breathe

EDMONTON'S GREEN NETWORK STRATEGY

Strategic Plan

August 2017

Edmonton

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POLICY ACTIONS 79

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PHOTO CREDITS

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Edmonton's Green Network: Layers + Functions

2.1 The Functions of the Green Network

BREATHE adopts a multifunctional network approach to open space planning. The Strategy considers the amount, function and configuration of not only municipal parks, but all publicly accessible open spaces, in order to form a comprehensive picture of how the entire green network performs. Understanding both the structure of the green network and the value of the services it provides is important for developing a *Green Network Strategy* that addresses the needs of humans and the environment, and that enables decision makers to optimize public land use using a defensible, evidence based approach.

THE FUNCTIONAL ANALYSIS

The project team evaluated the supply and demand for open space both now and into the future. But rather than simply measuring the amount of open space available, the team sought to obtain a holistic perspective on the green network by assessing functionality and access as well. Evaluating the green network from a functional perspective was a novel approach that required the project team to categorize and measure the services the network provides – how open space amenities and characteristics combine to improve the urban environment, provide places for people to come together, and contribute to human health and wellness.

As a first step, the project team defined 15 functions that encompass those services. The functions were developed through research and valuable expertise from park managers, urban planners and urban ecology experts, who sought to capture the myriad of ways that open spaces can provide value to humans (e.g. providing recreational amenities) or the environment (e.g. improving habitat). The *Green Network Strategy* considers the functions in terms of their contribution to three overarching values or themes: **Ecology**, **Celebration** and **Wellness**.

Next, every open space in Edmonton was assigned a functional "score" based on the degree to which its amenities and characteristics supported each function. For instance, an open space with a large amount of natural land cover results in a better score for biodiversity and climate regulation functions, and contributes to aesthetic value as well.

The network maps in the following pages show a summary of how well each open space supports each theme: Ecology, Celebration and Wellness. The darker the colour, the better the open space supports the functions that contribute to the theme. Larger versions of these maps are available in **APPENDIX C**.

For more information about how the evaluation was performed, see the *Stage 2 Summary Report* available at **edmonton.ca/breathe**.

ECOLOGY

CELEBRATION

WELLNESS

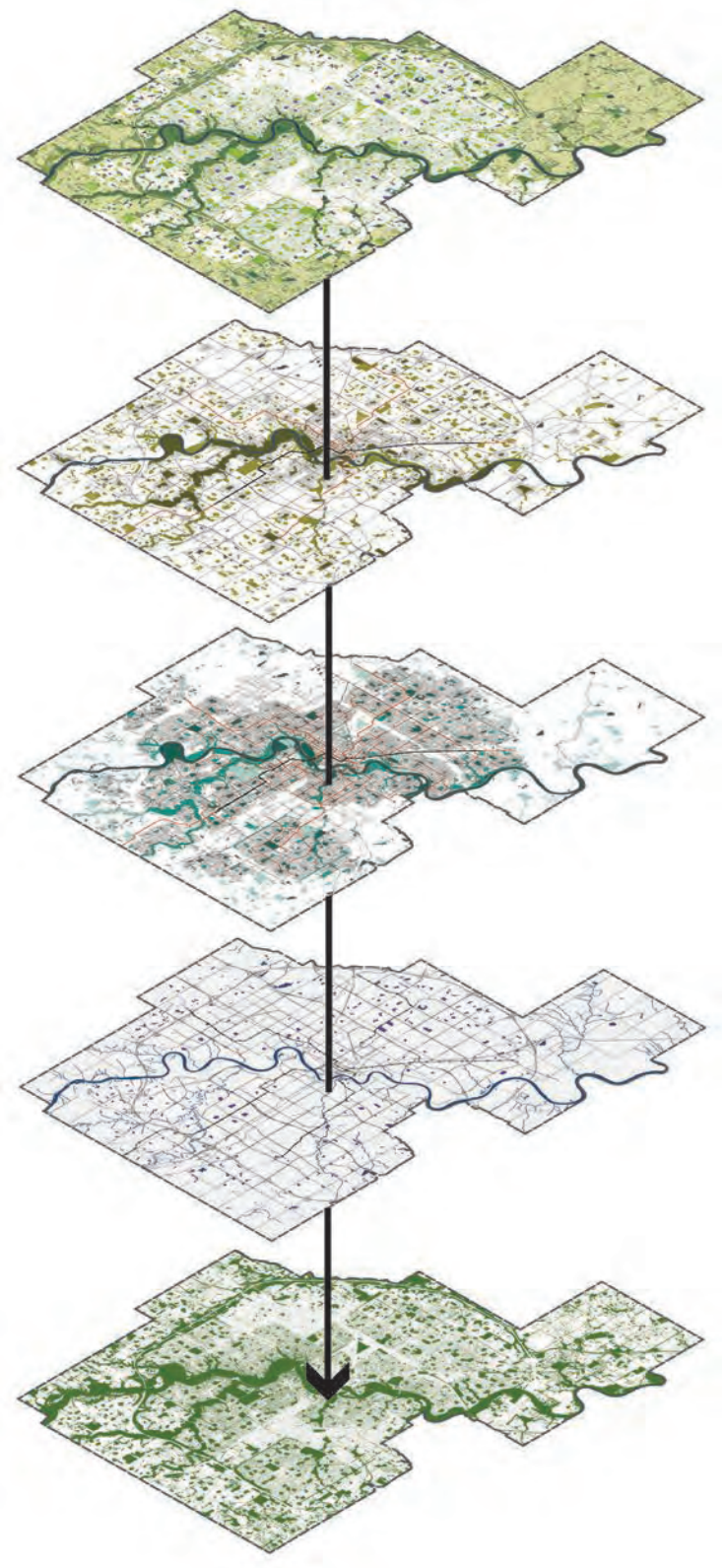


FIG. 6: Functional Layers of the Green Network

Ecology Network

- Environmentally Sensitive Areas
- Natural and Semi-Natural Areas
- Community Gardens
- Waterbodies
- Wetlands
- Stormwater Features and Ponds
- Hydrology
- Wildlife Connectivity and Habitat
- Urban Forest Canopy

Celebration Network

- Festival and Event Spaces
- Community Gathering Spaces
- Historic and Culturally Significant Landscapes
- Main and Pedestrian-Priority Streets
- Squares, Plazas and Promenades
- Public Art
- Ceremonial Spaces
- Special Purpose Facilities

Wellness Network

- Scenic and Serene Spaces
- Sports Fields and Athletic Amenities
- Educational Activity Centres
- Pathways and Trails
- Cycling Routes
- Playgrounds and Spray Parks
- Outdoor Ice Rinks and Skating Trails
- Ski Hills and Cross Country Trails

Urban Infrastructure Network

- Road and Pathway Network
- Transit Network
- Drainage Infrastructure
- Power and Water Networks
- Communications Infrastructure
- Land Use and Development

The Green Network

Publicly accessible open spaces contributing the city's:

- Ecological Function
- Operational Capacity
- Recreational Potential
- Social Community
- Health and Wellbeing

2.2 The Ecology Network

2.2.1 ECOLOGY NETWORK STRUCTURE

Edmonton's Ecology Network is a mosaic of natural or near natural vegetated core areas, stepping stones and corridors, set in a matrix of urban development. The Ecology Network influences the flow of species, energy, nutrients, and water moving through the city. The following "indispensable landscape patterns" (after Forman, 1995) are closely linked to important ecological processes and should be maintained within the city.

- Core areas of natural vegetation which provide natural habitat, increase species diversity, and support natural ecological functioning
- Connectivity between natural areas in the form of low-disturbance vegetated corridors
- Vegetated riparian areas along ravines, streams, and rivers provide functional species movement, erosion control, water quality and habitat
- Stepping stones of natural vegetation through developed areas to support habitat and animal movement

In Edmonton, these "indispensible patterns" are manifested in the following network components.

NATURAL AREAS

Regional Core Natural Areas: Large natural or near natural areas supporting a diversity of species by providing larger contiguous habitats. Core areas maintain natural ecological processes, and provide unique recreational and cultural experiences. Important natural areas include Enoch Cree Nation and Lois Hole Centennial Provincial Park.

Local Natural Areas: Natural or near natural areas providing important habitats within city limits.

Pocket Natural Areas: Small remnant natural habitats that are important for resident local species with lower mobility (e.g. plants, birds, insects, smaller mammals).

Natural Area Buffers: Allow for conflicting land uses to coexist by protecting natural areas and linkages from negative impacts, development and activities.

CORRIDORS, LINKAGES AND STEPPING STONES

Open spaces are connected with one another through corridors used by humans and wildlife for travelling throughout the city. Likewise, habitat and open space functionality is extended into the matrix through the urban tree canopy, complete streets and even residential backyards.

Regional Landscape Corridors: The North Saskatchewan River Valley acts as a regionally important wildlife movement corridor, and provides important habitat areas.

Ravine Corridors: Linear corridors following many creeks and streams in the city, including Whitemud Creek Ravine, Mill Creek, Fulton Creek and Oldman Creek Ravines.

Greenway and Utility Corridors: Semi-natural linear corridors designed for human movement, rights-of-way and/or pipeline and utility corridors, but may also be used by local wildlife, provided the areas are not routinely disturbed by human activity.

Stepping-Stone Corridors: Groups of natural open spaces that can act as "stepping stones" that provide refuge during movement through otherwise impassable areas.

THE URBAN MATRIX

The natural core areas, stepping stones and corridors of Edmonton exist within a matrix of urban development. The ability of this highly altered matrix to support species and ecological values can greatly influence overall biodiversity and ecological functioning in the city. Within the matrix, enhancement of the urban forest tree canopy and understory vegetation can mitigate urban heat island effect, reduce stormwater runoff, sequester carbon and provide improved habitats for birds and localized species. The Edmonton green network is embedded within a larger regional system that extends across and beyond the city at many different scales. Managing and preserving this system requires creative, committed collaboration with regional partners to ensure the network remains sustainable and resilient into the future.

ECOLOGY

Supports and enhances the environment by sustaining healthy and resilient ecosystems.

OPEN SPACE FUNCTIONS

WATER MANAGEMENT

Open spaces can absorb storm water and prevent flooding, as well as provide water treatment and purification for the City.

CLIMATE REGULATION

Vegetation in open spaces can mitigate urban heat island effect, improve air quality and mitigate climate change.

BIODIVERSITY

Many types of open space provide habitat for plants and animals, which supports biodiversity and wildlife connectivity.

RISK MITIGATION

Open spaces can minimize environmental risks by stabilizing slopes, protecting floodways and repurposing contaminated sites.

WASTE MANAGEMENT

Open spaces can be used for waste management activities like composting and recycling/biofuel facilities.

FOOD PRODUCTION

Local food production promotes food security, community interaction, and skill development.

Open spaces support and improve the urban ecosystem by providing wildlife habitat and supplying valuable ecological services. How open spaces contribute to ecological functioning was evaluated based on six functions. Each of these functions was evaluated using metrics such as rainwater infiltration potential, green land cover, biodiversity, potential to integrate compost and other waste streams, flood mitigation, and community gardens or edible landscapes. The results of the Ecology assessment are a combination of the 'scores' of its component open space functions.

Ecology functions are incorporated into the Ecology network illustrated in **MAP 3**.

2.2.2 ECOLOGY NETWORK SUMMARY

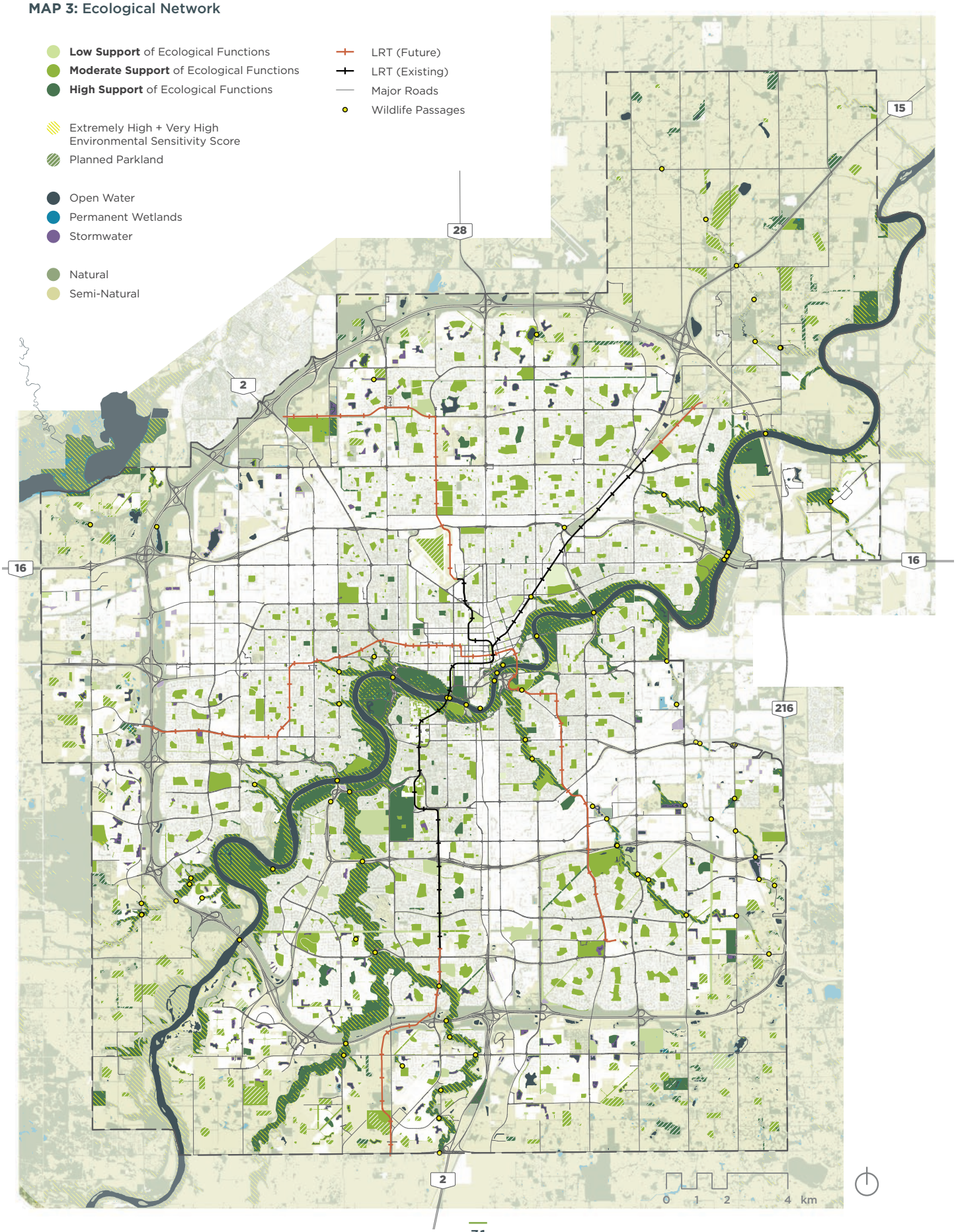
The Ecology Network (**MAP 3**) is intrinsically interconnected. It extends far beyond the boundaries of the City's open spaces. The River Valley and Ravine System forms a unique and highly functional natural core distributed widely throughout the city, but it relies on continuous natural processes that flow into and out of the natural areas, interacting with the more developed and highly used lands surrounding it. The health of the natural core is dependent on what occurs around it, and the city must be managed as a single connected system to ensure its long-term sustainability.

BREATHE recognizes that humans are part of the ecosystem, and that we impact, and are impacted by, the ecological functioning of the green network. Stewardship of the Ecology Network must ensure the structural and functional connectivity of the landscape. The continuity of the natural landscape must be strengthened by retaining existing natural areas, mitigating fragmentation and reclaiming disturbed areas. The functional connectivity of the landscape can be improved by extending the urban tree canopy, increasing the use of native vegetation in plazas and fields, and developing more complete streets with a mix of uses and resources. Robust linkages between core natural areas must be maintained.

It is imperative that human use of natural areas, and the lands around them, does not cause disturbance and disruption to the ecological processes that maintain the system. As the city expands, dense residential areas and the road networks that support them can cause severe disruption to the connectivity of the landscape. Habitat loss from development can be compounded by avoidance effects due to overused or poorly designed infrastructure, leading to declining populations and loss of the natural character which initially attracted people to the area.

Avoiding development and managing access in areas of highly significant or sensitive ecological value is the most essential aspect of wise stewardship. Following that, mitigation through design can substantially lower our impact. Wildlife passages placed on, under or over roadways can reduce wildlife road mortality, and thoughtful lighting design can reduce nighttime impacts on the natural character of landscapes. Well-designed wetlands and other semi-natural areas can increase their ecological functionality and ensure neighbourhoods are not isolated from the natural areas that surround them. Well-connected and sustainably accessible networks of open space are highly valuable for residents and native species, providing a better sense of connection to nature while minimizing barriers to ecological function.

MAP 3: Ecological Network



2.3 The Celebration Network

2.3.1 CELEBRATION NETWORK STRUCTURE

The Celebration network is a vibrant assemblage of multifunctional open spaces, providing a range of cultural gathering areas and services. Celebration spaces include civic plazas, festival and event areas, cultural or historic landscapes, and community gathering areas. In addition, main streets, complete streets, pedestrian oriented streets and roads temporarily closed to traffic for special events are used for celebration functions. These spaces need to be flexible and adaptive, supporting a range of uses from major city events and festivals to the more localized needs of the community for picnics, parties, and gatherings. The transit and active transportation networks support access to celebration spaces.

CIVIC CELEBRATION SPACES

Civic celebration spaces provide support for festivals, concerts and activities. The capability of an open space to support celebration functions and events relies on the quality, size, design and distribution of these spaces as well as their infrastructure and facilities. Appropriate celebration spaces provide aesthetic value, support for community building, public safety, heritage value, and tourism destination support. They bring people together, helping to build social capital and combat social isolation, particularly among vulnerable populations like seniors or newcomers.

Celebration spaces include not only large open spaces like the Provincial Legislature grounds or Hawrelak Park, which host widely popular events drawing very large crowds, but also local open spaces, such as pocket parks and community parks that host community league events, parties, and picnics. Civic Spaces are primarily concentrated in the core of the city but better distribution is needed as populations grow and facilities reach capacity.

CELEBRATION STREETS

Accounting for approximately 25% of a city's land area, streets are often single purpose spaces intended for vehicle conveyance. However, appropriately designed main streets, complete streets and pedestrian oriented streets, as well as streets temporarily closed to traffic, for special events have enormous potential to support Celebration and other functions.

CELEBRATION ACCESS CORRIDORS

The primary corridors and modes of transportation used to access open spaces for large Celebration events are transit and private vehicles. Secondary corridors for smaller scale events and gatherings include pedestrian pathways and cycling routes.

CELEBRATION

Connects people to each other and builds a sense of place by providing places for communities to thrive, gather and celebrate.

OPEN SPACE FUNCTIONS

AESTHETIC VALUE

Attractive and welcoming design is key in placemaking.

COMMUNITY BUILDING

Gathering spaces facilitate social interaction and community programming.

PUBLIC SAFETY

Open spaces can provide traffic calming, buffer zones and “eyes on the street”.

HERITAGE

Open spaces can highlight the cultural and/or historical value of a site or feature.

DESTINATION + TOURISM

Open spaces can draw people from the region, the nation and beyond.

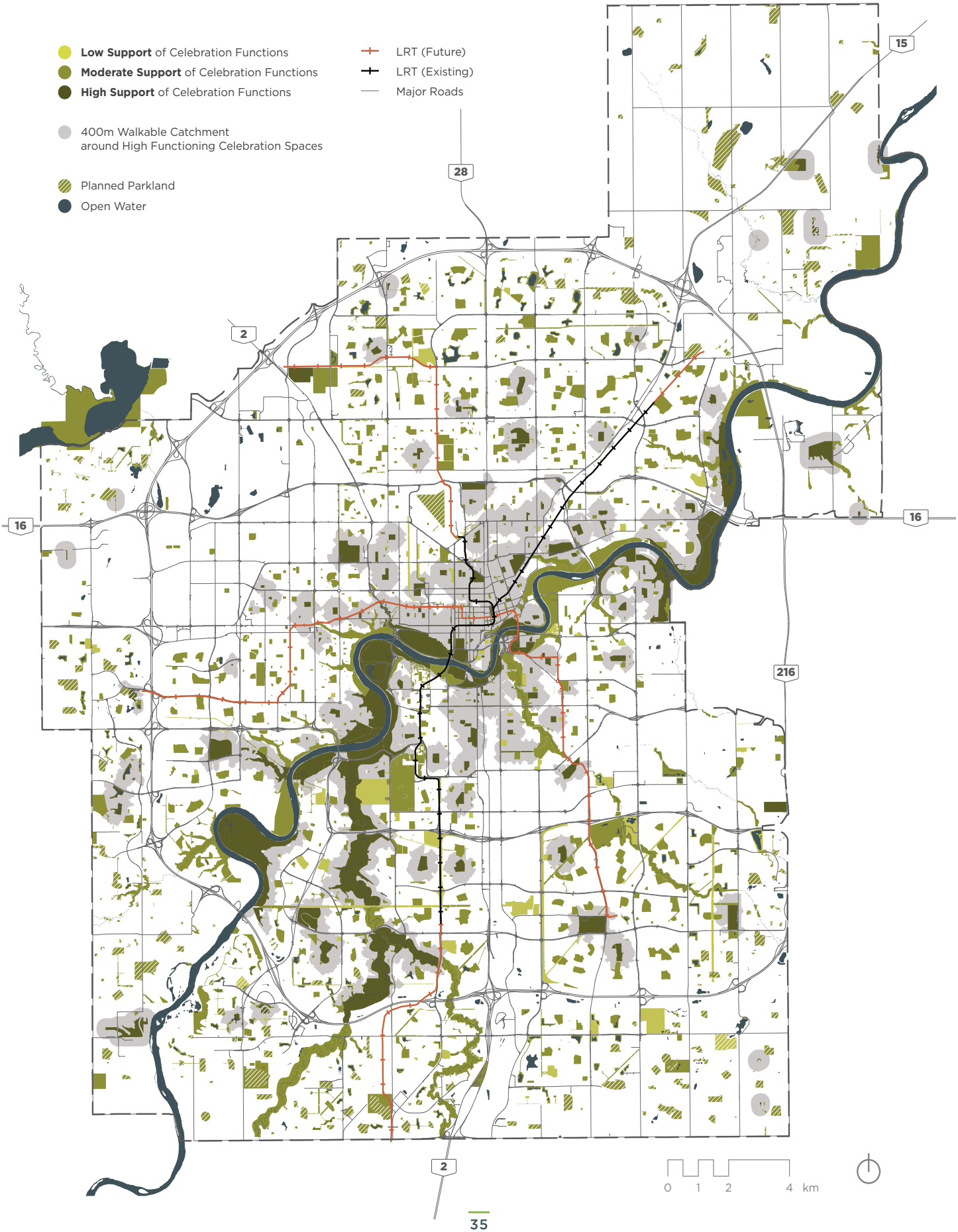
Open spaces provide opportunities for socializing, building community identity, and acknowledging our culture and heritage. They provide protection for heritage resources, and act as gathering spaces, bringing people together in celebration. How open spaces support social and celebratory activities was evaluated based on five functions. 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 results of the Celebration assessment are a combination of the “scores” of its component open space functions.

Celebration functions are incorporated into the Celebration network illustrated in **MAP 4**.

2.3.2 CELEBRATION NETWORK SUMMARY

A wide variety of open spaces throughout the city are appropriate as Celebration spaces (**MAP 4**), although there is substantial variation in their size and the possible scope of community events and festivals. Public input has highlighted the transit network as the most frequent means of access for Celebration. As the City expands its LRT network, larger portions will become appropriate to host and participate in festivals and other community events. As residents benefit from local gathering spaces for markets, picnics and other community-led initiatives, the broad distribution of small-scale Celebration spaces is important. Many streets throughout the city could be closed temporarily in order to accommodate events, festivals and gathering opportunities, which would help increase the supply and distribution of Celebration spaces for these and other ephemeral uses. At the same time, larger events require more planned infrastructure to support the numbers of attendees and therefore cannot be broadly distributed throughout the city. Alignment with LRT stations and other substantial transit hubs will reduce the need for sprawling parking lots that compete for usable space.

MAP 4: Celebration Network



2.4 The Wellness Network

2.4.1 WELLNESS NETWORK STRUCTURE

The Wellness Network adds an important layer of functionality to the green network. Open spaces promote active living, connection to scenic and serene spaces and are fundamental to physical and mental wellbeing. Many open spaces contribute to individual physical fitness, relaxation, active transportation, and work-life balance. Other spaces are more programmed and organized by communities or groups. It is important that the distribution of these spaces in the network enable easy access and encourages Edmontonians to live and play actively. Wellness open spaces such as sports fields, cycle networks, trails and pathways are supplemented by extensive indoor recreation facilities.

WELLNESS ELEMENTS

Wellness Elements are the open spaces that are highly supportive of Wellness activities. These spaces range in size from single amenity pocket parks with an exercise station or a playground to large parks with multiple amenities with an extensive network of walking and biking trails. Open spaces that are supportive of Wellness functions accommodate recreation, active transportation, mental health and wellbeing, and learn and play.

WELLNESS CORRIDORS

Wellness corridors can support access to open spaces, while simultaneously supporting Wellness functionality. For example, greenways often have bike routes and pedestrian paths passing through them, but are also large enough that they can support other recreational activities.

The primary corridors used by Edmontonians for Wellness are active transportation pathways and greenways.

WELLNESS

Promotes healthy living and fosters wellbeing through diverse kinds of recreation, mobility and environments.

OPEN SPACE FUNCTIONS

RECREATION

High-quality sports facilities and outdoor recreation spaces promote healthy living.

MENTAL HEALTH + WELLBEING

Open spaces can reduce stress and provide opportunities for therapeutic activities.

ACTIVE TRANSPORTATION

Well-connected trails and pathways encourage active transportation and improve mobility.

LEARN + PLAY

Programming and free-form play promotes learning, and nature is essential for children's development.

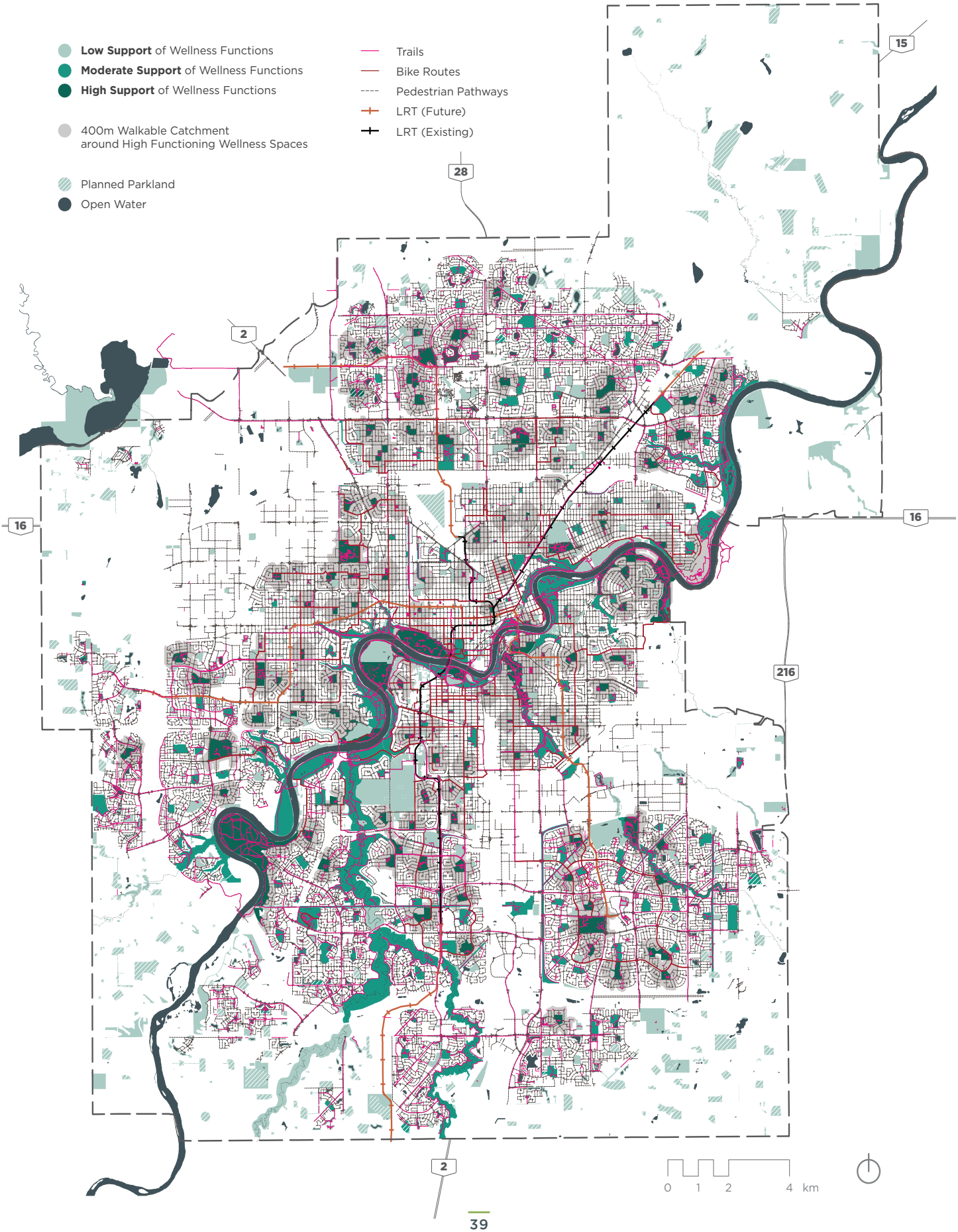
Open spaces support human health and wellness by providing opportunities for physical activity, emotional and spiritual fulfillment and healthy learning, socialization and development among children. How well open spaces provide those opportunities was assessed based on four functions. Each of these 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 (e.g. Green Shack Program). The results of the Wellness assessment are a combination of the "scores" of its component open space functions.

Wellness functions are incorporated into the Wellness network illustrated in **MAP 5**.

2.4.2 WELLNESS NETWORK SUMMARY

Although the provision of Wellness functionality is distributed throughout the city (**MAP 5**), many residents still dwell beyond an easily walkable distance to open spaces that provide high Wellness function, as highlighted by the 400 metre walkable catchments surrounding high-scoring open spaces. Active transportation routes (shared-use pathways and cycle tracks) are a key component of the Wellness network, connecting communities and open spaces together and providing broader access to the city. There are substantial gaps in this network, as industrial lands partition residential communities from the River Valley and Ravine System, and high traffic commuter roads and bridges pose substantial challenges to commuters using active transportation. In the winter months, City Operations personnel are challenged to efficiently manage snow and ice on the trails and pathways of the green network in order to sustain year-round recreational opportunities for residents, and also to control wear and tear on recreational infrastructure. In natural areas, a balance must be struck between the development of the paved trail system and more natural unpaved pathways. Erosion and overuse of trails leads to safety and upkeep concerns; therefore, regular monitoring and maintenance is a critical aspect of the long-term viability of the pathway system.

MAP 5: Wellness Network



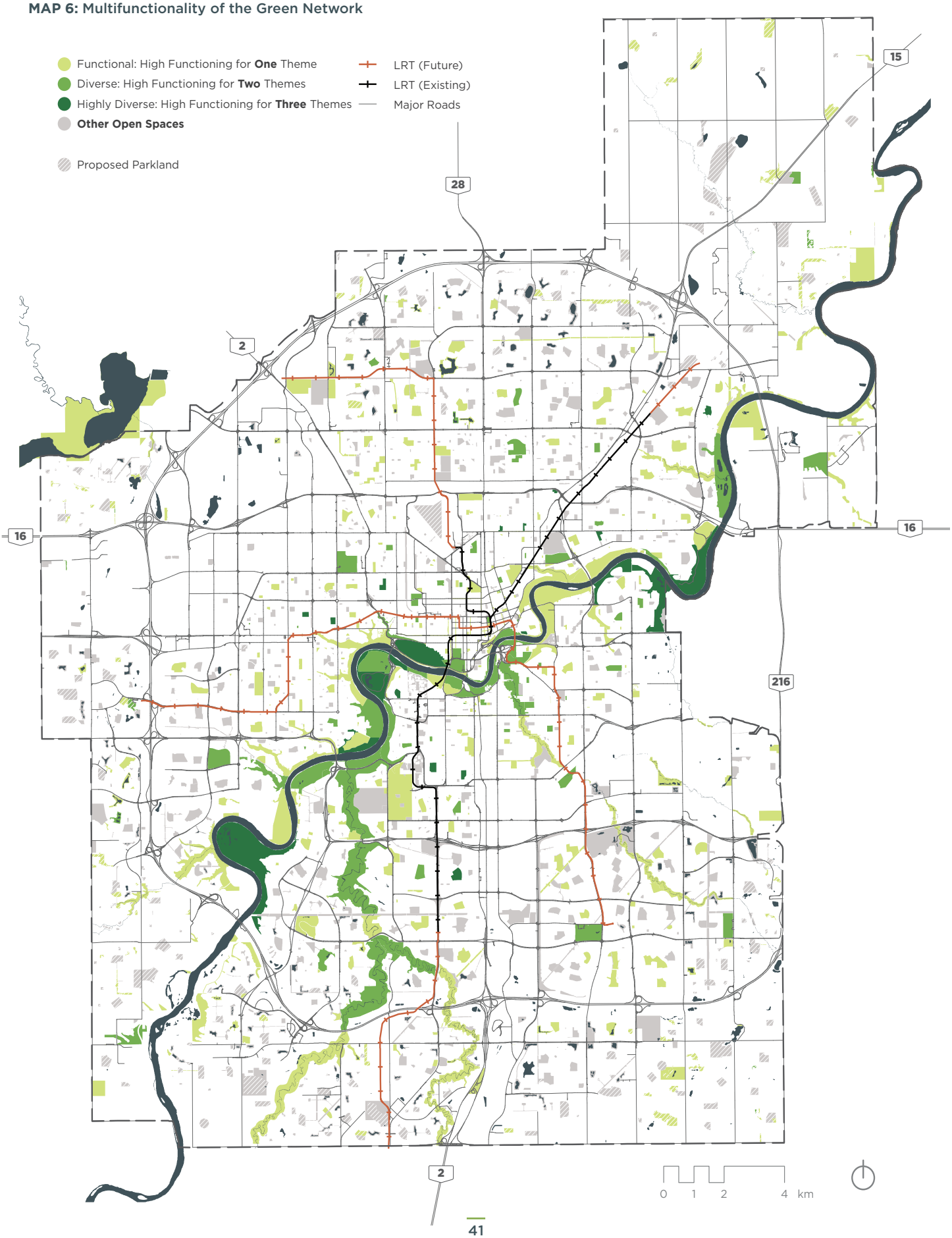
2.5 The Multifunctional Green Network

Understanding the functional strengths and weaknesses of open space networks provides valuable information for future planning. It allows more targeted investment to address specific gaps or under-serviced areas, where certain open space functions are not well supported. A focus on the functionality of open spaces, in addition to total area, allows for a more nuanced understanding of what each open space provides to the community it serves, greatly aiding open space programming and management. The functionality of open spaces may be enhanced to provide more functionality in areas where additional parkland is difficult to acquire, such as the Central Core.

Multifunctional open spaces that provide a wide range of experiences and amenities are highly desirable destinations. These open spaces provide valuable services and opportunities for a broad range of the population, and often serve as high profile attractions for visitors. However, multifunctional open spaces are subject to challenges, such as programming and maintaining them to avoid user conflicts, the impacts of overuse, and optimizing booking and communication processes. Multifunctional open spaces are highly desirable both for the end user (who is provided more diverse experiences at a single destination) and for the City, allowing limited public space to serve multiple roles and contribute to the overall value of the neighbourhoods that contain them.

MAP 6 highlights the multifunctionality of Edmonton's open spaces. In general, most multifunctional high-scoring open spaces are larger parks with district or citywide service areas. They contain more amenities, programs and services because of their larger size and their importance as destinations for the city and the region. Usually these parks include a variety of recreational amenities and facilities such as playgrounds, splash pads, sports fields, picnic sites, tobogganing hills, pavilions and recreation centres. In addition, as they attract more people, these open spaces also have enhanced park amenities such as washrooms, drinking fountains, parking facilities and shared-use pathways. Many of Edmonton's multifunctional 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.

MAP 6: Multifunctionality of the Green Network

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