

A stylized white leaf logo consisting of two leaves on a stem, positioned to the left of the word "breathe".

breathe

EDMONTON'S GREEN NETWORK STRATEGY

Report
Stage 2: Open Space Supply
October 2016

Prepared for
City of Edmonton

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Project Website
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1 INTRODUCTION



BREATHE: Edmonton's Green Network Strategy

Parks and open spaces are vital to a community's health. They provide places for people to play, gather, grow, learn and celebrate.

Because Edmonton Metro is projected to nearly double in population from 1.2 million people to 2.1 million people by 2050, the City has embarked on a process to plan the city's green network to meet the needs of growing communities.

BREATHE is a transformative strategy to make sure that each neighbourhood in Edmonton will be supported by an accessible network of open space as the city grows. The Green Network Strategy builds on the Urban Parks Management Plan and the Natural Connections Strategic Plan, and aligns with the goals identified in the City's strategic planning documents ("The Ways").

The Green Network Strategy will support the City of Edmonton commitment to:

- » Transform Edmonton's urban form;
- » Enhance the use of public transit and active modes of transportation;
- » Improve Edmonton's liveability;
- » Preserve and sustain Edmonton's environment;
- » Ensure Edmonton's financial sustainability; and
- » Diversify Edmonton's economy.

In the same way that organisms function within a natural ecosystem, open spaces function as part of a larger integrated whole within the urban ecosystem. Edmonton's Green Network Strategy will examine how open space in the City of Edmonton functions as an integrated network of public spaces that provide real, measurable value to Edmontonians.

About This Report

The Stage 2 Summary Report reviews the current state of the Edmonton open space system using a series of analyses that reflect the holistic perspective of the project.

- » The existing **Open Space Typology** has been updated to account for an expanded understanding of the green network, which includes parks, plazas, main streets, recreational spaces, school sites, and more
- » The **Supply Analysis** describes how much open space exists in Edmonton in relation to the city's population
- » The **Access Analysis** shows how much of the green network is within walking, cycling and driving distance from Edmontonians
- » The **Connectivity Analysis** determines the degree to which the green network is interconnected, and how people move across the city to access open spaces
- » The **Functions Analysis** evaluates open spaces based on the functions they provide – how their amenities and characteristics contribute to human health and wellness, improve the urban environment, and provide places for people to come together

Together, these analyses provide a snapshot of the quantity, quality, connectivity and accessibility of Edmonton's green network.

Scope of Analysis

For this Stage, analyses were generally restricted to areas within City boundaries, and exclude the Transportation Utility Corridor (i.e. Anthony Henday Drive) and potential annexation areas to the south of the city. In some cases, results are reported at a multiple-neighbourhood scale; these Open Space Reporting Units have been developed by the project team to facilitate result summarization, and help reveal where trends occur across the landscape.

Analysis Tools

A Geographic Information System (GIS) is a computer-based system for recording, storing, and displaying data related to geographic locations on the Earth's surface. GIS software enables the user to visualize multiple types of data about a place, and to manipulate that information to understand patterns and relationships.

For BREATHE: Edmonton's Green Network Strategy, GIS and complementary software is being used to perform a majority of the analyses in Stage 2 (Supply) and Stage 3 (Demand), using geospatial data and other information with a spatial component (e.g. crime statistics, civic events bookings). Ultimately, a geospatial database containing all the open spaces in the city, together with the results of the analyses, will provide the City of Edmonton with a tool to help them make management decisions about the open space system into the future.

Project Context

In order to plan for the future of open space in Edmonton, the City needs to understand the green network Edmontonians use today. This means the results from Stage 2 will be used to determine the existing strengths that can be built upon, the weaknesses that need improvement, and potential opportunities to expand and innovate.

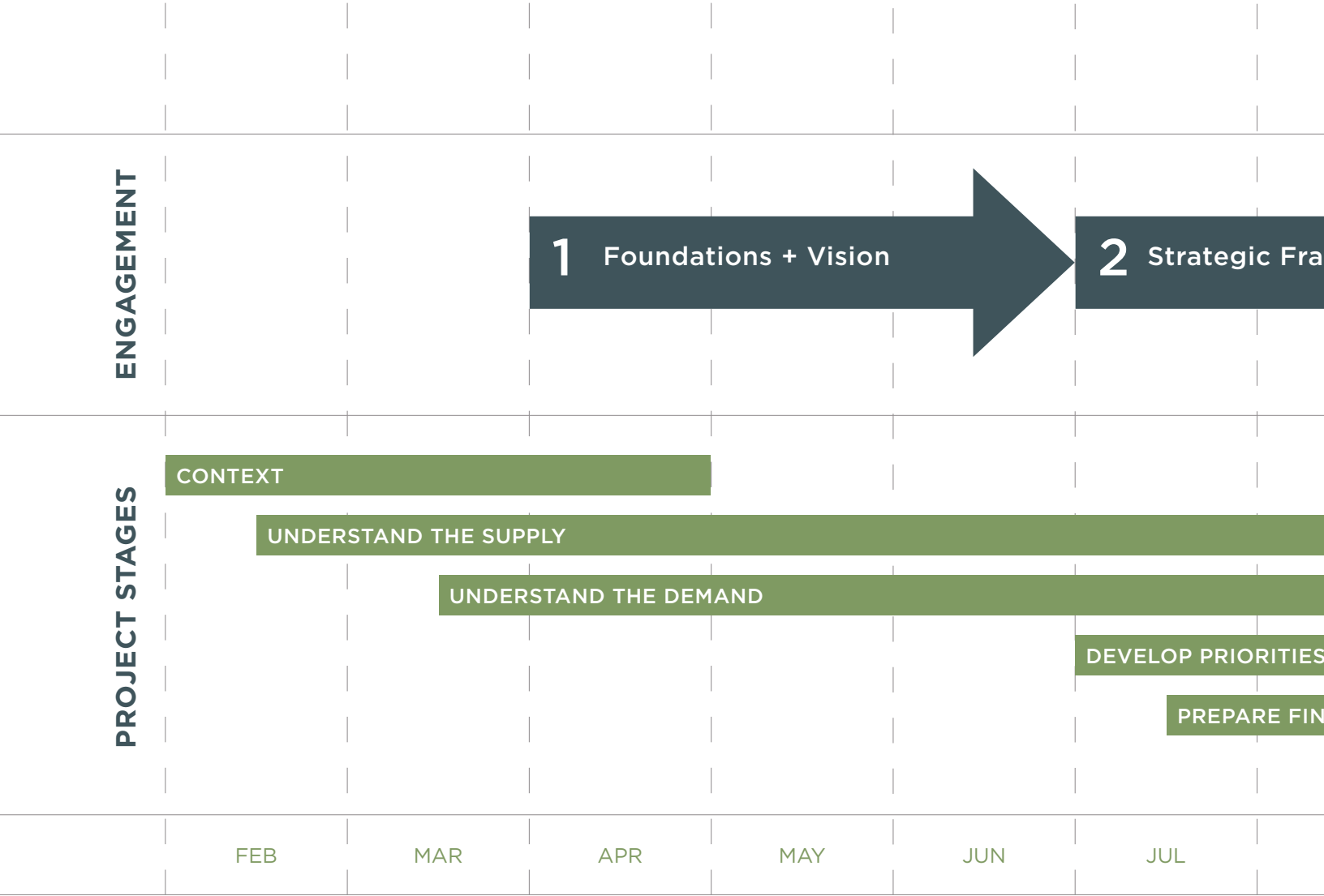
The Open Space Typology has been developed to help focus servicing and management recommendations; the analyses can be used to determine locations, connections and services that may be missing from the network. This information will be used explicitly in Stage 3 of the project, when we evaluate the current and future demands on the open space system. In a growing city, network gaps will become more pronounced, while changing demographics will place a greater demand on certain services and functions than others. Data about the current state of these gaps, services and functions helps to establish a reliable "baseline" from which to consider the changes that lie ahead.

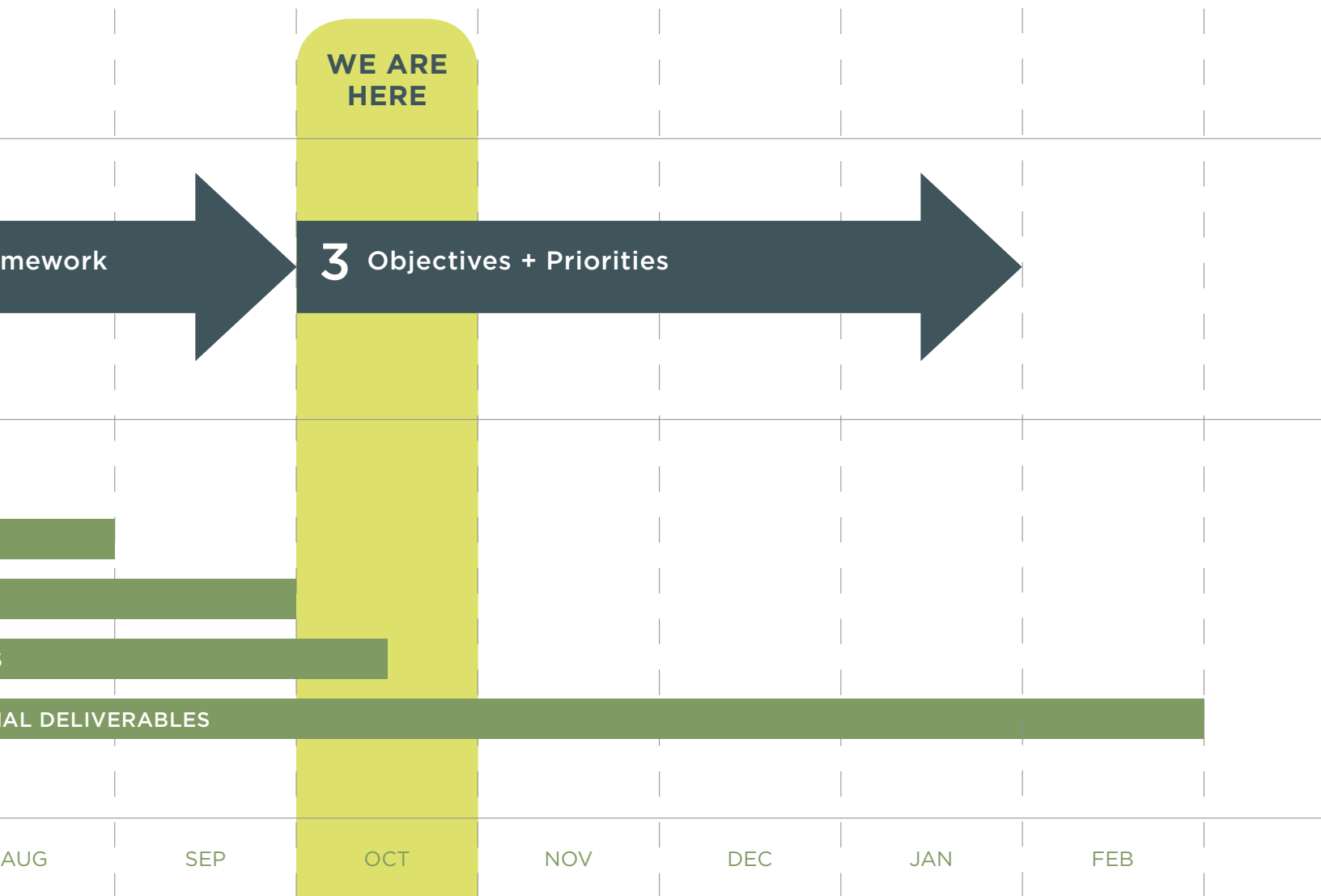
Because this is a Summary Report, by nature it contains only a summary of the information and results collected to date. More detail about the current state of the open space system will be provided in the final report for BREATHE: Green Network Strategy. The Strategy will be accompanied by a separate technical appendix that fully explains our analysis methodologies and results.

Similarly, activities for Public Engagement Phase 2: Strategic Framework + Priorities were ongoing at the time of writing. Those findings will be explored further in the Stage 3 Summary Report and incorporated into the recommendations of the final Green Network Strategy, as well as summarized in the Phase 2: Public Engagement What We Heard Report.

Figure 1.1 illustrates the Green Network Strategy project timeline, including project stages and the public engagement activities completed to date.

FIGURE 1.1 Green Network Strategy Timeline







2 FOUNDATIONS



What is an Open Space?

Open spaces are publicly accessible outdoor public lands used for recreation, nature preservation, passive outdoor enjoyment and public gatherings.

This includes not only public parks, gardens and nature reserves, but also squares, plazas, cemeteries and school yards. Some of these spaces might include facilities like community centres, arenas or sports fields, while others are co-located with popular attractions or civic buildings.



Although municipal parkland forms the core of any open space system, the Green Network Strategy is designed to consider open spaces from a holistic perspective. This means that open spaces like road boulevards, utility corridors and pathways are valued for their important role in connecting different parts of the network. Natural areas provide wildlife habitat and climate regulation services, even though they might not have many amenities for humans. Main streets are useful for transportation purposes, but they also provide opportunities for social interaction on the sidewalk or patio, and celebration during special events.



The Green Network Strategy embraces a wide range of outdoor spaces that encompass various sizes, locations, purposes, amenities, management arrangements, and physical characteristics. Planning for such a diversity of spaces can be challenging, but it is important to consider them all as part of a single, integrated green network – one whose many parts are linked with each other both geographically and functionally.

Open Space Typology

Although the analysis being undertaken for Stage 2 of the Green Network Strategy focuses on the connectivity and function of open spaces, a classification system is useful to characterize different types of open space for the purposes of management and strategic implementation. Each category represents an open space that is fundamentally different in form, size or management from every other, and that offers a unique range of functions and program opportunities. Distinguishing among open spaces in this way enables the City and its community partners to tailor their planning and management activities to the amenities, objectives and service standards specific to each type.

A parkland classification system was originally developed for Edmonton in the 1980s, and has evolved since then to reflect changing demographics and management needs. That evolution continues with the development of the Green Network Strategy, as the classification system is being expanded to encompass the many ways that Edmontonians use and benefit from open spaces. In addition to the City-owned parks that were the subject of previous management plans, the green network includes civic spaces, linear parks, other public lands, and the connections among them. Since the creation of the Urban Parks Management Plan (UPMP) in 2006, the City has increasingly recognized the importance of planning and managing the open space system in a holistic manner – and that means establishing a management framework based on a network approach that integrates parks with the other kinds of spaces which support personal wellness, ecological resilience, and opportunity for celebration.

In addition to new management categories reflecting an expanded scope for open space planning in Edmonton, the Green Network Strategy also updates existing categories to provide clarification to their definitions and intent. The following pages describe the new classification system and the changes that have been made from the previous system established in the Urban Parks Management Plan. Map 2.1 shows the complete open space network for the City of Edmonton according to its open space types.

Why create a classification?

Distinguishing among different types of open spaces can help make the results of analyses more useful for decision-making. For example, not all open spaces are accessed and used in the same way. Most people will drive to destination spaces such as festival grounds, stadiums, or city and district parks, but will walk to their local playground or community park. In a similar way, different types of open spaces provide different services. Community parks often support amenities like playgrounds, schools, and sports fields, while civic spaces enable people to gather and celebrate.

Establishing an open space typology enables the project team to make more nuanced conclusions during Stage 3, when current and future demands on the open space network are determined. Based on the unique characteristics of the City of Edmonton, the needs of its residents, and by reviewing best practices and trends in other jurisdictions, provision and servicing guidelines will be assigned to each open space type. Those guidelines will be compared against actual supply and demand metrics to determine how well the open space network is working for Edmontonians now and into the future.

Ultimately, the Green Network Strategy will make use of these conclusions to make targeted recommendations about the city's open spaces: whether more community parks are needed to keep up with a growing population, whether more benches should be installed in pocket parks to benefit an aging population, or whether civic spaces should incorporate more trees to promote ecological functionality across the city.

Edmonton's Open Space Classification System

As discussed above, Edmonton's open spaces provide a wide range of opportunities through a variety of hardscaped, landscaped and natural spaces. This can include small local parks where children gather to play; large natural areas with extensive trail systems; public plazas that host music concerts, farmers' markets and festivals; and community parks where schools, sports fields and community spaces are located. Because the definition of an open space is so broad, a classification system is helpful to organize open spaces into thematic groups with similar amenities, use, or management considerations.

The Urban Parks Management Plan (2006) created a typology for Edmonton's parks based on park size and the type of community and/or recreational amenities it provided. However, this classification system included only public parks owned and managed by the City of Edmonton. By contrast, the Green Network Strategy recognizes that opportunities for recreation, social interaction, mental and physical wellbeing, and ecological services can be supported through many different types of open space, and has therefore expanded the classification system, improving and reorganizing it to be more inclusive, easier to understand, and simpler to apply.

In the Green Network Strategy open space classification system, open space *classes* represent the different types of open space, such as community parks, connectors, school sites, linear parks, main streets, etc. All classes are organized into *thematic groups* based on the roles that different open spaces play in the green network. The classes within each group typically have a similar managing entity, amenities, accessibility, or purpose, making these groups a convenient basis for developing planning objectives in the final Green Network Strategy.

The updated classification system is outlined in Table 2.1, Table 2.2 and Table 2.3, which include descriptions for each class and examples of well-known Edmonton open spaces in each category.

MUNICIPAL PARKS

Municipal Parks are the 'backbone' of the green network. Collectively, they are intended to provide comprehensive park space functionality to their respective catchment areas, including recreation, social space, nature appreciation, and events, in addition to their role in supporting ecological functions. They are City-owned lands, typically maintained as discrete spaces by Parks Operations, unless agreements with Community Leagues, School Districts or other organizations have resulted in shared responsibility.

Municipal Parks are the only type of open space that was addressed in the previous Urban Parks Management Plan (UPMP). An explanation of the changes follows below.

» **City Parks** combine and update two park categories from the UPMP: City-Level Park, and River Valley and Ravine Park.

The City-Level Park from the UPMP was intended to be a 'one of a kind' park that attracts people from across the city. The Green Network Strategy builds on that definition to recognize the importance of these places beyond City boundaries and into the region beyond. This approach is consistent with many other jurisdictions.

For the UPMP, the River Valley and Ravine Park category was actually a new addition to the previous park typology. However, because of implementation challenges that have become apparent since 2006, the Green Network Strategy classifies the individual parks and open spaces of the River Valley and Ravine System within the Municipal Parks group. While acknowledging that River Valley and Ravine parks have special management considerations (e.g. a greater proportion of natural areas, adjacency to the river edge), a single category for these open spaces ignores the differences in size, programming and attraction among them. Several other documents help the City plan the River Valley and ravine system in a cohesive manner, such as the Ribbon of Green Master Plan (2006), and should be consulted in concert with the Green Network Strategy to address the unique preservation and connectivity issues in these spaces.

- » **District Parks** are an update to District Activity Park from the UPMP.

While most District Activity Parks will retain the same designation in practice, the updated classification recognizes that the open space needs of a city district vary depending on the size and location of that district, and the provision of amenities in the larger community. So although sports amenities are a central feature of many district parks, they may also be characterized by more multi-functional or natural features.

- » **Community Parks** combine and update two park categories from the UPMP: School and Community Park, and Urban Village Park.

From a functional perspective, School and Community Parks, and Urban Village Parks, served almost identical purposes: as the core open spaces within a neighbourhood, often providing community services and space for active and passive recreation. The updated definition combines these types and reduces their stringency in terms of location in the centre of a neighbourhood. In addition, the UPMP differentiated between presence of schools, and park size, creating unnecessary confusion.

- » **Pocket Parks** have not fundamentally changed compared to the UPMP. The Green Network Strategy has updated the definition to recognize that pocket parks can fulfil a wider variety of functions than the narrow range of passive and unstructured active recreation activities enumerated in the UPMP.
- » **Linear Parks** encompass some of the open spaces that the UPMP called Greenways.

The previous Greenway definition was both overly restrictive in terms of size, and not sufficiently imaginative in terms of programming. Many spaces in Edmonton serve as active transportation connections among open spaces and the pathway network, but are less than 10 metres wide (the minimum width for Greenways in the UPMP). Virtually any purpose-built connecting open space under 16 metres wide the Green Network Strategy classifies as Connectors (see below). At the same time, linear spaces greater

than 16 metres wide are large enough to offer programming complementary to a pathway, e.g. landscaping, benches, or play areas. These are now called Linear Parks to reflect their functional role as a core component of the green network.

- » The Green Network Strategy eliminates one former category: Natural Areas. New, more flexible definitions in the Strategy provide for a diverse range of activities and management practices for any given park type, including the potential for municipal parks that prioritize an environmentally sustainable balance between nature preservation/conservation and low-impact recreational activities.

CIVIC SPACES

Civic spaces are City-owned gathering places that are largely hard landscaped, such as plazas, squares, and mainstreets. They typically support good urban design, and ideally perform social or celebratory functions in the open space network. They are managed by a variety of organizations and branches ranging from Parks or Transportation Operations to maintenance personnel responsible for an associated public building (e.g. City Hall) or certain private or non-profit organizations (e.g. Business Revitalization Zones).

CORRIDORS

Corridors are vegetated spaces that feature a trail, pathway, or maintained grass (turf) connecting surrounding neighbourhoods, roads, or core open spaces. Corridors may or may not be located adjacent to (or within) roadways or utility corridors.

OTHER JURISDICTIONAL PARKLAND

Many important cultural, social, natural, or recreational parks are managed by other jurisdictions. While the ability of the City to alter their purpose and amenities is limited, sometimes these spaces are developed and/or maintained in partnership with the City, and provide valuable open space functions at the community and city level.

TABLE 2.1 Municipal Parks Classification

OPEN SPACE CLASS	DESCRIPTION	EXAMPLE
CITY PARK	City parks are feature parks for a city, intended to provide value to its residents and visitors throughout the greater Metro region. They are large in size, and are intended to serve Edmonton residents city-wide. City parks may have a variety of functions and uses, but usually contain features and amenities that are not available elsewhere in the city.	Terwillegar Park Rundle Park William Hawrelak Park Henry Singer Park
DISTRICT PARK	District parks are designed to meet the needs of multiple communities, such as a city quadrant or a collection of neighbourhoods (e.g. under an Area Structure Plan). They may be more specialized than community parks, but also may provide multi-functional amenities. Some district parks contain unique attractions/special purpose facilities. The size and programming depends on the community they are located within, and the provision of amenities in the larger community.	Jackie Parker Recreational Area Castle Downs Park The Meadows District Park Argyll Park
COMMUNITY PARK	Community parks are the basic units of the park system. They are intended to be frequent in the landscape, and flexible enough in programming to meet the social and recreational needs of most people in their catchment area. Community parks should be located central to the community they are intended to serve. Some community parks are co-located with Community Leagues or schools, usually elementary schools, and may be managed under a Joint Use Agreement or Occupancy License.	Ermineskin Park Elmwood Park Kitchener Park Cumberland Park
POCKET PARK	Pocket parks are small local parks meant to serve the nearby neighborhood and may contain only one amenity or serve one of the functions of open space (e.g. a playground, fitness amenity, or seating area).	Otto Leslie Park Peace Garden Park Kainai Park John G Niddrie Park
LINEAR PARK	Linear parks are linear, publicly accessible open spaces that operate as parkland, providing opportunities for active transportation, recreation or social encounters. However, they also act as connectors, featuring pathways that enable connections from one part of the city to another.	Edmonton Grads Park Ribbon of Steel Park Hazeldean Greenway

Municipal Parks

TABLE 2.2 Civic Spaces, Corridors, and Other Jurisdictional Parkland Classification

OPEN SPACE CLASS		DESCRIPTION	EXAMPLE
Civic Spaces	SQUARES, PLAZAS, AND PROMENADES	Squares, plazas, and promenades are hardscaped areas developed as gathering spaces for people. Some may contain markets, event venues, or small shops and food vendors. Most include seating areas. Some may be linear or part of a streetscape.	Sir Winston Churchill Square Centennial Plaza
	MAIN STREETS	Main streets are 'enhanced' streets intended to act as important gathering places or grand boulevards. They are pedestrian-friendly streets that also serve as major transportation links with a mix of active street-oriented land uses. They often include seating areas, street trees, vegetated traffic buffers, and room for street vendors and parklets.	Jasper Avenue Whyte Avenue 124 Street
	PEDESTRIAN-PRIORITY STREETS	Pedestrian-priority streets are road right-of-ways designed to prioritize the movement of pedestrians over other modes of travel. Some may allow vehicle traffic most of the time, while others may accommodate temporary road closures for events such as festivals.	104th Street NW The Armature 83 Avenue NW
Corridors	CONNECTORS	Connectors are primarily pathways with some associated green space, usually connecting two or more parks together, or two parts of a neighborhood. The primary purpose of connectors is to provide access to and between neighborhoods, roads, or open spaces, although they may also occasionally include park amenities such as small seating areas or landscaping.	
	ROADWAY GREENS	Roadway greens are green spaces on public property within right-of-ways: along roads or major walkways, or within roadways as traffic islands, medians or boulevards. Typically they are turfed/grass, planted with shrubs, or naturalized with native vegetation.	
Other Jurisdictional Parkland	PROVINCIAL PARKLAND	Provincial parks provide valuable regional and community open space services. Although these spaces are managed and operated by the provincial government, they are often integrated into the City's open space network through trails and pathways, and provide value to city residents. In addition, the Legislature Grounds surrounding the provincial legislature buildings in Edmonton are publicly accessible, carefully managed open spaces that attract both tourists and city residents.	Alberta Legislature Grounds Government House Grounds Big Island Natural Area
	FEDERAL PARKLAND	Federally owned or managed parks. Edmonton currently does not have any federal parkland within city limits.	
	CAMPUS	Publicly accessible provincial, college and university campuses, or teaching hospitals.	University of Alberta grounds NAIT grounds

OTHER PUBLIC OPEN SPACES

There are several types of 'other' open space that are part of the open space network from a functional perspective, but which are not parks. They support the ecological, recreational or social (celebration) functions of the city's open space system, and may be provincially, federally, or City-owned and operated.

Some of these lands are currently not formally managed as open spaces, but still function as open spaces by providing green land cover, acting as gathering spaces, or otherwise contributing to the functions of open space, even if the value they currently provide is limited due to accessibility issues (e.g. fee for access such as golf courses).

Some of these open spaces may eventually be developed into other land uses (e.g. vacant city holdings).

PRIVATELY OWNED, PUBLICLY ACCESSIBLE OPEN SPACES

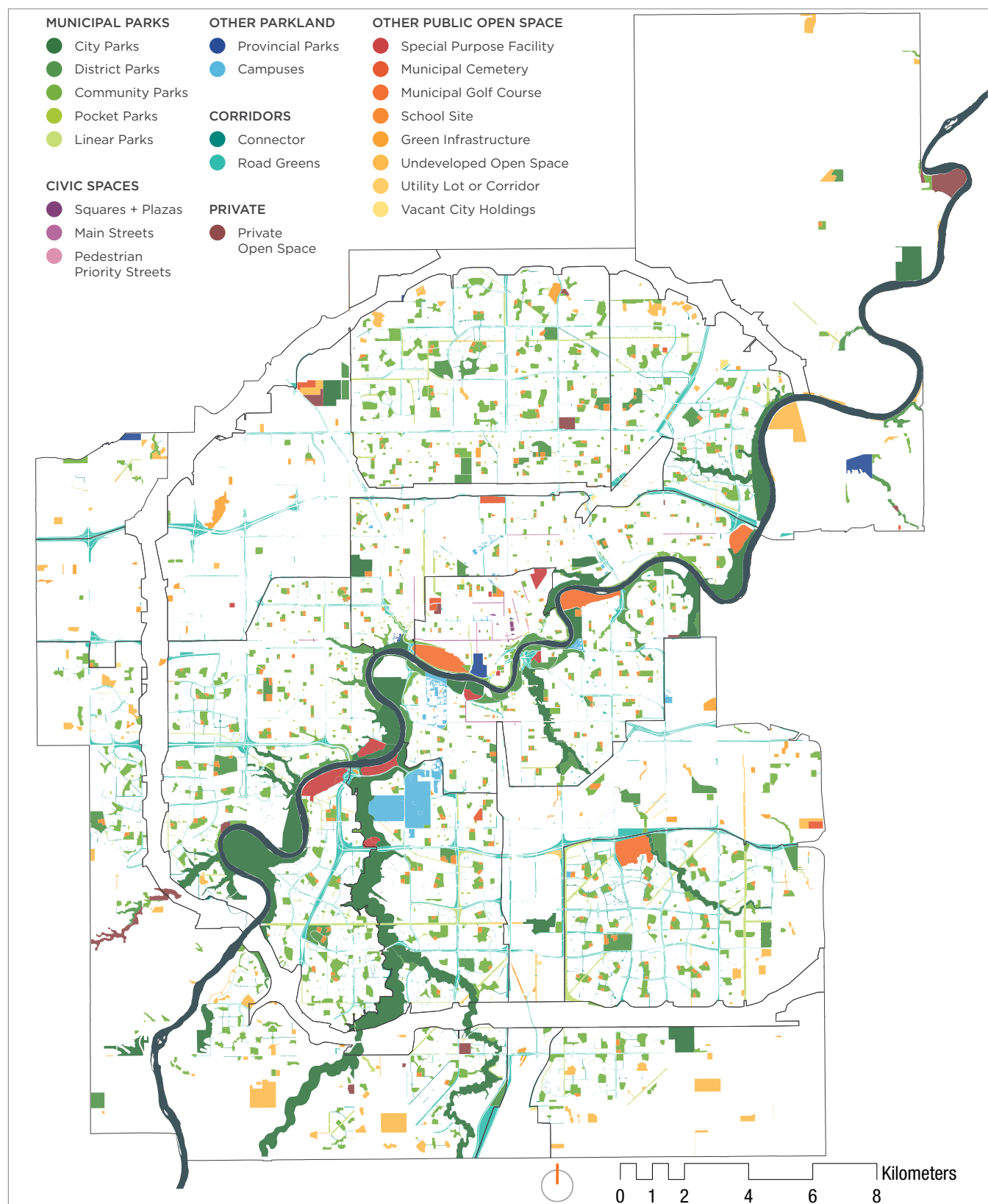
Privately-owned lands may provide some or all of the same open space functions as municipal open spaces, and are included in the open space network if publicly accessible. This includes places like NorQuest Plaza, Ice District Plaza (once complete, both are currently under construction), Frank Oliver Park, and some community gardens located on private land. These spaces will not be formally planned as part of the Green Network Strategy, and are not included in the classification tables in this section.



TABLE 2.3 Other Public Open Spaces Classification

Other Public Open Spaces	OPEN SPACE CLASS	DESCRIPTION	EXAMPLE
	SPECIAL PURPOSE FACILITY	Major cultural, recreational or sporting venues that provide a unique leisure, memorial or entertainment value that draws users from across Edmonton and the greater metropolitan region. They typically involve more intensive investment in facilities and associated services. Often they require a fee or membership for entrance, or restrict the hours or activities that are permitted. Some are located within larger parks.	Edmonton Valley Zoo Fort Edmonton Park Commonwealth Stadium
	SCHOOL SITE	Lands set aside for schools and owned, managed, or maintained by the City of Edmonton, or by an Edmonton school board (e.g. Public, Catholic, or Francophone School Board). These sites include the building envelope and other school facilities such as playgrounds, and may also contain some green space. Some of these areas are adjacent to larger parks, and most are managed through the Joint-Use Agreements which allow for public access. Some school sites have not yet been developed (unoccupied), while others have been identified as being surplus and released for other land uses.	
	MUNICIPAL CEMETERY	Municipally-owned cemeteries provide important cultural services, and may also provide some of the same uses as municipal parks, such as passive recreation.	Northern Lights South Haven
	MUNICIPAL GOLF COURSE	Municipally-owned golf courses often have restricted access (restricted to club members or require a fee for access) but the City retains ownership, allowing for other additional open space uses such as picnic areas or winter skiing opportunities.	Victoria Golf Course Rundle Golf Course
	GREEN INFRASTRUCTURE	Human-made physical structures and facilities that mimic natural processes to provide valuable ecological services. These features may be stand-alone, or may also be present as integrated components of other open spaces (e.g. part of a Municipal Park).	Ellerslie Fire Station bioswales
	VACANT CITY HOLDINGS	Vacant city holdings include vacant lots and other City owned spaces which have not yet been developed into other land uses or sold. They may currently provide open space services such as green space, and represent an opportunity for future open space developments such as civic spaces, greenways, and parks.	
	UTILITY LOTS OR CORRIDORS	Publicly accessible utility corridors and lots which provide some the functions of open space by providing green land cover, off-leash areas, connectors, or other uses. They are typically not owned by the City, but have public access agreements in place.	Hodgson Altalink Corridor

MAP 2.1 Edmonton Green Network, by Open Space Type



Open Space Reporting Units

Throughout this report, the results of analysis are reported at different scales: the access analysis shows the amount of open space walkable from every location (i.e. 100 m² surface area) in the city, the connectivity analysis shows patterns of movement in a continuous cover across the landscape, and the functions analysis shows how well each open space performs from a functional perspective. By contrast, the supply analysis is summarized at a multiple-neighbourhood scale: the Open Space Reporting Unit.

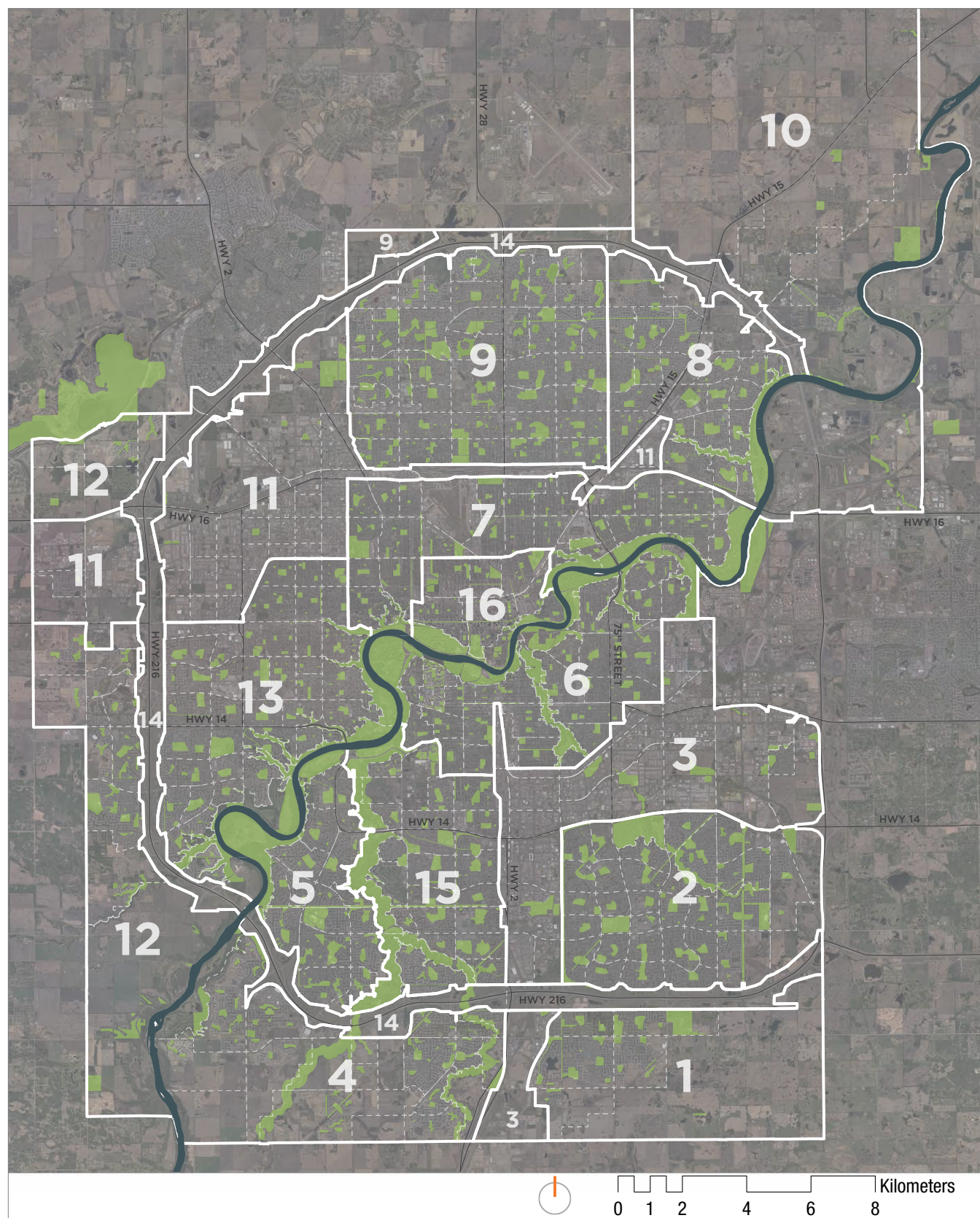
Reporting Units were developed early in the project as an efficient means of summarizing the results of analysis, visualizing trends across the landscape, and targeting policy recommendations to different areas of the city. As the BREATHE project progresses, Reporting Units will continue to be employed to mitigate reporting limitations, to offer an alternative perspective to reporting at the open space or citywide scale, and eventually to organize planning recommendations into geographically relevant divisions.

Each Reporting Unit is intended to represent some common traits among the neighbourhoods it contains. To that end, the boundaries of each Unit are based on the City Sectors that describe the general development pattern in Edmonton, and that categorize the city as Central Core, Mature, Established, Urban Growth Area, Developing, and Industrial areas, as well as the Transportation Utility Corridor (which contains Anthony Henday Drive) and the River Valley and Ravine System. Adjacent neighbourhoods with the same (or similar) City Sector type were grouped together based on major barriers in the landscape, such as the North Saskatchewan River, Whitemud Creek, major roadways, and major transitions in land use (e.g. industrial areas).

Each Reporting Unit therefore encompasses a group or cluster of neighborhoods with similar landscape patterns, development stages, and locations in the cityscape. Each Unit tells a story about its strengths, weaknesses and opportunities that is distinct from the story of every other Unit. City planners, community partners and others who have a role in managing open space can use those unique stories to develop policy recommendations and management plans tailored to each area of the city, which work in concert to ensure the open space network thrives.

The following pages identify the Open Space Reporting Units on a map of Edmonton (see Map 2.2), and describe their predominant characteristics. These pages can be used as a reference to help identify a point of interest (e.g. home, work, school) when reviewing the results of the analyses.

MAP 2.2 Open Space Reporting Units



1. Developing Fringe South-East

This area contains rural and newly developing communities, and important new open spaces like the Ivor Dent Sports Park.

2. Settled South-East

This area contains both established neighbourhoods, like Mill Woods, and newer and developing neighbourhoods, like Silver Berry. In addition to the Mill Creek Ravine, open spaces here include the Jackie Parker Recreation Area, and Mill Woods Park.

3. Industrial South

With the exception of the Maple Ridge neighbourhood, this area is mostly industrial, although it does contain the John Fry Sports Park.

4. Developing Fringe South-West

One of the newer parts of Edmonton, this area south of the Anthony Henday contains rural lands and new residential communities like Heritage Valley. Blackmud Creek runs through the area.

5. Settled South-West B

Just to the west of Reporting Unit #15, this area contains established and newly developing neighbourhoods served by open spaces like Terwillegar and Terwillegar Heights Parks.

6. City Centre South

This area south of the River contains the denser neighbourhoods around Strathcona and the University of Alberta, along with other mature inner city neighbourhoods north of the industrial area. Key open spaces include the Mill Creek Ravine, Gold Bar Park, and Rollie Miles Athletic Park.

7. City Centre North

This is the area north of Downtown comprised of mature, inner city neighbourhoods, along with the redeveloping Blatchford site. Coronation Park and Borden Park are the most prominent open spaces in the area.

8. Settled North-East

Although most of this area is currently developing, there are also established and mature residential neighbourhoods that contain open spaces like Matt Berry Park.

9. Settled North

This area contains a mixture of newly developing, established, and mature neighbourhoods. Key open spaces include Castle Downs Park and Grand Trunk Park.

10. New Growth Area North-East

Most of this area is currently rural, but is planned to accommodate industrial and residential development in the future.

11. Industrial North

With the exception of Westview Village, this area is exclusively industrial and contains few open space amenities.

12. Developing Fringe West

This area contains the newly developing residential neighbourhoods west of the Anthony Henday. Although many open spaces have not yet been constructed, important new parks like The Grange are being developed to service the increasing population. This area has access to Big Lake, and Wedgewood Ravine.

13. Settled West

Nestled between the central core and the Anthony Henday, this area contains established and mature neighbourhoods, and open spaces like the Edmonton Valley Zoo, Buena Vista Park, Callingwood and Sir Wilfred Laurier Parks.

15. Settled South-West A

The area includes the mature and established neighbourhoods between Whitemud Creek and the industrial area to the east. Key open spaces include Confederation and Twin Brooks Parks.

16. Downtown Core

Located to the north of the North Saskatchewan River, this area contains a concentration of commercial uses, with important civic spaces like City Hall Plaza and Sir Winston Churchill Square.

Note that the Transportation Utility Corridor (Reporting Unit #14, aka Anthony Henday Drive) is not included in the analyses.



3 SUPPLY ANALYSIS



What is a supply analysis?

At its most basic, a supply analysis measures how much open space there is within a certain unit area. This measure can be absolute (e.g. number of hectares) or can be calculated in relation to another metric, like population (e.g. number of hectares per capita). The results can also be calculated for different units of area, and for different types of open space.

For this Stage 2 Summary Report, the primary metric of interest is quantity of open space per capita, reported as number of hectares per 1,000 people. Supply was measured using spatial data about Edmonton's open spaces, which provides the size of each space, and demographic data for each neighbourhood derived from the 2014 Municipal Census.

Supply was calculated for public, currently developed open spaces within City of Edmonton boundaries, including:

- Municipal parks
- Civic spaces
- Provincial parkland
- Campuses
- Special purpose facilities
- Municipal cemeteries and golf courses
- School sites
- Green infrastructure

Although classified under the Open Space Typology, some open spaces were excluded from analysis because they are not publicly accessible, or they are not currently developed as open space (e.g. connectors, road greens, and private open space).

Map 3.1 shows the existing supply of all public open spaces discussed above, while Map 3.2 shows the existing supply of municipal parks only. Both maps show the results of the supply analysis according to Open Space Reporting Units. Results depicted on the maps are divided into categories for ease of interpretation; detailed results are available in Table 3.1.

Why evaluate supply?

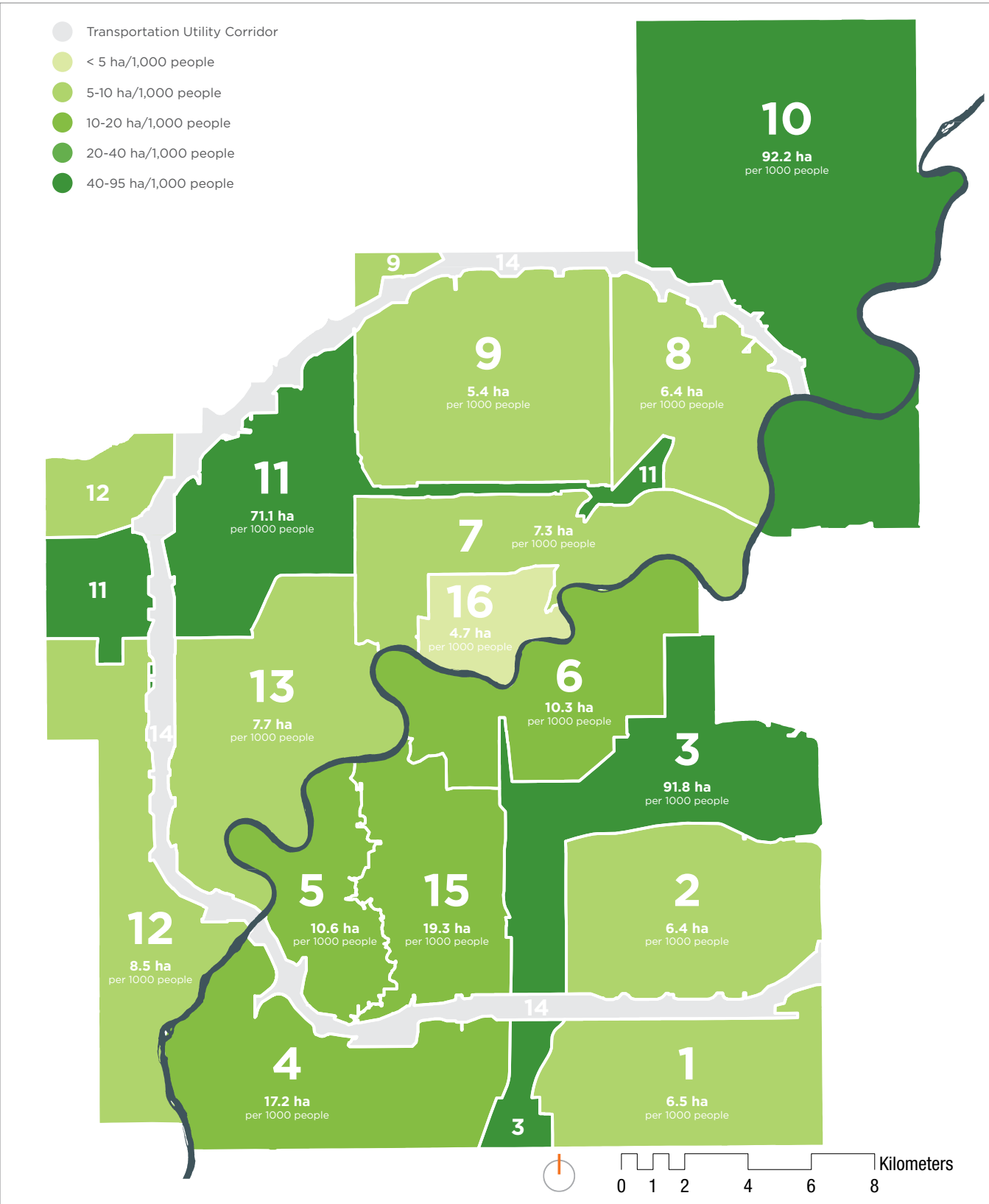
Information about the amount of open space in the city, its distribution across the city, and its availability in relation to the number of residents, are the foundation of any open space plan. The provision of open space is the precursor to questions about accessibility, connectivity and functionality. To ensure equitable access to the services provided by the green network, open spaces should be distributed across the city and located within traveling distance to residential areas. And because land uses within cities will often persist over time, understanding the current presence, absence, and location of open spaces in the city landscape has a great impact on future open space planning.

Metrics about open space supply establish a baseline of data about existing conditions, which can be used to compare one part of the city with another, or to compare Edmonton with other jurisdictions, where appropriate. For example, a Reporting Unit with less open space per capita might be selected as a target for future open space acquisition or development. Alternatively, the citywide supply of municipal parkland could be compared with relevant guidelines, standards or best practices from other jurisdictions or from recognized parks planning agencies to determine how Edmonton's green network performs in comparison.

These types of comparisons not only help answer questions about how well the existing open space system is serving Edmontonians – about strengths and weaknesses today – but also help to direct attention toward potential issues in the future. An area with a low absolute amount of open space, or a high amount of open space per capita, could indicate a newly-developing part of the city, whose open space supply should be closely monitored as the residential population increases over time.

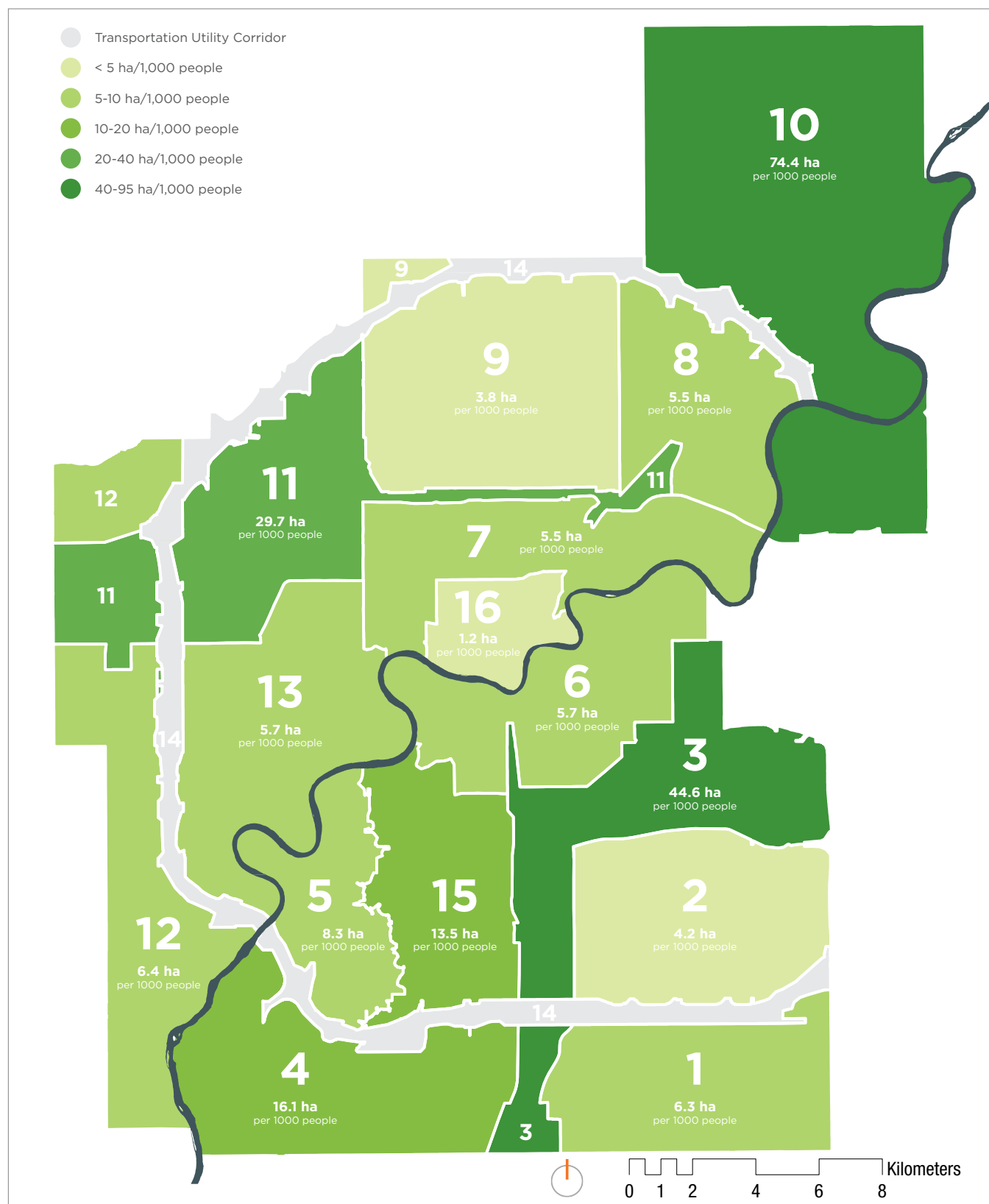
Open Space Supply

MAP 3.1 Supply of open spaces per capita (hectares per 1,000 people)



Municipal Parkland Supply

MAP 3.2 Supply of municipal parkland per capita (hectares per 1,000 people)



Discussion

The Supply Analysis helps to identify areas of the city which are over- or under-supplied in terms of the amount of available open space. Calculating per capita provision of open space by Reporting Unit allows for a comparison of open space supply across different parts of the city. Larger populations create more demand for the services that open spaces provide, but at the same time, areas of the city with high population density may have fewer open spaces, or less overall amount of open space because there is a smaller land base for open space development.

The amount of open space per 1,000 residents in the City of Edmonton ranges from 4.7 ha/1,000 residents in the Downtown Core (Reporting Unit 16) to 92.2 ha/1,000 residents in the North-East New Growth Area (Reporting Unit 10) for all open spaces (see Table 3.1). For municipal parks only, provision ranges from 1.2 ha/1,000 in the Downtown Core to 74.4 ha/1,000 in the North-East New Growth Area. However, these two Reporting Units are vastly different in terms of population density, available land base, and planning objectives. These factors have a major impact on the history of open space development in these areas of the city, with the Downtown Core representing an area of very high population density and very small available land base in comparison to the North-East New Growth Area, where land use is primarily agricultural and rural residential, with excellent opportunities for future growth and open space development.

In general, provision per capita is highest in the developing and industrial areas of the city. This is the result of lower population density: while there is less open space overall, a lower population means a relatively higher amount of open space per capita. In the developing fringe, much of the area is still country residential or agricultural, and there is virtually no residential development in the industrial areas (with a few exceptions, such as Maple Ridge and Westview Village).

Excluding outliers such as industrial areas, the average provision of open space across residential areas of the city is 9.2 ha/1,000 for all open spaces, and 6.9 ha/1,000 for municipal parks. Most settled areas of the city

contain around 6.5 ha/1,000 for all types of open space, while developing areas (where housing density is lower or not yet fully developed) are higher at around 10 ha/1,000. Provision in the inner city is actually around 8.0 ha/1,000, because of the availability of considerable open space in the form of campuses, golf courses, and large city parks along the North Saskatchewan River. The provision of municipal parks, the 'backbone' of the open space system, is much lower for the inner city, at about 5.5 ha/1,000, and only 1.2 ha/1,000 in the Downtown Core itself.

While open space provision in the City of Edmonton can be compared across Reporting Units, the overall amount of open space can also be compared to other municipalities and provisional standards. For example, a target of 4.0 ha of parkland per 1,000 residents is commonly used for open space planning in North America, and has been adopted by the US National Park and Recreation Association (NRPA). Comparing this standard to provision of municipal parks in the City of Edmonton, all reporting units exceed the standard, with the exception of the Settled North area (Reporting Unit 9) at 3.8 ha/1,000 people, and the Downtown Core at 1.2 ha/1,000 people. However, the open space network is comprised of many different types of open space, such as campuses, provincial parks, squares and plazas, main streets, and schools. These spaces provide some of the same functions as municipal parks, even though they may be managed by other public entities such as school boards or the provincial government. When considering all types of publicly accessible open space, even the Downtown Core, with the lowest level of provision, provides 4.7 ha/1,000 residents.

It is important to remember that interpretations of open space over- or under-supply should account for local context, other open space characteristics, and municipal goals. For example, although some areas have fewer open spaces, those spaces may have been developed to a higher standard, or may have better or more specialized functionality. (An evaluation of open space functions can be found in Section 6.) Areas currently over-supplied with open space suggest there is open space capacity to spare, and could present opportunities for further population growth.

Additionally, due to the differences in population density, land development constraints, available land base, and development history among Reporting Units, applying a single provision standard for all areas of the city may not be appropriate. It may be difficult to find opportunities for increasing the amount of open space in the Downtown Core, but the existing open space system could instead be enhanced to provide more services. The development of appropriate provision standards, tailored to the needs and expectations of the City of Edmonton and its residents, will be explored in the next project phase.

TABLE 3.1 Supply Analysis Summary of Results

REPORTING UNIT		HECTARES (ALL OPEN SPACE)	HECTARES PER 1,000 (ALL OPEN SPACE)	HECTARES (MUNICIPAL PARKLAND)	HECTARES PER 1,000 (MUNICIPAL PARKLAND)
1	DEVELOPING FRINGE SOUTH-EAST	176	6.5	170	6.3
2	SETTLED SOUTH-EAST	715	6.4	464	4.2
3	INDUSTRIAL SOUTH	225	91.8	109	44.6
4	DEVELOPING FRINGE SOUTH-WEST	612	17.2	573	16.1
5	SETTLED SOUTH-WEST B	553	10.6	434	8.3
6	CITY CENTRE SOUTH	913	10.3	506	5.7
7	CITY CENTRE NORTH	567	7.3	431	5.5
8	SETTLED NORTH-EAST	465	6.4	398	5.5
9	SETTLED NORTH	756	5.4	526	3.8
10	NEW GROWTH AREA NORTH-EAST	226	92.2	182	74.4
11	INDUSTRIAL NORTH	173	71.1	72	29.7
12	DEVELOPING FRINGE WEST	254	8.5	189	6.4
13	SETTLED WEST	847	7.7	629	5.7
15	SETTLED SOUTH-WEST A	1214	19.3	847	13.5
16	DOWNTOWN CORE	280	4.7	72	1.2
CITYWIDE AVERAGE (RESIDENTIAL AREAS)		613 ha/ Reporting Unit	9.21 ha/1,000 people	437 ha/ Reporting Unit	6.85 ha/1,000 people

- The Transportation Utility Corridor (Reporting Unit #14, aka Anthony Henday Drive) is not included in this analysis.
- Citywide average does not include industrial areas (Reporting Units 3 and 11) or new growth areas (Reporting Unit 10) where urban residential land use is underdeveloped.

4 ACCESS ANALYSIS



What is an access analysis?

Although a supply analysis provides information about how much open space is within a city, it cannot reveal how easy those spaces are for residents to access. An access analysis identifies 'servicing areas' that are accessible from a certain distance from open spaces. Depending on the available mode of transportation, residents experience a substantial difference in open space access.

In order to measure access to open spaces, we carried out a detailed servicing area (also called catchment) analysis. A catchment can be defined in different ways, but generally it represents the area surrounding an open space that corresponds to a reasonable traveling distance to that open space. This is similar in principle to a school catchment area, which uses a geographic circumference around each school (together with capacity and travel factors) to identify the neighbourhoods whose children should attend that particular school.

For the access analyses, different thresholds were established to reflect a reasonable travel distance using different modes of transportation: a 400 m (5 minute) walking distance, a 1.3 km (5 minute) cycling distance, and a 4 km (10 minute) driving distance. The transit access analysis considers an open space accessible by public transit if it is within a 400 m (5 minute) walking distance from a public transit stop, i.e. bus stops and Light Rapid Transit (LRT) platforms. These distances were selected by performing a literature review pertaining to accessibility, and choosing the figures most appropriate for the City of Edmonton.

Additionally, instead of measuring the catchment distance as a straight line outward from the open space (i.e. 'as the crow flies'), the distance was measured using reasonable routes of travel for each mode of transportation — in other words, along the pedestrian, cycling and roadway networks for the walking, cycling and driving analyses, respectively.

For the walking access analysis, the road network dataset was refined to include only roads that had sidewalks alongside them. These 'walkable' roads were combined with share-use pathways and off-street pedestrian

paths and trails. Similarly, for the cycling access analysis, the cycling network dataset was built using maps of bike lanes (on and offstreet) and cycling-friendly pathways and trails. The driving access analysis includes all vehicle-accessible public roadways.

Establishing a catchment around each open space is the first step to determining which parts of the city are within reasonable travel distances to open spaces, and which are not. But open spaces may be located close to one another and catchments may be large, so the servicing area of one open space very often overlaps with the servicing area of another. For that reason, with the exception of the transit access analysis, the results shown in Maps 4.1 to 4.8 actually represent the amount of open space accessible from every location in the city. This enables planners to see not only whether a specific residential dwelling is within a reasonable distance from an open space (i.e. answering a 'yes or no' question), but also how much open space lies within a reasonable distance. For each analysis, the 'how much' question is answered by providing both a count of accessible open spaces, and area of accessible open spaces in hectares.

The transit access analysis does not use this approach, because planners are interested in whether open spaces are well serviced by nearby transit stops, not whether transit stops are well serviced by nearby open spaces. As a result, Map 4.9 shows the 400 m walking catchment area surrounding each open space without any overlaps. The open spaces themselves indicate how many transit stops are within their respective catchments, as a measure of how well or how poorly they are serviced by transit.

Why evaluate access?

A large, well-distributed network of open spaces has little value to humans if we cannot reach them. An access analysis is intended to provide information to parks planners and managers about how well open spaces are servicing Edmontonians, where there are servicing area gaps, and how access varies among different user groups (i.e. walkers,

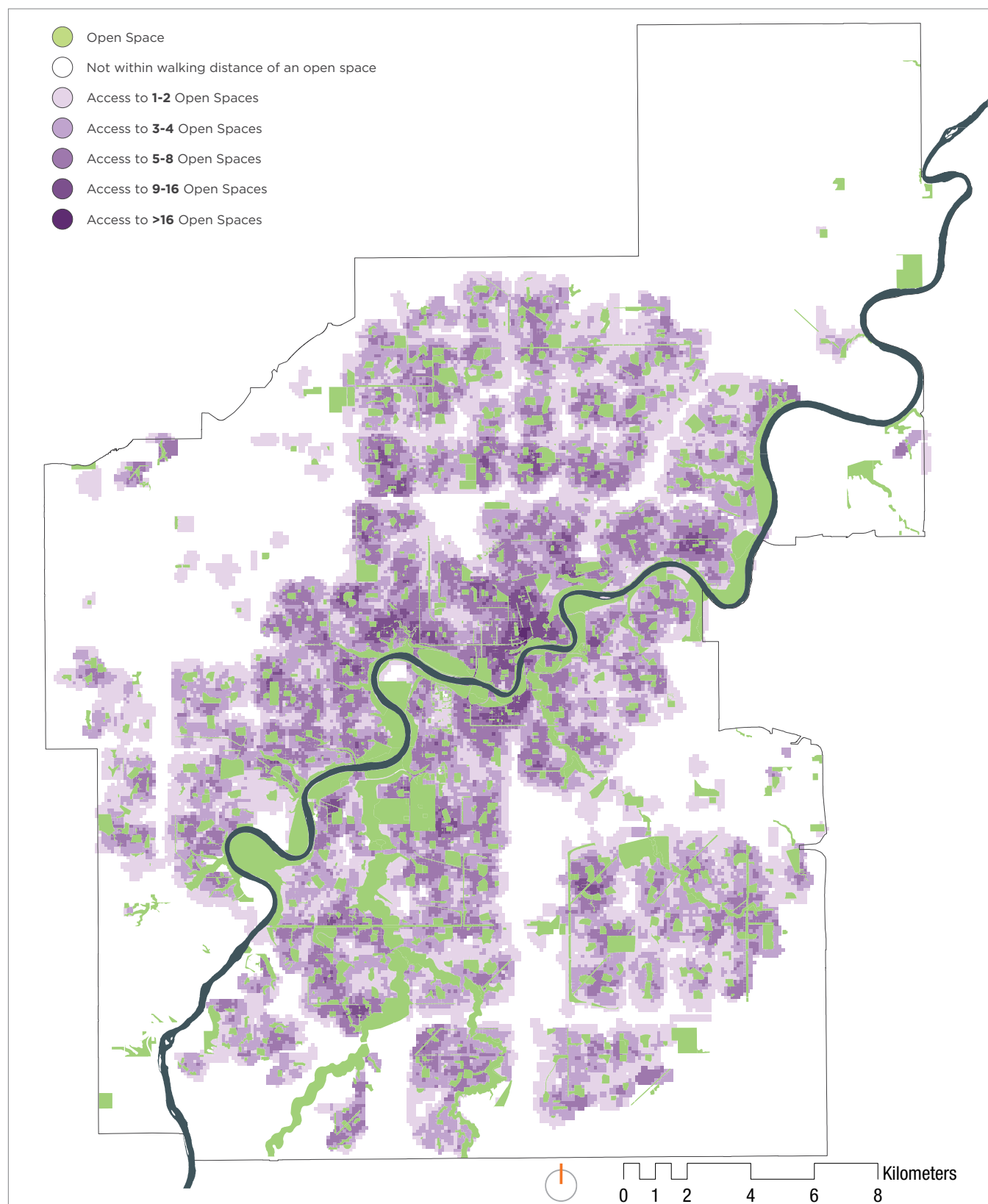
cyclists, drivers, transit users). In other words, it identifies areas that are well serviced and others that require improvement.

Identifying areas that require improved access can suggest a number of management interventions. For example, gaps or weaknesses in servicing catchments can identify locations where potential vacant, leased, or acquirable land can be considered for conversion into open space. The analysis can also help identify areas that require further development of walking, cycling and roadway networks, or expanded transit service areas, so that existing open spaces can be accessed more easily.

It is important to remember that the results of an access analysis must be considered in relation to management goals and objectives. Some types of open spaces might be targeted for better access using certain modes of transportation. For example, community parks are the most important type for walking access, because they are intended as widely accessible community hubs, and walking (or using a mobility assisting device on the pedestrian network) is the transportation mode most accessible to the most people, including children and the elderly. By contrast, municipal golf courses are typically accessed by vehicle, because users are often transporting golfing equipment, and may be traveling from distant parts of the city. Regardless of management decisions, the access analysis helps to inform conversations about equity — about which spaces are accessible by people who cannot afford to own a personal vehicle, or which are accessible by people who must use a specialized vehicle for transportation.

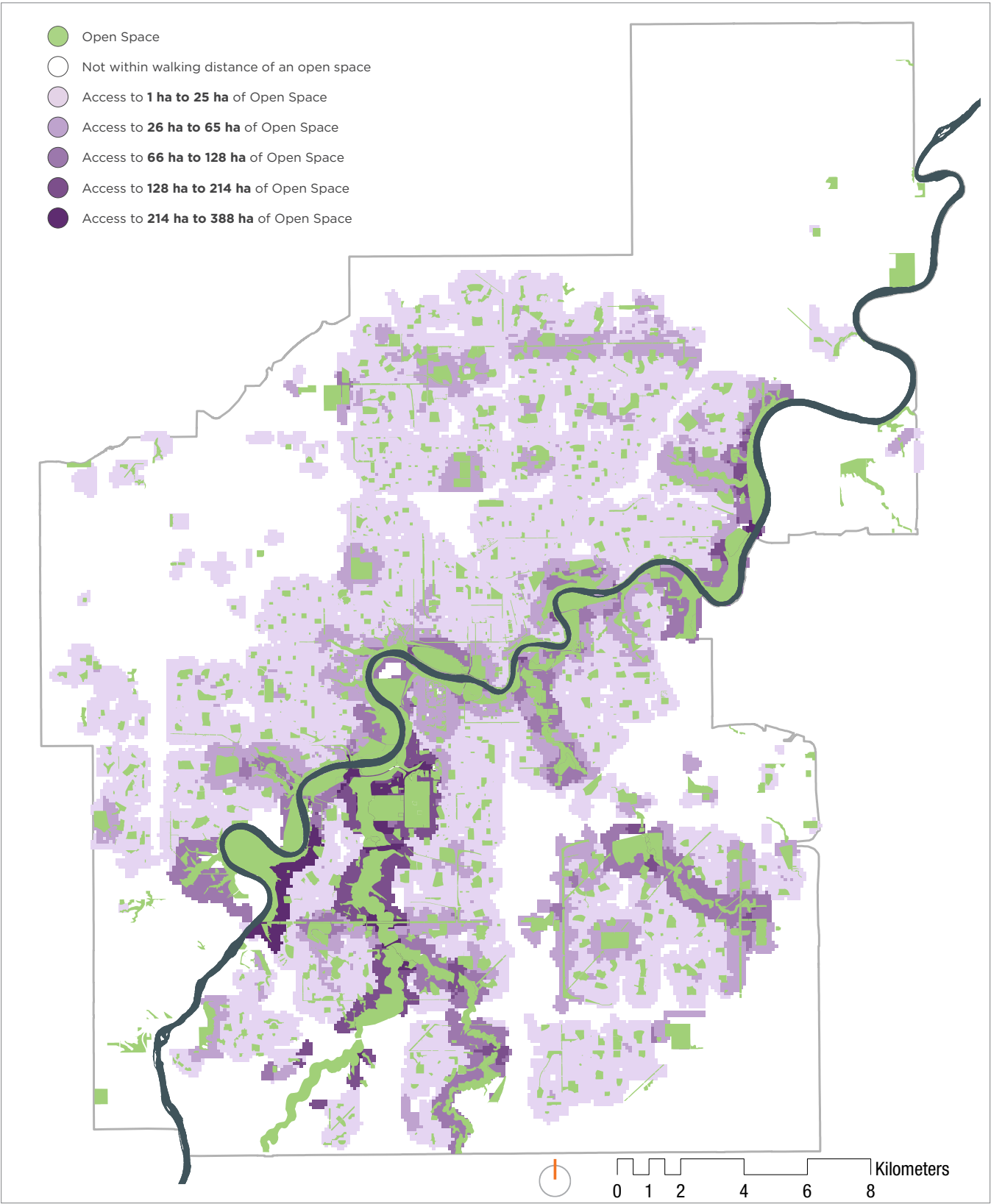
Walking Access — Count

MAP 4.1 Number of open spaces within 400 m of any location, along pedestrian friendly routes



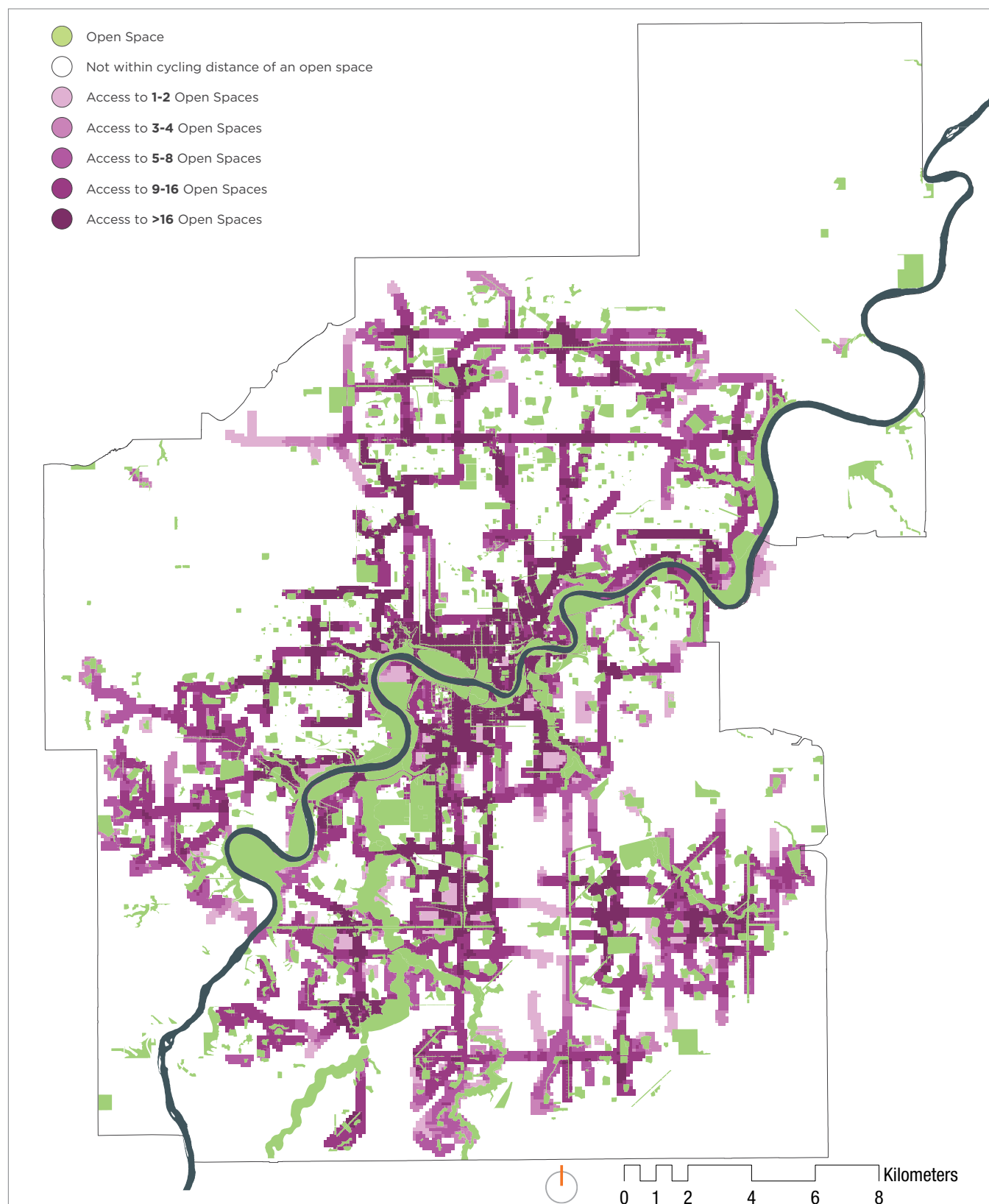
Walking Access — Area

MAP 4.2 Amount of open spaces within 400 m of any location, along pedestrian friendly routes



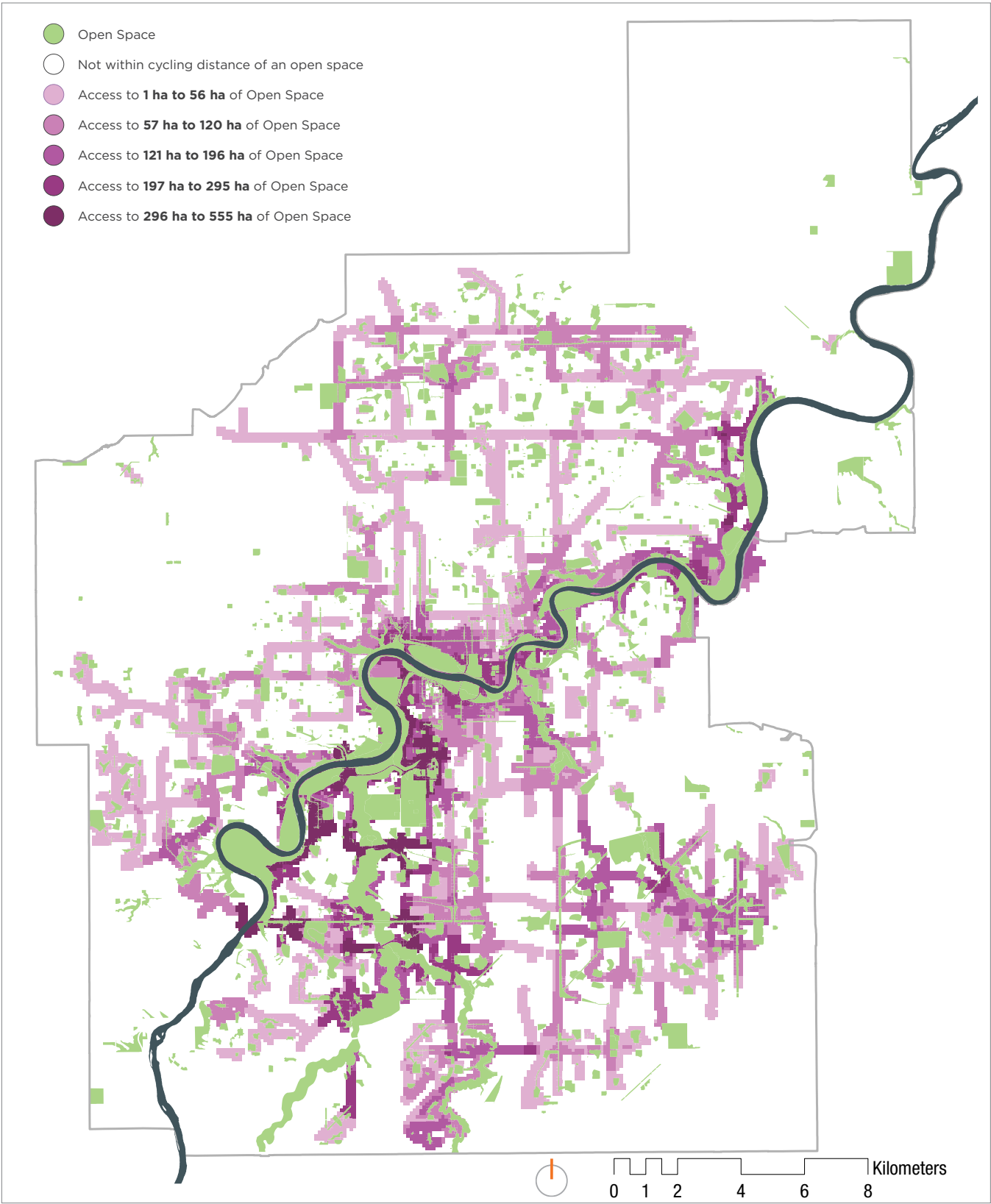
Cycling Access — Count

MAP 4.3 Number of open spaces within 1.3 km of any location, along cycling friendly routes



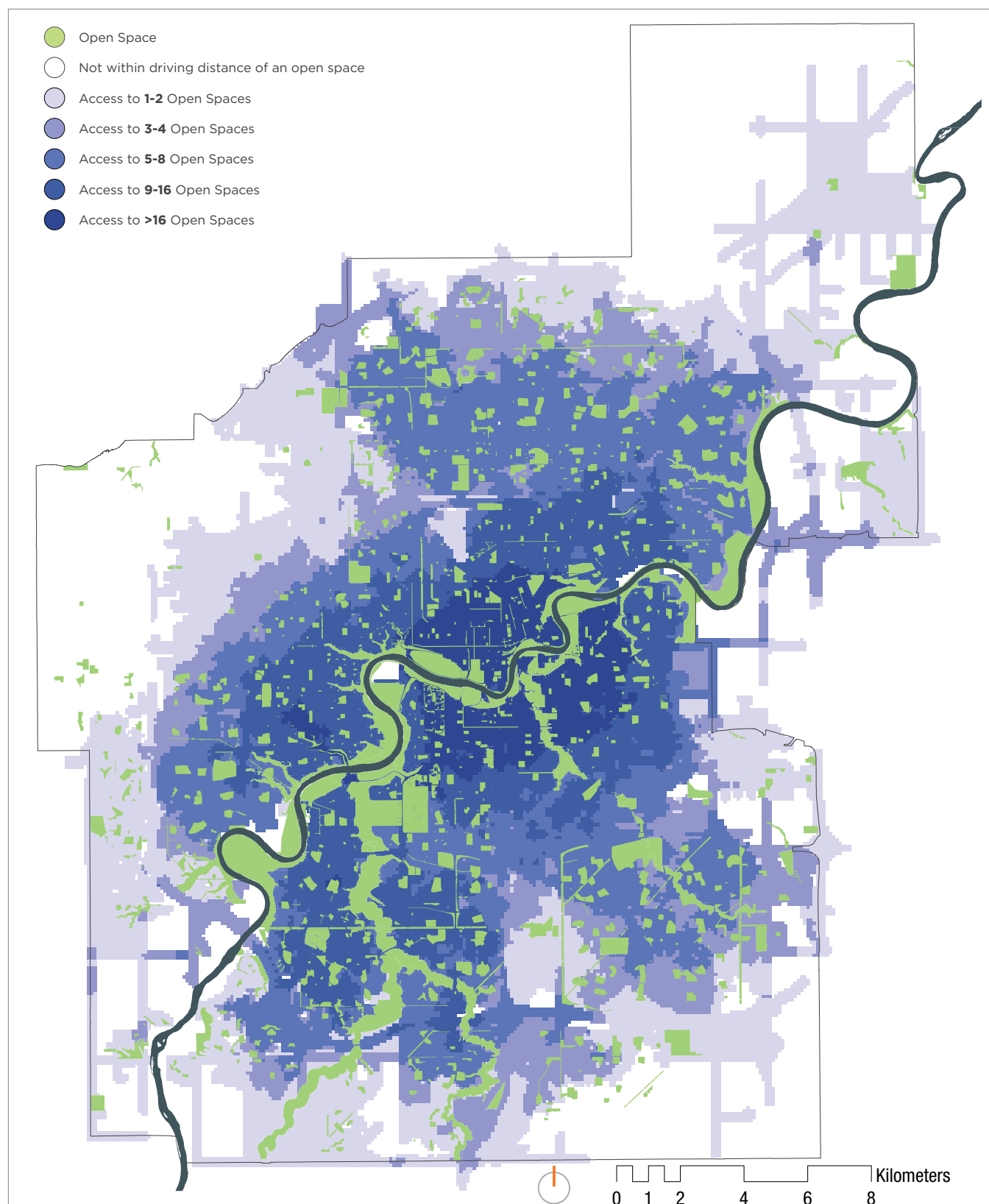
Cycling Access — Area

MAP 4.4 Amount of open space within 1.3 km of any location, along cycling friendly routes



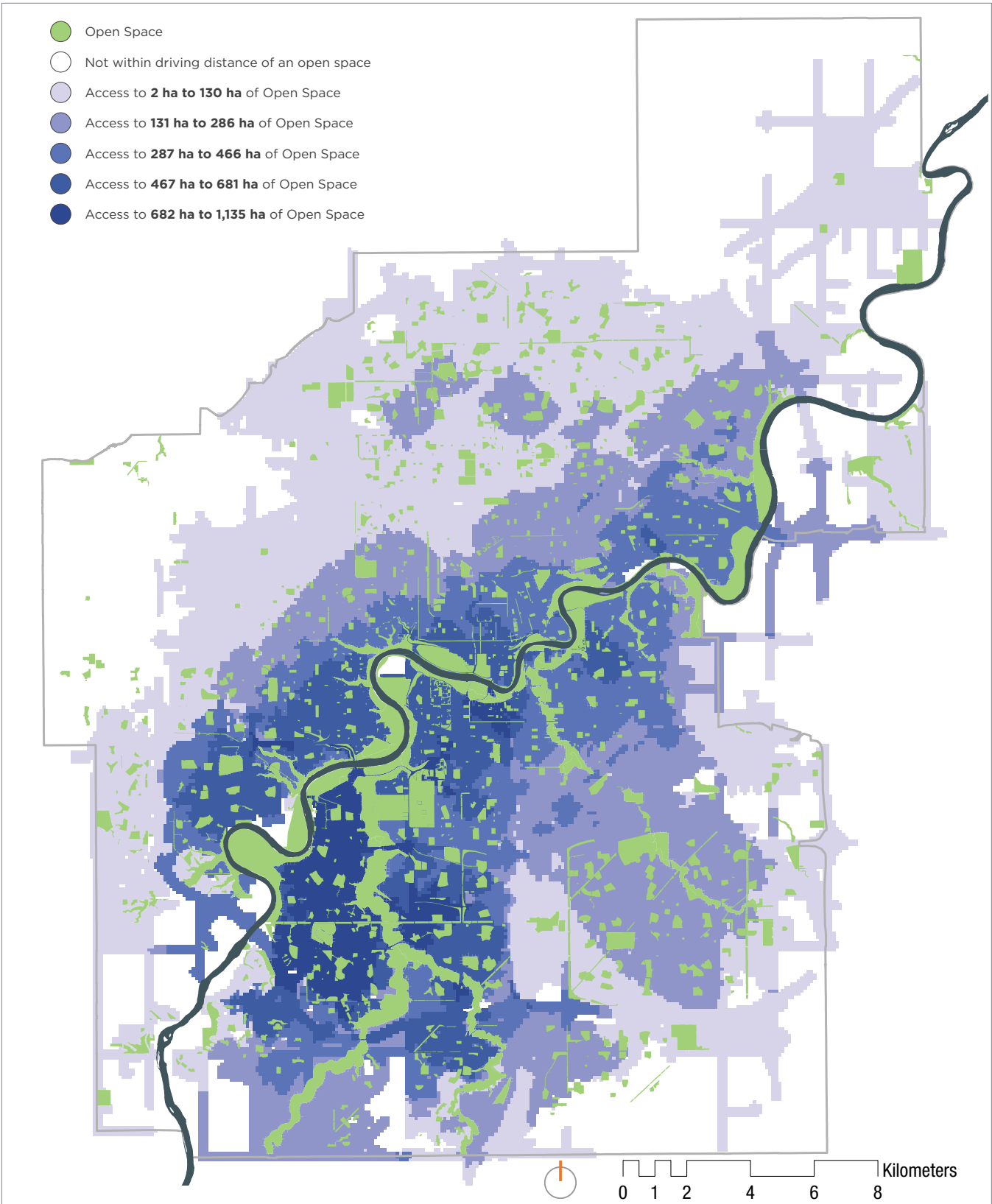
Driving Access — Count (City, District, Special Purpose)

MAP 4.5 Number of open spaces within 4 km of any location (City and District Parks, and Special Purpose Facilities only)



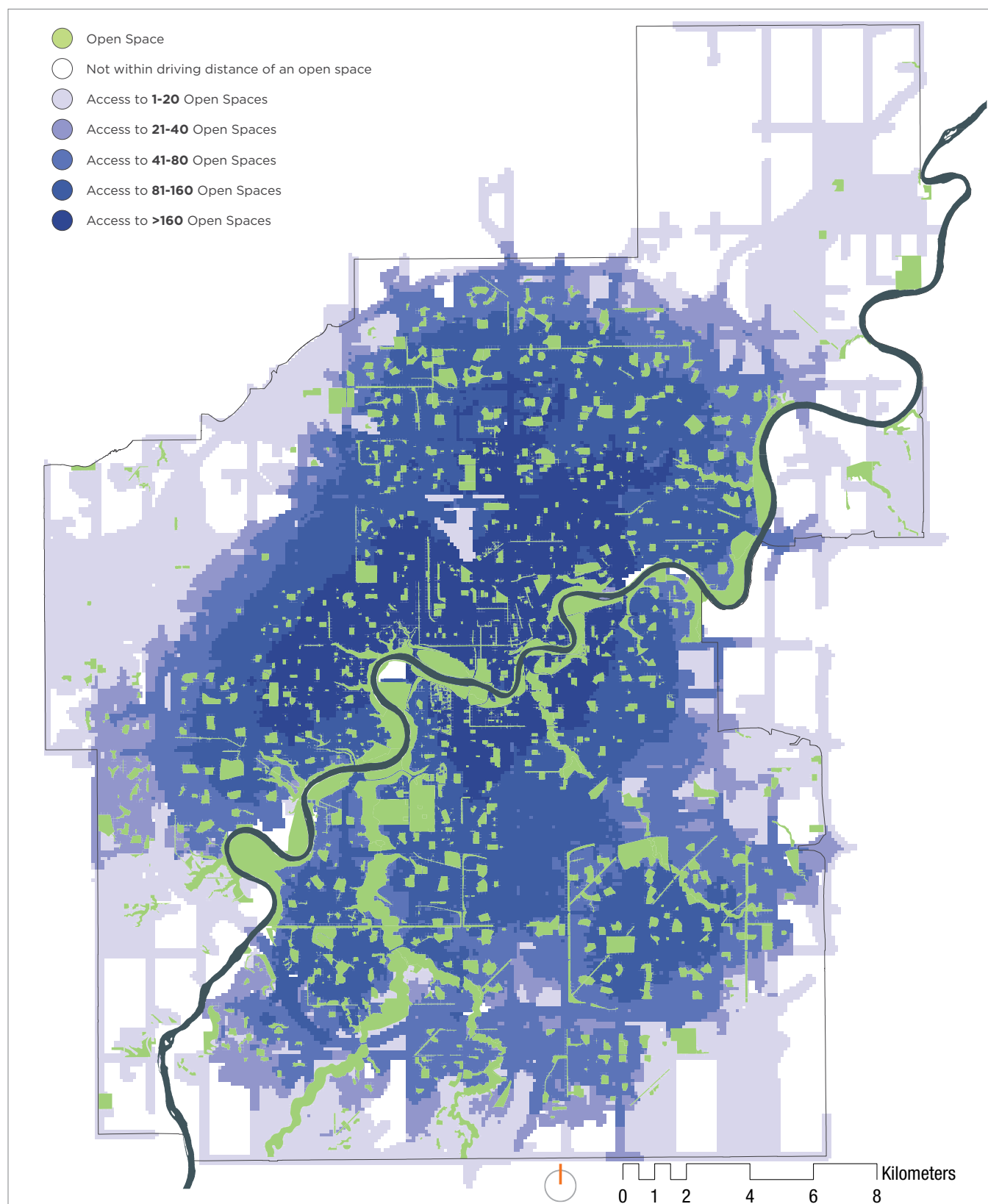
Driving Access — Area (City, District, Special Purpose)

MAP 4.6 Amount of open space within 4 km of any location (City and District Parks, and Special Purpose Facilities only)



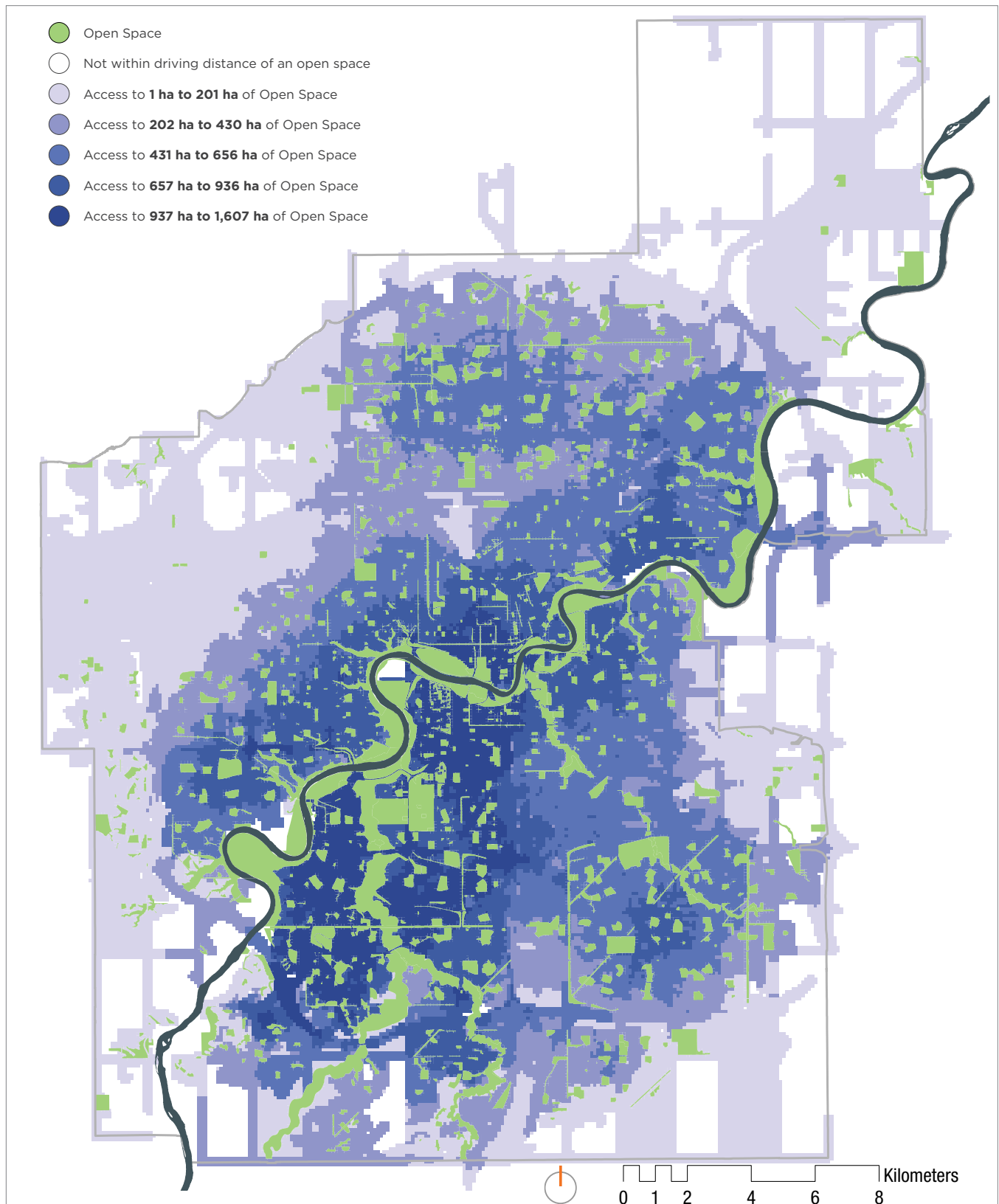
Driving Access — Count (All Open Spaces)

MAP 4.7 Number of open spaces within 4 km of any location (all open spaces)



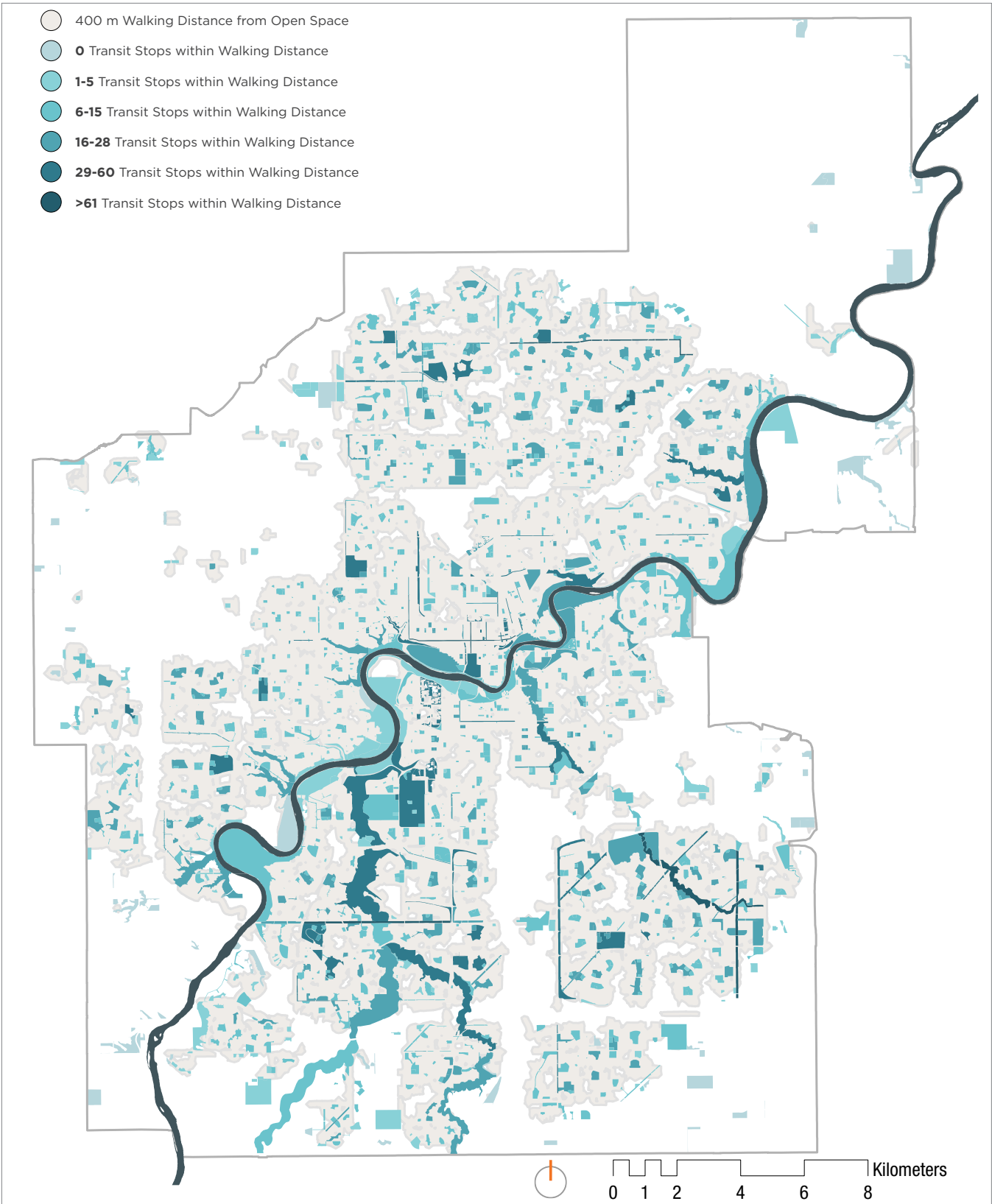
Driving Access — Area (All Open Spaces)

MAP 4.8 Amount of open space within 4 km of any location (all open spaces)



Transit Access

MAP 4.9 Number of transit stops within 400 m of an open space



Discussion

Access to open space is evaluated using a series of 'catchments' surrounding each open space, the scale of which depends on the mode of transport: walking, biking, driving or transit. The relative distribution of open space access changes dramatically in response to the size of a catchment, meaning that residents experience substantial difference in their access to open space depending on the modes of transportation available to them.

Walking Access

Most residential areas (94%) in the city are within a 400 m walking distance (along walkable roads and paths) of at least one open space, while 99% of residential areas are located within 800 m from an open space. Hotspots of walking access are found throughout the city, particularly north of the River Valley in the neighbourhoods to the east and west of the Downtown Core. However, few areas have walking access to a high density of open spaces (the darkest colours on Map 4.1). Areas with the least walking access to open space are the newly developing communities at the fringes of the city. In these places, land uses are currently rural in nature and population density remains low, so relatively few open spaces have been developed to service them. In addition, walking networks are largely incomplete, as neighborhoods have not been fully developed yet. The far south-west regions in particular are largely disconnected from the green network from a pedestrian's perspective.

Map 4.2 gives a better idea of the types of open spaces that residents have access to by showing the number of hectares within walking distance. The majority of residential areas are served by fewer than 25 hectares of open space within walking distance. This reveals that although many Edmontonians have access to several open spaces within walking distance, those spaces tend to be relatively small. By contrast, some parts of the city that have access to fewer open spaces by number ultimately have the best access to open space by area. The neighbourhoods surrounding Whitemud Ravine, Terwillegar Park and Mill Creek are good examples of this trend: while they have walking access to

a variable *number* of open spaces, they have among the best access in the city to a large *amount* of open space, due to their proximity to large parks and natural areas.

Cycling Access

Overall, 37% of residential areas can access open spaces via existing cycling routes within 1,300 m of where they live, along designated bike paths and routes. The well-connected bike routes in the inner city provide a high degree of cycling access to the city's open spaces. The central areas north and south of the North Saskatchewan River provide the highest density of cycling accessible open spaces. Moving into the peripheral areas of the city, easy cycling access declines substantially, and linear catchment patterns (due to linear cycling routes) lead to highly variable access across the landscape. The far south-west areas of the city in particular have poor cycling access to open spaces, and access for newly developing regions is limited due to a lack of designated bike routes. The results of this analysis show that even though a great majority of residents have good access to open spaces along walking trails and sidewalks, access is severely curtailed for people who prefer to use alternative modes of transportation, such as a bicycle, and who are not comfortable using automobile-oriented travel routes.

Similar to the result for the walking access analysis, Map 4.4 shows that cycling access to open space is inequitably distributed across the city. While most cycling-friendly routes connect a high number of open spaces, only select neighbourhoods enjoy cycling access to high amounts of open space — specifically, those near Whitemud and Blackmud Ravines, Terwillegar Park, the University of Alberta Farm, and some other parts of the River Valley and Ravine System.

Driving Access

Approximately 97% of residential areas are located within a 4 km driving distance to major destination spaces (city parks, district parks, and special purpose facilities). The

areas within and immediately surrounding the Downtown Core in particular have a high degree of driving access to these open spaces. (However, note that the driving analyses have not accounted for parking amenities, which may compromise the convenience of driving to certain open spaces, particularly in the inner city.) Mature neighbourhoods also tend to have similar access. Moving further from the inner city, the west, northwest and southeast show a rapid decline in driving access, while the northeast and southwest retain relatively good driving access. This general pattern — better driving access near the centre of the city, and poorer driving access near the periphery — is the result of two primary factors: central areas of the city (including the River Valley and Ravine System) have more district parks, city parks and special purpose facilities; and central areas of the city have a higher density of roadways than peripheral areas, which means there are fewer gaps in driving catchments.

Assessing driving access to any type of open space shows a similar spatial pattern, but the number of open spaces accessible within the same 4 km distance is an order of magnitude higher than the 'destination' spaces summarized above. The highest densities of open spaces within driving distance are again within the areas surrounding the inner city, but a greater density also extends further north, reflecting the distribution of other open space types in this area. Periphery areas have relatively less access, but this is due to the low density of open spaces in newly developing areas.

When considering driving access to hectares, rather than numbers, of open spaces, Edmonton drivers remain well served by the green network. However, some notable differences do emerge. Although the central city, particularly the Downtown Core, has access to the highest number of 'destination' spaces, driving access to the highest amount of 'destination' space is centred south and west of Downtown, especially in Reporting Unit 5 (Settled South-West B). Additionally, while they have driving access to a moderate number of 'destination' spaces, the open spaces accessible to the north and south-east of the city are relatively smaller than those

accessible to the central city. The pattern of driving access to all open spaces reflects these same trends, but also shows that the north-west of the city has driving access to a higher number of relatively smaller open spaces.

Transit Access

Most open spaces (91%) are within a 400 m walking distance from a public transit stop. Furthermore, half of all open spaces are within walking distance to between 6 and 15 transit stops. It is important to note that for this analysis, the walking 'catchment' was measured from the centre of an open space, so the actual distance to a transit stop may be longer depending on where a person begins their walking trip within the open space.

Pedestrian priority streets, main streets, and squares and plazas are the most accessible open spaces from public transit, with over 27 stops within walking distance on average. City parks, district parks, linear parks, and community parks are all moderately accessible (>10 bus stops on average). Open spaces with linear shapes, like ravines, linear parks, main streets or pedestrian priority streets, tend to have much more access to transit stops than more compact open spaces, because multiple stops are arrayed along their length. Additionally, open spaces that were farther and less connected to collector roads, which are well used by transit routes, tend to have a lower number of bus stops within reach. Expansion of transit service on to more local streets could be considered to improve accessibility, particularly to enable seasonal access to destination spaces such as city parks.

Among open spaces with no access to transit are 43 community parks, 9 district parks, and 5 city parks, including River Valley Oleskiw, Henry Singer Park, and a southwestern portion of Whitemud Park. Most of these inaccessible parks are outside Anthony Henday Drive, and those within the Anthony Henday are mostly located within newly developing neighbourhoods. All special purpose facilities are accessible by public transit.

5 CONNECTIVITY ANALYSIS



What is a connectivity analysis?

One of the primary functions of the open space network is to support human and ecological connectivity across the city. A network of connected spaces ensures that people and wildlife can move through the city by walking, cycling, skating, or other active transportation methods. A well-connected network is one that ensures continuity in green space, and provides movement corridors and connections among important open spaces.

There are three major components of the green network from a connectivity perspective: destinations, or 'nodes'; movement corridors; and stepping stones. In order to evaluate connectivity, particular open spaces were identified as destinations, or nodes, that are targeted by individuals traveling through the network. Open spaces that were considered destinations are designed to support programming and contain amenities and infrastructure designed for active use: city parks, community parks, district parks, pocket parks, linear parks, special purpose facilities, and provincial parkland. Other open spaces play a supporting role to movement by acting as continuous movement corridors or discontinuous stepping stones (destination spaces can perform a supporting role, as well). Open spaces that are not presently designed to support programming (e.g. road greens, connectors, utility corridors) were excluded.

When analyzing connectivity, there are two types of connectivity that can be considered:

- » **Structural connectivity** describes the degree to which open spaces are physically connected to each other
- » **Functional connectivity** describes the degree to which a person, despite a lack of structural connectivity, can pass through the landscape to reach open spaces.

The model for the structural connectivity analysis represents physically connected open spaces as one contiguous patch, but allows a 30 m gap crossing ability to simulate road crossing behaviour of people when they encounter intersections. This threshold represents the average width of a road that is not considered a Major Arterial road. The open

spaces are evaluated using an algorithm that assesses the degree of importance a patch has to network connectivity. This is simulated by removing a patch from the network and measuring the change in connectivity. The more that connectivity is affected by the removal of an open space, the more important it is within the network. An open space can be more important due to its configuration within the network, or due to the number of links it provides to other open spaces. Results of the structural analysis are shown in Map 5.1.

In contrast, the model for the functional connectivity analysis simulates the amount of human movement 'flow' passing through the landscape. The more flow there is passing through the open space, the more human movement is directed or channeled through that area; the less flow, the more diffuse or impeded human movement is through that area.

The ability of a person to move through the landscape considers the physical resistance to movement (e.g. due to dense land cover or barriers), the danger of movement through the landscape (e.g. due to traffic or moving water), and the willingness of the person to move through different types of landscape (e.g. due to perceived fears or discomfort).

To model this movement, a relative value (rank) is assigned to every feature on the landscape, both within and outside the existing open space network, including land cover (e.g. trees, shrubs, maintained grass), land use (e.g. residential, commercial, industrial), ground slope, and physical barriers to movement (e.g. rivers, fences, wetlands, roads, buildings). The higher the resistance, the more difficult it is for a person to move through the landscape.

Results of the functional analysis are shown in a variety of formats. Map 5.2 shows the 'raw' model of human movement flow across the landscape, while Map 5.3 represents high-movement corridors (typically sidewalks) in relation to the green network. Maps 5.4 and 5.5 both show the relative connectivity importance of open spaces based on how they accommodate human movement. Map 5.5 takes into account the size of open spaces to control

for the impact of area on movement flow, while Map 5.4 is uncorrected for area. The area-controlled result focuses on open spaces that are contributing more flow to the network than would be expected based on their size alone. These spaces contribute higher relative flow due to their central position in the network, potentially acting as ‘gatekeepers’ which exert a strong influence on network interconnectivity. In the results uncontrolled for area, the relative contribution of an open space could be attributed to either movement occurring *within* the space, and/or movement the space enables to other open spaces.

Maps 5.6 and 5.7 show the walkable open space network. Unlike structural connectivity, the walkable open space network connects open spaces based on whether they are within 200 m walking distance of each other. In this analysis, open spaces do not need to be a contiguous patch, but rather, are connected by a person’s ability to walk between them. Map 5.6 therefore shows the walkable buffer between open spaces, and Map 5.7 shows which open spaces are connected by this walkable buffer, forming the open space walking network.

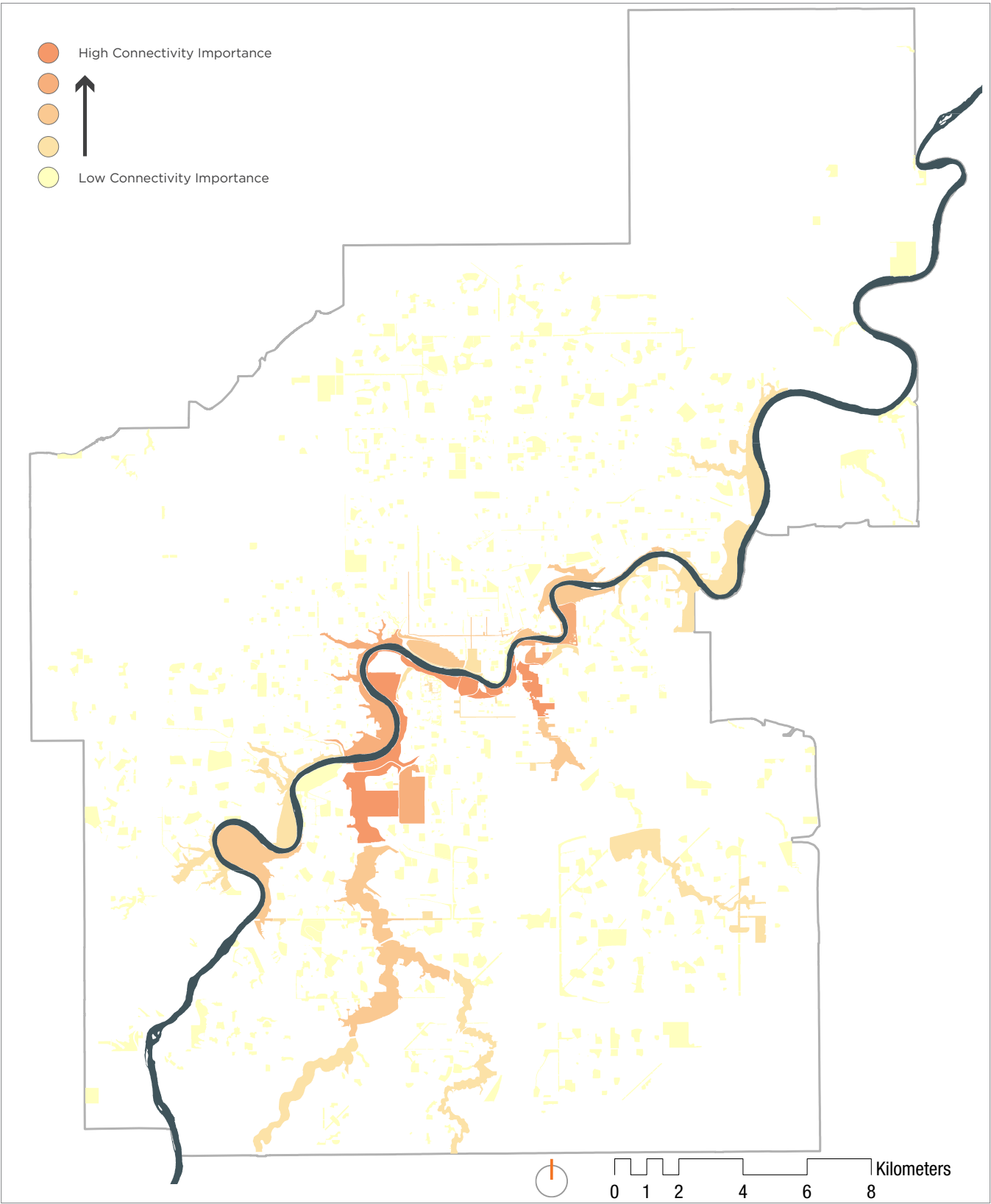
A functional connectivity analysis identifies locations with low and high connectivity, but because the model incorporates certain assumptions about willingness and physical ability to move through the landscape, the analysis generates a more realistic representation of areas that pose barriers to movement (e.g. roads, rivers, fences, water bodies) and potential movement corridors being used to access open spaces. Notably, the landscapes that people use to access open spaces may not be designed for this purpose (e.g. vacant land, utility corridors), and often are not even part of the designated system of open spaces (e.g. urban residential areas). These areas of high connectivity can be either pinch-points (areas where movement is constricted through a ‘bottleneck’) or corridors (areas where movement is channeled and the least difficult). The functional connectivity analysis can also identify open spaces that have impediments to human movement in the form of barriers or pedestrian-unfriendly land uses or land covers.

Why evaluate connectivity?

As opposed to an access analysis, the amount of landscape considered by the connectivity analysis is not restricted by any geographic limits (e.g. a 400 m walking buffer, only pedestrian routes). Instead, the connectivity analysis evaluates the role of open spaces within the green network as a whole. It evaluates all potential connections within the city, allowing planners and parks managers to determine how well the network is interconnected, and which open spaces are well or poorly connected to one another. Focusing on connectivity allows planners to see whether a park originally planned as a centrally located, highly connected space is actually performing that way, or whether a park assumed to play a minor role is actually a hub of system interconnectivity. Examining paths of connection can reveal that a poorly connected or isolated park may require only a few additions (e.g. connectors) to connect them to the network.

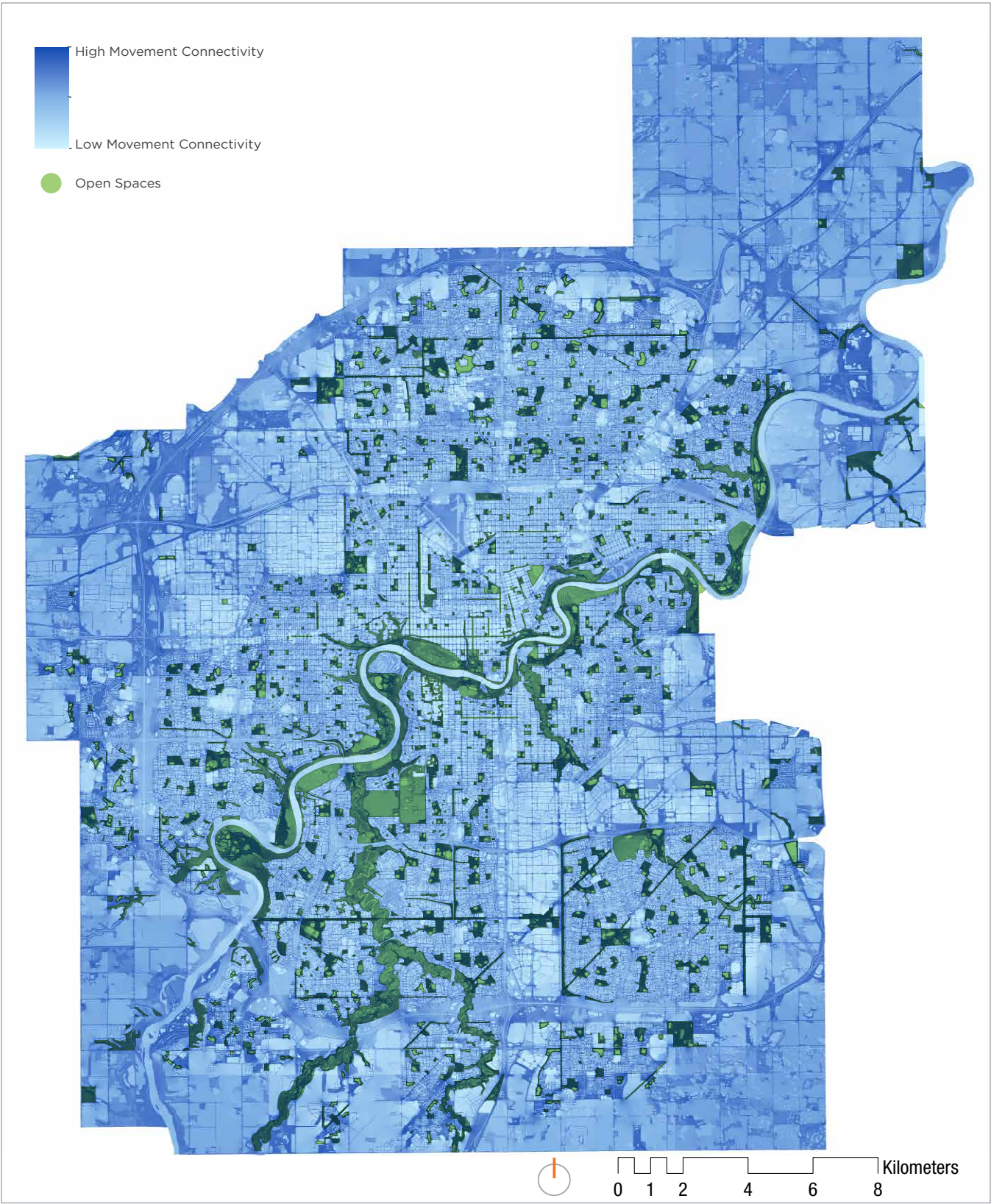
Structural Connectivity of the Green Network

MAP 5.1 Importance of open spaces to structural connectivity of the green network



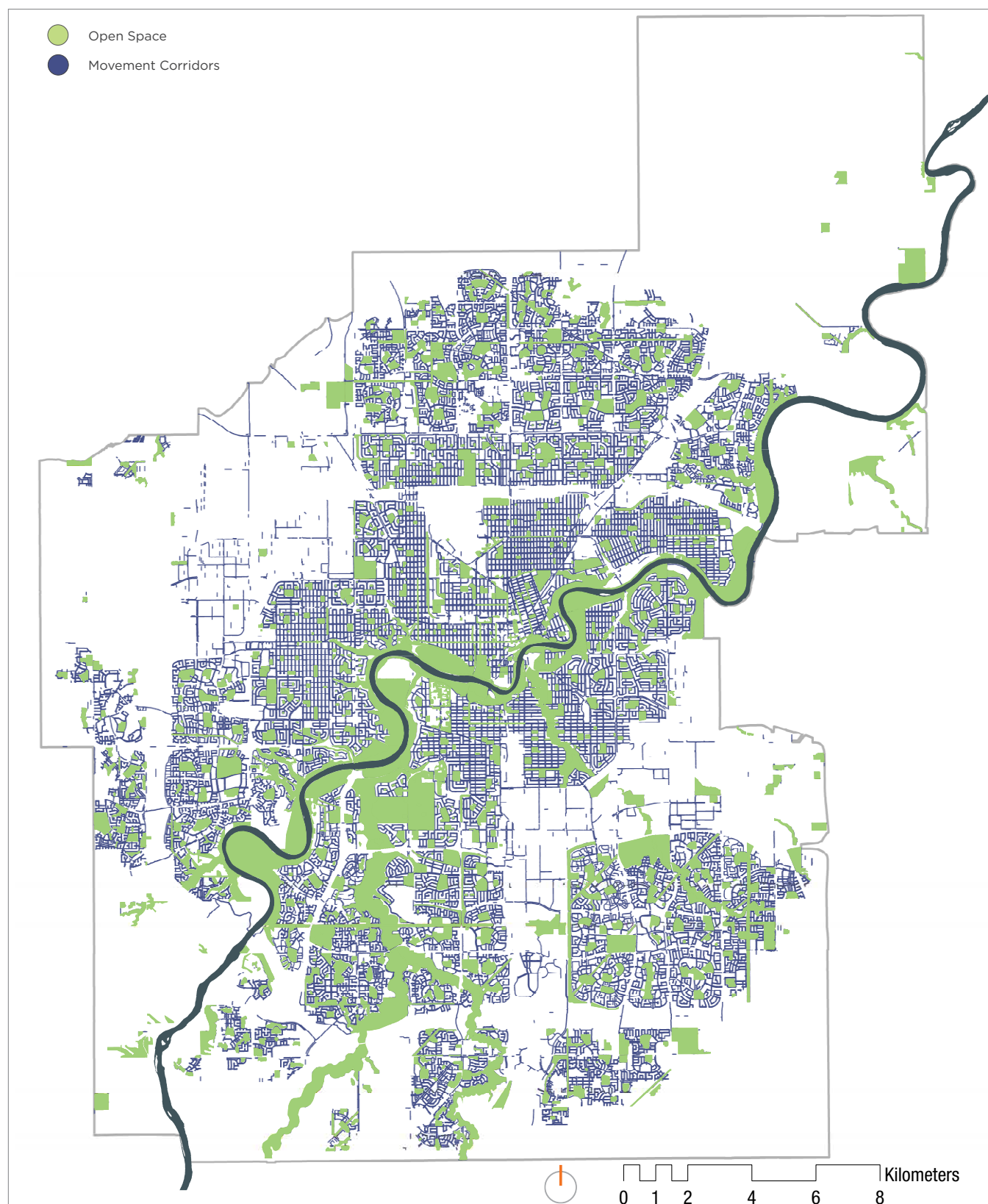
Human Movement through the Landscape

MAP 5.2 Human movement flows across the landscape



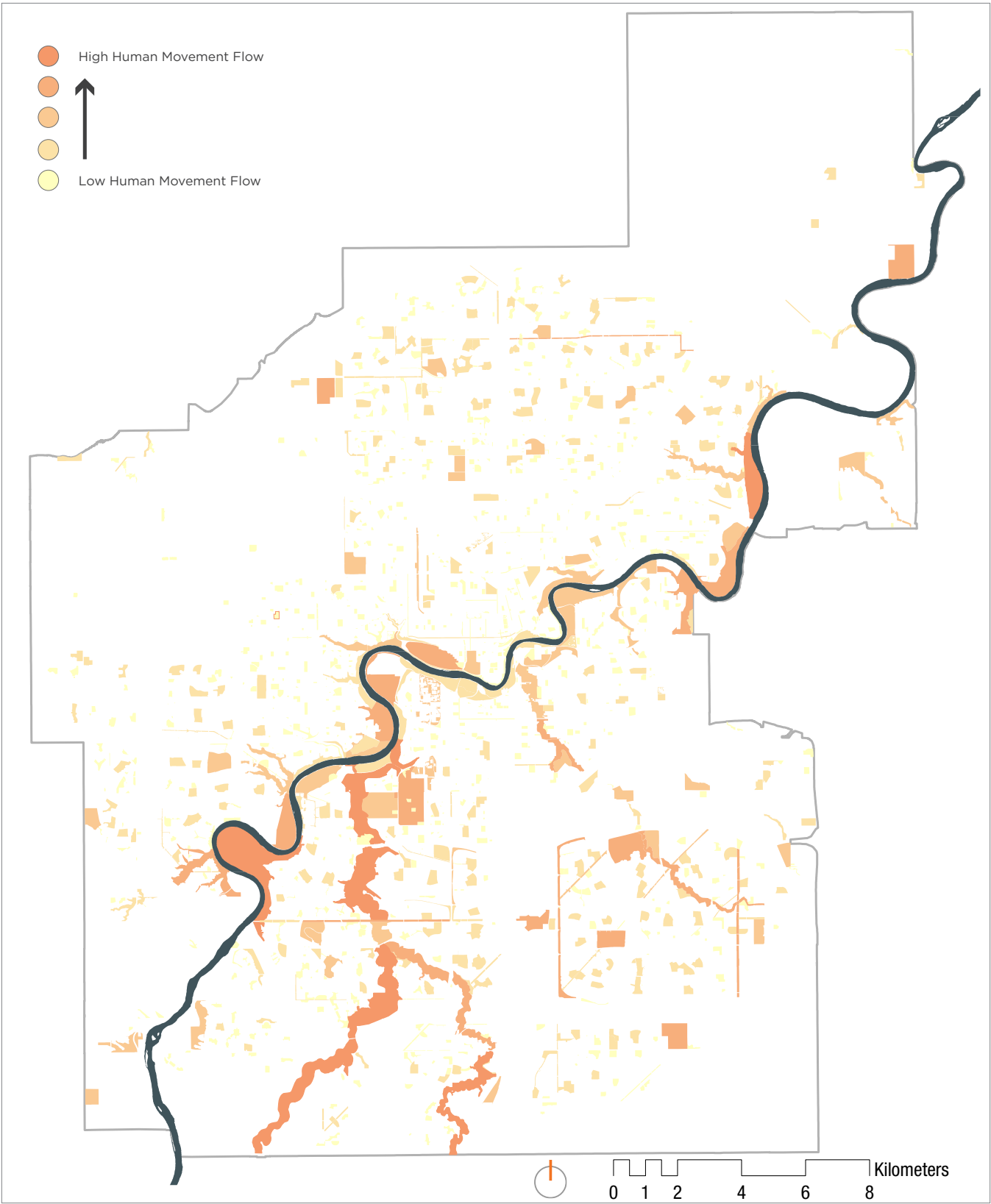
Human Movement Corridors

MAP 5.3 Green network interconnectivity, including high connectivity routes



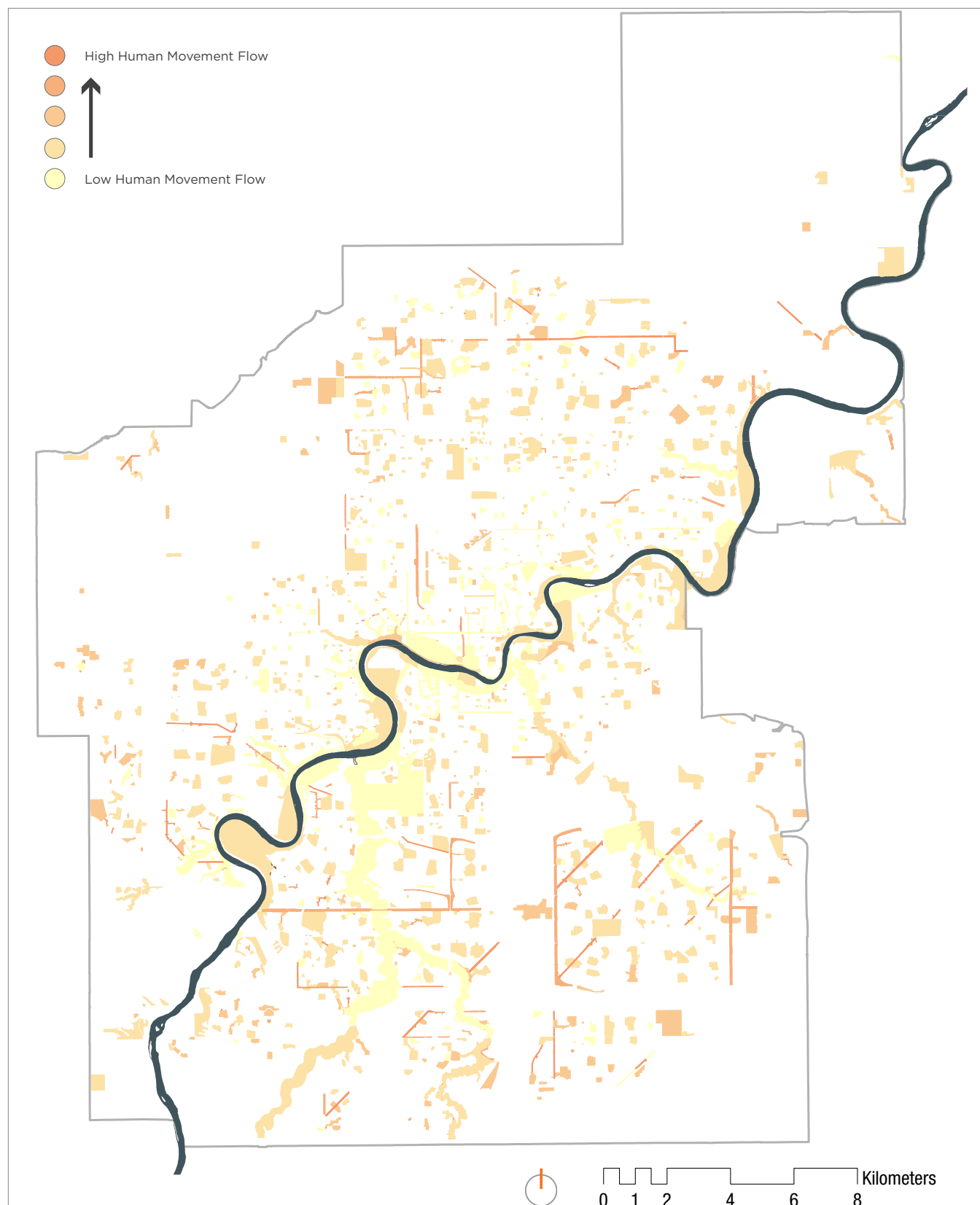
Human Movement through the Green Network

MAP 5.4 Importance of open spaces to human (functional) connectivity of the green network, disregarding size of open space



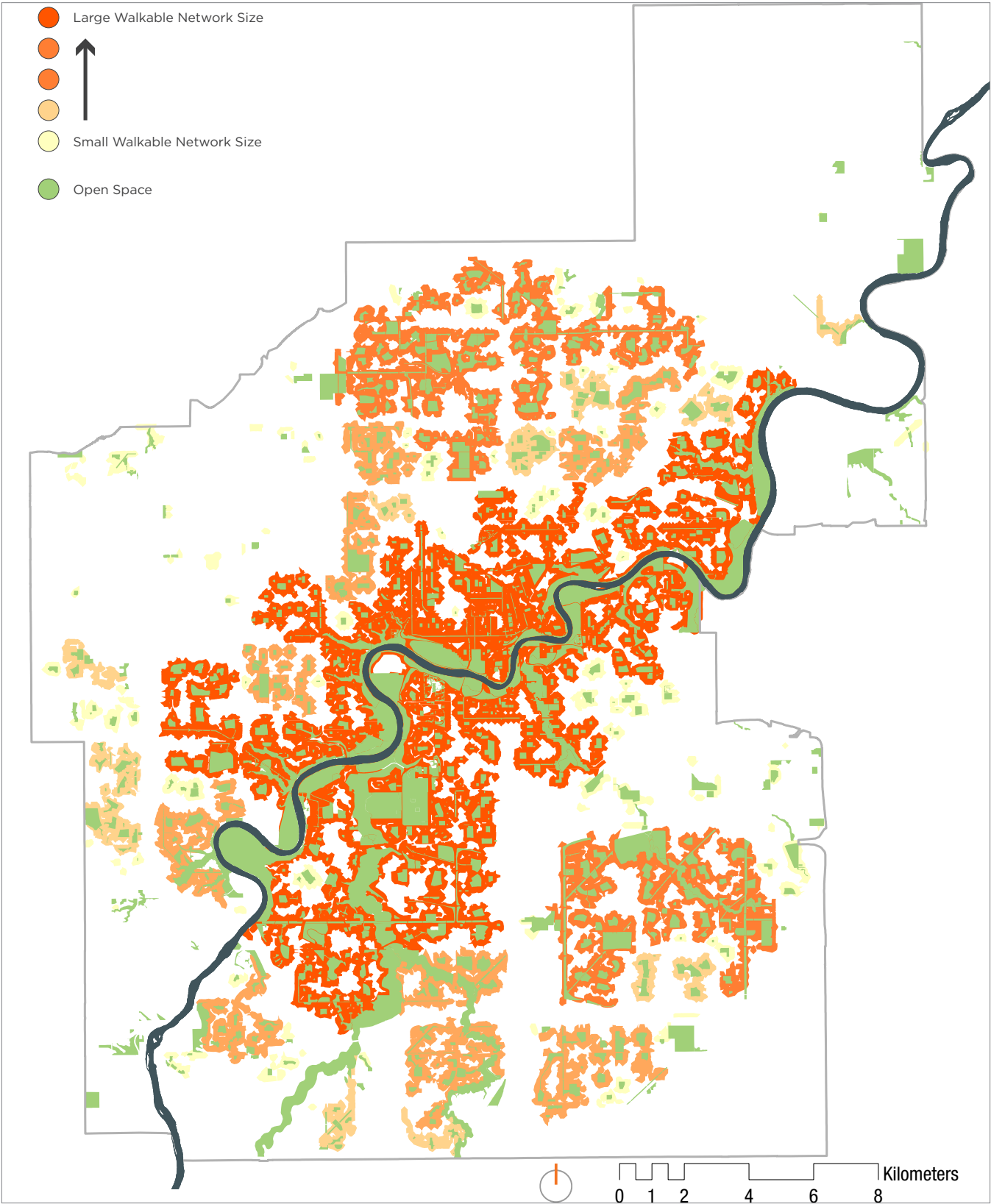
Human Movement (Area Controlled)

MAP 5.5 Importance of open spaces to human (functional) connectivity of the green network, controlling for size of open space



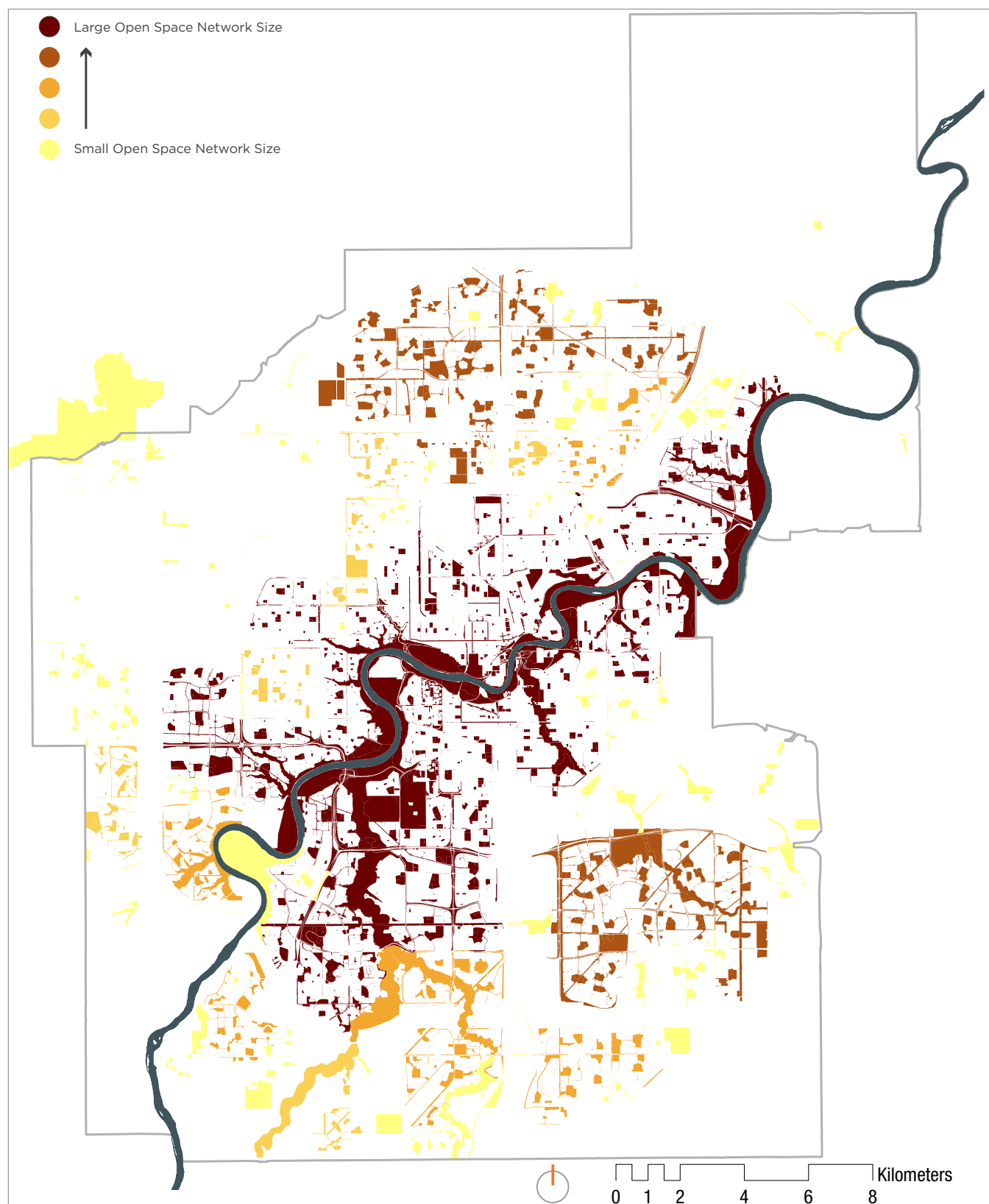
Walking Networks to Open Spaces

MAP 5.6 Walking networks to open spaces, based on a 200 m walking distance



Sub-Networks by Walking Distance

MAP 5.7 Connectivity of open space sub-networks (within 200 m walking distance)



Discussion

Structural Network Connectivity

The structural connectivity analysis should be viewed as a descriptive analysis, providing information about the existing state of open space contiguity in Edmonton. It is not a purely structural approach, since it takes into account a 30 m gap crossing ability for minor road crossings and intersections. However, it provides descriptive metrics about open space connectivity from a structural perspective.

There are numerous parks in the network that are connected with one another, but isolated from others. These groupings form subnetworks. The largest three by area include:

1. Rainbow Valley Park to the Riverside Golf Course (987ha)
2. Edmonton Valley Zoo to River Valley Highlands (503ha)
3. Whitemud Creek Ravine South to the nearby community parks (273ha)

Map 5.1 shows individual structurally contiguous open spaces by their degree of connectivity with one another (High to Low). Open space types with the least structural contribution to the network are community parks, linear parks, school sites, and municipal cemeteries.

These results highlight the importance of using functional connectivity network analyses as a tool for planning, and structural connectivity analyses as tool for describing the state of the landscape. As an example, this distinction can be illustrated by the pedestrian bridges/crossings that functionally connect Terwillegar Park through a linear corridor to Whitemud Creek Ravine South. These spaces are structurally disconnected because the parks are not physically 'touching' and also not within the road gap crossing threshold, since both the disconnections are over roads with four or more lanes. Therefore, the structural connectivity discussed here should be used as a conservative minimum or 'baseline' measure of connectivity, from which more complex structural connections in the landscape can be understood.

Human Movement Connectivity

The connectivity analysis provides a tool to understand how people move through and in between the components of the green network. It simulates random (not targeted or routed) walking through the landscape, graphically representing a person that is taking the easiest paths for movement.

The movement corridors displayed in Map 5.1 (blue) are formed by areas with the highest movement flow (movement corridors). Unsurprisingly, these routes are generally trails and sidewalks, because they are the landscape type friendliest for human movement.

The following open space types are those that allow the most movement within the network, when controlling for area, in order of importance. Their contribution is likely more related to their position in the network, channeling high movement flow, than their area.

1. Linear Parks
2. Pocket Parks
3. District Parks
4. Municipal Cemeteries
5. Community Parks
6. City Parks
7. Squares and Plazas
8. Campuses
9. Provincial Parklands
10. Pedestrian Priority Streets

The top five individual open spaces with the highest degree of movement are all linear parks. These parks are also acting as network connectors, channeling movement flow through the landscape in a manner similar to trails, sidewalks, and connectors.

All other open space classes have a wide range of contribution within the network depending on their placement, with more

diffuse flow or lower movement within them. Pocket parks that have higher movement flow due to their land cover (mostly maintained grass) and their configuration are likely to be acting as connectivity 'stepping stones' within the landscape. Some community parks are also located in central positions, contributing to the highest category of connectivity in the landscape.

City parks, although they are providing large structural green corridors, are not as central in the landscape compared to other open spaces. When focusing on both the area provided for human movement (intrapatch connectivity), and not just the position of the open space within the landscape, the following parks are the most important contributors to the network:

1. Terwillegar Park
2. Whitemud Creek Ravine Southwest
3. Whitemud Creek Ravine South
4. Whitemud Creek Ravine North
5. Blackburn Creek Park
6. Sir Wilfred Laurier Park

The five individual open spaces with the highest degree of movement are all city parks. Since these parks are very large, high flow in these areas can be largely due to the amount of movement they allow within the space (intrapatch connectivity), and not necessarily due to them acting as stepping stones to other open spaces.

Walkable Network Connectivity

The walkable network indicates which open spaces are connected to each other based on an average person's ability to walk between them.

The walkable buffers shown in Map 5.6 indicate all areas of the city within 200 m walking distance of each open space. Where these buffers overlap, the open spaces can be considered to be functionally connected. In other words, a person is reasonably likely to walk from one open space to another. The darker the colour of the buffer area, the larger the potential walkable network.

Map 5.7 shows the same information but in terms of how it relates to the open spaces themselves. In this map, all the open spaces that are within walking distance of each other are considered "connected" and therefore part of the same open space walking network.

As with many other analyses included in this report, the walkable network analysis highlights the importance of the River Valley and Ravine System. Of all the 140 walkable open space networks across the City of Edmonton, the central network that runs along the North Saskatchewan River Valley is by far the largest, and most connected. It includes over 2,600 open spaces along the North Saskatchewan River and Ravines, and connects to many important city, district, and community parks.



6 FUNCTIONS ANALYSIS



What is a functions analysis?

The functions analysis is intended to capture a measure of open space quality – how each open space provides different types of human and ecological services, and how those services combine to provide value to Edmontonians. We call these services ‘functions’ and evaluate each open space in the open space network for its ability to provide, support, or enhance these functions.

Figure 6.1 reviews the fifteen functions that open spaces provide, which have been organized according to the general themes of Ecology, Celebration and Wellness. The functions were developed through research and valuable expertise from park managers, urban planners, and urban ecology experts, who sought to capture the myriad ways that open spaces can provide value and benefit to residents either directly (e.g. providing recreational amenities) or indirectly (e.g. improving environmental outcomes). These functions were evaluated for the same open space types as the Supply Analysis (i.e. municipal parks, civic spaces, provincial parkland, campuses, special purpose facilities, municipal cemeteries and golf courses), with the exception that school sites were treated as an educational characteristic of adjacent parks, as explained below.

The results of the functions analysis are the product of a qualitative, cumulative scoring approach. For each function in Figure 6.1, a value was calculated for each open space based on characteristics (amenities or qualities) that describe or measure how well an open space contributes to the given function. Table 6.1, Table 6.2, and Table 6.3 provide an overview of the data that were used to represent these characteristics, and which functions they measure. For example, open spaces support water management by retaining and improving the quality of stormwater; enhancing rainwater infiltration; preserving natural wetlands; and protecting riparian vegetation. These attributes can be measured by using relevant datasets, which might provide information about the presence and size of stormwater management features, the amount of infiltration-enhancing land cover, the presence of riparian vegetation or natural wetlands, or the position of the open space in the landscape.

Every characteristic was assigned a score up to a maximum value of 1 (i.e. each characteristic was weighted evenly), and the sum of these scores results in the functional value of the open space. The only exceptions are characteristics that do not contribute directly to the function in question, but rather enhance people’s experience of that function. For instance, benches are not essential for recreational use of an open space, but they are useful as resting places during recreational activities. These enhancements were included only after tallying the scores of the other open space characteristics. This valuation method will be explained in further detail in the Technical Appendix to the final Green Network Strategy.

Map 6.1, Map 6.2, and Map 6.3 show the results of the functions analysis, summarized by the three overarching functional themes: Ecology, Celebration and Wellness. Each map is accompanied by a discussion of the functional strengths and weaknesses that influence the results, and of any trends that can be observed on the landscape. The darker the colour, the better that space supports a diversity of functions pertaining to that theme. Map 6.4 shows a summary of results that treats each of the fifteen functions equally, regardless of theme. For the aggregate score, the darker the colour, the better that space supports a diversity of functions from all three themes.

Why evaluate functionality?

Urban residents unquestionably benefit from the presence of open spaces in their community. This assumption underlies standards or guidelines about the amount of open space that should be provided in a city. Further nuance can be gleaned by determining how easy or difficult it is for residents to access those spaces – the distance they must travel to reach a park, whether they can travel safely from park to park, and the environments they must use to get there. However, these types of analyses can reveal little about the value of open spaces: their quality as destinations where people gather, learn and recreate, or as purveyors and regulators of environmental services.

The Green Network Strategy is unique in seeking to explore beyond the standard questions about supply, access and connectivity, and instead to evaluate the successes and gaps in Edmonton's open spaces from a functional perspective. For example, it is useful to know that a neighbourhood has 100 ha of open space, and that 90% of residents are within walking distance from those spaces. But it is even more useful to know that two of the neighbourhood's most walkable parks also provide excellent recreational value, or that its open spaces contribute poorly to water management. And comparing across areas of the city, it is possible that another neighbourhood contains 200 ha of open space, but those spaces might perform worse in terms of community building or public safety.

Understanding the functional strengths and weaknesses of the open space networks provides valuable information for future planning. It allows more targeted investment to address specific gaps or underserved areas, where certain open space functions are not well supported. For example, installing a playground or implementing a Green Shacks program in an area of low Learn and Play functionality provides greater overall benefit than implementing those same services in an area where there are plenty of Learn and Play opportunities. This is particularly important for ensuring equity in open space use and access across Edmonton. For instance, smaller open spaces may be enhanced to provide more functionality in areas where additional parkland is difficult to acquire, such as the inner city and downtown core.

TABLE 6.1 Datasets used in Ecology Functions Analysis



	WATER MANAGEMENT	CLIMATE REGULATION	BIODIVERSITY	WASTE MANAGEMENT	RISK MITIGATION	FOOD PRODUCTION
Natural Wetlands	✓					
Land Cover Diversity		✓	✓			
Stormwater Features	✓					
Green Infrastructure	✓					
Tree Diversity			✓			
Tree Canopy		✓				
Vegetative Land Cover	✓	✓	✓			
Flood Risk					✓	
Steep Slopes					✓	
Garden Beds				✓		
Recycling Depots				✓		
Community Gardens				✓		✓

TABLE 6.2 Datasets used in Celebration Functions Analysis



CELEBRATION

	AESTHETIC VALUE	COMMUNITY BUILDING	PUBLIC SAFETY	HERITAGE	DESTINATION + TOURISM
Garden Beds	✓				
Ornamental Water Features	✓				
Tree Inventory	✓				
Tree Canopy	✓				
Public Art	✓			✓	
Viewpoints	✓				
Litter Containers	✓				
Community Gardens		✓			
Community League Halls		✓			
Community Events		✓			
Civic Spaces		✓			
Picnic Areas		✓			
Blue Phones			✓		
Crime Rate			✓		
Fencing			✓		
Lighting			✓		
Traffic Rates			✓		
Road Speeds			✓		
Cemeteries				✓	
Historic Buildings	✓			✓	
Heritage Landscapes				✓	
Traditional Indigenous Territories				✓	
Festivals					✓
Special Destination Venues					✓
Provincial Parkland					✓
City Parks					✓
Aesthetic Value					✓
Heritage Value					✓
Washrooms		✓			✓
Benches		✓			✓

TABLE 6.3 Datasets used in Wellness Functions Analysis



WELLNESS

	RECREATION	ACTIVE TRANSPORTATION	MENTAL HEALTH + WELLBEING	LEARN + PLAY
Toboggan Hills	✓			✓
Skate Parks	✓			
Nordic + Downhill Skiing	✓			
Boat Launches	✓			
Outdoor Skating Rinks	✓			✓
Sports Fields	✓			
Dog Off-leash Areas	✓			
Outdoor Swimming Pools	✓			✓
Cycling + Pedestrian Pathways	✓	✓		
Playgrounds	✓			✓
Splash Pads	✓			✓
Green Shack Programs				✓
School Sites				✓
Aesthetic Value			✓	
Recreation Value			✓	
Community Building Value			✓	
Learn + Play Value			✓	
Benches	✓			✓
Bike Racks	✓	✓		
Bleachers	✓			
Washrooms	✓			✓
Tables				✓
Drinking Fountains	✓	✓		✓
Lighting	✓	✓		
Winter Chalets	✓			

FIGURE 6.1 Open Space Functions

Open Space Functions

ECOLOGY



Water Management

Open spaces have the capacity to handle a significant amount of stormwater, as well as provide water storage, treatment, and purification for the city, reducing the impact of urban areas on water quality and quantity in the North Saskatchewan River and its tributaries.



Climate Regulation

Open spaces provide a myriad of benefits for the urban, built environment, including mitigating the urban heat island effect, stabilizing micro-climates, reducing wind tunnels, improving air quality, and mitigating climate change.



Biodiversity

Not limited to just preservation and conservation lands, many types of open space provide habitats for plants and animals that can help ensure biodiversity and wildlife connectivity. Effective and appropriate management and regulation of these spaces is crucial to integration with other open space functions.



Waste Management

When considering the role of open space in waste management, most think of landfills. However, open spaces can be innovatively used to close the loop for waste management, providing spaces for active composting, and recycling / biofuel facilities.



Risk Mitigation

Open spaces can be used to minimize environmental risks, for example, by stabilizing slopes, protecting floodways, and repurposing contaminated sites. Rehabilitating contaminated sites (i.e. brownfields, former landfills) restores or improves the function of open spaces.



Food Production

Open spaces provide opportunities for food production, which in turn provides the city with food security, healthier communities, community interaction, food/local agriculture connections, and skill development.



Aesthetic Value

Welcoming spaces with attractive design, natural scenery and public art are place-makers, attracting and retaining people. Proper maintenance, colourful vegetation, and protection for unique views can promote aesthetic appeal.



Community Building

Open spaces make cities. They act as gathering spaces – anchors – that facilitate social interactions and providing space for programming such as community events (i.e. farmers markets, art fairs). Open spaces created in partnership with the local community foster a sense of community identity and ownership.



Public Safety

Trees and open spaces can contribute to public safety by creating a vibrant public realm, providing transitions between land uses where otherwise conflicts might occur (such as noise), and serving as a traffic calming devices. Well-designed open space can help create safer streets for pedestrians and drivers.



Heritage

Open spaces can be effectively used to highlight the cultural and historical significance of a site, a feature, or the city's heritage in general. Cultural expression in the form of public art often finds a home in the green network.



Destination + Tourism

Open spaces not only serve as gathering spaces for a neighbourhood or community, but can also function as a destination, a draw for the larger area whether the region, province, or nation.



Recreation

Open spaces function as recreation spaces that accommodate sport facilities, as well as outdoor recreation, such as running, cycling, field sports/activities, walking, etc. High quality recreation spaces that are easily accessible and accommodate a range of different activities are crucial to promoting healthy living.



Active Transportation

The inclusion of well-connected, high quality trails and pathways within the open space network is key to promoting and encouraging active transportation modes, improving residents' health, improving overall mobility, reducing carbon emissions, and alleviating general demand on vehicular transportation networks.



Mental Health + Wellbeing

An important function of open space is the role of spaces in providing calm and therapy, by reducing stress and providing opportunities for the disabled or elderly to engage in therapeutic activities, such as gardening. Spending time in open spaces can foster a connection with nature that promotes spiritual fulfillment.



Learn + Play

Nature provides unique opportunities for people of all ages to learn (about environmental processes and cultural and historical heritage) through a variety of programming or free form play. Open spaces and nature are also integral to the mental and physical development of children.

CELEBRATION

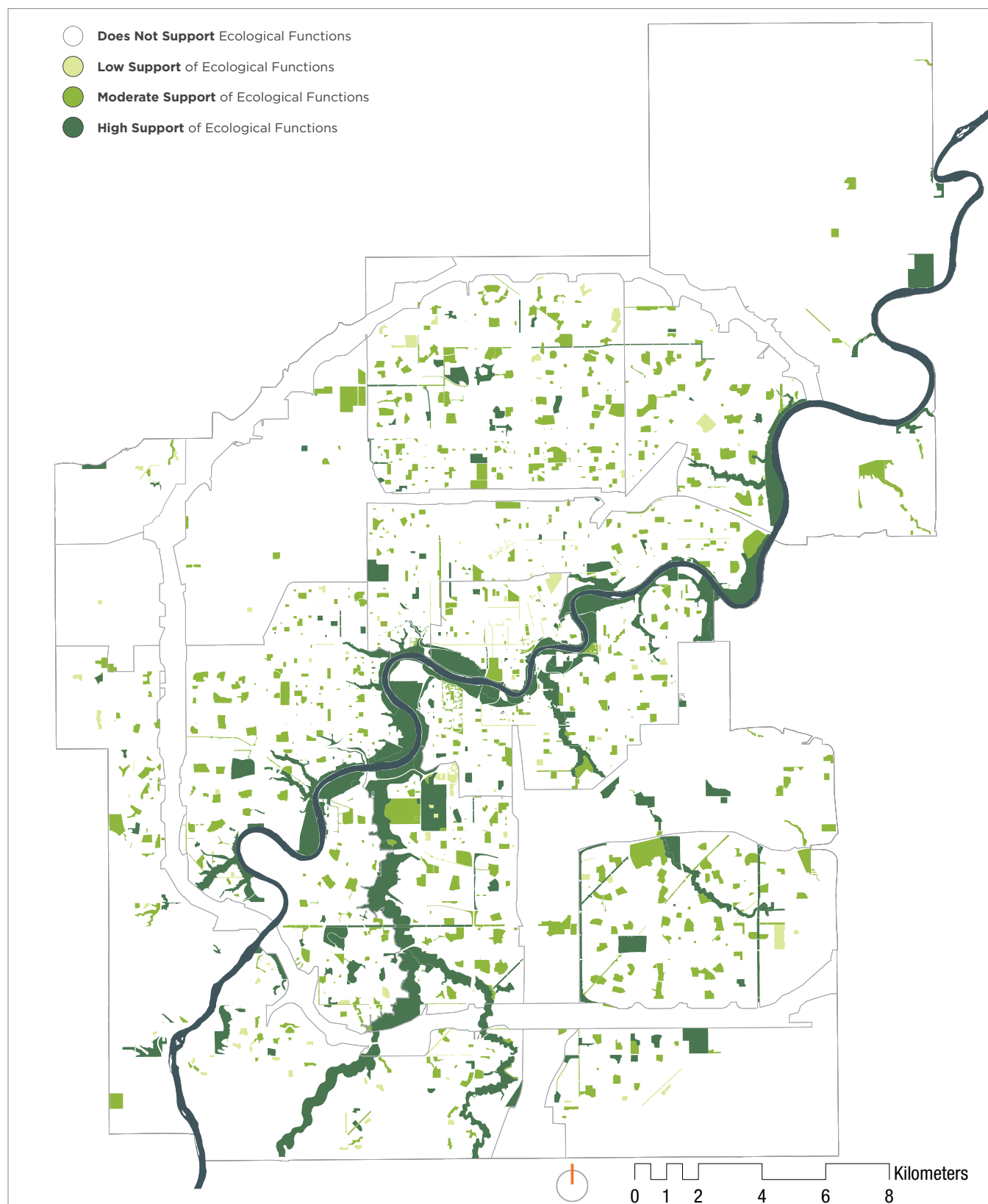


WELLNESS



Ecology

MAP 6.1 Degree of support for Ecology functions



Discussion: Ecology

Open spaces support and improve the urban ecosystem by providing wildlife habitat and supplying valuable ecological services. Open spaces' contribution to ecological functioning in the City of Edmonton is based on the following basic functions: Water Management; Climate Regulation; Biodiversity; Waste Management; Risk Mitigation; and Food Production. Each of these functions was evaluated using metrics such as rainwater infiltration potential, green land cover, the Simpsons index of biodiversity, potential to integrate compost and other waste streams, flood mitigation, and community gardens or edible landscapes.

By combining the assessments of ecological function into a single value, open spaces could be easily assessed and compared against each other. To facilitate comparison, open spaces are categorized into High, Medium and Low levels of support for ecological function. A total of 232 open spaces provide a high level of support for ecological function, from large city and district parks (such as Hermitage and Rundle Parks, and Blackmud, Wedgewood and Cameron Ravines) to 25 pocket parks which are under half a hectare in size.

The Muttart Conservatory (and Gallagher Park), and Terwillegar and Whitemud Parks score highest, each for different reasons. Although it lacks the natural land cover that contributes to climate regulation and water management functions, the Muttart Conservatory contains demonstration gardens that help promote urban agriculture and that use compost waste to boost soil nutrients, resulting in high values for Food Production and Waste Management functions. By contrast, Terwillegar and Whitemud Parks have low scores for Food Production, but contribute well to other ecological functions. In particular, both contain abundant green land cover, which helps regulate climate impacts, and both help mitigate risk by preventing development on the steep slopes and flood hazard areas of the River Valley and Ravine System.

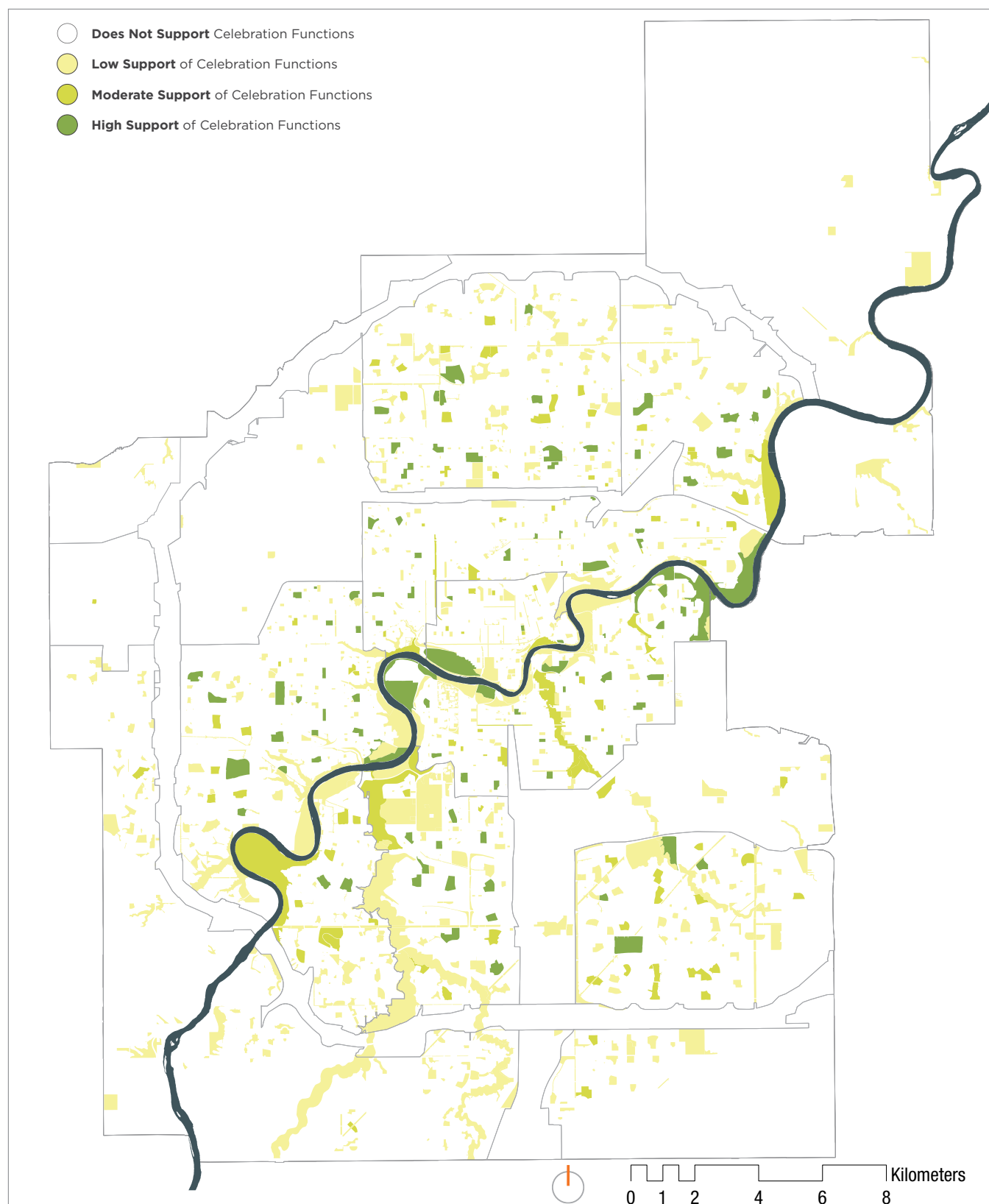
In general, open spaces within the River Valley and Ravine System tend to have higher values for ecological function, as do larger open spaces elsewhere (with some exceptions, such as golf courses). There were 894 open spaces that perform moderately well, and only 248 open spaces within the lowest category. Most of the lowest-scoring spaces are smaller spaces such as pocket parks, which may lack the space for amenities such as stormwater management features (which contribute to Water Management functioning) or substantial amounts of trees or other high-value land cover (which contributes to Climate Regulation functioning). Nevertheless, some pocket parks do have high ecological functionality, for example where they contain community gardens or garden beds that serve as a sink for compost or yard waste.

Only two open spaces over 20 ha in size perform poorly in terms of ecological function: The Meadows District Park and the University of Alberta's South Campus both have only small amounts of land cover that promotes Biodiversity, Climate Regulation and Water Management functions, and do not contain features to support Food Production or Waste Management.

It is important to remember that some open spaces contribute more to ecological functioning than others because of where they are located within the open space network. For example, River Valley and Ravine System parks generally perform well because they are able to mitigate flooding and hazardous slope risks, which may not apply to upland areas. For these reasons, there is a good chance that River Valley and Ravine System parks will always perform best in terms of ecological functioning. At the same time, there are many actions that could be taken to improve the value of upland parks: tree planting and naturalization can improve Biodiversity and Climate Regulation scores, while creating more community gardens in public open spaces can encourage Food Production.

Celebration

MAP 6.2 Degree of support for Celebration functions



Discussion: Celebration

Open spaces provide opportunities for socialising, building community identity, and acknowledging our culture and heritage. They provide protection for heritage resources, and act as gathering spaces, bringing people together in celebration. How open spaces support social and celebratory activities was evaluated based on five functions: Aesthetic Value, Community Building, Public Safety, Heritage, and Destination + Tourism. Each of these functions was assessed based on the presence of historical structures or historically significant landscapes, how well the space ensures safety in the context of human risk, the use of a space for community events and festivals, or the presence of scenic features like ornamental gardens and view points.

The assessments of the functions noted above have been combined into a single Celebration value, and then categorized into open spaces which provide a High, Medium or Low level of support for those functions. A total of 99 open spaces provide a high level of support for celebration functions. While the majority of these spaces are community parks, 7 are city parks (Borden, Coronation, William Hawrelak, Sir Wilfrid Laurier, Kinsmen, Rundle and Gold Bar Parks) and 10 are district parks (Castle Downs, Emily Murphy, Johnny Bright, Callingwood, McLeod, Mill Woods, Capilano, Gallagher, Jackie Parker and Glengarry Parks).

Many of the highest-scoring open spaces will be familiar to Edmontonians as popular places to gather and celebrate, enabling activities ranging from family gatherings to community events, and even festivals that draw thousands of visitors to the city. Some of these open spaces include City Hall Plaza and Sir Winston Churchill Square, which host many community events and festivals like Taste of Edmonton; locations in Old Strathcona, such as Whyte Avenue and Strathcona Park, where locals and visitors congregate for Fringe Festival, the Pride Parade and Ice on Whyte; and larger spaces like Gallagher Park and Hawrelak Park, which host the Edmonton Folk Festival and Servus Heritage Festival, respectively.

Coronation Park provides the greatest total contribution to the functions of Celebration. It contains vegetation and landscaping that make it aesthetically pleasing, the Woodcroft

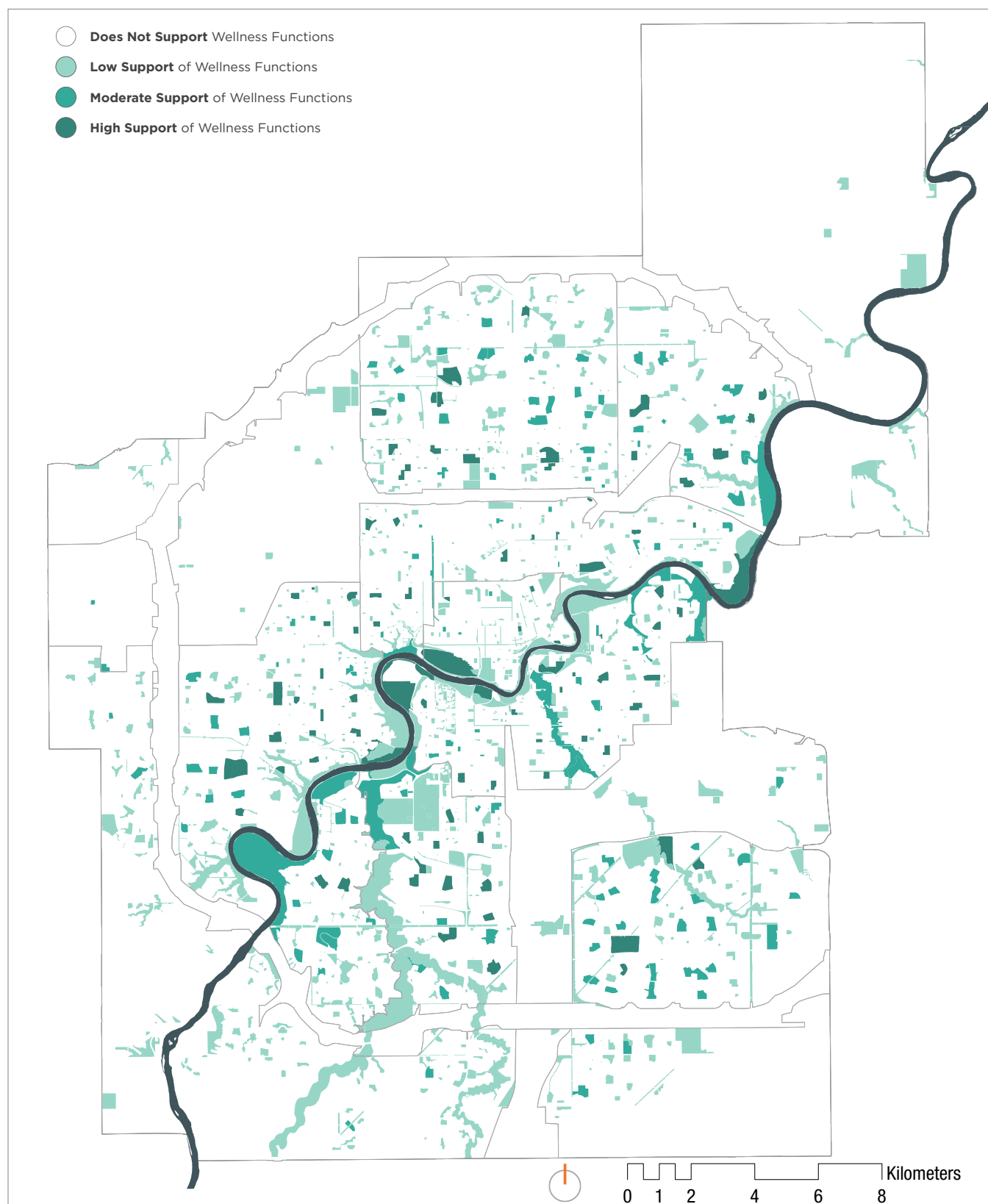
Community Hall and Ross Sheppard High School that promote community interaction, picnic tables for families to gather and play, and the Telus World of Science that attracts visitors from near and far. The Victoria Parkland Golf Course (and Park) also scores high in terms of celebration value, because it contains a relatively high proportion of aesthetically valuable features (green land cover, view points) and reflects Edmonton's rich culture and history in public art installations, heritage landscapes, and lands belonging to traditional First Nations territories.

108 open spaces contribute moderately well to Celebration functionality. The majority of these spaces are community parks, although 7 city and 8 district parks are also included, predominately located in the southern part of the city. The remaining 1,194 open spaces do not contribute well to the functions of Celebration. Pocket and linear parks are included within this category, but so too are 27 city parks. One of these is Whitemud Park, which performs very well in terms of Ecology functions, but supplies few amenities that promote significant gatherings of people, and few features that reflect heritage values or that serve as tourist attractions.

It is important to recognize that the Low, Medium and High categories reflect *relative* values, rather than absolute ones. Obtaining a score that assigns an open space to the Low category only means that space does not support the functions of Celebration as well as open spaces in the Medium or High categories. However, the results do suggest that there are many opportunities to improve the community building, heritage, aesthetic, safety and destination values of open spaces across the city. Potential improvements range from the installation of more lighting, public art or picnic facilities to the promotion of community events and celebrations in local parks and squares. While large spaces typically offer more of these services and amenities at present, even smaller spaces can play a role in celebrating Edmonton.

Wellness

MAP 6.3 Degree of support for Wellness functions



Discussion: Wellness

Open spaces support human health and wellness by providing opportunities for physical activity, emotional and spiritual fulfilment, and healthy learning, socialisation and development among children. How well open spaces provide those opportunities was assessed based on four functions: Recreation, Active Transportation, Mental Health + Wellbeing, and Learn + Play. Each of these functions was evaluated based on amenities that support specific wellness activities, such as shared use pathways, sport fields, bicycle racks, playgrounds, or splash pads, and by amenities, services, programs or attributes that enhance human wellness, such as educational and recreational programs.

All functions which contribute to Wellness were summarized into a single value, which was categorized into High, Moderate and Low support for human health and wellness functionality. Only 65 open spaces achieve the highest category of Wellness functionality. The majority of these high scoring parks are community parks, although 5 city parks (Borden, Coronation, William Hawrelak, Kinsmen and Rundle Parks), and 8 district parks (Castle Downs, Johnny Bright, Callingwood, McLeod, Mill Woods, Gallagher, Jackie Parker and Glengarry Parks) also scored well. This pattern reflects the purpose of community parks, which is to provide for the essential recreational needs of Edmontonians. These spaces are also often co-located with schools, which increases their value as places for learning and playing among school-aged children. The larger parks that perform well typically contain significant pathway networks and winter recreation amenities that contribute to recreation and active transportation scores (e.g. River Valley and Ravine parks), or substantial numbers of sports fields that draw residents from across the city for their organized recreation needs (e.g. district parks).

Coronation Park was the highest scoring open space overall. It contains many family-friendly amenities that promote learning and active living among children, including playgrounds, toboggan hills, a skating rink, and summer Green Shack program, and many sports facilities to encourage recreation among people of all ages. Rundle Park also

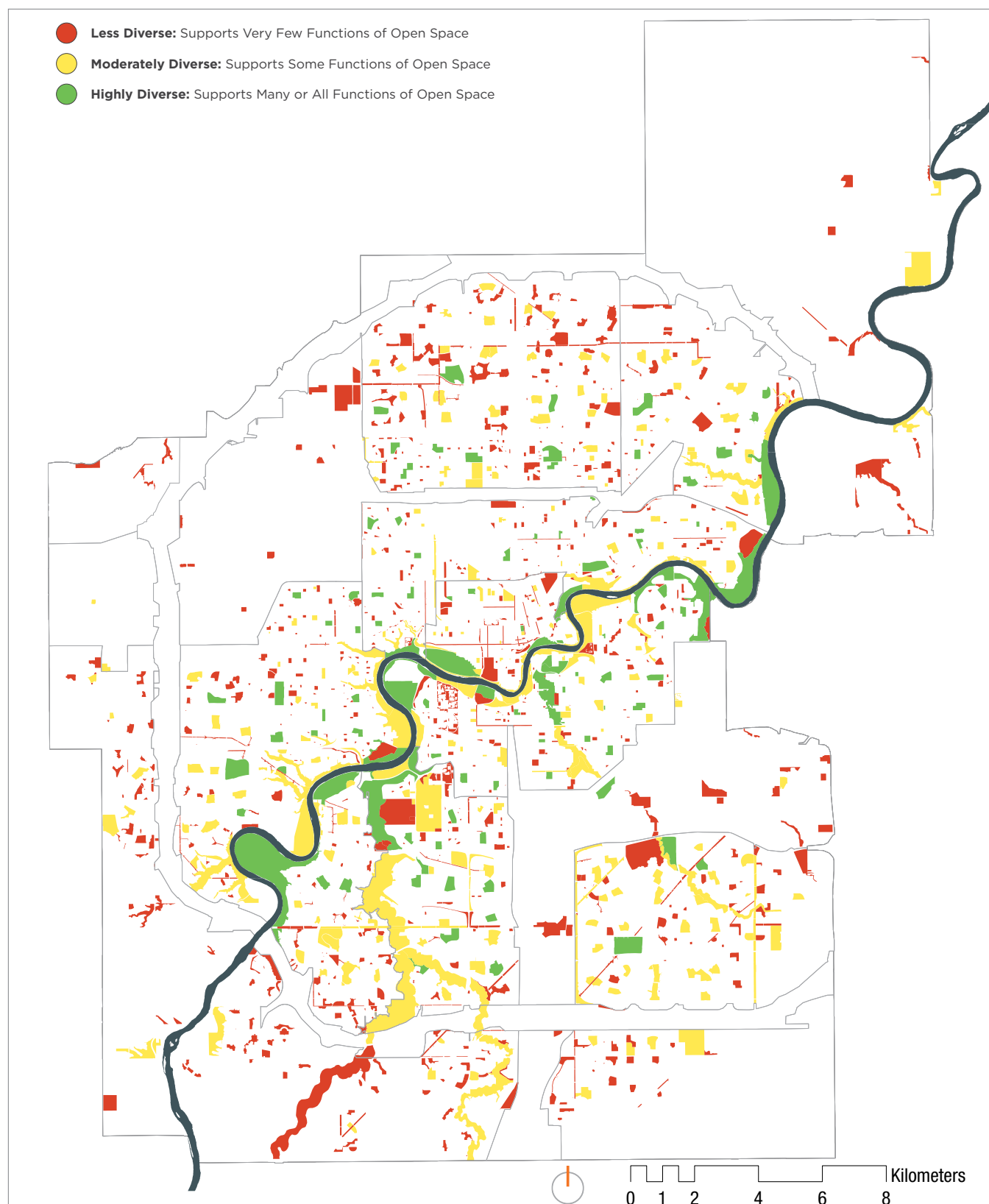
performs very well, due in large part to its profusion of sports amenities, particularly those oriented toward winter activities (e.g. toboggan hill, skating rink, Winter Chalet and nordic skiing trails). Notably, both parks have qualities that contribute to mental health and wellbeing: scenic and aesthetically attractive surroundings, amenities that support healthy lifestyles, and features or events to encourage social inclusion and a sense of belonging.

By contrast, few high scoring parks are found in the periphery, especially towards the south end of the city, and with the exception of the River Valley, few in the Downtown Core. Although it contains many people-friendly streets and civic spaces that encourage healthy social lives, Downtown poorly supports other Wellness functions, which benefit from abundant space to construct pathways, sports fields, and places of learning.

Parks in the 'moderately scoring' category (116 in total) are broadly distributed throughout the city, notably in the ravines immediately south of the River Valley, and in northern and southeastern neighbourhoods. The remaining 1,193 parks fell into the 'low scoring' category, as they provided few functions which contributed to Wellness. Similar to the Downtown Core, many of these spaces are small pocket parks that do not have sufficient space for many amenities, or parks that provide for a single function (e.g. recreational trails, or a toboggan hill) to the exclusion of the others.

Summary of Functionality

MAP 6.4 Degree of support for all open space functions



Discussion: Summary of Functionality

By weighting each theme equally and combining their individual scores, an aggregate score allows the comparison of open spaces across all functional values. High values of this aggregate score indicates that the open space provides adequate functionality across all three themes, which can result from good scores for a wide diversity of functions, or exceptional scores for fewer functions.

In general, most multi-functional high scoring open spaces are city or district parks: not only do they contain more amenities, programs and services because of their larger size, but also because of their importance as destinations for the city or the region. Usually these parks include a variety of recreational amenities and facilities such as playgrounds, splash pads, sports fields, picnic sites, tobogganing hills, warming huts, and leisure centres. And because they attract more people, these open spaces also have enhanced park amenities designed to support higher usage, such as washrooms, drinking fountains, parking facilities, shared use pathways, etc. In addition, many of Edmonton's city and district parks are located within the River Valley and Ravine System, which encompasses large natural areas that contribute to high scores for the functions of Ecology. As a result, River Valley city and district parks tend to score higher for Risk Mitigation (by preventing development in steep slope and flood hazard areas), Biodiversity (by providing habitat and wildlife movement corridors), Water Management (by regulating storm water infiltration) and Climate Regulation (by mitigating the heat island effect and absorbing greenhouse gas emissions).

At the same time, it is important to recognize that many smaller community parks and even some pocket parks can be enhanced with amenities or programming to provide better functionality. Some community parks have excellent functional summary scores. For instance, Riverdale Park achieves the third highest overall score in the city, supported by particularly high values for Waste Management (garden beds provide a sink for compost waste) and Learn + Play (child-friendly

recreational amenities are supplemented by a Green Shack program), and moderately high values for Mental Health + Wellbeing, Community Building and Recreation.

The highest scoring open space overall was Rundle Park, followed closely by Coronation Park, which have both been discussed above. A total of 103 parks and open spaces fall within the highest category for the aggregate functionality score. Among these, 13 are city parks, ranging in size from 17.9 ha (Kinsmen Park), up to the largest parks in the city, i.e. Whitemud Park (151.4 ha) and Terwillegar Park (230.2 ha). Other notable well-performing open spaces include William Hawrelak Park, Sir Wilfred Laurier Park, City Hall Plaza, Kinsmen Park, Goldbar Park, and Hermitage Park. The Victoria Golf Course, Fort Edmonton Park, and the Muttart Conservatory are also notable high value special purpose open spaces. 12 district parks also scored especially well, including Mill Woods Campus Park, Callingwood Park and Capilano Park. The remaining 74 highest value open spaces are community parks, ranging in size from 0.88 ha (Mary Finlay Park) to 15.1 ha (Blue Quill Park). The majority (and largest) of the 103 highest scoring sites are found in or near the River Valley and Ravine System, although other high scoring open spaces are distributed throughout the city, predominantly in the north and central-south areas.

The 259 moderately scoring sites comprise the majority of the River Valley and Ravine System, but are also distributed throughout the city. Community parks are the most common type of moderately scoring open space, but a range of other types are present as well, from city parks to linear and pocket parks. The remaining 1,016 low scoring open spaces are also distributed throughout the city, divided relatively equally among community, linear and pocket parks. There are also 6 city parks and 21 district parks that fall into the low scoring category, mostly comprising single-purpose spaces that do not support a diversity of functions.

Overall, the Settled West, Settled South-East, Settled South-West (A and B), and City-Centre South have the best scoring parks, but in many cases this is mainly due to their proximity to the River Valley and Ravine System.



7 CONCLUSION

Key Findings

Three key overall trends were identified in this report:

1. Undersupply in terms of connectivity, quality and amount of open space in the City Centre North, Settled North-East and Downtown Core;
2. Poor connectivity to the River Valley and Ravine System in the Settled North and Settled South-East; and
3. Isolation of the Developing Fringe West and Developing Fringe South from the rest of the city due to the location of the Transportation Utility Corridor.

These findings are summarized in greater detail below. Opportunities for addressing these gaps in the Green Network Strategy will be explored in the next project stages.

CONNECTIVITY TO THE RIVER VALLEY AND RAVINE SYSTEM

Edmonton's River Valley and Ravine System acts as the 'backbone' of the open space network. The importance of the river valley for ecological value and human connectivity is well recognized in the many plans and policies created for the protection and management of this important area. Along the North Saskatchewan River and its ravines lie many of the most highly functional, largest, and best connected parks citywide. Examples of River Valley and Ravine System parks that also exhibit high functionality include Rundle Park, William Hawrelak Park, Terwillegar Park, Sir Wilfrid Laurier Park (and Edmonton Valley Zoo), Kinsmen Park, Gold Bar Park, Hermitage Park, Fort Edmonton Park, and the Whitemud and Mill Creek Ravines.

Regional movement corridors for active transportation are also concentrated along the river valley and its associated ravines. Access to the river valley is therefore critical for human movement across the cityscape: many of its trails and pathways connect city quadrants and neighbourhoods to each other, and to key areas such as the Downtown Core and destination spaces. Connecting smaller open space networks to the river valley is therefore also important for improving the functionality and connectivity of open spaces

throughout Edmonton. Outside the river valley, smaller open space networks create connectivity across local communities.

Gaps in the walking network usually occur because of large tracts of privately-owned land such as private golf courses, or due to physical barriers such as highways. Gaps in the cycling network include disconnected pathway systems, where often cyclists are expected to follow major, potentially unsafe roadways to travel across the city. These include major roads such as 97th Street in the Settled North Reporting Unit, 66th Street NW in the Settled South-East, Terwillegar Drive in the Settled South-West (B), Stony Plain Road and Whitemud Drive in the Settled West, and poor connectivity in general in the City Centre North Reporting Unit.

Connecting these internal networks to the river valley will be important for future open space planning, with projects such as the Mill Creek Daylighting Project moving the city toward an integrated, accessible, and connected open space system.

KEY SPACES OUTSIDE THE RIVER VALLEY

Emphasis on the River Valley and Ravine System as an important component of the open space network should not overshadow the outstanding, multi-functional upland parks that attract visitors from across the city and the greater region. Coronation Park, for example, contains a plethora of amenities and unique attractions, such as the Telus World of Science, numerous sports fields, several playgrounds, a fitness and leisure centre, and other features that support human health and wellness, celebration and gathering space, and the urban ecosystem. Castle Downs Park in the Settled North Reporting Unit includes a spray park, playgrounds, skate park, sports fields, picnic sites, an outdoor rink, water fountains, seating areas, and other attractive services to support recreational opportunities. Mill Woods Campus Park includes many of the same features, and is located conveniently close to Mill Woods Town Centre, an accessible and central location well connected through a linear park system to the rest of the community.

In addition, some key open spaces outside the River Valley provide a high level of functionality for at least one of the 'themes,' such as Callingwood Park, Jackie Parker Recreation Area, Gallagher Park, Kinsmen Park, Glengarry Park, MacLeod District Park, and St. Elizabeth Seton Park. All of these open spaces score well for both Wellness and Celebration due to their superb and varied gathering spaces, facilities, and park amenities. The University of Alberta Farm, Wedgewood and Cameron Ravines, Fulton Creek, Callingwood Park, Hangmans Park, and Borden Park score well for Ecology due to their provision of green space, natural landscapes, or community gardens.

CITYWIDE SUPPLY

In terms of overall supply of open space, the Settled North, Settled South-East, and Downtown Core Reporting Units have the lowest amount of open space per capita (1,000 residents). For the Settled North and Settled South-East, this is due to a combination of two factors: little or no access to the River Valley And Ravine System, which includes the greatest concentration of (and the largest) parks citywide; and relatively high population density, with each Unit accommodating approximately 110,000 people. By comparison, most Reporting Units in the settled regions of the city average around 60,000 people.

The Downtown Core is challenged primarily by high population density in an area with a very small available land base. While municipal parkland in most of the Downtown Core is limited to small pocket and community parks, those who live close to the Legislature Grounds and River Valley and Ravine system (which includes Louise McKinney Park, Dawson Park, and Victoria Park) have access to larger parks. In addition, most of Edmonton's civic spaces are located in the Downtown Core, which includes main streets such as Jasper Avenue, and pedestrian priority streets like the 4th Street Promenade and the Armature. While these are not municipal parks, they do offer some similar amenities, and act as important gathering spaces. Further developing the supply and quality of Downtown open spaces will be important for supporting and attracting a diverse population as the area continues to grow in the future.

OPEN SPACE DISTRIBUTION

In general, the distribution of open spaces across the City of Edmonton is equitable across the Reporting Units, at least in terms of the functions of open space. Multi-functional and high quality spaces are available in every Unit, with the highest concentration located along the River Valley and Ravine System. One notable exception is the Settled Southwest (B), which includes mostly community parks and natural district/city parks, with few Celebration and Wellness amenities except for educational and nature appreciation opportunities. Similarly, the Settled North-East and City Centre North have fewer multi-functional parks, although they do contain two of the highest scoring spaces in the city (Coronation Park and Hermitage Park).

Some key 'park deserts' have also been identified. In the City Centre North Reporting Unit, the former Edmonton City Centre Airport represents a large area of the city and is largely inaccessible during its redevelopment as the Blatchford neighbourhood. While Airway Park, Beechmount Cemetery, and small local community parks are located around the redevelopment site, they have limited functionality. The NAIT campus does provide some open space nearby, but it is not managed by the City, so its contributions to future open space supply in this area may be limited.

In the Settled West, the Edmonton Country Club and Golf Course lies between residential developments and the River Valley, cutting off direct access to places such as River Valley Oleskiw and creating a significant connectivity gap between Wedgewood and Cameron Ravine / Donsdale Natural Area and the rest of the river valley.

The Settled South-East Reporting Unit is poorly connected to the rest of the city, and isolated from the river valley by industrial land uses in the Industrial South. Similarly, the Settled North Reporting Unit also cannot access the river valley. Although it is fairly well connected internally, it contains few active transportation and open space network connections to the rest of the city.

FUTURE GROWTH

At the edge of the city, the developing fringes and new growth areas are open space networks in the making. At present, these areas appear well supplied, as the demand produced by residential development 'catches up' over time to the supply of open spaces already designated or constructed. However, ensuring that open spaces in these areas are well-connected, accessible, and functional will be critical in the future if Edmonton is to achieve its goal of creating a green network that meets the needs of a projected 2.1 million residents by 2050. Physical barriers such as the Transportation Utility Corridor and industrial areas will present a challenge for connecting residential areas along the city's perimeter to core areas such as the River Valley and the Downtown Core.

Moving Forward

The next stage of the project will be an analysis of the demand for open space. This means connecting the current supply with future demographics and population density to identify areas of the city where projected usage patterns of open space and open space amenities do not align with the amount and distribution of open spaces identified in this report. Projecting demographics and city growth 5, 10 and 30 years into the future will enable the City to predict where the most demand will happen, or where major demographic shifts will result in different open space needs.

THE IMPORTANCE OF STAGE 2

Understanding the supply, accessibility, connectivity, and quality of open spaces in the City of Edmonton is crucial for establishing a baseline for future open space planning. It allows the City to focus on over- or under-supplied areas of the city to efficiently and effectively direct resources to where they are most needed. The analyses summarized in this report will be used to identify gaps in the current open space network; identify inequitable access to open space across the city; and highlight specific open spaces that could be better developed to serve their community, or better celebrated for the many wonderful services they provide.

This provides a foundational understanding of the current state of the Green Network, allowing the city to predict and plan for a greener future.



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