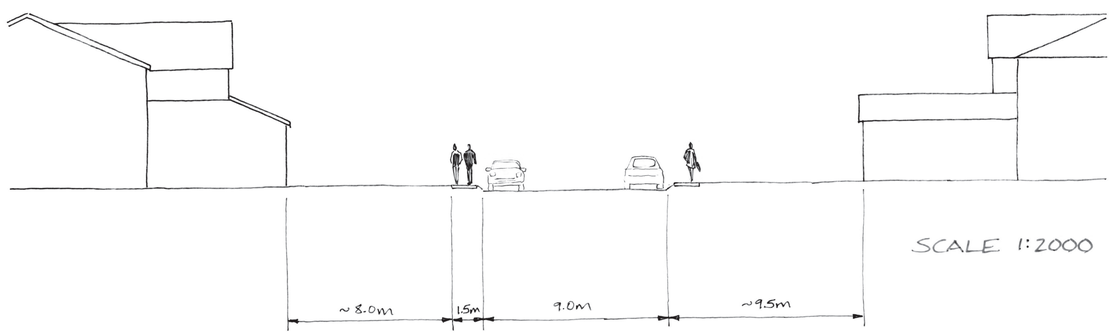
Housing Typologies

living area

1,760

sqaure feet

Street Section



street use

75|0|25

road|blvd|ped

Analysis

Analysis

Connectivity

The grid patterns of Westmount and King Edward Park streets are clearly the most connected. From that point on until the 1990s the streets became successively less grid-like and more hierarchical - following the same trends as many North American cities. Additionally, back lanes were phased out between the 1960s (Lendrum Place) and the 1990s (Twin Brooks) as front attached garages became more common.

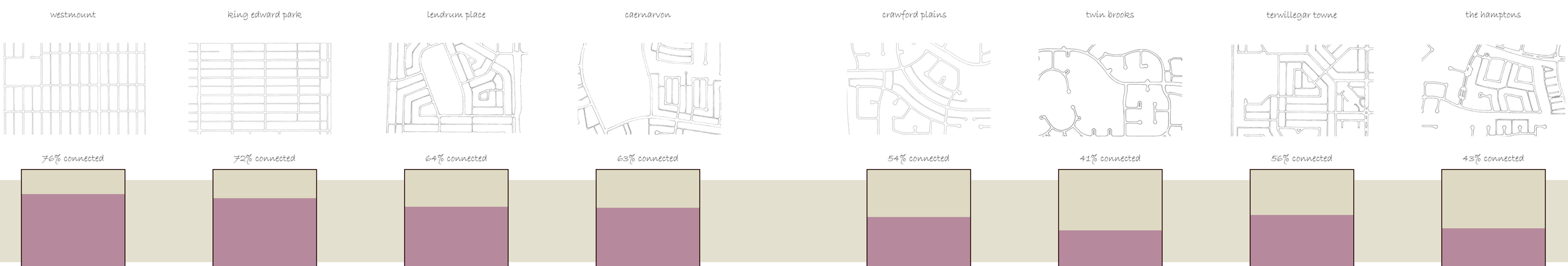
Edmonton first lost its grid when the City hired its first planner, Noel Dant, in 1949. Although many streets had already been surveyed in grid patterns during speculation between 1912 and 1914 and lay waiting for development, the sudden rise in automobiles led Dant to design cul-de-sacs and crescents to keep traffic out of residential neighbourhoods.

In more recent neighbourhoods, such as The Hamptons and particularly Terwillegar Towne, there is a recognition for the need for better connectivity. Therefore, to varying degrees their street patterns are hybrids that reach back to earlier times.

In recognition for the need for connectivity, particularly for walking, the newer neighbourhoods often include pedestrian-only walkways.

Although the benefits of connected streets are well documented, the market for curvilinear roads and cul-de-sacs is still strong. People want the privacy of cul-de-sacs, where traffic won't shortcut through their neighbourhood. People are often not aware however, of the design tools that can address these concerns without reducing connectivity. A host of traffic calming measures can dissuade traffic from entering a community, and need not be restricted to annoying speed bumps. Planted traffic circles and curb bulbs, for example, slow traffic, while greening the community, improving aesthetics, and building community pride.

Another possible solution is the fused grid, which allows communities access to the best of both worlds. Fused grids are transportation networks where pedestrian routes are relatively more direct than vehicles routes. With fused grids people can still live in cul-de-sacs yet have the benefit of well-connected, car-free cycle and pedestrian paths (CMHC, 2008).



Land Use

Typical of most suburban communities, all of the neighbourhoods are comprised mainly of residential uses. Each of the neighbourhoods also has access to varying amounts of green space and commercial amenities.

In the grid communities, commercial uses are concentrated along arterial roads: 124th Street in Westmount and Whyte Avenue in King Edward Park. However, while 124th Street is a pedestrian-oriented area, with storefronts sitting right up to the sidewalk, the eastern portion of Whyte Avenue that bounds King Edward Park is more car oriented with strip malls with small parking lots in front. Much of the charm of the historical portion of Whyte Avenue to the west, is lost by this time. Another difference is that 124th Street runs through Westmount, while Whyte Avenue is at the edge of King Edward Park.

The grid-less communities also have local commercial areas, but they tend to be much more auto-oriented strip malls and plazas. Additionally, with the exception of Caernarvon and Terwillegar Towne, these commercial areas are located at the entrances of the neighbourhood, which allows for quick vehicle access, but does not provide a center point for the communities.

The offerings of the commercial areas also vary. While 124th Street in Westmount was originally a local serving retail area where residents could supply their daily needs, it could not compete with the development of the Westmount Mall in 1955. The retail strip declined and was replaced with offices. Today the area is being revitalized and the street now offers retail uses once again; however, instead of providing daily amenities, the stores offer more unique, destination shopping.

The later neighbourhoods generally provide more local-serving amenities, but they generally lack full services such as grocery stores and pharmacies. The newest neighbourhoods offer very little in terms of commercial space. Twin Brooks only has a gas station, and to-date Terwillegar Towne and The Hamptons each have a single convenience store. Daily needs are met instead at large power centers or shopping malls.

While local commercial space has generally declined, neighbourhood open space has by-and-large significantly increased over time. This change may be attributed to several factors: neighbourhood location, development philosophy at the time and City requirements.

Older neighbourhoods, such as Westmount and King Edward Park have generally developed next to the river valley and the city's many ravines, providing an abundance of natural park space. This is also the case for Twin Brooks, although it is a newer community.

Suburban planning models had a strong emphasis on open space which is seen in the large central green areas in the neighbourhoods developed after the 1950s.

More recently, the City has developed more generous park area requirements. New neighbourhoods must dedicate ten percent of land to parks and open space. New developments are also required to capture and treat runoff onsite with stormwater management ponds, providing additional access to open space.

Density

Because the blocks are all comprised solely of single-family housing, dwelling densities are all low. The densities are relatively consistent, with no discernable pattern, with the exception of Terwillegar Towne and The Hamptons, which achieved the highest densities.

The variations in density are directly correlated to lot size. At an average of approximately 3,700 square feet, the Terwilllegar Towne block has significantly smaller lot size than the other neighbourhood blocks. The blocks with lowest density, Twin Brooks and Lendrum Place have average lot areas of 7,800 square feet and 7,700 square feet, respectively.

The small lots/high densities in Terwillegar Towne and The Hamptons might be a consequence of rising land prices in the City as well as a recognition that higher density communities are more efficient.

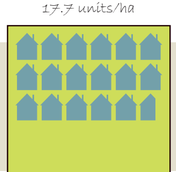
Although communities tend to resist density, the need for more efficient development is becoming inevitable as cities struggle to sustain sprawling infrastructure. An aversion to density often stems from misconceptions. As Jane Jacobs (1993), points out, there is a need to distinguish between density, diversity and overcrowding.

Furthermore, density can take on a variety of forms; it does not need to be a high-rise or a large monolithic building. Even the density in The Hamptons is not a pleasing form despite being detached houses. It is what Julie Campoli and Alexis MacLean (2007) might refer to as "dense sprawl." Although, part of the problem might be the housing style itself, as well as its uniformity, this form of higher density can feel claustraphobic and stifling.

Although, it was not specifically looked at in this study, each of the neighbourhoods has some higher density forms: mostly low-rise and walk up apartments, townhouses and duplexes. In older neighbourhoods, Westmount, King Edward Park and Lendrum Place, these units are somewhat dispersed in the community. In the later communities however, higher density forms are clustered together and are often inward facing and surrounded with parking.

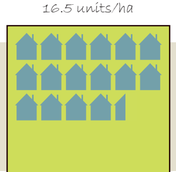
westmount

17.7 units/ha



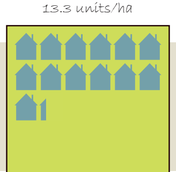
king edward park

16.5 units/ha



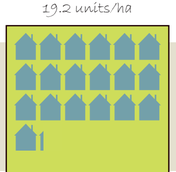
lendrum place

13.3 units/ha



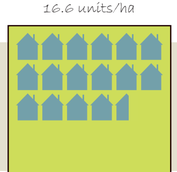
caernarvon

19.2 units/ha



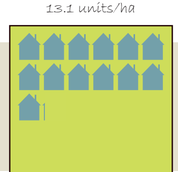
crawford plains

16.6 units/ha



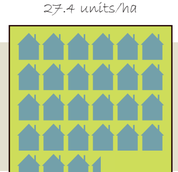
twin brooks

13.1 units/ha



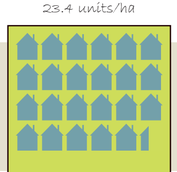
terwillegar towne

27.4 units/ha



the hamptons

23.4 units/ha



Massing

Stepping through the neighbourhoods chronologically we see a definite change in housing massing. Heights shrink and then grow back: from two- and two-and-a-half-storeys in Westmount, to one and one-and-a-half-storeys in King Edward Park, all the way down to one-storeys in Lendrum Place and Caernarvon. In the 1980s there is a turnaround: Crawford Plains has mostly split levels and bi-levels, while Twin Brooks and beyond is predominantly back to two-storeys.

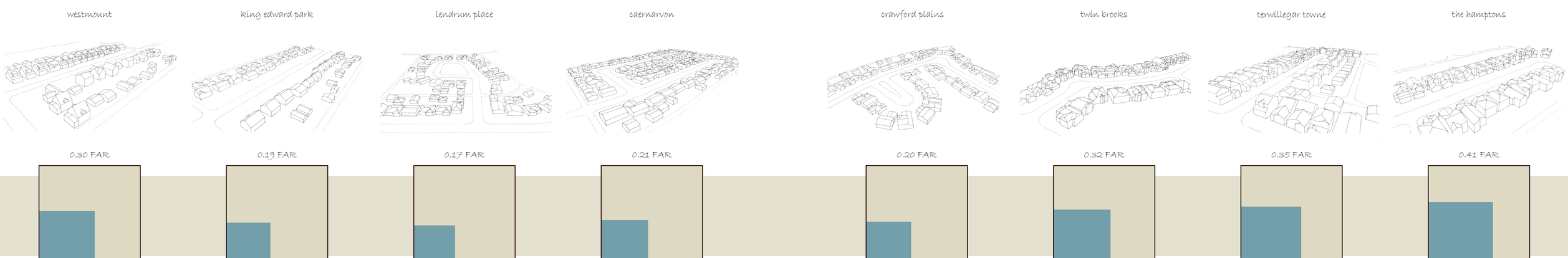
Lot coverage and siting also vary. In Westmount, lot sizes vary significantly as single lots were subdivided speculatively in the early 1900s. In some cases houses are squeezed onto their lots such that they almost touch the building next door. Other lots are spaced widely apart.

King Edward Park has the smallest building footprint (most are roughly 800 square feet) and the longest setback. As such they have expansive front and side yards.

In the following three decades the building footprint changed little at approximately 1,100 to 1,200 square feet.

In the late 1980s and 1990s building footprints exploded as seen in Twin Brooks. From this point on houses tend to maximize their allowable building envelope.

Maximizing building envelope has resulted in the newer neighbourhoods having high FAR. In this case the FAR is not a good indicator of dwelling unit density. For example, Twin Brooks and Terwillegar Towne both have relatively similar FARs; yet these neighbourhoods are very dissimilar. Twin Brooks' high FAR comes from its large built volume, while Terwillegar Towne's comes from having small lots.



Housing Typologies

When driving through Edmonton's neighbourhoods, it was the houses themselves that were perhaps the most telling indication of when the subdivision was developed. According to Avi Friedman and David Krawitz (2002) "trends in housing are subject to history and fashion" (p. ix). They further note that homes "have always been a physical manifestation of the culture, values, and economic status of the people who inhabit them" and "...the home we live in proclaims our social standing and reflects the trends of the time."

Until the 1950s and the proliferation of suburbs, the change in housing styles (as well as the change in households) was gradual. But once post-war suburbs appeared, housing styles changed by the decade, reflecting the style of the times. Additionally, as these suburbs were developed en-masse, houses lost their uniqueness. Often the same few models, with slight variations are repeated. This repetition becomes particularly apparent in newer neighbourhoods, where there has been time to individualize homes.

Many of the older Westmount houses are built in a foursquare or craftsman style.

In King Edward Park there is no attempt to mask the many almost identical, Cape Cod tract-style houses.

In Lendrum Place and Caernarvon, bungalows prevail, and a second look shows that three or four housing models repeat themselves.

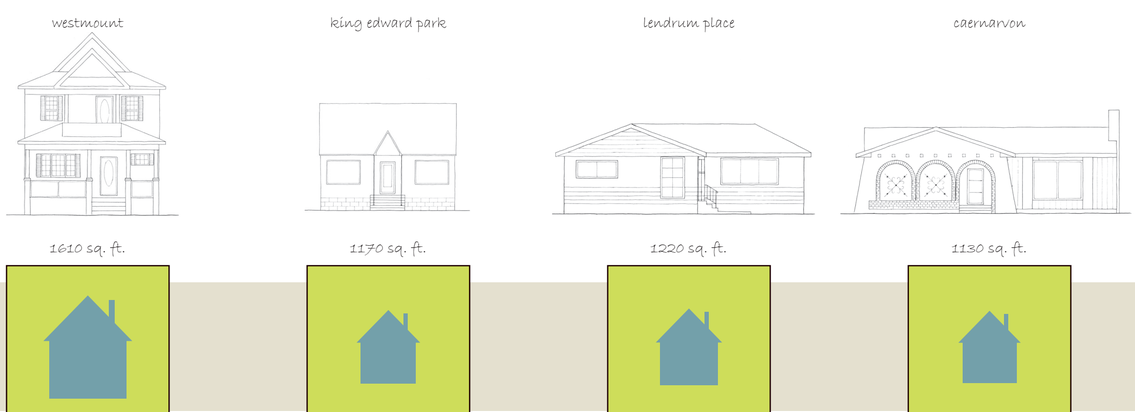
In Mill Woods and Twin Brooks the houses look more distinct from each other but still evidently exude the style of the decade. Many Mill Woods houses are split-level ranch style houses with bow windows.

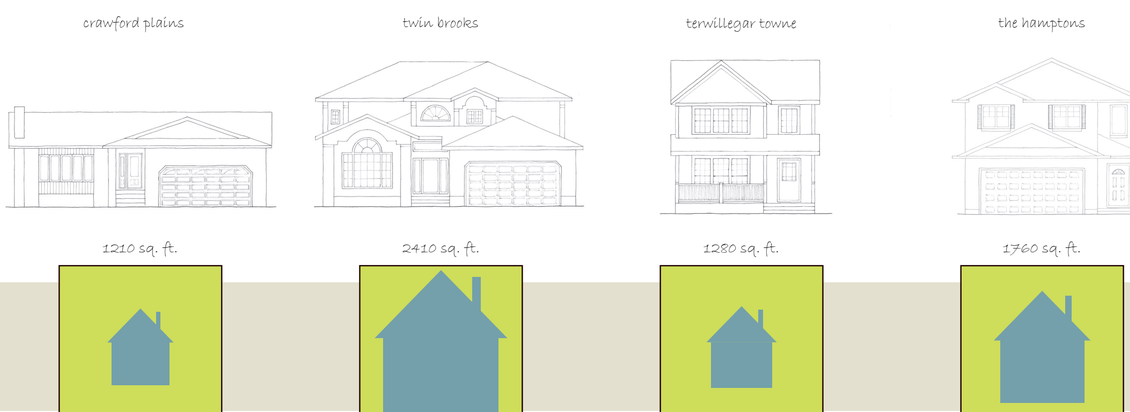
Twin Brooks houses might be considered neo-eclectic. The houses are not identical, but with the widespread use of multiple gables, pseudo-Palladian windows along with stucco, vinyl siding and cedar shakes, the houses manage to look uniform.

In Terwillegar Towne the "Olde Towne" themed houses may have curb appeal, but they seem out of place in a modern suburb. The attempt to recreate the past feels inauthentic. This contraction is exacerbated by the use of vinyl siding.

Houses in The Hamptons appear more utilitarian. There are three or four repeating housing styles, but the differences are barely discernable. Front garages dominate facade, and driveways take up most of the front yard. The cladding, stucco or vinyl siding, are various muted shades of browns and greys.

There may be nothing intrinsically wrong with housing styles that appear outdated, but they might be symptomatic of what Friedman and Krawitz (2002 describe as the commodification of houses. While houses used to last generations, today North Americans are perpetually moving - often into bigger and better houses. And builders add features - often gimmicky and non-functional, to entice home-buyers. Unfortunately the houses they leave behind are meant to last decades.





Street Section

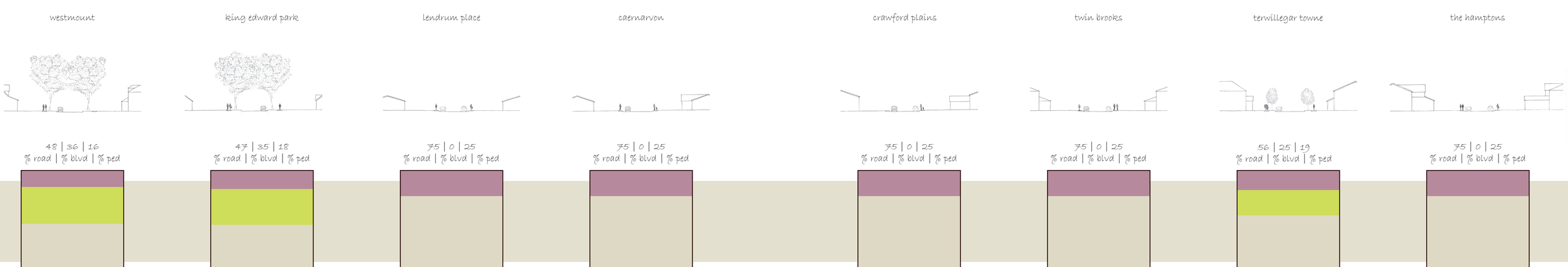
The local streets of Westmount and King Edward Park are narrower at about 8m. Since then, local streets have been widened to 9m. Along with wider roads, curb radii have increased. Wider curb radii allow vehicles to take corners faster, which is convenient for those in vehicles, but poses safety issue if for pedestrians, cyclists and children playing in the street. Additional, as curb radii increases, so do crossing distances for pedestrians.

Sidewalk width has been almost consistent throughout all the neighbourhoods. With the exception of Westmount with a 1.2 m sidewalk, the other neighbourhoods all have sidewalk widths of 1.5m. What is perhaps the most noticeable difference in street sections is the disappearance of a treed boulevard that separated the sidewalk from the roadway which occurred between the 1950s and 1960s. Instead they were replaced with a combined walkway curb and gutter. Today separate walkways with boulevards are often discouraged by the city: with front driveway continually cutting into the sidewalk, they become difficult to maintain.

In new neighbourhoods homeowners often plant trees on their front lawns, but they don't provide the same function as street trees, which add definition to the street, separate pedestrians from traffic, shade the sidewalk in the summer and possibly even slow traffic.

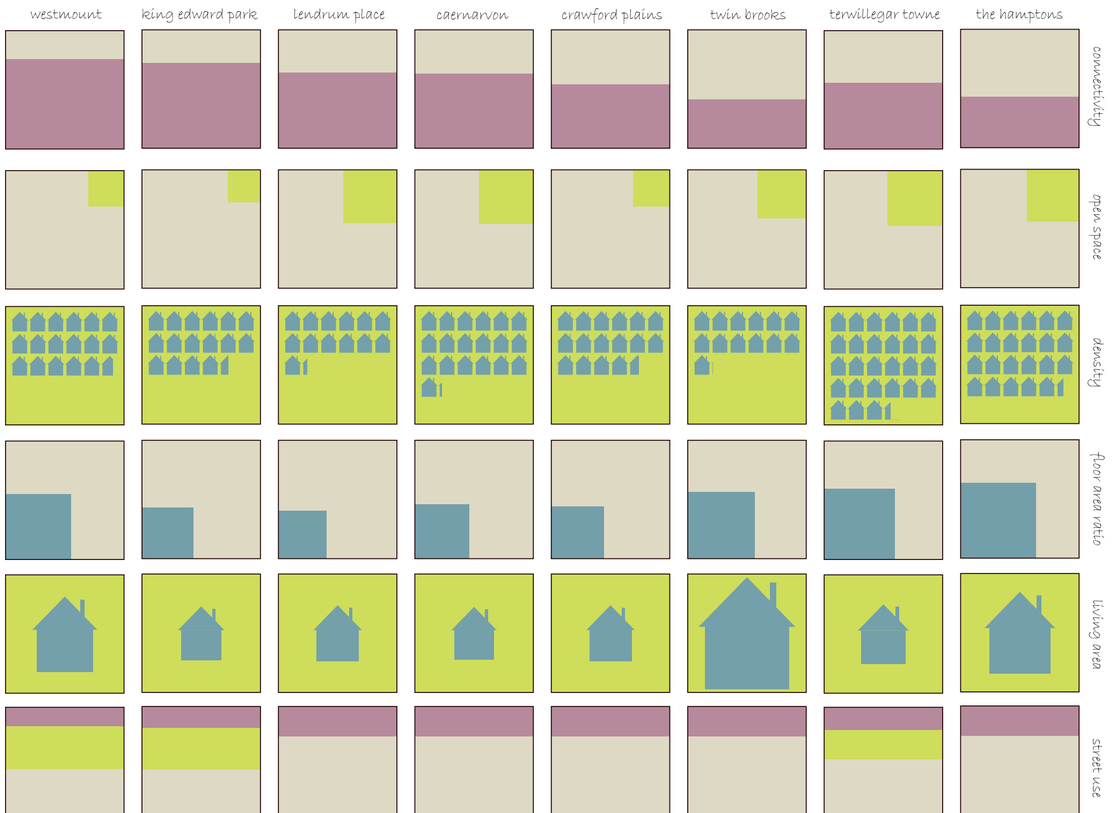
Housing setbacks also vary, although inconsistently. In Westmount, there is a wide range of setbacks as houses were built over a period of several years. Newer neighbourhoods have more uniform setbacks, possibly because they tend to maximize their allowable building footprint, but also because houses are often built quickly in a matter of a couple years.

Terwillegar Towne has the shortest setback. Along with narrow side yards, tight curb radii and many parked cars, this makes the street feel narrower and possibly more crowded than other typical streets of the same era. King Edward Park, by contrast has the longest setback as well as large side yards. Without the street trees, these roads would be sorely lacking in definition.



Analysis

Summary



Discussion

Summary

As we move chronologically through the neighbourhoods, definite patterns emerge:

From grid patterns to hierarchical loops, there has been a significant loss of connectivity. Although there have been some improvements in the last decade, the connectivity of the pre-war communities has not been matched.

Park and open space have generally increased; large central green areas have become standard since the 1960s.

Density has varied slightly and without any clear pattern. The neighbourhoods of the 2000s have the highest density.

The propensity for single-storey houses in the 1960s and 1970s have been countered by a return to two-storey dwellings. FARs have also increased significantly since the 1990s.

Housing types have reflected the style of their decade of construction. A major change appears first in the 1970s with Caernarvon's attached front garages. By the 1990s these garages have become a standard feature.

One of the most noticeable differences between Edmonton's older and newer neighbourhoods are the street trees. Most older neighbourhood streets are flanked with a planted boulevard and towering street trees. With the exception of Terwillegar Towne, boulevards and street trees have disappeared from local streets since the 1960s.

Discussion

Neighbourhood Critique

While residents may feel satisfied or dissatisfied with their communities, some rank better according to current planning and design theories.

Westmount. Westmount might be considered the most walkable of the neighbourhoods studied, despite having the narrowest sidewalks. With relatively narrow roadways, towering elm trees and historic homes, the residential streets of Westmount are scenic and comfortable to walk. The grid streets provide good connectivity and are easy to navigate. Westmount is notably only one of two communities with an arterial road running through it. 124th street however, instead of dividing the community, provides a commercial hub. This commercial corridor as well as the adjacent Groat Ravine provide rewarding destinations making the community even more walkable.

King Edward Park. King Edward Park is also a walkable, grid-patterned neighbourhood. The street proportions are similar to Westmount although the sidewalks are a little wider at 1.5m. The biggest difference in the streetscape are the houses. The little box-like homes with little ornamentation look even smaller on their large lots and long setbacks. Without the trees framing the street, King Edward Park might feel uncomfortably expansive. King Edward Park also provides good pedestrian destinations: Whyte Avenue to the north and Mill Creek Ravine to the west.

Lendrum Place. Lendrum Place marks several firsts for the selected neighbourhoods. It is the first to depart from the grid and in doing so loses connectivity. Street trees are also noticeably absent and the sidewalk in no longer separated from the roadway curb and gutter. Pedestrian-oriented commercial area is also missing. Instead a strip mall sits at one corner of the community where it is set back from an arterial road by a parking lot. These elements combine to make Lendrum Place less desirable to walk. On the plus side the adjacent University of Alberta farm provides a walking destination. It is also the first neighbourhood to benefit from a large central green area.

Caernarvon. Caernarvon presents another change in road network patterns. Here, looping, hierarchical streets are introduced which unfortunately further lowers connectivity. Back lanes have been phased out on some blocks and the occasional front garage appears.

Caernarvon also has a large central green area; however, much of it is simply a grassed area. Unlike Lendrum Place, it has a centrally located commercial area which provide better access for pedestrians. However, the commercial plaza is suburban in style, flanked with parking, again making it a less desirable pedestrian destination. Additionally, although the commercial and green areas might be well-placed, they are surrounded by wide collector roads which provide good vehicle access, but are generally less pleasant to walk along and certainly less pleasant to cross.

Crawford Plains. Despite a conscious goal to have cars "serve rather than dictate" (City of Edmonton, 2009), Crawford Plains continues with the hierarchical, looped street pattern, and has even fewer lanes than Caernarvon. The result is another drop in connectivity. The presence/absence of lanes also brings a dichotomy in housing styles. Lots with lane access tend to be smaller, single storey or split level houses. Lots without lanes have larger, often two-storey homes with attached front garages.

In Crawford Plains, we start to see a definite split in housing between blocks with and without lanes. Houses without lane access have front garages and are bigger, often 2 storeys; those with lanes are smaller and usually only one-level or split levels.

Crawford Plains also has a central green area which it shares with other nearby communities. The community has access to local commercial uses. A gas station and small strip mall are at one of the neighbourhood entrances, and another small plaza sits in the adjacent neighbourhood.

Interestingly, Mill Woods Town Centre - supposed to be the dense urban core - is only a suburban Mall, a sign Mill Woods failed to achieve the design ideals presented in the plan.

Twin Brooks. Twin Brooks might be considered the low point of neighbourhood design by current planning literature. The massive houses with front garages, low density, and highly disconnected roads devoid of back lanes are all fodder for criticism. For example, critics often pan houses with so many gables that "try to create a skyline" (Duany, Plater-Zyberk & Speck, 2001, p. 76). and the mashing of architectural styles. While Twin Brooks has a small commercial area, it is not functional by urban design principles. Its location is in the corner adjacent to a busy arterial road, made specifically for vehicle access outside the community. In addition, the only business in the area is a gas station – hardly enough to supply the daily needs of a community.

On the brighter side, the Whitemud and Blackmud Creek Ravines are easily accessible, and there is plenty of park space. It is also the first of the neighbourhoods to have a stormwater management pond which treats runoff while providing a community amenity. Finally, pedestrian-only walkways provide some improvement to the overall connectivity.

Terwillegar Towne. Terwillegar Towne is an interesting case because it adopted some principles of New Urbanism and tried to recreate some of the successes of older communities. Some of these features include greater connectivity, higher density, smaller setbacks, and street trees. Despite these efforts, the success of this community is debateable.

Perhaps Terwillegar Towne's greatest success is its relatively high density (although the density of the block studied is not sustained throughout the neighbourhood). The streets are much more walkable than those of the previous decades, although they do not achieve the connectivity of the grid. While most of the streets are not curvilinear, navigating the neighbourhood can be disorienting and labyrinthine. A lack of destinations however, prevents it from being a truly walkable neighbourhood. Although the plan boasts of a mixed-use "Towne Centre," the only non-residential use to date is a Mac's store. Some of the land is yet to be developed, so perhaps that will change. Terwillegar Towne's distance from the city core makes it almost inherently car-dependent; retail needs are most likely met by big box power centres located in adjacent communities.

Another criticism of this community are the houses. They have curb appeal, yet are somewhat out of place in a modern suburb, misplaced in time and place.

Despite these faults, these efforts to improve suburbs are commendable. It is arguably the first step in the right direction since the loss of the grid.

The Hamptons. The Hamptons is a typical suburb of the 2000s. Its road network is disconnected although there is some marginal improvement over neighbourhoods like Twin Brooks. Some back lanes are also reintroduced along with rear garages. Interestingly, smaller houses are usually situated on these lots, while larger homes still have no lane access and front attached garages. The front garages tend take up most of the front facade and driveways most of the front yard. Between the lack of boulevard, paved front yards, house colours (varying shades of greys and browns) and the newness, these neighbourhoods can feel quite sterile.

The Hamptons does however benefit from generous open spaces including a stormwater pond and pedestrian walkways. Residents of The Hamptons also have close access to a nearby shopping area; the proximity however, is countered by the vast parking lot that surrounds the stores, making walking an unlikely choice.

Limitations

This project only aims to provide an introduction to the design of Edmonton neighbourhoods. With this small scope there are three major limitations: small sample size, limited number of design elements studied, and no measure of actual performance. The limitations, however, also provide opportunities for further study.

Sampling. The eight sample neighbourhoods are snapshots of a growing and evolving city. They are not necessarily representative; scientific and statistical analyses could not be derived solely from this data. A more rigorous study would examine more neighbourhoods.

Within neighbourhoods, the sample blocks, streets, and houses are not necessarily representative of the whole community. This is particularly evident in newer neighbourhoods where houses are grouped according to target market, whether starter homes, move-up, or estates. Consequently, there is a significant discrepancy between the densities, massing and housing typologies between these sub-areas.

Design Elements. In order to gain a more complete picture of the neighbourhoods, several other key elements of the urban design could be researched.

- Multi-family housing: building typologies and percent of total dwelling units. A wide range in the quantity of multi-family units exists between neighbourhoods. For example, Twin Brooks has only 15% non-single detached housing while Westmount has 52%.

- Commercial Uses: building typologies, street frontage (percent windows, setback), type of commercial. The quality of commercial areas can play a significant role in creating walkability. High quality commercial areas supply daily amenities and are street oriented. Unfortunately, many Edmonton communities lack this amenity. For example, the commercial area in Twin Brooks consists solely of a gas station. While it may look good on a land use plan, this commercial space hardly provides a significant portion of daily household needs. At the other end of the spectrum are communities like The Hamptons, which are adjacent to big box power centres. Although there are many stores close-by, walkability is severely limited by the vast amount of surface parking between the stores and the wide arterial roads that service them.

- Open space: design and functionality (for environmental function, recreation, sports fields, children, etc.). Some open spaces are not particularly useful, and essentially end up as vast lawns. Others are multi-functional: most new neighbourhoods include ponds that store and treat stormwater while providing scenic walking paths. Similarly Lendrum Place has recently developed a dry pond: throughout most of the year it is a playing field, but during large storm events the pond holds water until there is available sewer capacity.

- Arterial street sections and uses. Arterial roads that bound neighbourhoods can indicate how a community interacts with the rest of the city. Is it inward facing, with the backs of building to the street or do retail strips front the road and invite others into the community? Similarly, is the road solely a means of high speed transportation, or is it a destination in itself?

Performance. While the drawings and metrics give us some idea of the community, a next step might be to measure how they actually function. Studies have correlated people's behaviours to their environments, but how does that play out in Edmonton's neighbourhoods? Do people in Westmount walk more than those in Twin Brooks? Do residents in Terwillegar Towne spend more time on in their front yards than those in The Hamptons? Are people's daily choices measurably affected by the design of their communities?

Final Thoughts

There are a multitude of reasons for the changes in Edmonton`s neighbourhoods, but a few stand out as transforming post-war suburbs: the rise of the automobile, cheap land, and the desire for home ownership.

The proliferation of affordable, convenient transportation made suburbs possible; the need for good accessibility was displaced with mobility. The growth of suburbs in Edmonton has not been checked by any natural features, and the abundance of cheap land has made spreading out an easy option. Owning a home is part of the North American dream, and the 1950s ideal of suburban living is still fixed in our culture. Ongoing demand for single family homes spurs on developers in creating new subdivisions.

These factors are not singular to Edmonton, but have shaped the growth of cities throughout Canada and the US.

The continued growth of suburbs, however, is widely recognized as unsustainable, High infrastructure costs, traffic congestion, rising oil prices and climate change are just some of the reasons to re-evaluate the way we build cities.

Given their unsustainable nature, it is hard not to feel frustrated by the pace and scope of suburban development. In the past, suburbs were considered cutting edge; certainly the Mill Woods plan of the 1960s was based on the highest planning ideals. But now, when we know discontinuous streets lead to car-dependence, when we know separating uses destroys diversity, where is the logic? And who is to blame? The developer for sticking with what works? The City (either the planners or Council) for a lack of vision? The public overwhelming demanding more suburbs? Or some combination of all three?

How then do we re-think suburbs? Whether it be greenfield development or retrofitting existing neighbourhoods, how can we build true communities? How do we do it in a way that is authentic to our time and place? How do we do it in a way that makes them desirable – more desirable than our current neighbourhoods?

The answers are not easy. But perhaps the first step is to take another look at our neighbourhoods and start a conversation about communities and design.

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