



RIBBON *of* GREEN

TECHNICAL REPORT

2019

Introduction

INTRODUCTION TO THE ANALYSES

Planning the North Saskatchewan River Valley and Ravine System requires extensive engagement and analysis to understand site characteristics and conditions. This technical report summarizes the analyses and engagement undertaken as part of the *Ribbon of Green SW + NE* project. Specifically, the following analyses were considered:

- + Public and Stakeholder Engagement
- + Indigenous Engagement
- + An Ecological Resources Overview
- + A Historical Resources Overview
- + A Recreation Assessment
- + A Geotechnical Assessment
- + Transportation Analysis

The desktop analyses align with the overall intent of the *Ribbon of Green SW + NE* to provide high-level direction that will be confirmed and refined during detailed site-specific studies. It highlights important features, opportunities, challenges, and ideas to be verified and further explored. Additionally, it is also intended to help scope future field surveys and studies. The purpose of the analyses is not to dictate the final status of an area, and outcomes may change should there be developments through field verification or data acquisition.

Each analysis and public engagement phase examines the River Valley and Ravine System from different perspectives and can inform future programming, protection, education and outreach efforts. It is important that each aspect is considered, to ensure a sustainable System that is informed from an ecological, cultural, and recreational perspective. Each perspective is reflected throughout the *Ribbon of Green SW + NE Plan* including the vision and principles, policy direction, land management classifications and program guidance for each study area. Together, they inform the City of Edmonton's long-term planning and investment in the River Valley and Ravine System.

DATA OVERVIEW

All analyses conducted during the *Ribbon of Green SW + NE* process have been at a desktop level. The size of each study area, and the limited access to several locations due to ownership status and lack of accessibility limit the feasibility and ability to conduct an in-situ study. Therefore, the desktop assessments were conducted using the data available at the time. Further River Valley and Ravine System planning will require field assessments and site-specific studies to verify and refine the direction contained within the *Ribbon of Green SW + NE* to inform the detailed planning and design for specific sites within the System.

Since the completion of the Historical Resources Overview, additional heritage resources field assessments have been conducted and submitted to the Alberta Culture and Tourism for specific sites within the River Valley and Ravine System. As final reports for this work was not available to be included in the Historical Resources Overview and the *Ribbon of Green SW+NE*, it should be included in future site-specific planning processes.

An overview of the analysis data generated from the *Ribbon of Green SW + NE* process, and provided to the City to inform future work and studies has been included in Appendix I.

Outline of Analyses

Inputs

Engagement Summary

Engagement throughout the Ribbon of Green SW + NE process took two forms:

- + Public and Stakeholder Engagement
- + Indigenous Engagement

Public + Stakeholder Engagement

The four-phase public and stakeholder engagement program created opportunities for people to:

- + Share knowledge, expertise and ideas
- + Shape policies, classifications, and programming
- + Confirm the direction of the Plan

Indigenous Engagement

Through engagement with the City, Indigenous communities contributed valuable input that informed policies, the land management classifications, and program guidance.

Ecological Resources Overview

The ecological assessment used available data to study and identify key ecological features of both study areas and helped to identify areas for protection and other areas to host activities in a respectful manner.

Ecological Evaluation

The Ecological Evaluation included an examination of the System's natural areas and an assessment of the most valuable lands with regards to biodiversity and ecological connectivity.

Land Management Classifications

The Land within both study areas were classified as preservation, conservation or active/working landscapes based on public feedback and analyses.

Ecological Network

The Ecological Network defines the most important areas to protect to ensure the System's ecological integrity while locating recreational areas appropriately.

Historical Resources Overview

The Historic Resources Overview identified cultural resources, which included an inventory of historic sites as well as known and unknown archaeological sites.

Recreation Assessment

The Recreational Assessment identified the types of passive and active recreational activities that may be appropriate for each study area based on preferences, trends, important connections, nearby planned and existing open spaces, and gaps in River Valley and Ravine System park programming.

Checks

Geotechnical Assessment

The Geotechnical Assessment examined the feasibility of access points and routes into each study area at a high-level to guide programming and future work.

Transportation Analysis

The Transportation Analysis reviewed the multi-modal neighbourhood transportation networks surrounding each study area and provided recommendations for links, parking, and access.

Outputs

The Ribbon of Green SW + NE Plan

Vision + Principles
Policies
Program Guidance
Implementation

Inputs

The following pages summarize each of the key inputs into the Ribbon of Green SW + NE Plan.

ENGAGEMENT SUMMARY

PUBLIC + STAKEHOLDER ENGAGEMENT

May 2017 - Nov 2018

Role of Analysis	Public engagement provided opportunities to: <ul style="list-style-type: none"> + Learn from participants' experiences and knowledge of the System + Suggest locations for protection and activities for recreation + Review draft directions and provide feedback 	
Public Engagement Method	Phase 1: Share Ideas May 2017	Information presented: An overview of both study areas Feedback informed: The vision, program statement, priorities and policies for each study area
	Phase 2: Shape Our Ribbon Nov 2017	Information presented: Vision and Principles, Policy Framework, and Land Management Classifications Feedback informed: Edits to the Land Management Classifications and ideas for policy direction and programming
	Phase 3: Plan Our Ribbon May 2018	Information presented: The draft Ribbon of Green SW + NE Plan Feedback informed: Edits to the Plan
	Phase 4: Confirm Our Ribbon Nov 2018	Information presented: The final Ribbon of Green SW + NE Plan Feedback informed: Final edits to the Plan prior to Council presentation for approval
Key Insights	The primary discussion topic across all four engagement stages revolved around achieving the appropriate balance between ecological protection and recreational access. More specifically, comments from engagement activities highlighted the importance of: <ul style="list-style-type: none"> + Ecological preservation + Access to and enjoyment of nature + Low-impact recreational use + Mobility through the System + Community gathering and celebration places + Connections to and from neighbourhoods, and within the System To support the above points, participants emphasized the importance of infrastructure, connections and amenities, with emphasis on washrooms.	
Future Role	The Engagement Summary is a record of the tactics used and key themes that can contribute to planning further engagement tactics and conversations. This engagement record will illustrate how values and ideas change or remain the same over the years.	

INDIGENOUS ENGAGEMENT

Fall 2016 - Fall 2018

<p>Role of Analysis</p>	<p>The Indigenous engagement program provided opportunities to:</p> <ul style="list-style-type: none"> + Build relationships with the multiple Indigenous communities within and around Edmonton + Outline how the City and Indigenous communities can work together on River Valley and Ravine System Planning + Inform policy and programming direction to acknowledge, respect and include Indigenous history, uses and practices
<p>Indigenous Engagement Method</p>	<p>The Indigenous engagement had two streams: involve and inform. These streams guided the engagement and communications with Indigenous communities. Each community was invited to select their preferred stream. By default, communities were assigned into the 'inform' stream where they were apprised about the project and engagement opportunities, however if communities wished to be 'involved', then they would be further engaged. Throughout the project, Indigenous communities had the choice to alternate between streams based on their interests and capacity to engage at the time.</p>
<p>Key Insights</p>	<p>The City of Edmonton is committed to keeping Indigenous communities informed and engaged throughout the Ribbon of Green SW + NE and will continue to do so for future site-specific plans. The City met with several communities and hosted workshops with Traditional Knowledge Keepers to learn about the System. The following themes emerged from these engagements:</p> <ul style="list-style-type: none"> + Recognition of Indigenous Peoples: First Nations and Métis history, culture and traditional knowledge contributes to the diversity of Edmonton and helps improve the quality of life for all citizens. + Significant Cultural/Historical Sites: Future park development and construction should plan for the possibility of finding burial sites, archaeological remains and modified/ marked trees. + Gathering Places: Edmonton needs Indigenous gathering places to practice ceremonies, celebrate, teach and promote culture. + Protection of Natural Areas: Rivers, streams, wetlands and natural areas are environmentally/ culturally significant to Indigenous people. + Environmental Stewardship: Caring for and respecting the environment (e.g. monitoring, management, restoration, environmental awareness and education) is important and should involve Indigenous peoples. + Traditional Plants: There are many natural and undeveloped areas throughout Edmonton that contain traditional plants that are important and sacred to Indigenous peoples and should be protected. + Engagement: Indigenous communities are interested in collaborating early in the process with meaningful in-person and in-situ engagement, to share traditional knowledge, identify issues and concerns.
<p>Future Role</p>	<p>Indigenous engagement was a crucial component of the Ribbon of Green SW + NE process that began a long-term conversation and collaboration opportunities with Indigenous communities to share information, protect significant areas and help shape future development. This engagement also set the parameters and expectations for future in-person and in-situ engagement to occur during the site-specific planning processes.</p>

ECOLOGICAL RESOURCES REVIEW

ECOLOGICAL EVALUATION

April 2018

Role of Analysis	<p>The ecological assessment used existing available data to study and ascertain key ecological features to identify areas for protection and spaces to focus activity in a respectful manner. Specifically, the role of the ecological evaluation was to:</p> <ul style="list-style-type: none"> + Assess natural features, potential biodiversity, and their likely contribution to ecological connectivity + Inform technical and field studies during future site-specific planning + Provide planners with an understanding of the specific features that comprises the Ribbon of Green SW + NE 				
Method Outline	Land Cover Classifications	<p>This involved mapping the following different types of land cover:</p> <ul style="list-style-type: none"> + Modified landscapes + Naturally wooded areas + Wetland + Naturally non-wooded areas + Natural landscapes + Developed landscapes <p>These maps highlighted the different landscapes within the two study areas and provided ecological connectivity insights to inform the Land Management Classifications.</p>			
	Natural Features Mapping	<p>This involved mapping the following natural features:</p> <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> + Natural waterbodies + Sand + Mineral soil + Wetlands + Stand type + Shrub </td> <td style="vertical-align: top; padding-left: 20px;"> <ul style="list-style-type: none"> + Herbaceous grass + Treed shelterbelt + Non-maintained grass/shrubs + Drainage courses/streams </td> <td style="vertical-align: top; padding-left: 20px;"> <ul style="list-style-type: none"> + Potential microclimate sites + Floodways and flood fringes </td> </tr> </table>	<ul style="list-style-type: none"> + Natural waterbodies + Sand + Mineral soil + Wetlands + Stand type + Shrub 	<ul style="list-style-type: none"> + Herbaceous grass + Treed shelterbelt + Non-maintained grass/shrubs + Drainage courses/streams 	<ul style="list-style-type: none"> + Potential microclimate sites + Floodways and flood fringes
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	Ecological Evaluation	<p>The biodiversity potential, ecological connectivity, and representative value of both study areas were assessed using the City's Ecological Evaluation Tool. This tool is used to assess the ecological value of a natural areas using several factors (e.g. biodiversity potential, ecological connectivity), and is found within the City's Phase II Ecological Network Report Terms of Reference.</p>			
Habitat Classification	<p>This involved allocating natural areas and non-maintained semi-natural areas to the following classifications:</p> <ul style="list-style-type: none"> + Core habitat + Habitat + Corridors + Stepping stones 				
Key Insights	<p>Important insights that came out of this analysis include:</p> <ul style="list-style-type: none"> + The diversity of natural features distributed throughout the System + A preliminary ranking of areas with low, moderate or high natural assets + Areas with important habitats to be considered and further studied during future site-specific planning 				
Future Role	<p>The maps and data from the ecological assessment provide an inventory of key features in both study areas that can be used as a starting point to inform future site-specific planning.</p>				

LAND MANAGEMENT CLASSIFICATIONS

April 2018

<p>Role of Analysis</p>	<p>Land Management Classifications define the physical site conditions, operations, activities, and amenities within the entire River Valley and Ravine System. These management classifications outline the level of protection or permitted development within each area.</p> <p>The three Land Management Classifications include:</p> <ul style="list-style-type: none"> + Preservation + Conservation + Active/Working Landscapes 	<p>Preservation: Protects and, when necessary, restores natural processes, key habitat areas, wildlife corridors, sensitive archaeological/cultural/historic sites to support a healthy River Valley and Ravine System.</p> <p>Conservation: Provides opportunities to enjoy and appreciate the natural setting while minimizing environmental impact and restoring ecological functioning. There are two sub-classifications of Conservation that include:</p> <ul style="list-style-type: none"> + Trail-based Recreation: Facilitates a variety of trail experiences in harmony with the natural environment through a connected trail network. + Natural Recreation: Provides opportunities for the public to rest, linger, gather, and play in natural settings while minimizing environmental impact. <p>Active/Working Landscapes: Facilitates gathering and recreation within the System, recognizing existing uses and encouraging restoration. This classification also acknowledges existing uses, including urban services. There are three sub-classifications of the Active/Working Landscapes that include:</p> <ul style="list-style-type: none"> + Intensive Recreation: Provides a wide range of recreational opportunities tailored to the river valley and ravine setting. + Agriculture and Horticulture: Recognizes existing agricultural and horticultural uses. + Urban Services and City-wide Attractions: Supports city-wide attractions while acknowledging the importance of urban services to accommodate a growing city. 		
<p>Method Outline</p>	<p>Data-Derived Land Management Classifications</p>	<p>The initial identification of Land Management Classifications was developed using the ecological evaluation natural area ratings, landslide risks, the environmental sensitivity model and archaeological potential. Each dataset was assigned a Land Management Classification based on their level of sensitivity (e.g. Landslide Risk areas were assigned to Preservation).</p>		
	<p>Manual Refinement</p>	<p>The Data-Derived Land Management Classifications were then reviewed closely and manually refined to reflect past, existing and planned conditions, uses, and access. Three principles informed the manual refinement:</p> <ul style="list-style-type: none"> + Direct activity to areas with lower ecological value + Concentrate activity in already disturbed areas + Focus activity, when possible, in areas with good access (roads, trails etc.) 		
<p>Key Insights</p>	<p>The resulting map allocates the majority of the land area to preservation with strategic conservation and recreational opportunities.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>NE Study Area</p> <ul style="list-style-type: none"> + 49.6% Preservation + 14.1% Conservation + 36.3% Active/Working Landscapes </td> <td style="width: 50%; vertical-align: top;"> <p>SW Study Area</p> <ul style="list-style-type: none"> + 67.9% Preservation + 16.5% Conservation + 12.5% Active/Working Landscapes </td> </tr> </table>		<p>NE Study Area</p> <ul style="list-style-type: none"> + 49.6% Preservation + 14.1% Conservation + 36.3% Active/Working Landscapes 	<p>SW Study Area</p> <ul style="list-style-type: none"> + 67.9% Preservation + 16.5% Conservation + 12.5% Active/Working Landscapes
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<p>Future Role</p>	<p>The Land Management Classifications and sub-classifications will guide design and programming decisions to create park amenities and operations standards that are appropriate to their location within the River Valley and Ravine System. Their precise boundaries and locations will be confirmed during site-specific planning, when on-the-ground conditions are verified.</p>			

ECOLOGICAL NETWORK

April 2018

Role of Analysis	<p>The role of the Ecological Network Analysis was:</p> <ul style="list-style-type: none"> + To define potential restoration areas + To identify the existing ecological network + To combine the potential restoration areas, the existing ecological network and the program guidance to create the recommended ecological network 	
Method Outline	Potential Restoration Areas	Identified by intersecting preservation and conservation areas with developed and modified land cover classes.
	Existing Ecological Network	Mapped the ecological evaluation natural area rating, wetlands, storm water management features, open water, streams with Strahler order 3 and above, existing trails, wildlife passages, major roads, coyote and chickadee corridors and key pinch points.
	Recommended Ecological Network	Overlaid the program guidance in the Plan and potential restoration areas on the existing ecological network.
Key Insights	<p>This analysis resulted in the following key insights:</p> <ul style="list-style-type: none"> + Important features, sites and habitats in the system + Locations to restore + A recommended network to respect and implement through further planning + Illustrated ecological guidance for the Plan's reaches 	
Future Role	<p>The restoration areas and recommended future ecological network were arrived at through a desktop level study and, as a result, are a starting point for future work, and will accompany proposed infrastructure and programming. This means that the restoration areas and ecological network will be refined and confirmed based on field assessments and the design process during site-specific planning.</p>	

HISTORICAL RESOURCES OVERVIEW

CULTURAL ASSESSMENT OF STUDY AREAS 1 AND 2

Nov 2017

Role of Analysis	<p>Use of the River Valley and Ravines has a long history, dating back approximately 10,000 years. An understanding of the heritage resources that are present within the Ribbon of Green SW + NE footprint is a fundamental aspect of enabling Edmontonians to engage with the City's parks and green spaces. As a starting point, the historical resources overview role was:</p> <ul style="list-style-type: none"> + To evaluate known and unknown archaeological resources and identify key historic sites + To categorize areas according to their sensitivity to inform the Land Management Classifications + To help identify narratives and events to highlight in the program guidance 	
Method Outline	Known Archaeological Resources	An archaeological site search was conducted, and each site was evaluated to determine the appropriate level of protection.
	Unknown Archaeological Resources	<p>This step involved assessing landforms based on their archaeological potential, which includes the following criteria:</p> <ul style="list-style-type: none"> + Distinctiveness of the landform (i.e. poorly versus well-defined margins) + Previously recorded data + Designated sites within the Significant Sites Listing + Previous disturbance (e.g. cultivation, industrial activity)
	Historic Sites	This process involved a review of the historical resources inventories, maps, archives, local history books, online resources and historic impact assessment reports. After the sites were identified, their integrity was evaluated using satellite imagery and LiDAR.
Key Insights	<p>Overall both study areas include the following:</p> <ul style="list-style-type: none"> + 101 known archaeological resources (e.g. prehistoric campsites, homesteads with artifacts found etc.). + 137 zones of archaeological potential (e.g. disturbed sites with a low potential or floodplains with a high potential etc.). + 32 historic sites (e.g. farms, mines, bridges etc.). 	
Future Role	This data will serve as a baseline and background information to inform future archaeological study and collaboration with Alberta Culture and Tourism during site-specific planning, including site programming and interpretation.	

RECREATION ASSESSMENT

Sept 2017

Role of Analysis	<p>High quality recreation spaces that are easily accessible and accommodate a range of activities are crucial to promoting health living. The role of the recreation analysis was to:</p> <ul style="list-style-type: none"> + Evaluate the current use and programming of river valley and ravine system parks + Examine changing recreational preferences and trends + Identify key connections and recreation opportunities to consider 	
Method Outline	Recreation throughout the Ribbon of Green SW + NE	<p>The following steps were undertaken to understand the existing and planned recreational context within and adjacent to the Ribbon of Green SW + NE:</p> <ul style="list-style-type: none"> + Map existing and planned top-of-bank parks spaces + Note existing amenities in the top-of-bank parks + Map central River Valley and Ravine System Parks, describe the park's purpose and note their amenities + Tally all the recreational features throughout the River Valley and Ravine System + Review and summarize key findings from past related engagement
	Recreation Planning Influences	<p>This section involved reviewing approved recreation planning direction and larger municipal, provincial and national recreation surveys. This section also included a best practice review of recreational activities that are increasing in popularity and are applicable to the River Valley and Ravine System. The review resulted in principles to guide recreational planning and ideas to consider.</p>
	Ribbon of Green SW + NE SWOC Assessment	<p>The strengths, weaknesses, opportunities and constraints were evaluated for the Ribbon of Green SW + NE as a whole as well as both study areas in particular.</p>
	Study Area Recreation Considerations	<p>The last section of the plan provides spatial recommendations for recreational activities based on neighbouring uses and intensity, topography and important connections to preliminarily identify:</p> <ul style="list-style-type: none"> + Nodes or trail heads + Pathways and trails + Support amenities + River access + Unstructured areas + Programmable areas
Key Insights	<p>For the southwest, there is potential to maximize immersion in nature, and trail-based recreation through a variety of unstructured recreational activities and nature interpretive opportunities.</p> <p>For the northeast, the large, flat and disturbed land base offers opportunities to develop multiple different types of recreation amenities. Agriculture-based recreation is also an opportunity.</p>	
Future Role	<p>This recreation assessment is a snapshot of recreation patterns and trends during the creation of this plan and provides a framework of the subjects and areas to revisit in the future to ensure recreational considerations are taken into account through future site-specific planning.</p>	

Checks

The following pages provide the geotechnical and transportation summaries to ensure that the recommendations based on the engagement and analyses are feasible from a landscape and access perspective. They confirmed the direction present in the *Ribbon of Green SW + NE*.

GEOTECHNICAL ASSESSMENT

LANDSCAPE FEASIBILITY STUDY PRELIMINARY GEOTECHNICAL ASSESSMENT

Nov 2017

Role of Analysis	<p>The role of the preliminary geotechnical assessment was to:</p> <ul style="list-style-type: none"> + Identify the geological characteristics of both study areas + Record active or recent landslides, old landslides and debris sliding + Provide an initial evaluation to guide concept development and policies + Describe the topographical and geological setting + Note specific site observations + Assess initial trail and programming ideas for each amenity node for geotechnical feasibility 	
Method Outline	Preliminary Desktop Study	<p>The first part of the preliminary geotechnical assessment involved reviewing:</p> <ul style="list-style-type: none"> + Published geological maps within the study area + Available general geotechnical information + Current LiDAR maps
	Desktop Study and Site Visits	<p>The second part involved evaluating the initial programming ideas and trail connections identified based on public engagement, analyses, and best practices to identify and evaluate feasible access routes and infrastructure using the datasets gathered during the preliminary assessment through:</p> <ul style="list-style-type: none"> + A review of the site's geology + Site scans to observe site and geotechnical conditions when the site is accessible through public land
Key Insights	<p>This preliminary assessment identified areas to avoid or study further based on geotechnical considerations as well as provided a discussion of the overall geology and topography of both study areas.</p>	
Future Role	<p>The datasets that informed this report will be used for all other future planning. The preliminary geotechnical evaluation and notes also provide a starting point and consideration for further geotechnical field assessments.</p>	

TRANSPORTATION ANALYSIS

TRANSPORTATION AND PARKING EVALUATION

Oct 2018

Role of Analysis	The purpose of the transportation and parking evaluation was to: <ul style="list-style-type: none">✦ Note existing access points for each of the amenity nodes✦ Evaluate initial design ideas for transportation and parking implications and opportunities✦ Highlight approved plans and note important connections✦ Summarize the results of the parking counts of existing River Valley and Ravine System lots✦ Provide parking recommendations based on initial design ideas to inform revisions✦ Provide implementation recommendations for further concept plans to be developed	
Method Outline	Transportation Evaluation	Review each site amenity node and primary trail head for transportation considerations, opportunities and constraints.
	Parking Evaluation	Counted the number of cars at Terwillegar Park (Metropolitan Park), Argyll Park (District Park), Hermitage Park (District Park), Mactaggart Sanctuary (Ecological Park), Victoria Park (Metropolitan Park) and Oleskiw River Valley Park (Metropolitan Park) at different times, seasons and temperatures to understand parking demand in the River Valley and Ravine System.
Key Insights	The transportation opportunities and constraints analysis identified existing access points and transportation connections to take advantage of as well as potential parking solutions to meet demand without requiring extensive amounts of land.	
Future Role	This is a document that provides key considerations and ideas to be examined during future planning of the transportation connections and facilitating parking access within the system.	

