

Neglected Landscapes:
A Transformative Future for Winnipeg's Infrastructure Corridors

by

Aaron Bomback

A Practicum submitted to the Faculty of Graduate Studies of

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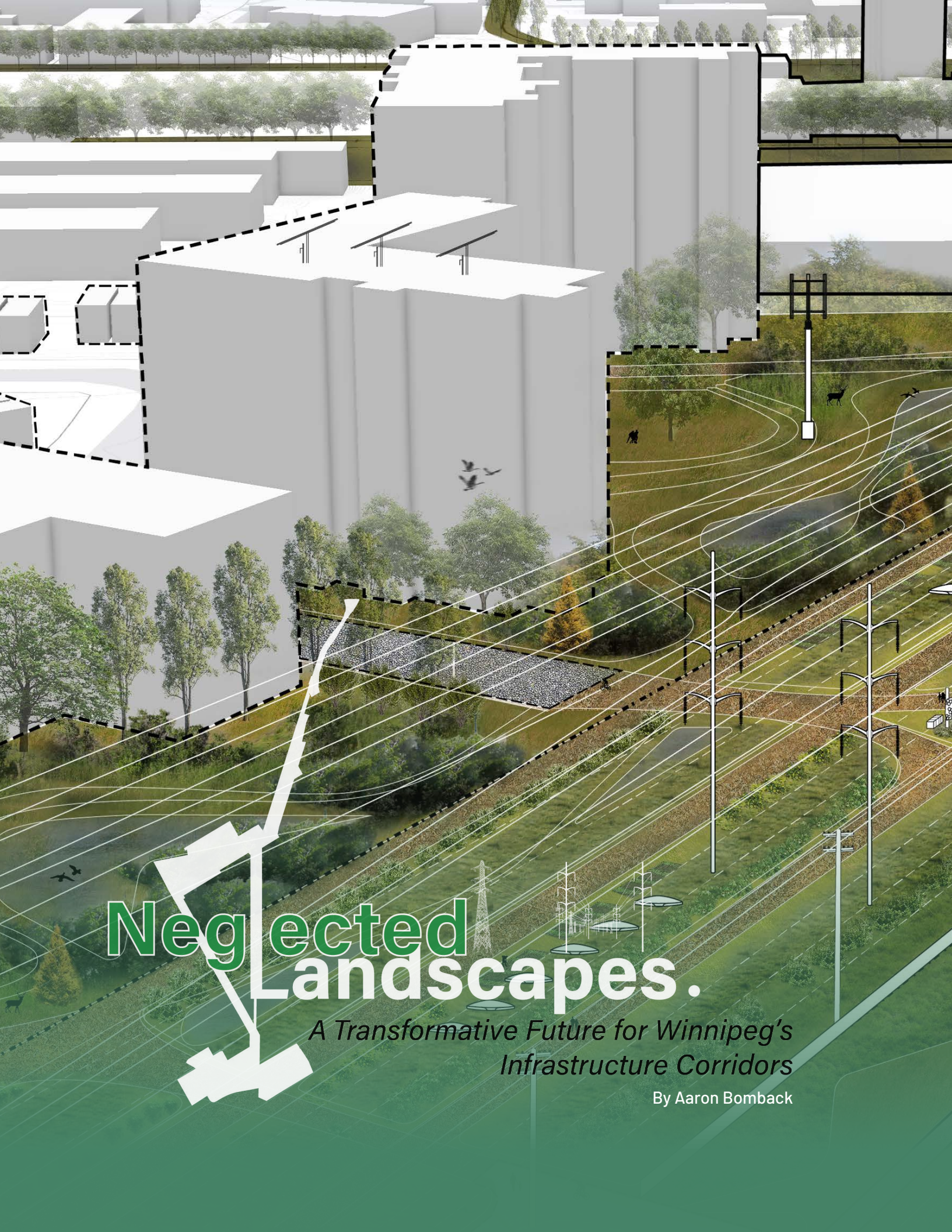
MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture

University of Manitoba

Winnipeg

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Neglected Landscapes.

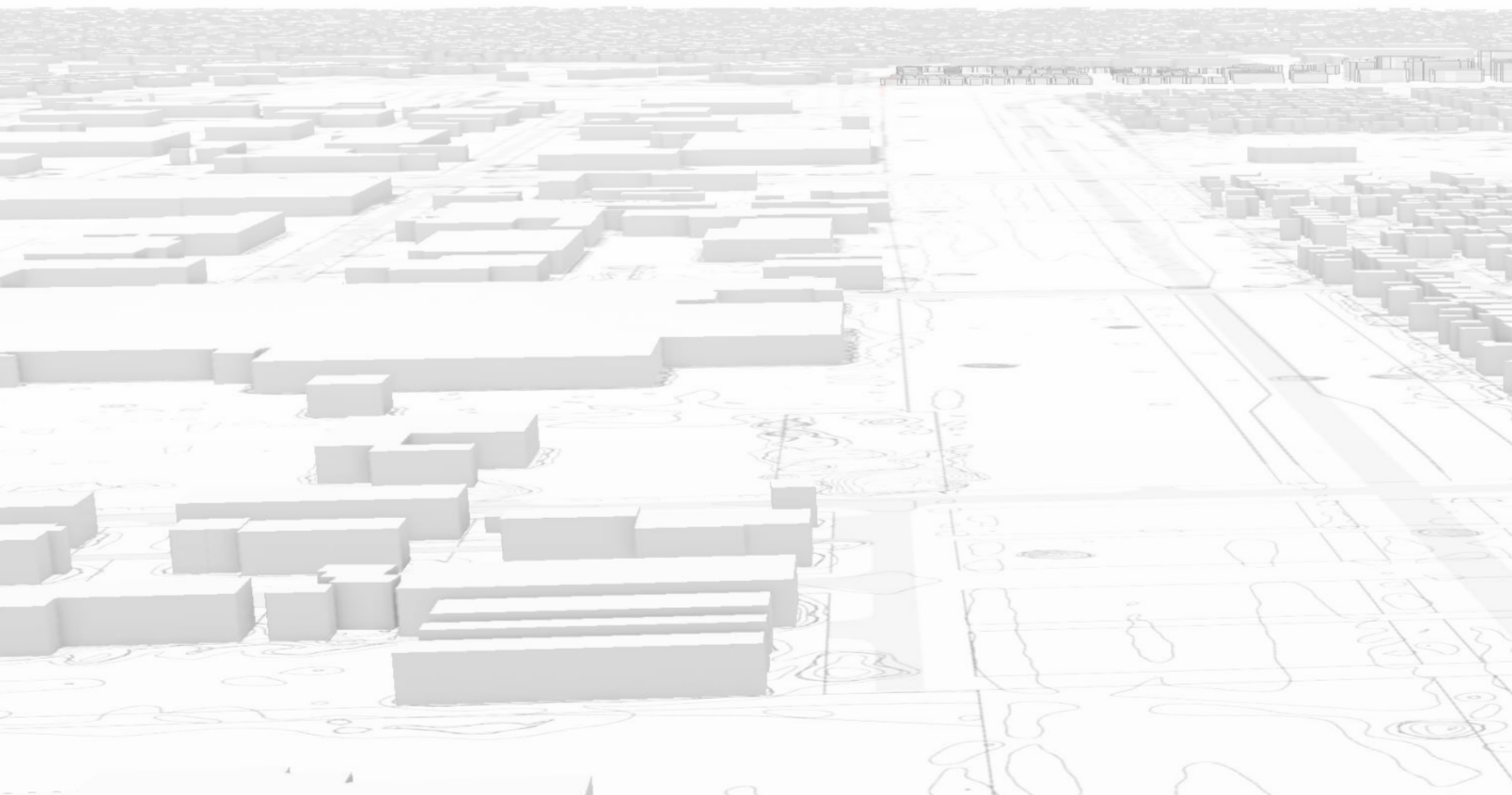
*A Transformative Future for Winnipeg's
Infrastructure Corridors*

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Figure 1: Biodiversity Corridors and Greenway

A
PRACTICUM
BY
AARON
BOMBACK





"When we plan, when we conserve, when
we design, when we manage, and when
we make wise decisions for landscapes,
and especially for regions, we manifest
sustainable thinking and act for human
generations."¹

Richard T.T. Forman

*Land Mosaics: The ecology of
landscapes and regions*

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ABSTRACT

This research explores how underutilized infrastructure and vacant industrial lands can address the need for reclaimed parks and ecological networks in Winnipeg, Manitoba. The change in social and cultural interpretations of neglected spaces within infrastructure corridors will be explored with applied research. The focus will be along the Manitoba Hydro Transmission corridors, CN Railway lines, and vacant uncultivated agricultural lands along major roadway verges. Unique opportunities for transformative change are also present at the intersection of the Southwest Bus Rapid Transitway that is adjacent to major redevelopment sites in the Southwest of Winnipeg.

Above: Geospatial analysis and inventory of Southwest Winnipeg Landscape Framework.

This research intends to demonstrate how integrating redevelopment sites and principles of urban ecology with former industrial landscapes within infrastructure corridors can influence a city's ability to realize the potential of these spaces. *Neglected Landscapes* can be used as a catalyst for landscape design to form a cohesive parkland strategy and ecological network at a regional scale, creating valuable recreational spaces, addressing the loss of biodiversity due to development, and meeting the need for future urban parks and sites for transformative urban design.

Over the last 30 years, Winnipeg's population and demand for park development have increased while investment and accessibility have been inconsistent across the City.² Between 2011 and 2016, Winnipeg increased by 6 percent to more than 700,000 people, and by 2020 the population reached 766, 900.³ The City of Winnipeg anticipates

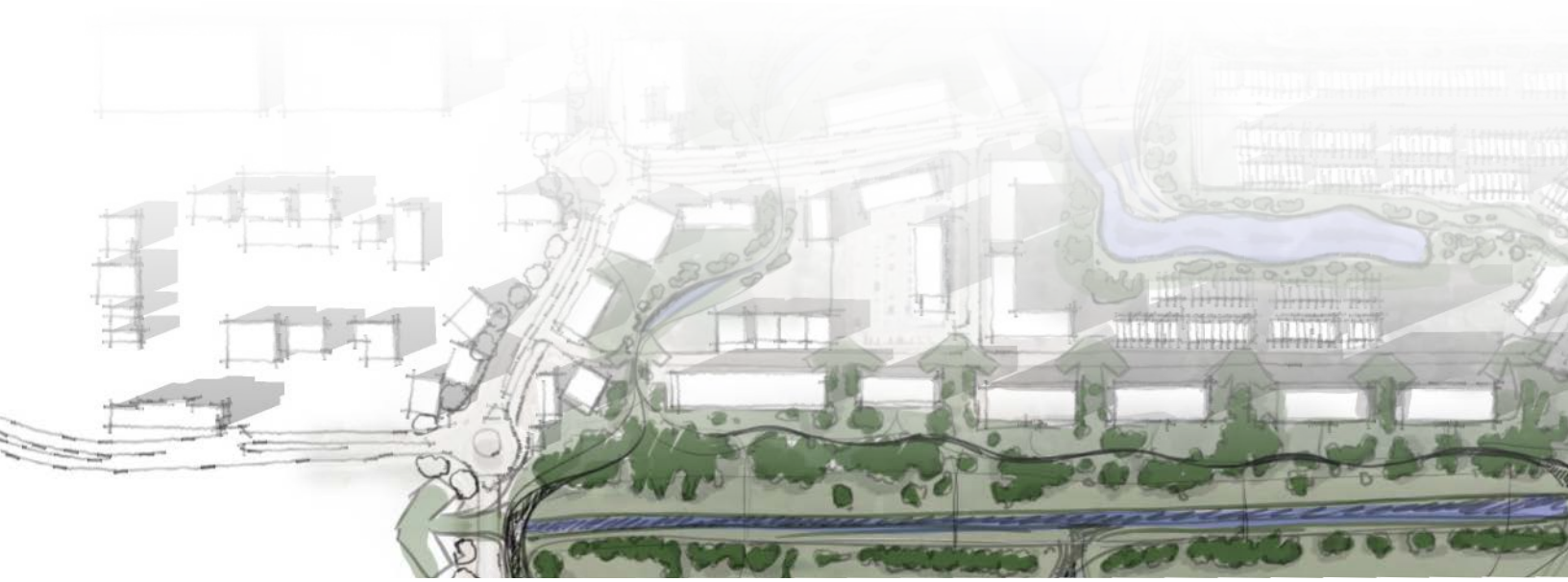


Figure 2: Landscape Framework Modeling

continued growth of an additional 200,000 people by 2049.⁴ These changing demographics put pressure on city amenities, services, and the need for park development and land acquisition.⁵ Acquiring new parkland in Winnipeg is limited due to the case-by-case basis of land acquisition through development in new communities and the process of reserve dedication for future development. Moreover, insufficient budgets to match the continued outward growth of new communities moving further away from mature neighborhoods add higher maintenance and operating costs to a rising demand for parkland.⁶ Winnipeg is sprawling in both population and total developed areas.⁷ This fact alone, if not addressed, leaves the City with varying degrees of service and maintenance city-wide, and a situation arises where new communities will not see the same degree of service or access to parkland in the long-term.

By taking advantage of neglected lands under infrastructure corridors and applying new types of synergies between urban ecology and infrastructure, a potential exists to grow these spaces into a more extensive Winnipeg-wide ecological network. This approach can fill in missing links and inform an ecologically optimum land transformation that addresses the increasing demand for green spaces in new communities and mature areas suitable for redevelopment in the future.

Key Words: Ecological Networking, Industrial and Vacant Lands, Infrastructure Corridors, Land Transformation, Neglected Landscapes



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Above: Conceptual explorations of potential transformative opportunities.

Dietmar Straub, MALA, CSLA, ASLA, ByAK

Thank you, Dietmar, for your guidance, enthusiasm, and knowledge which has always been appreciated during our discussions exploring topics related to this practicum research. Your expertise and unwavering enthusiasm have been greatly appreciated and has helped inform my thinking about landscape architecture and the importance of the design process. I am grateful for your continued support and encouragement which has guided me along the way and kept me inspired to explore new ideas.



Figure 3: Concept Design

Peter Soland, AAPQ, CSLA, Founding Partner civiliti

Thank you, Peter, for your time and patience with this practicum. I am very grateful for your involvement in the work and your willingness to discuss landscape design. Thank you for making time to discuss this practicum and for providing thoughtful advice, sharing your experience and expertise, and for your supportive feedback and encouragement along the way.

My Family

Thank you, Mom, Dad, and Dustin for your ongoing support and encouragement through my education. Without your advice and reassurance, this work and my education would not have been possible. Thank you for believing in me.

The Faculty

Thank you to all the faculty members at the University of Manitoba in the Department of Landscape Architecture. I am grateful for the opportunity to work and learn alongside dedicated instructors and students always excited to explore prairie landscapes in Manitoba.

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CHAPTER 01 INTRODUCTION

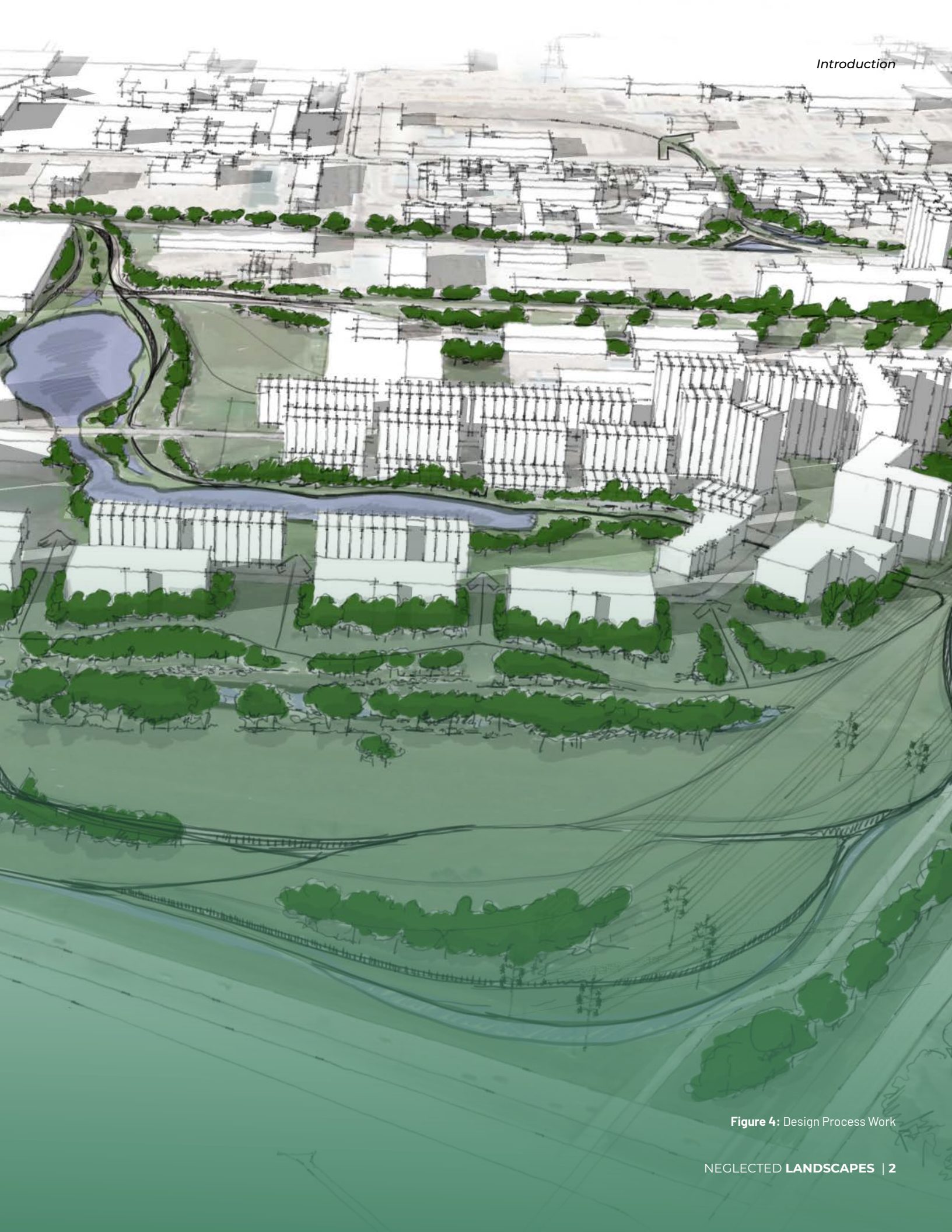
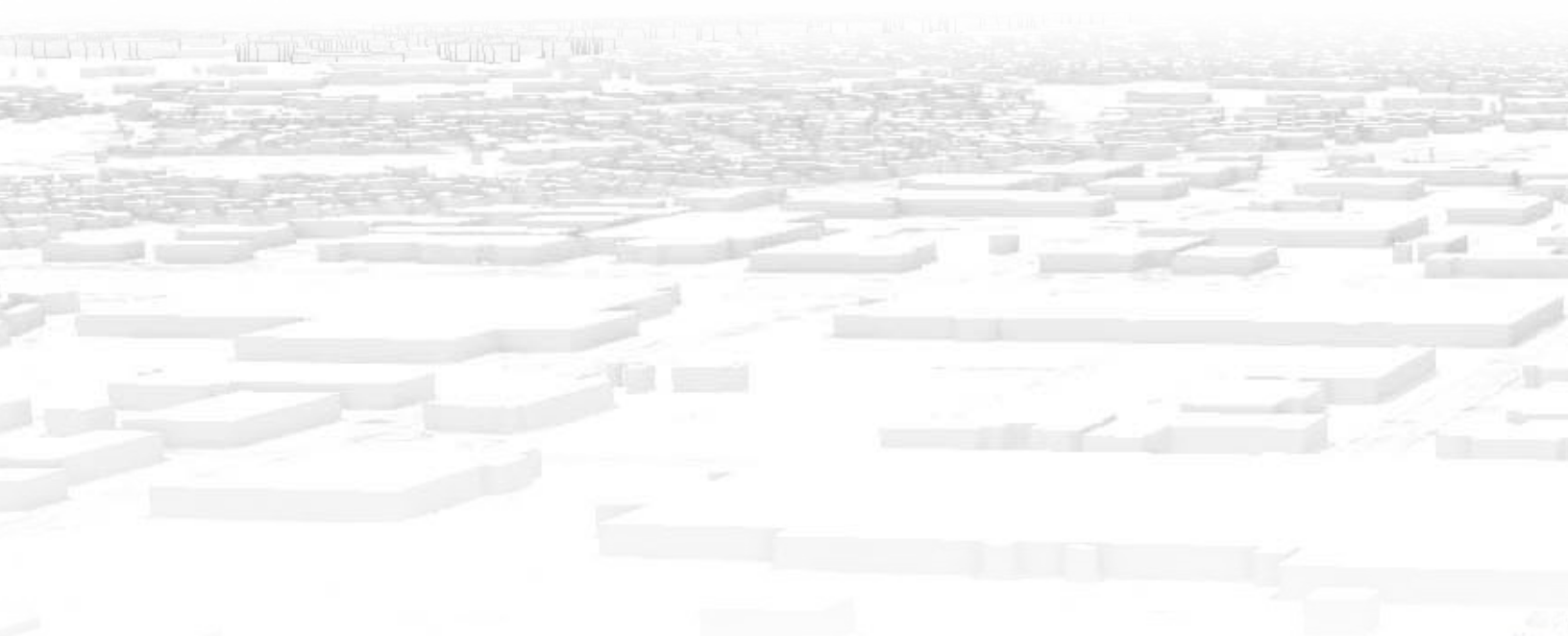


Figure 4: Design Process Work



DOCUMENT STRUCTURE

Chapter 2: Stages of Work

This section of the practicum provides an overview of the research purpose, questions, and methods applied for the design approach for the work. Stages of work introduce the key precedent studies and literature review that informed the output of the applied research.

Above: Initial Manitoba Hydro Corridor Study and Edge Conditions.

Chapter 3: Background and Key Issues

Key issues from the research practicum aims to address the morphology of the City of Winnipeg and the need for parkland that protects biodiversity. Key strategies from this practicum will help inform and address a growing need for parkland demands, ecological networks, and searching for transformative opportunities, and synergies adjacent to infrastructure and redevelopment sites. This section of the practicum will outline transformative futures to explore infrastructure with urban ecology and strategies to create a cohesive network of biodiversity corridors in Winnipeg along neglected landscapes.

Chapter 4: Initial Explorations

This section of the document outlines key initial explorations of the research looking at existing conditions at a city-wide scale and in the Southwest of Winnipeg. A key focus of initial investigations explores existing infrastructure networks, underutilized vacant lands, and



Figure 5: Corridor Study

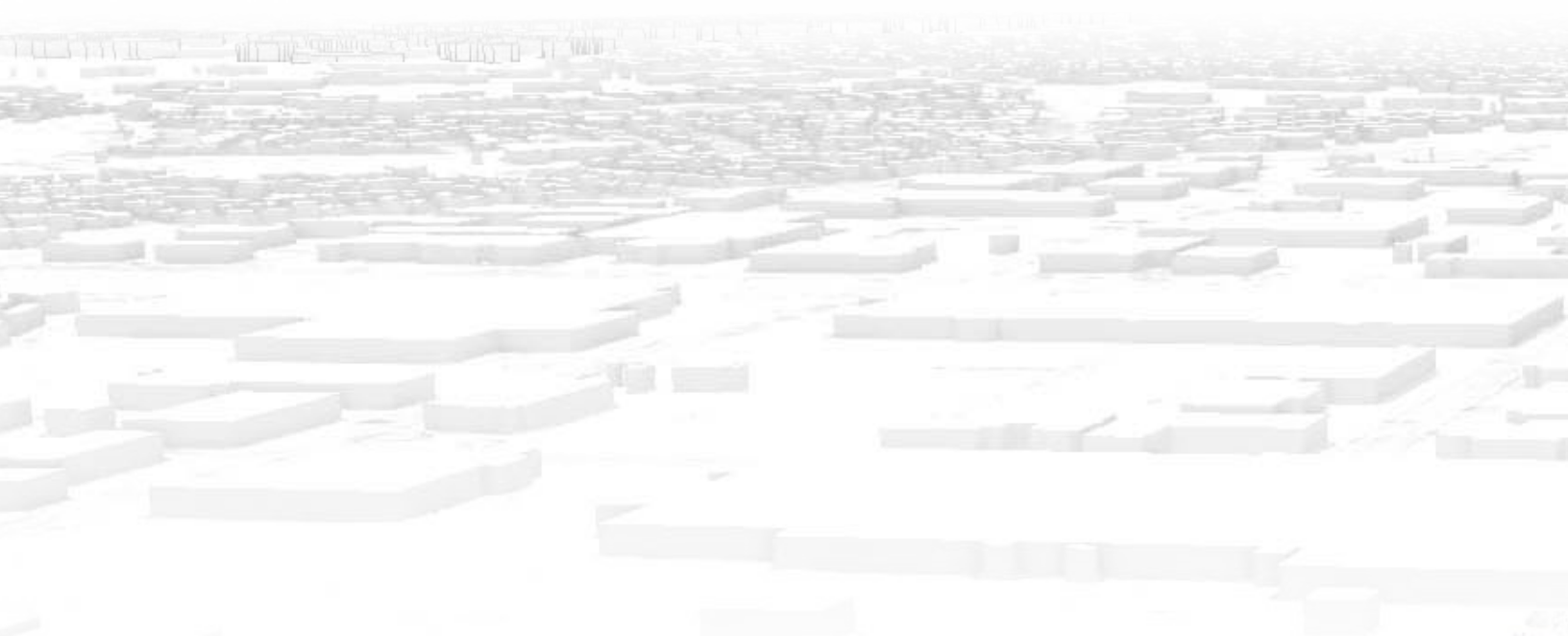
existing parks and open spaces. These initial explorations help to inform and frame the area of study for applying geospatial modeling and delineating a landscape framework.

Chapter 5: In Situ + Geospatial Modeling

This section documents the site investigations and infrastructure types reviewed, including vehicle roadways and verges, Manitoba hydro corridors, and CN railway lines that have future strategies for integrating urban ecology with infrastructure. This section begins to explore the key landscape components and initial geospatial modeling to identify transformative opportunities using a land-based model and criteria approach.

Chapter 6: Landscape Framework

This section outlines a review of existing patches, corridors, and relationships that can inform a Patch-Corridor-Matrix Model for the Southwest of Winnipeg. Building upon the initial geospatial modeling using land-use based criteria, a custom inventory of landscape patches and corridors were reviewed and created to formulate a landscape framework that has the potential to serve as ecological networks based on Richard Forman's key principles for indispensable patterns and key locations within a landscape.



Chapter 7: Selected Sites

Using the landscape framework and applying the Patch-Corridor-Matrix for the Southwest of Winnipeg, the selected sites were determined using the guiding principles for indispensable patterns in planning a landscape, and determining landscape influences for patches and corridors to inform the selected sites for the practicum work.

Above: Initial Manitoba Hydro Corridor Study and Edge Conditions.

Chapter 8: Site and Content Analysis

A detailed site analysis was conducted for the selected sites, including a review of neighborhood context, major land uses, employment, and vacant lands, built form and redevelopment, existing infrastructure, transportation connections, Patch-Corridor-Matrix Model, topography, and drainage. Key outcomes from the analysis helped to inform the opportunities and future strategies for transformative change.

Chapter 9: Process Work

The process work and the initial sketches helped to inform the site and content analysis. The process work outlines the key synergies identified through the initial explorations and key infrastructure types and constraints considered to inform opportunities for transformative change and future strategies within neglected landscapes in Southwest Winnipeg.



Figure 6: Corridor Study

Chapter 10: Neglected Landscapes

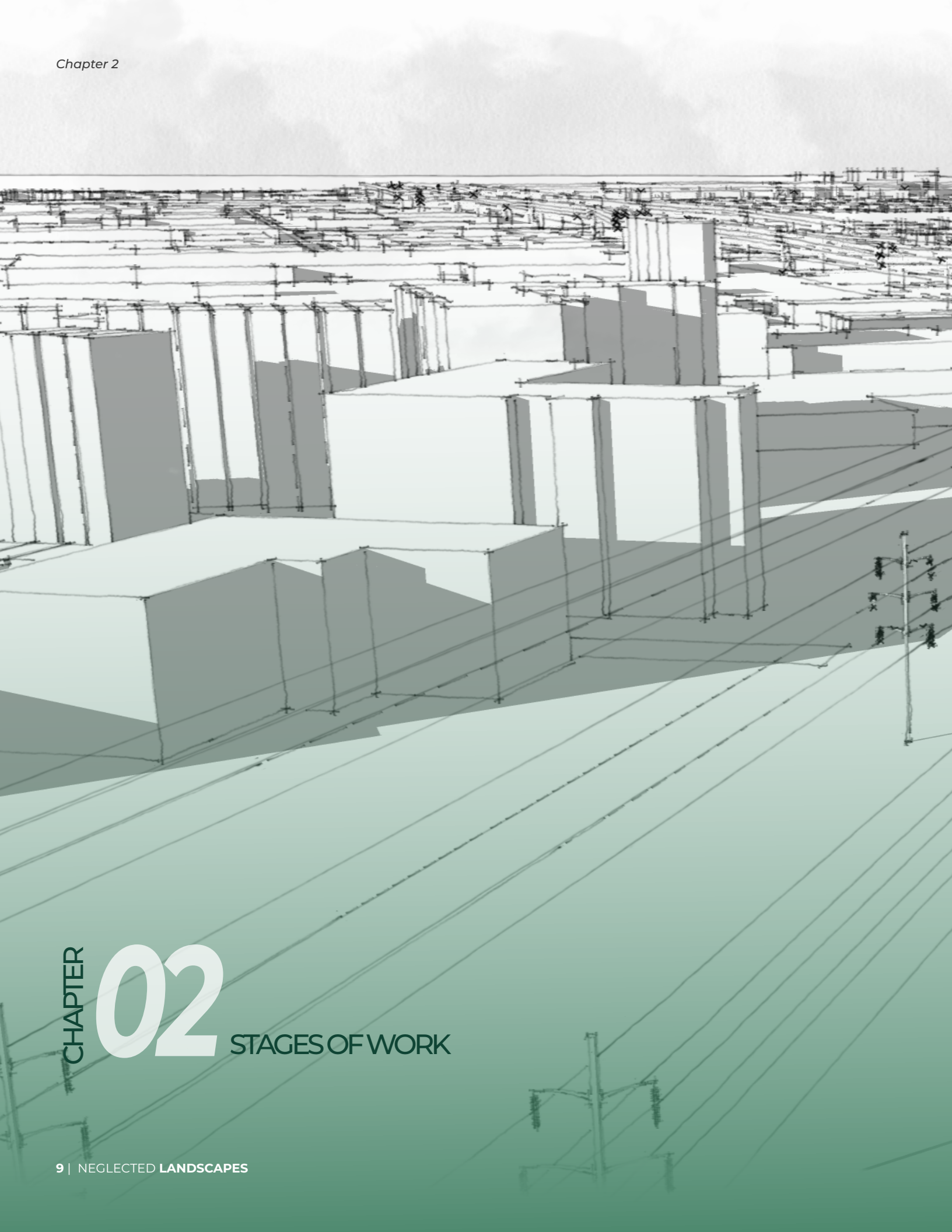
This section of the document is an evaluation of the selected sites, reviewing existing conditions of the infrastructure types and areas for synergies, and transformative futures for Winnipeg's infrastructure corridors using Richard Forman's Patch-Corridor-Matrix Model and framework for neglected landscapes. Infrastructure types are illustrated showing the existing and future conditions.

Chapter 11: Summary and Reflection

The practicum's final chapter will summarize the infrastructure potential of corridors to protect biodiversity while helping transform Winnipeg's industrial lands. This section will reflect on urban ecology as a method and the challenges of shifting towards a new type of landscape in Winnipeg. The summary will conclude by reflecting upon the disciplinary challenges of identifying landscape strategies to establish a new relationship between neglected landscapes, infrastructure corridors, industrial and vacant lands, and urban ecologies as part of this practicum work.

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CHAPTER 02

STAGES OF WORK

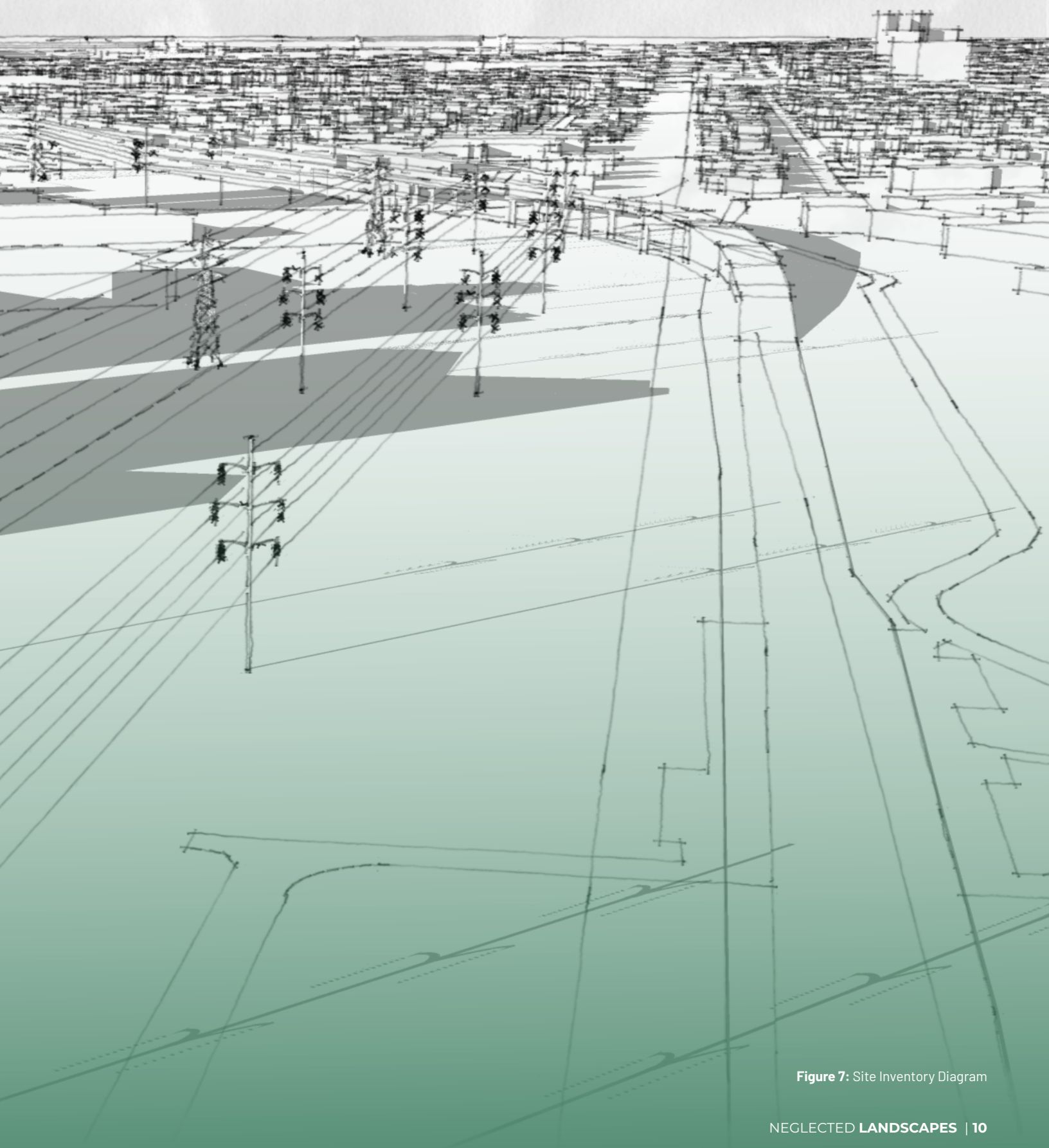


Figure 7: Site Inventory Diagram



PURPOSE

The public realm and built form have increasing layers of permanence due to development in the urban and natural environment, which has long-term impacts on the spatial relationships between human settlement, infrastructure, ecology, and the social and cultural interpretations of a place. This research focused on creating design strategies for neglected landscapes to reclaim infrastructure corridors, industrial landscapes, and vacant lands in the Southwest of Winnipeg. By realizing the opportunities of redevelopment sites in proximity to the Manitoba hydro grid, railways, and transitway, neglected landscapes will inform the design strategies for a cohesive ecological network. This network can offer valuable recreational spaces, protect biodiversity, and connect future urban parkland. A palimpsestual approach in research can be used to explain how Winnipeg's past and present morphology can inform an ecologically optimum land transformation in the future. It can draw on the importance of remaking and remembering narratives using tangible and intangible elements to create old or new interpretations of neglected or vacant industrial lands as reclaimed parks with renewed systems in urban ecology.⁸ It is challenging to debate for change in the landscape without understanding Winnipeg's history and past transformations.⁹

Above: Infrastructure Connections and land use adjacencies.

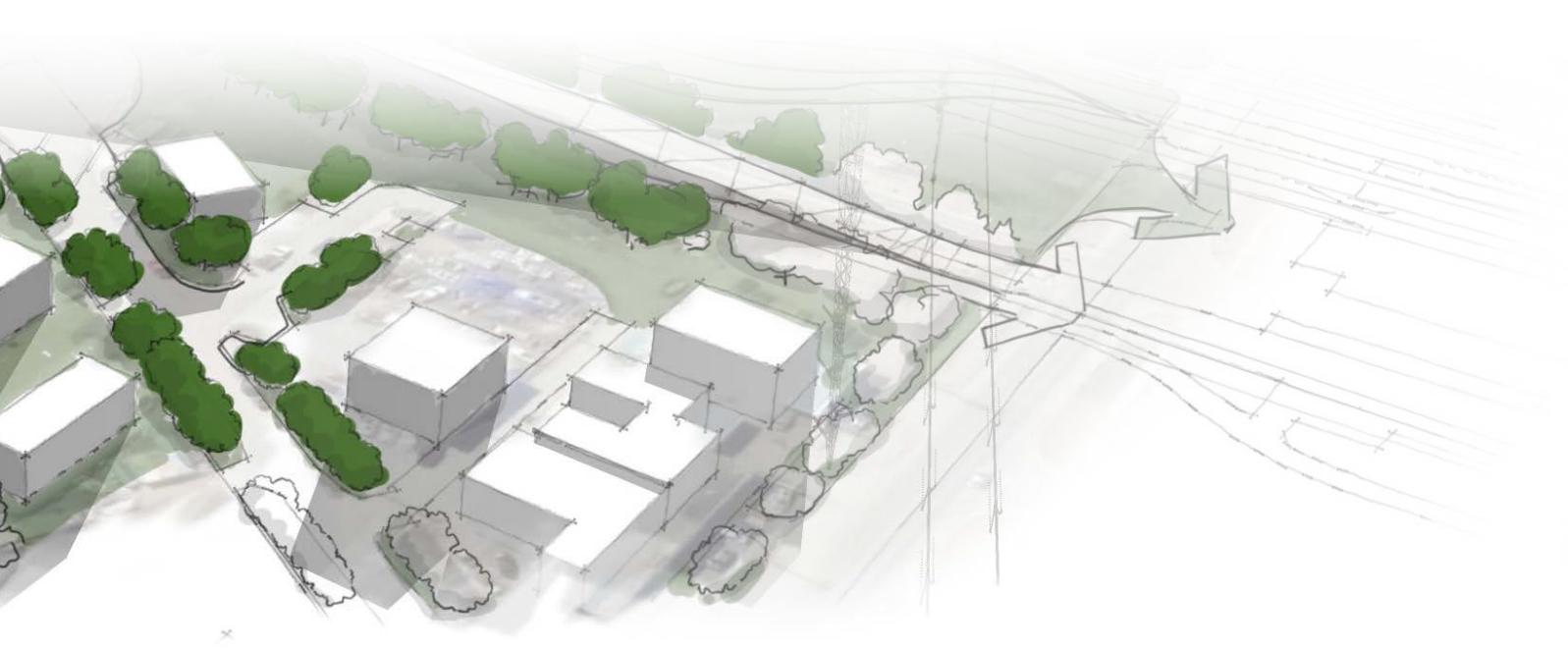


Figure 8: Infrastructure Corridors as a Case Study

By applying the theoretical groundings of palimpsest, we can explore how the morphology of the City can impact future strategies in land transformation. As the City of Winnipeg has grown over the last 151 years, the morphology of the City has made it more challenging to maintain and fund the creation of new parkland as communities continue to sprawl and populations migrate to suburban and new communities on the urban fringe. There is an opportunity to redevelop underutilized infrastructure corridors to re-imagine these spaces as transformative opportunities to change how communities perceive the meaning of parkland and infrastructure in Winnipeg.

For designers, Winnipeg has an opportunity to convert neglected sites into green corridors that offer benefits such as native grassland regeneration, community agriculture, and create ecological opportunities for stepping stones and wildlife habitats as part of a rehabilitation approach based on the size, location, and land patterns.



RESEARCH QUESTIONS + METHODS

This research investigates the landscape issues related to creating an ecological network using Richard Forman's "Patch-Corridor-Matrix Model"¹⁰ and guiding principles for a "Jaws-and-Chunks Land Transformation"¹¹ in the Southwest of Winnipeg. This methodology will facilitate steps to re-imagine how neglected landscapes will interface with infrastructure and redevelopment sites. By applying infrastructure types within a landscape framework, transformative possibilities are proposed. The primary research methods employed for the practicum are Interpretive Research Strategies, which are reflexive in the interactions between theory and practice.

This methodology would involve applying principles of urban ecology to inform an ecologically optimum land transformation using infrastructure corridors as a case study in the Southwest of Winnipeg. Essential methods will include quantitative spatial analysis, precedent studies, reviewing primary documents and written texts, content analysis, study infrastructure types, and a landscape-based historical narrative of Winnipeg's morphology related to the selected sites and design strategies.¹²

Above: Infrastructure Connections and land use adjacencies.

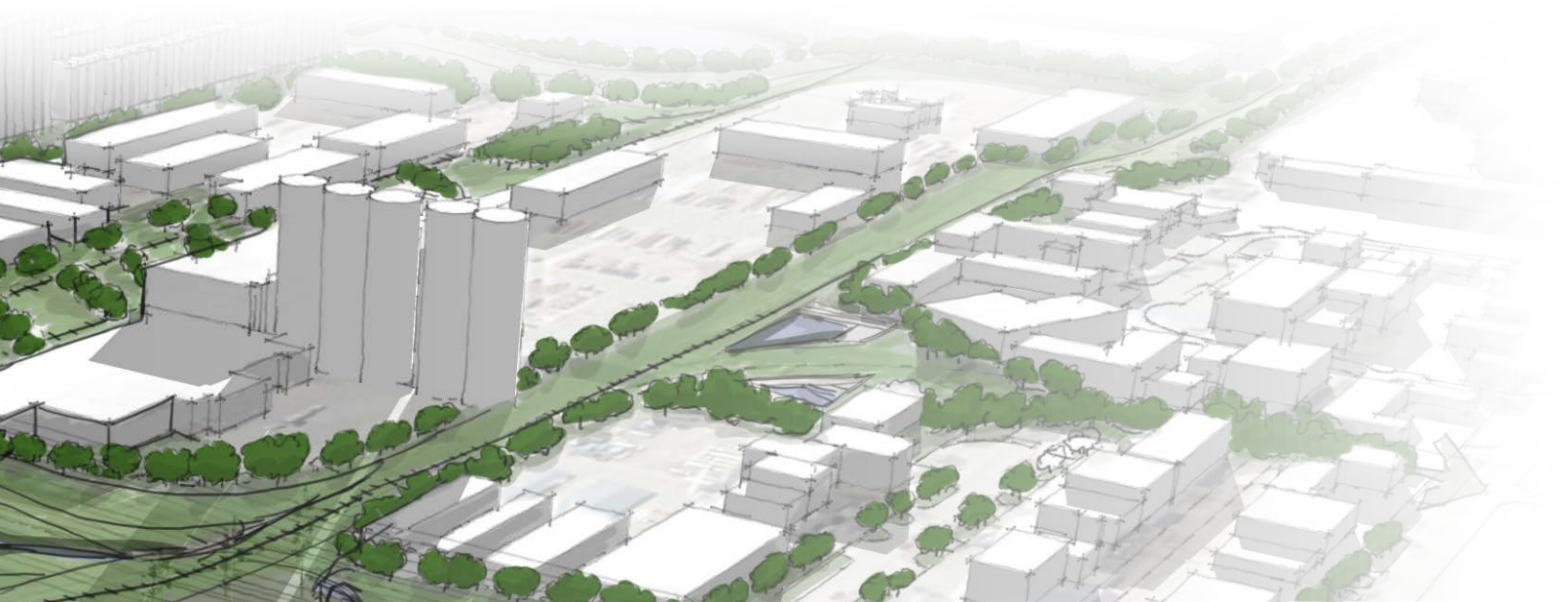


Figure 9: Infrastructure Corridors as a Case Study

A reflexive approach to this research will allow an analysis and reflection of how the infrastructure corridors and adjacent development can be reclaimed as urban parkland acting as a catalyst for transformative urban design. This approach will illustrate how a corridor design for neglected landscapes can be applied in Southwest Winnipeg as an example that could be scaled up as a more extensive Winnipeg-wide ecological network that can fill in missing links and inform future ecologically optimum land transformation strategies.

The following research questions will guide this practicum:

1. How can infrastructure corridors protect biodiversity while helping transform Winnipeg's industrial lands?
2. How can landscape design establish a new relationship between neglected landscapes, infrastructure corridors, industrial and vacant lands, and urban ecologies?

John Dixon Hunt



1936 - Present

English Landscape Historian,
Professor of History and Theory of
Landscape, University of Pennsylvania

Marc Treib



1943 - Present

American Architect, Writer, Critic, and Historian,
Professor Emeritus of Architecture at the
University of California, Berkeley

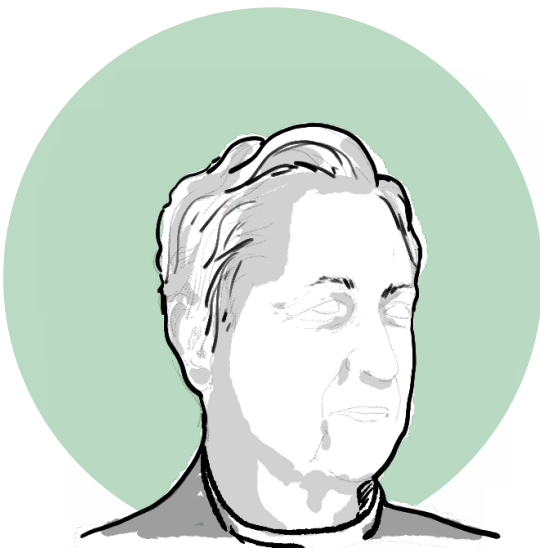
LITERATURE REVIEW

This practicum incorporates urban ecology and a renewed meaning in vacant and underutilized lands. The Southwest of Winnipeg was used to focus specifically on Manitoba's Hydro Transmission grid and CN Railway corridors adjacent to the major redevelopment sites and close to the Bus Rapid Transitway and station areas.

This research will look to selected works of Richard T.T. Forman, a Landscape Ecologist; Michael Hough, a Canadian Landscape Architect; John Dixon Hunt, a Theorist and Landscape Historian; and Marc Treib, a Professor and Landscape Historian. This practicum reviewed Forman and Hough's research and principles of urban ecology in cities to identify an optimum land transformation for an ecological network in the Southwest of Winnipeg.^{13, 14}

Above: Literature review and authors on landscape theory.

Richard T. T. Forman



1935 – Present

American Author, Landscape Ecologist,
Professor Emeritus in the Graduate School of
Design at Harvard University

Michael Hough



1928 – 2013

Canadian Landscape Architect,
Past Professor in Faculty of Environmental
Design at York University

Figure 10: Key Authors

Above: Literature review and authors for urban ecology and natural process.

Work on city morphology and historical land transformation was informed by Hunt and Treib in the initial explorations of the site and content analysis to identify potential connections to historical land change over temporal scales as part of future transformative opportunities within infrastructure corridors.¹⁵ Re-imagining infrastructure through material traces of the past and speculated future strategies will reinforce the palimpsestual approach to constructing a landscape-based analysis and future design strategies.^{16, 17} This practicum aims to change the perceptions of industrial remnants found in infrastructure corridors and former industrial lands to help designers re-define how people can perceive neglected landscapes with a re-newed perception for design opportunities for transformative change.



Figure 11: Biodiversity Corridor, Borough of Saint-Laurent, Montreal, Quebec

PRECEDENT STUDIES

Research into precedent studies included existing studies in Canada and the Netherlands whereby different approaches to utilizing transmission line corridors have been used to create Biodiversity Corridors in Montreal, Quebec and Energy Ecological Networks in Amsterdam, Netherlands. The Master Plan was created as part of a competition for a Biodiversity Corridor in the Borough of Saint-Laurent, Montreal, which launched in the City of Montreal in 2018.¹⁸ The design firm civiliti and partnering consultants won the competition. The Master Plan for the Borough of Saint-Laurent focused on creating guidelines for implementing a Biodiversity Corridor utilizing the existing power lines to create green areas, flowering meadows, and wooded edges that brought biodiversity into the City for Saint-Laurent workers and residents to enjoy.¹⁹ For this practicum, lessons learned from the Master Plan competition was used to inform an approach for hydro corridors in Winnipeg and the potential for integrating biodiversity within the city and meeting future needs for cities.

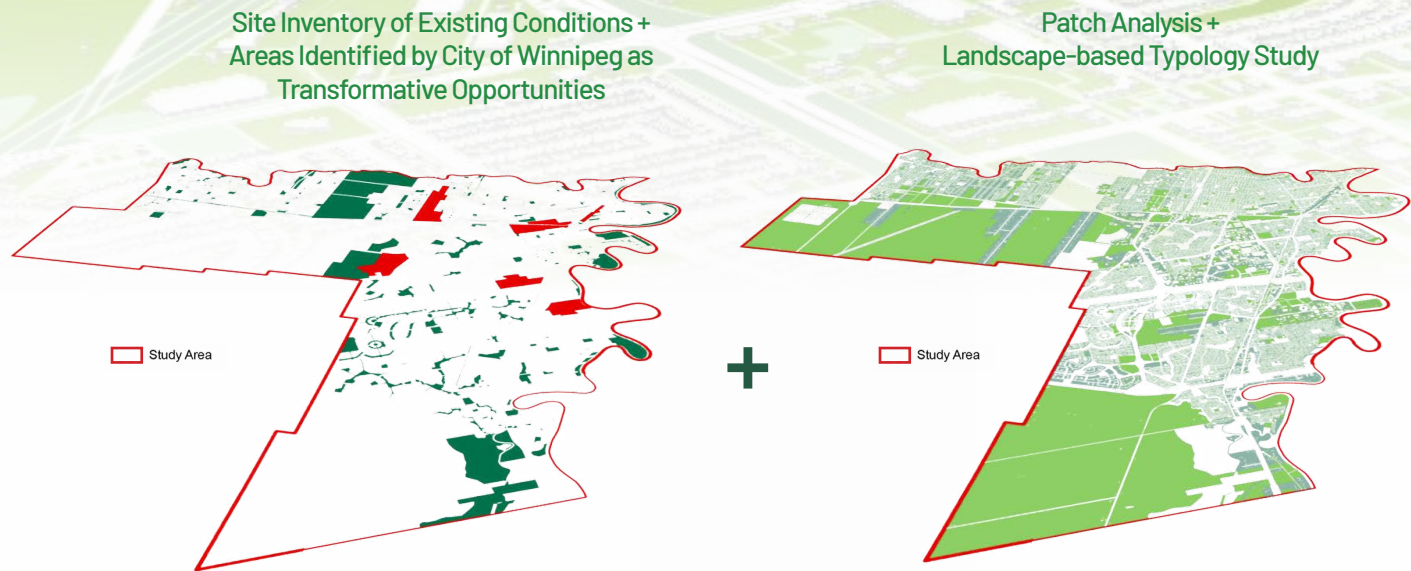
Above: Case study of Biodiversity Corridors in Montreal, Quebec.



Figure 12: Corridor Rendering, Borough of Saint-Laurent, Montreal, Quebec

Above: Case study review of Energy Ecological Networking using existing infrastructure corridors.

A similar approach to re-imagining transmission lines included a strategic design for an urban green network in the Netherlands, which focused on case studies in Amsterdam and Rotterdam to create a coalition between energy companies, provinces, and government municipalities to form partnerships to construct an Ecological Energy Network (EEN) as part of The Green Architecture Competition in 2014.²⁰ FABRICations was the design firm that proposed the green network and research projects for exploring these coalitions and design strategies as part of a pilot project in the Netherlands. The project aimed to create ecosystems in underutilized lands under the power lines, while also looking to connect urban ecologies that interfaces with nature and opportunities for leisure and forming the largest national parkland in the Netherlands. A key design strategy of the EEN is to fill in missing links in the National Ecological Network as part of a regional strategy.²¹ For this practicum, the Manitoba Hydro corridors and other key infrastructure types in Winnipeg have the potential to create a regional network of parks that are contiguous and offer ways to enhance biodiversity city-wide.



OUTPUT

As cities grow and change, so do the complexity of the interdependencies that govern their built and natural environments and the need for future land acquisition for parkland in Winnipeg. In response to addressing this issue, the practicum research will offer design strategies and a review of infrastructure types to inform future strategies for neglected landscapes as part of a final deliverable.

The practicum research will work to outline a methodology for creating an inventory for a landscape framework in Winnipeg using the Southwest as a case study. The review of infrastructure types will illustrate the interface between urban ecology and

Above: Overview of key steps to creating a Landscape Framework.

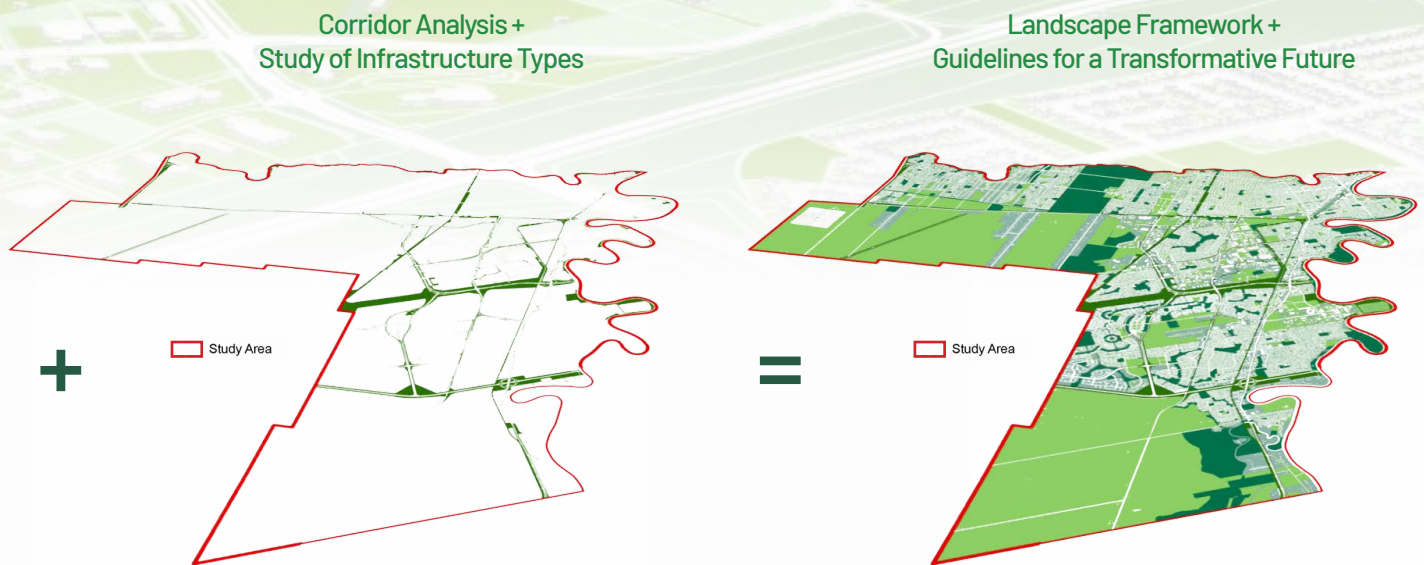


Figure 13: High-level Outputs and Deliverables

future opportunities for transformative change that can be used to re-imagine how infrastructure can be interpreted in Winnipeg to inform future strategies for consideration in the City of Winnipeg Parks Strategy.

The practicum will conclude with a summary and a reflection on the potential for transformative change and urban ecology as a method for synergies between infrastructure, city investment, and landscape design.

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CHAPTER

03

BACKGROUND + KEY ISSUES

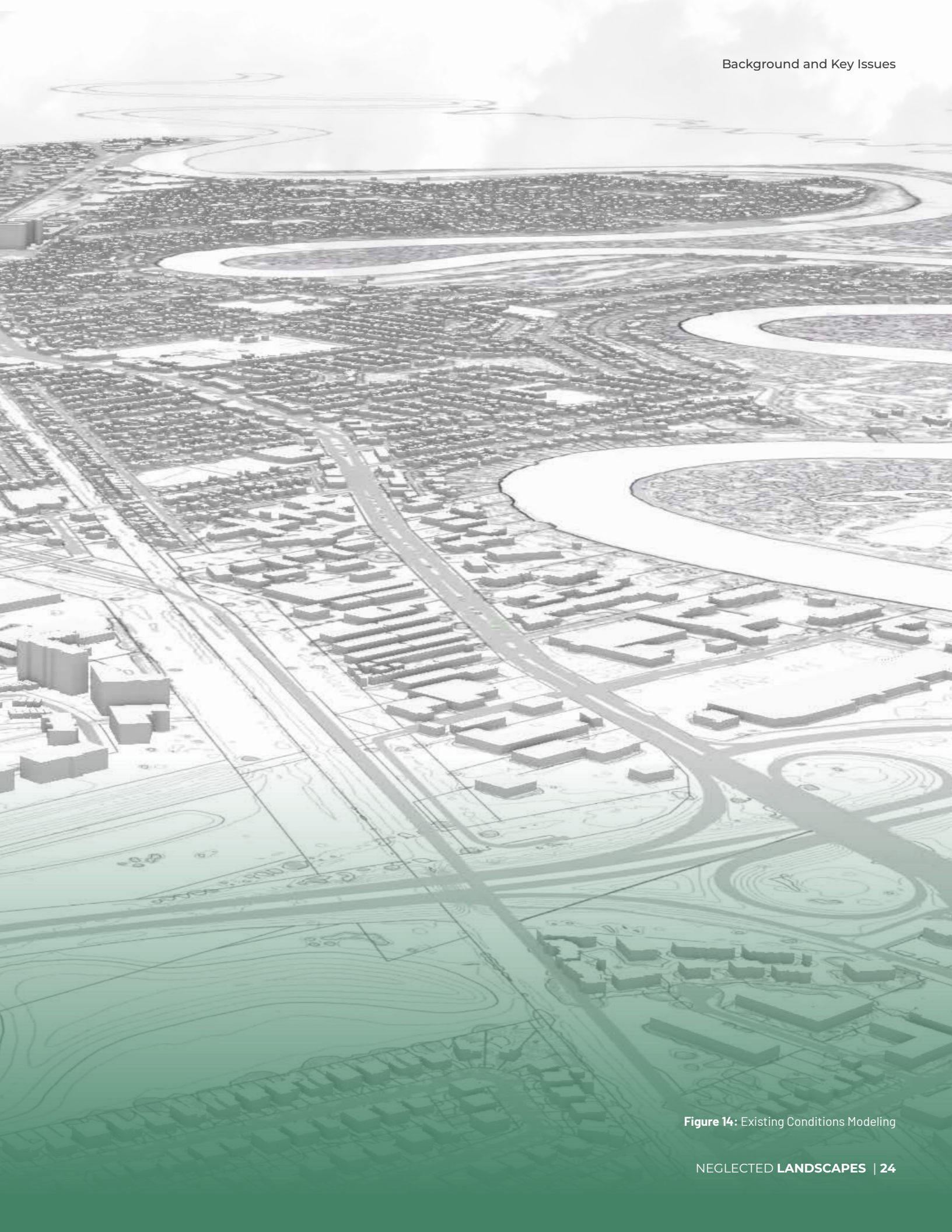


Figure 14: Existing Conditions Modeling

MORPHOLOGY OF A CITY

Over the last 30 years, Winnipeg's population and demand for park development have increased, and so has the demand for city amenities, services, and park development and acquisition, which has occurred on a case-by-case basis as new communities are built, or funding opportunities arise.²² However, with limited city budgets and new communities developing outwards, Winnipeg is experiencing an increased pressure on the parks system and city infrastructure.²³ Winnipeg's urban footprint has grown substantially over time between 1870 and 2021. The morphology of the city and how established and new

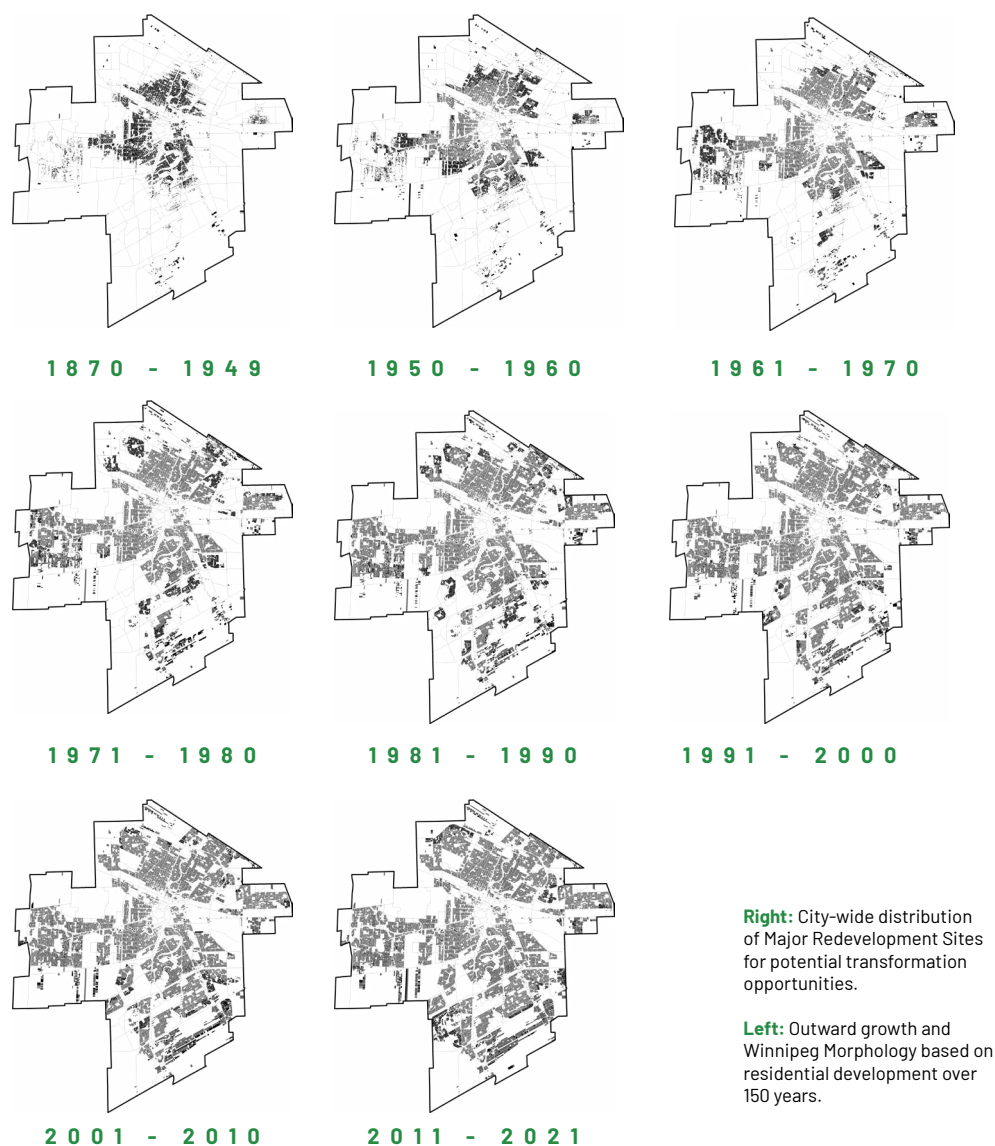
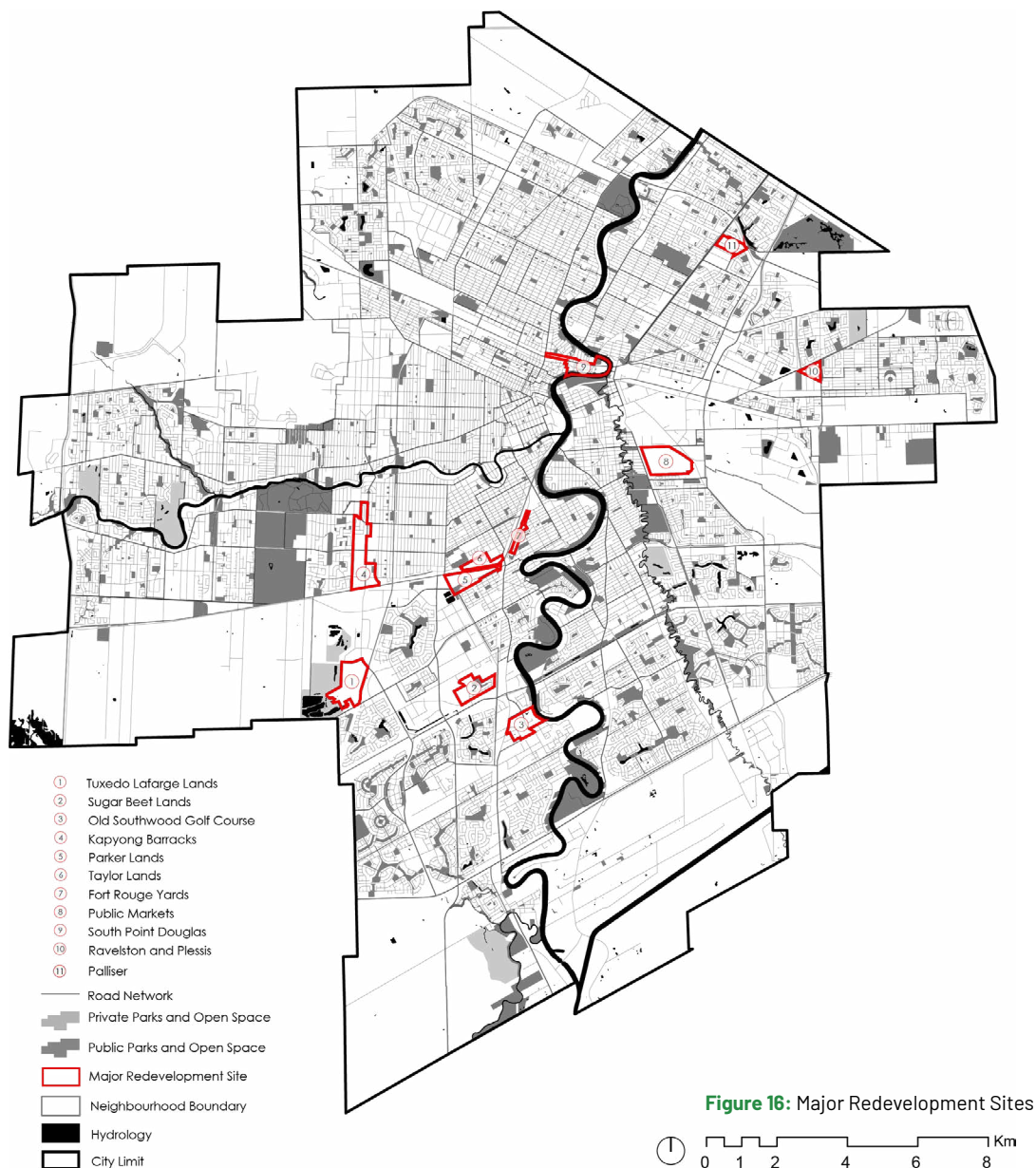


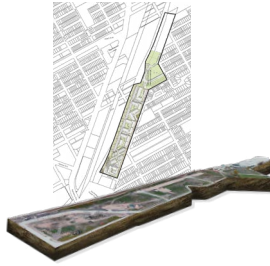
Figure 15: Residential Year Built, 1870-2021

communities are developed directly impact the public health of citizens and their ability to access parks and open spaces within walkable distances, while also creating challenges for maintaining essential biodiversity in the City. There is a need for acquiring and allocating land to accommodate parks for the overall needs of the City that increases usage demand in new communities but also in mature areas suitable for redevelopment. There is transformative opportunities to re-imagine infrastructure corridors as suitable lands for creating a regional ecological network that enhances urban ecology but also addresses parkland needs.





Parker Lands



Fort Rouge Yards



Taylor Lands



Kapyong Barracks



Sugar Beet Lands



Tuxedo Lafarge Lands

WINNIPEG STRATEGIES

In the Province of Manitoba key legislation and sources of information guide redevelopment opportunities, including the *Contaminated Sites Remediation Act* and the associated *Contaminated Sites Remediation Regulation*.²⁴ The Province provides additional legislation for sustainable development and guidance which encourages municipalities to consider brownfield redevelopment as part of a planning component to the creation or updating of Official Community Plans and strategies. In the Province of Manitoba, the Provincial Planning Regulation requires development plans to be consistent with the *Regulation*, which promotes intensification of lands, including the re-use of brownfield sites.²⁵

In the City of Winnipeg, *OurWinnipeg 2045 Development Plan* identifies Transformative Areas as Major Redevelopment

Above: Exploration of Major Redevelopment Sites and opportunities for synergies with ecology and infrastructure.



South Point Douglas



Old Southwood Golf Course



Ravelston and Plessis



Public Markets



Palliser

Figure 17: Master Plans and Secondary Plans

Sites in the urban structure that have high potential for infill and reinvestment. Policies in *OurWinnipeg* identifies major redevelopment sites in the urban structure as key locations for transformative, sustainable, and walkable urban environments to accommodate Winnipeg's significant growth and change.²⁶ Brownfields in Winnipeg are defined as lands previously developed and are currently abandoned, vacant, derelict, or underutilized and may have real or perceived contamination, typically industrial or commercial uses with known or suspected ground contamination that requires remediation.²⁷

This practicum reviewed the potential synergies to interface these Transformative Areas identified in *Winnipeg's Development Plan* and *Winnipeg Complete Communities 2.0: OurWinnipeg Strategy* with *Winnipeg's Parks Strategy* for opportunities to align infrastructure corridors with transformative change using urban ecology.

A GROWING NEED

The *Winnipeg Complete Communities 2.0: An OurWinnipeg Direction Strategy* identifies Transformative Areas as the Downtown, Mixed Use Centres, Corridors, Major Redevelopment Sites, and New Communities.²⁸ *Complete Communities 2.0* outlines policies for redevelopment of vacant and underutilized lands to support increased residential and mixed-use development. These sites pose opportunities for landscape architecture strategies while working towards achieving the goals for infill and urban intensification in mature, recent, and established communities and combating urban sprawl.

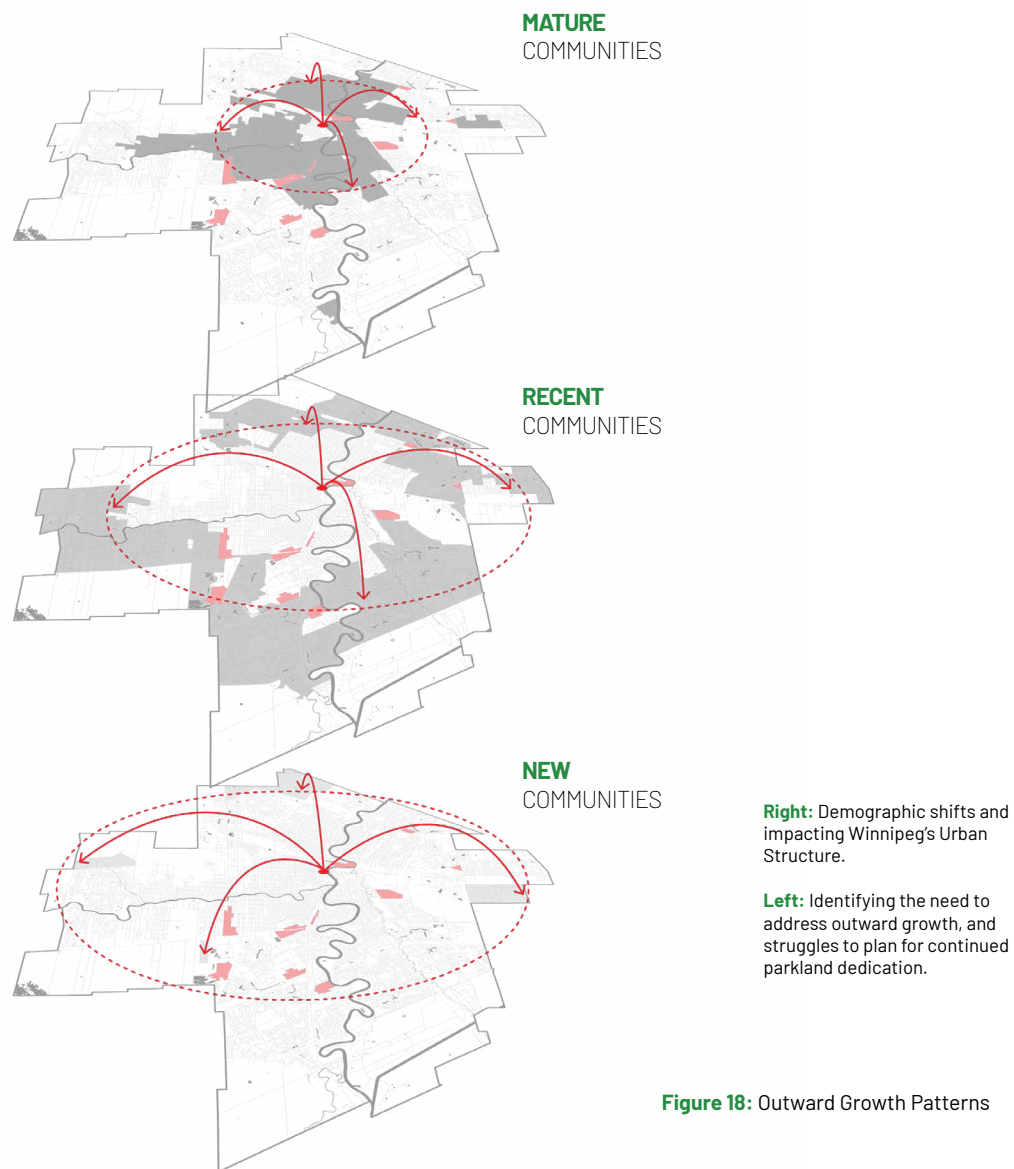


Figure 18: Outward Growth Patterns

Efforts to promote more redevelopment opportunities in Winnipeg will have added benefits of more parkland creation and less pressure on infrastructure services and costs, as the capital infrastructure deficit for Parks alone is estimated at \$190 Million over ten years (2018-2027) with the demand for parks increasing as Winnipeg grows in both population and total developed area.²⁹

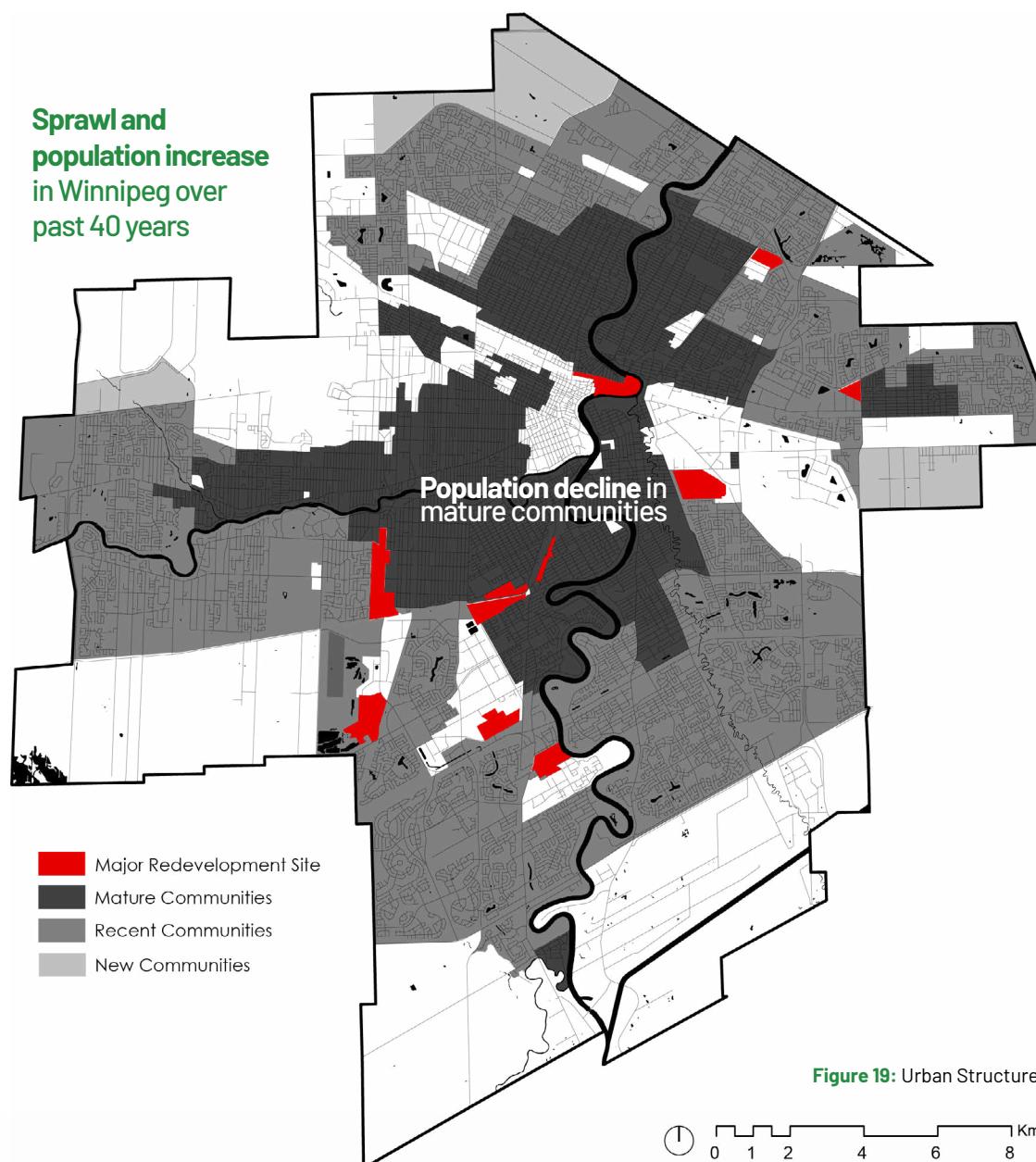


Figure 19: Urban Structure

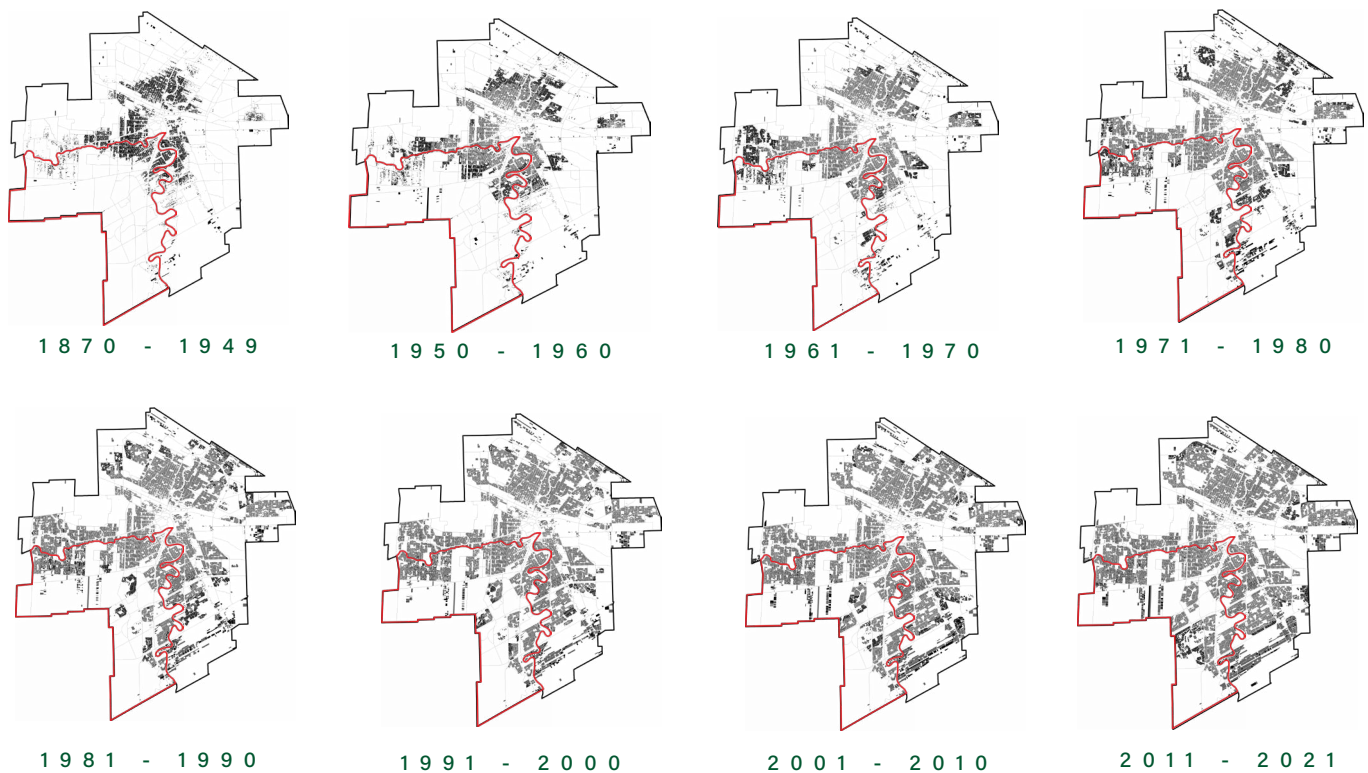


Figure 20: City sprawl impacting parkland, 1870-2021

TRANSFORMATIVE OPPORTUNITIES

By reviewing Winnipeg's remnant lands dedicated to infrastructure, there is an opportunity to re-imagine these corridors using a 'jaws' model of land transformation, whereby the undeveloped corridor network that has been neglected by development for infrastructure with small patches which create opportunities for additional ecological benefits.³⁰ By reviewing an ecologically optimum mosaic sequence for land transformation in Winnipeg, as development continues, the consideration of redevelopment and reducing long-term sprawl creates opportunities to re-examine these neglected corridor networks as future transformative opportunities for nature patches, park patches, pocket parks, garden patches, and green corridors that can be applied at a regional scale across Winnipeg.

Above: Winnipeg's city sprawl in the Southwest.

Right: Urban morphology and the opportunities to re-imagine neglected infrastructure and remnant lands excluded from development over time.

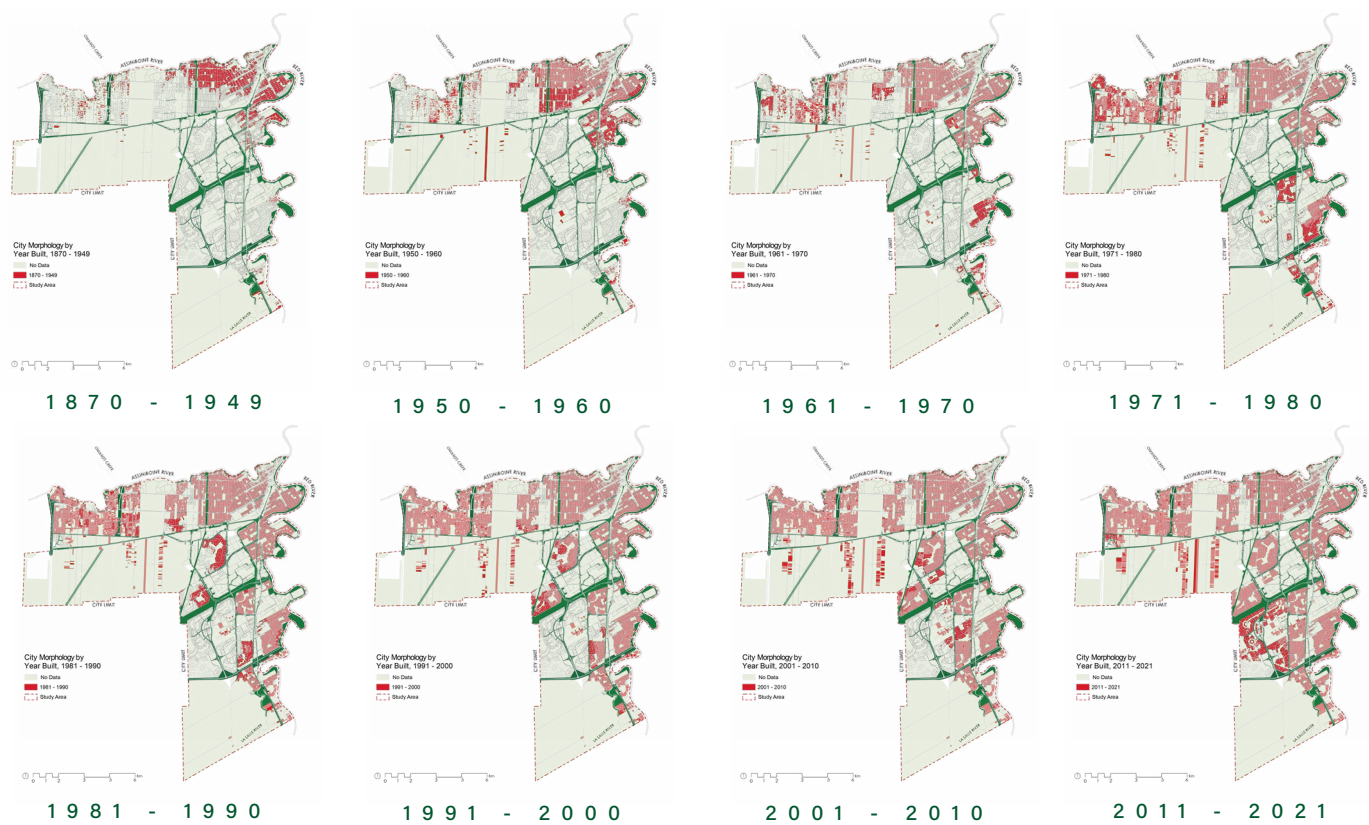


Figure 21: Southwest Winnipeg residential sprawl, 1870-2021

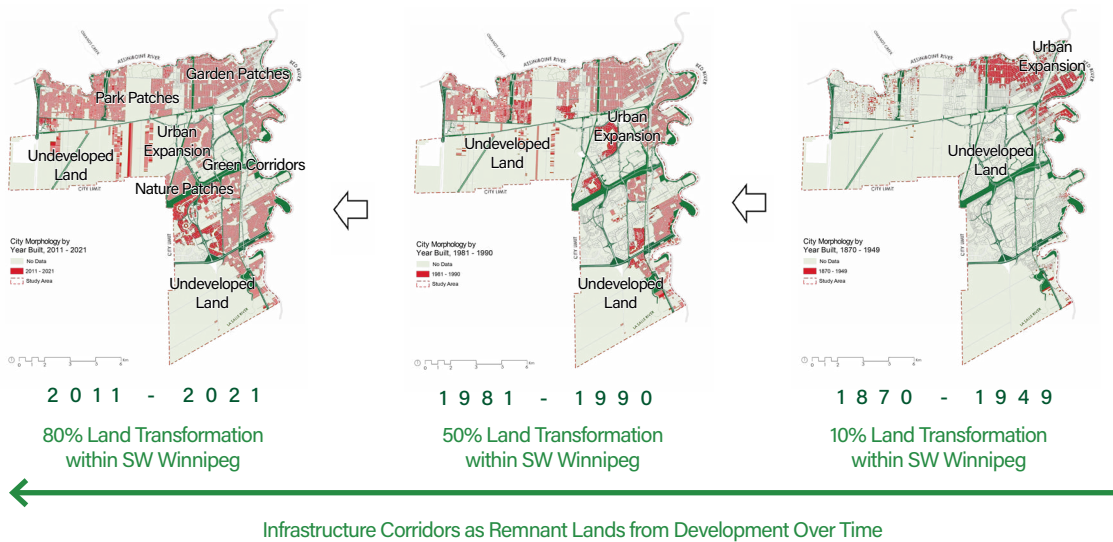


Figure 22: Land Transformation

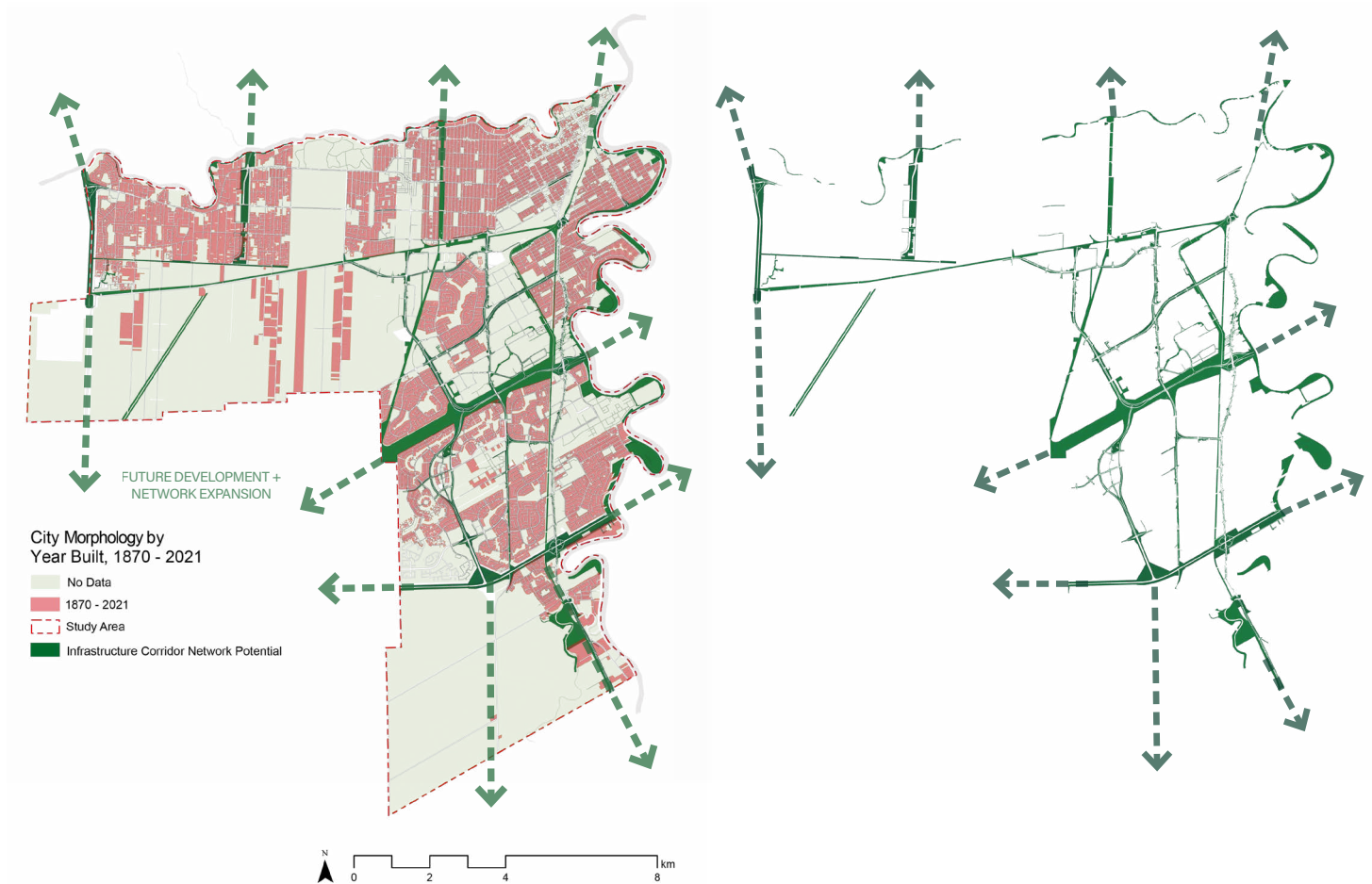


Figure 23: Residential Year Built, 1870-2021

TRANSFORMATIVE FUTURES

Using the Southwest of Winnipeg as a case study due to potential synergies, development patterns for perforation, fragmentation, and other spatial processes experienced due to land development over time creates opportunities for a new land type for neglected landscapes with ecological characteristics. These transformative futures include patch appearance or proliferation, expansion, coalescence, aggregation, connection, and infilling opportunities for habitat restoration as part of a cohesive network.³¹

Above: Remnant lands excluded from development over time as transformative opportunities for a landscape framework and ecological network.

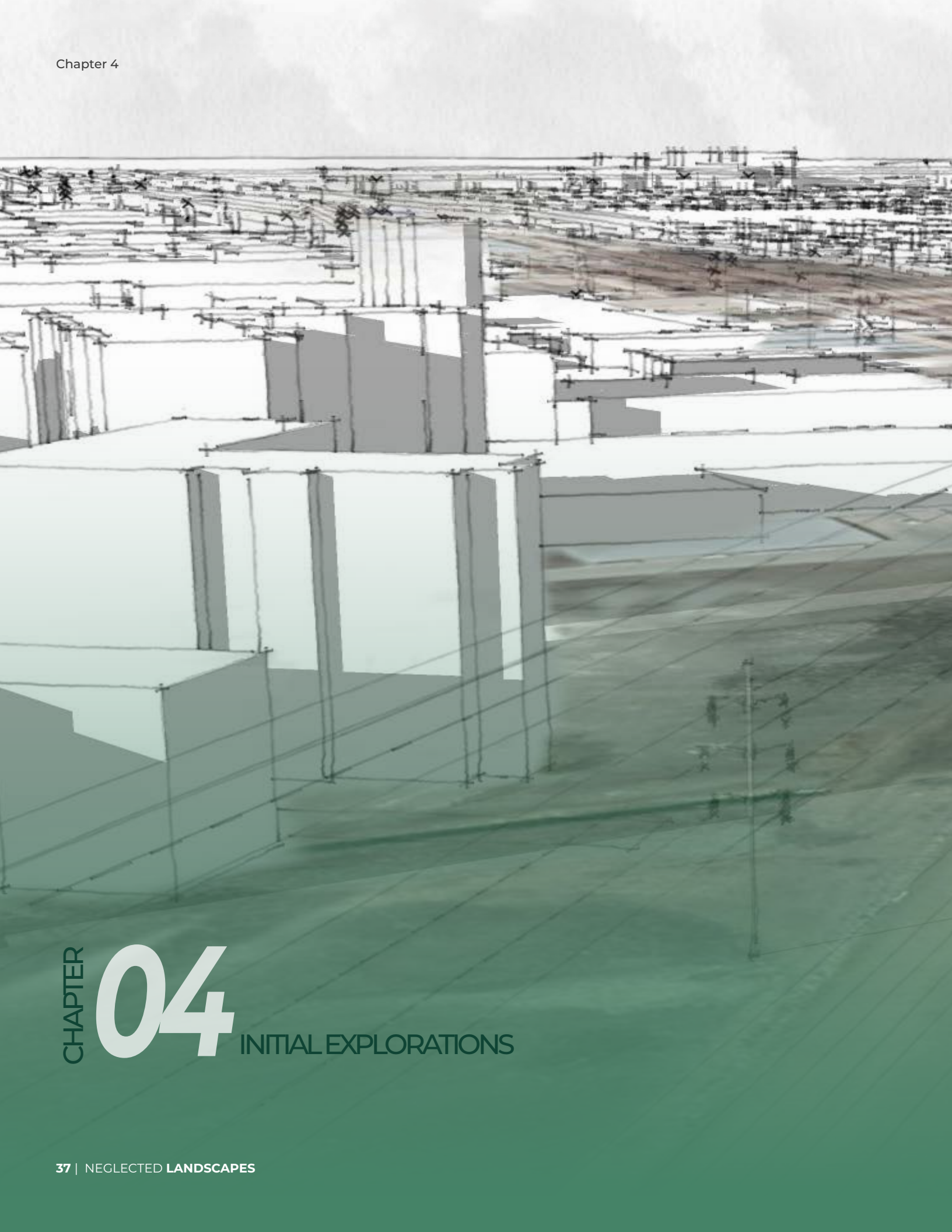
Right: Aerial analysis and desktop review of existing conditions in the Southwest of Winnipeg.



Figure 24: Aerial Imagery of Southwest Winnipeg, 2019

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CHAPTER 04

INITIAL EXPLORATIONS

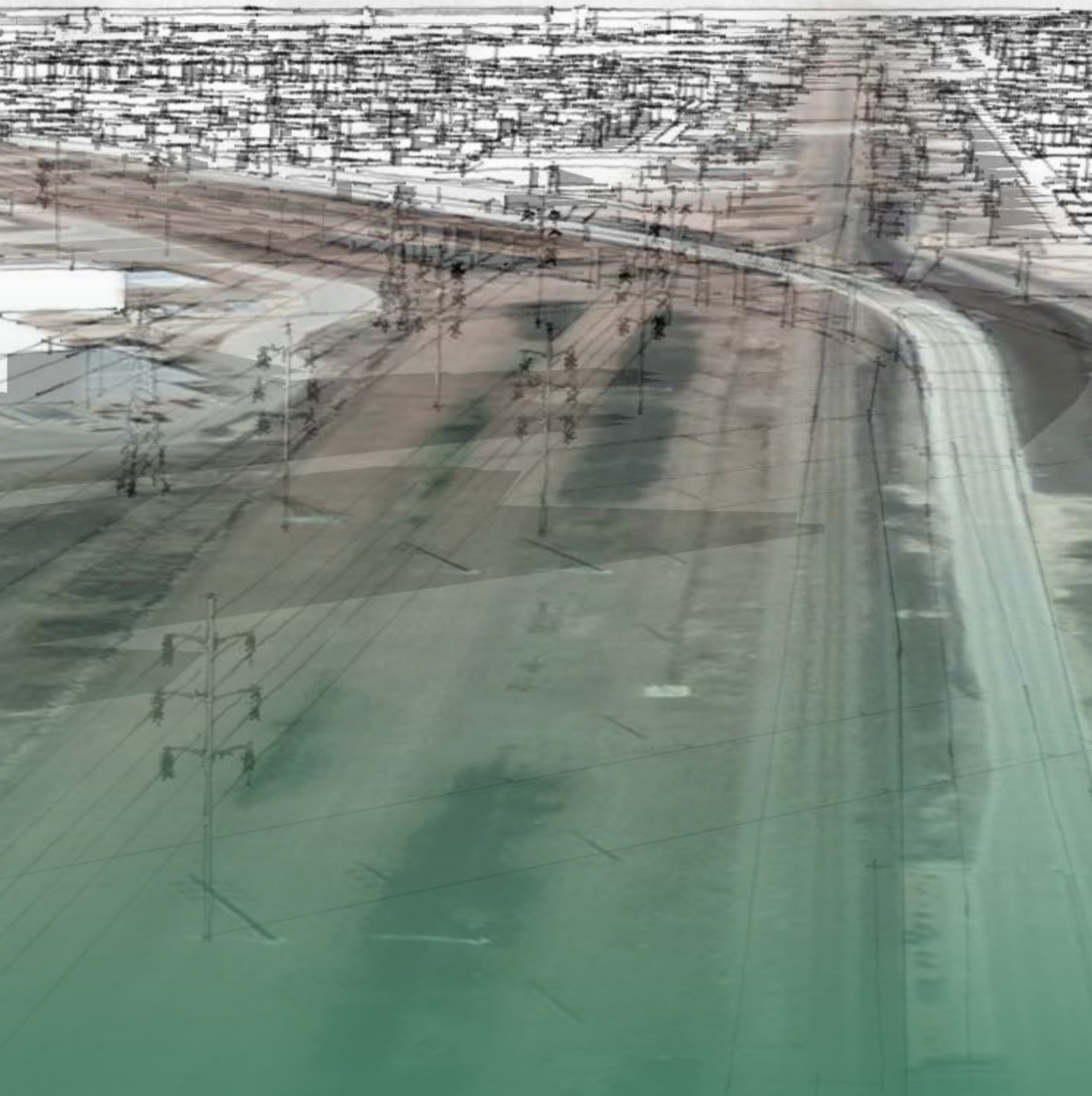


Figure 25: Initial Exploratory Analysis

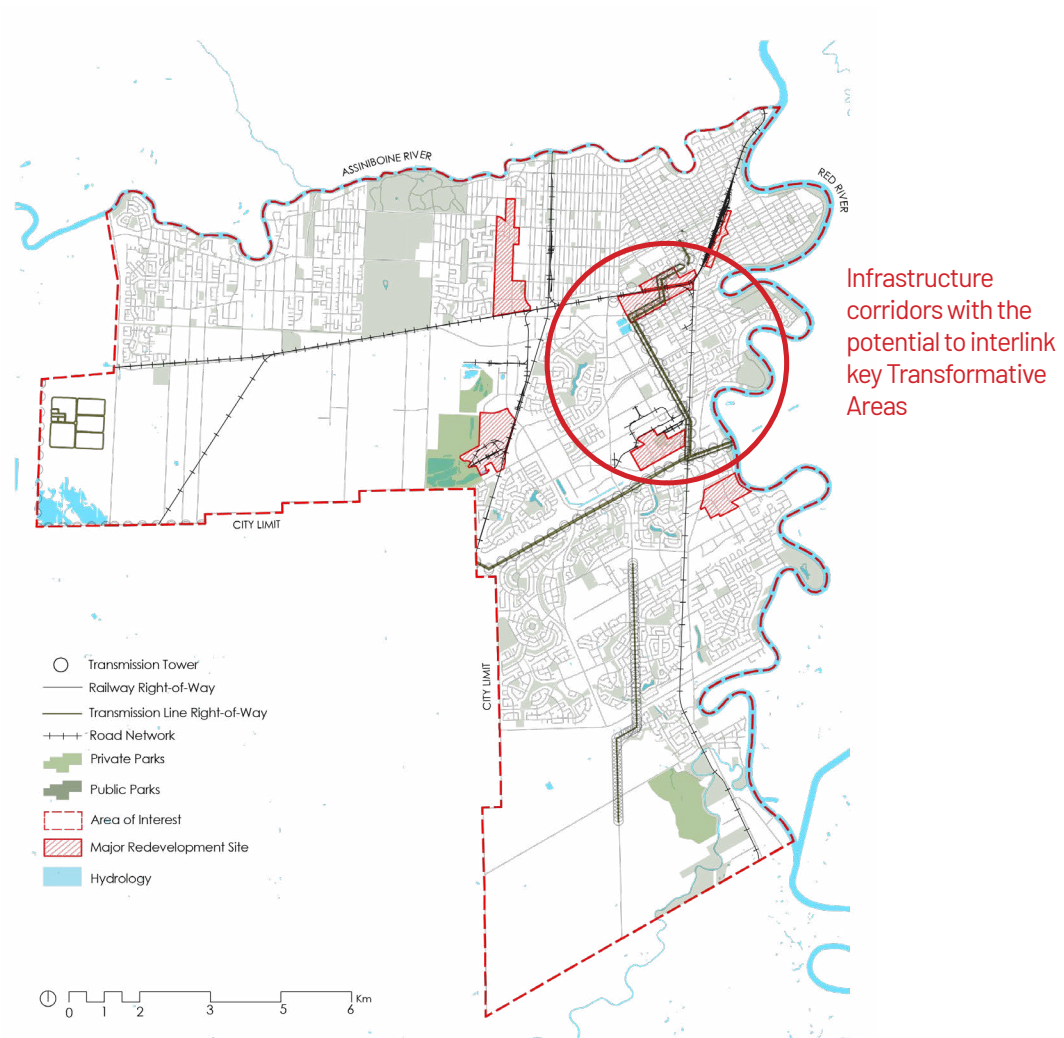


Figure 26: Southwest Railway and Hydro Infrastructure

INFRASTRUCTURE

Existing infrastructure in Winnipeg has the potential to create a series of linked park strategies that coincide with existing or proposed natural features as part of developing Major Redevelopment Sites and other human-made elements such as railway rights-of-way, utility and power-line easements and corridors that could form the beginnings of greenways, parkways, or a biodiversity corridor. The possibility of green corridors in the Southwest can offer the ability to connect places and key destinations but also link neighbourhoods with parks that can be linked to larger open space system. Greenways can also create opportunities for edge and linkage features that form edge effects that are more effective than the value of individual isolated parks of a similar size. Each landscape element contains an edge effect that impacts an ecosystem near its perimeter, where influences of the surroundings may prevent development of other interior landscape conditions.

Above: Key infrastructure networks within the Southwest of Winnipeg.

Right: City-wide inventory of infrastructure networks and corridors.

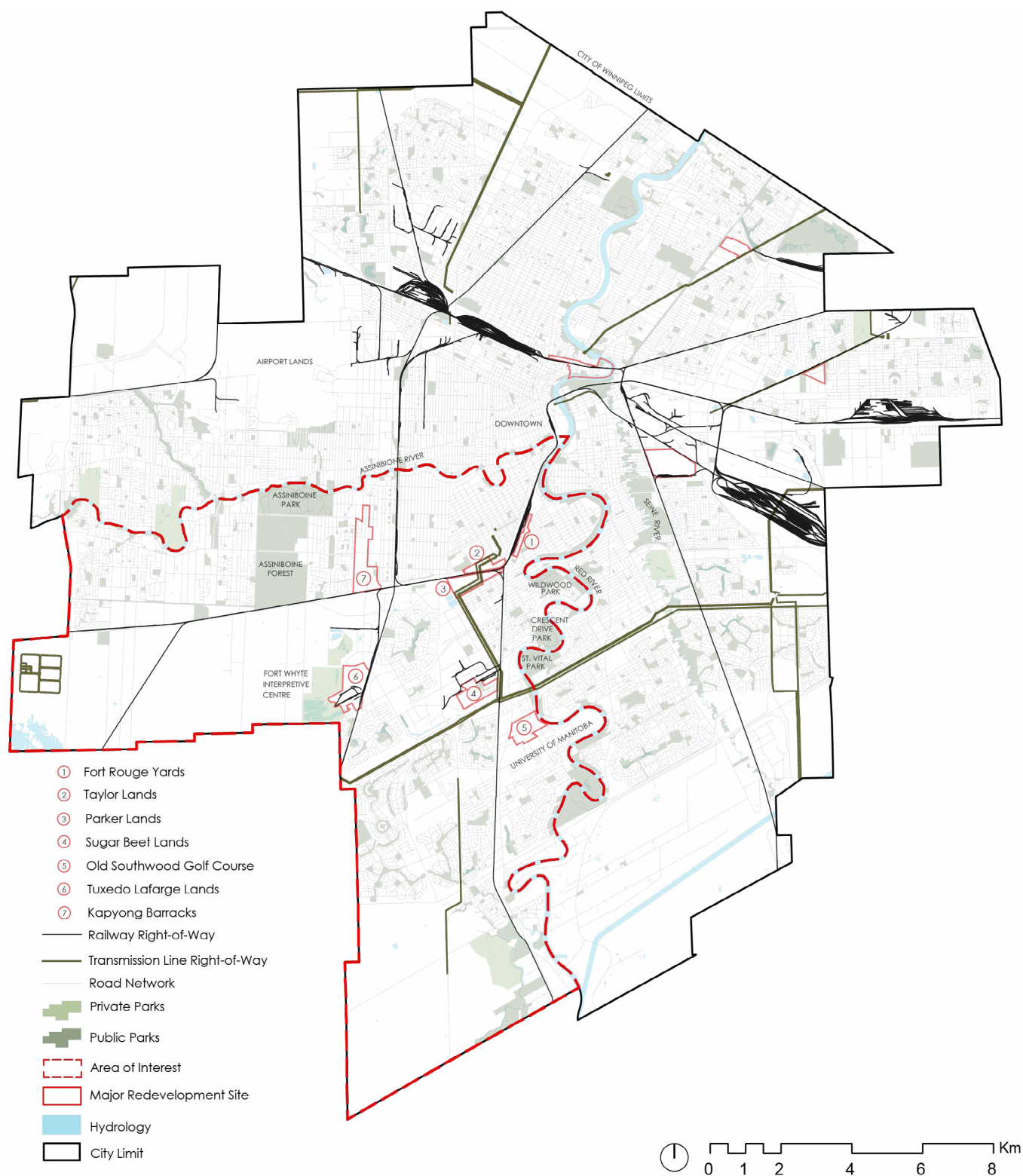


Figure 27: City-wide Railway and Manitoba Hydro Infrastructure

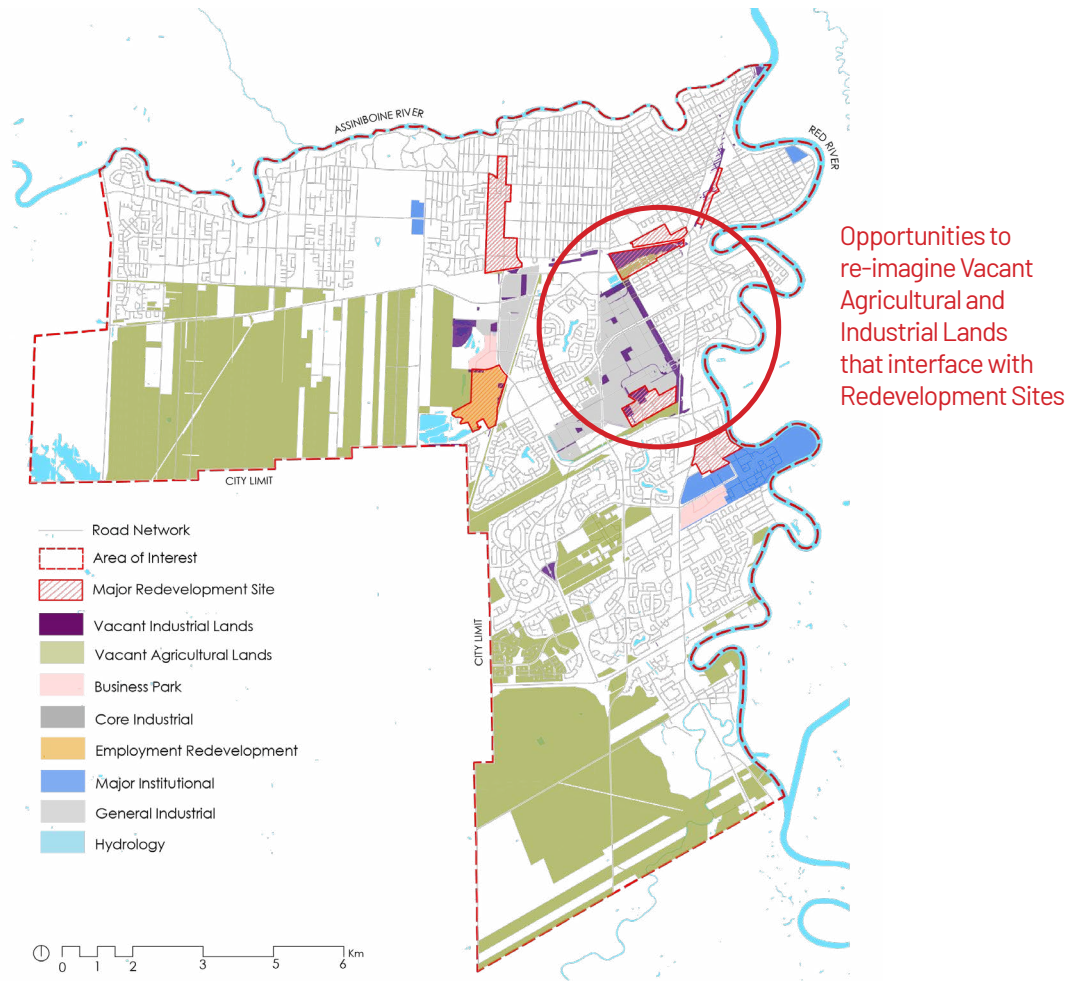


Figure 28: Southwest Employment and Vacant Lands

EMPLOYMENT + VACANT LANDS

The Parker Lands, Taylor Lands, Fort Rouge Yards, and Sugar Beet Lands create potential sites where former industrial lands could be revised to incorporate more priorities for landscape design strategies that accentuate the Southwest opportunities for a greenway, parkway, or biodiversity corridors that integrates with proposed redevelopment plans. Existing vacant industrial and uncultivated agricultural lands that are underutilized create patterns and connections that could be further investigated as part of landscape strategies. In the Southwest portions of the City of Winnipeg, clustering of Major Redevelopment Sites, vacant industrial lands, vacant park lands, and infrastructure corridors such as the Southwest Rapid Transitway, Manitoba Hydro corridors, and railway rights-of-way create transformative opportunities in proximity to the Fort Rouge Yards, Taylor Lands, Parker Lands, and Sugar Beet Lands.

Above: Existing Employment and Vacant Lands in the Southwest of Winnipeg and future opportunities for transformative change.

Right: City-wide inventory of vacant lands and opportunities for reclaiming vacant industrial and agricultural lands.

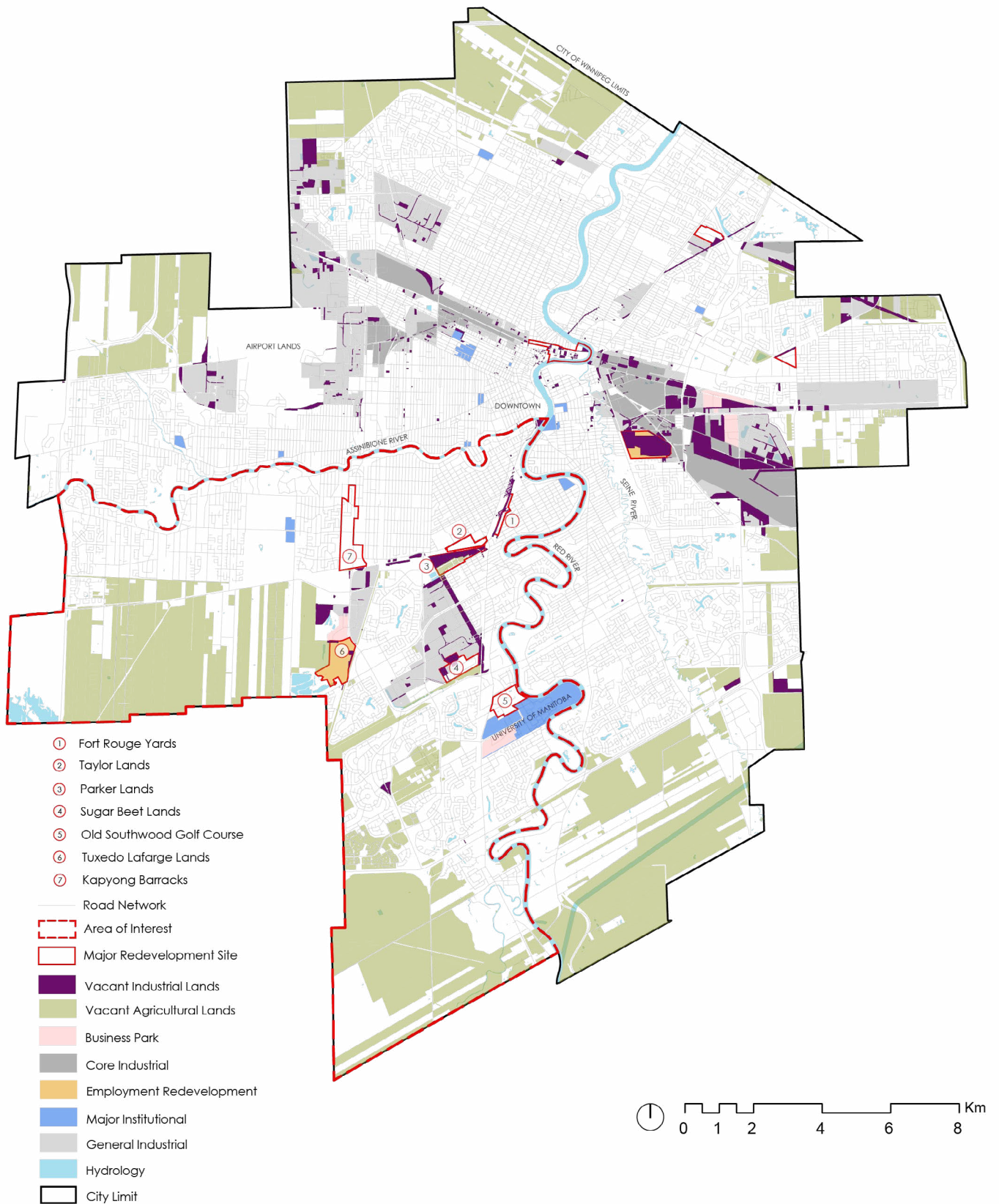


Figure 29: City-wide Employment and Vacant Lands

Note: Vacant agricultural lands contain portions of land that are uncultivated and underutilized, but are predominately undeveloped. Vacant industrial lands are portions of land currently undeveloped or pose opportunities for redevelopment or landscape design.

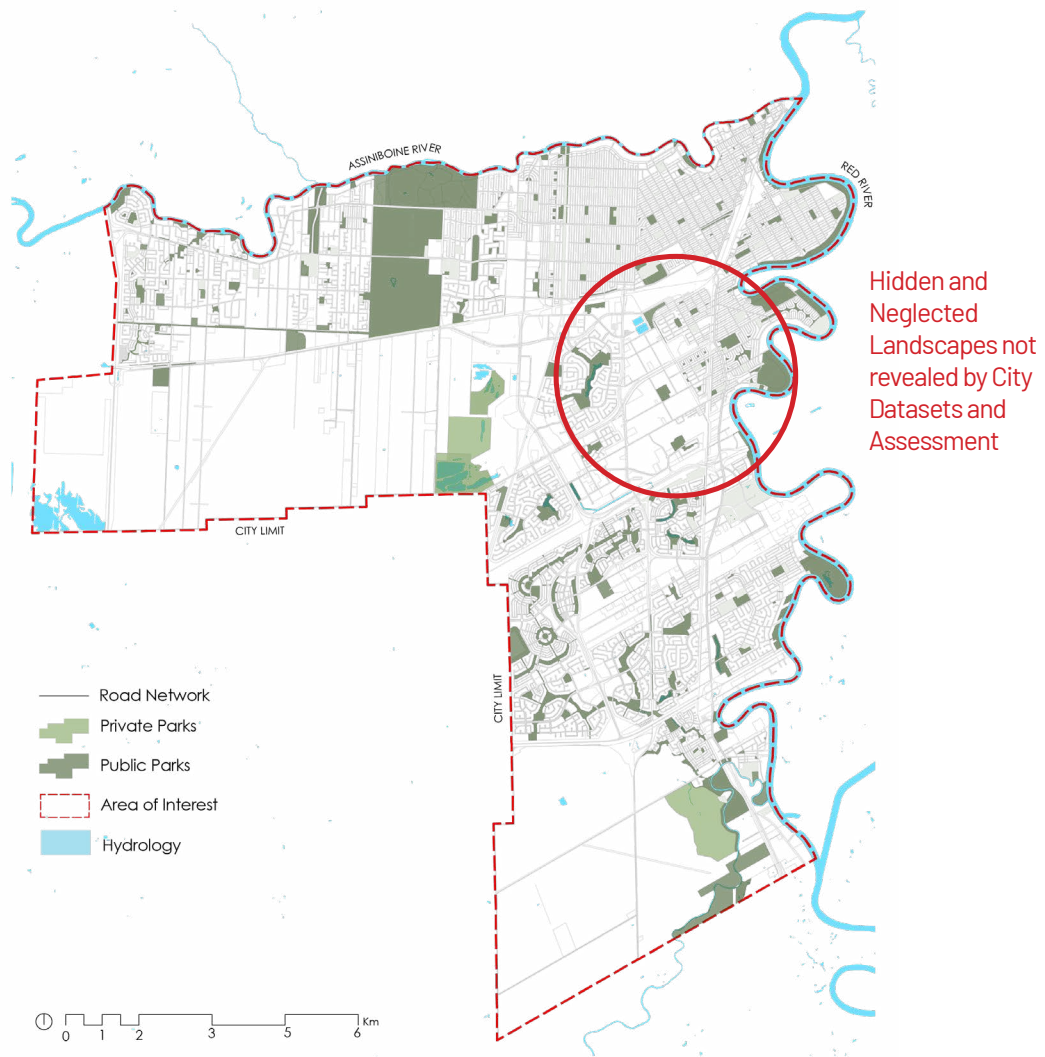


Figure 30: Southwest Existing Parks

EXISTING PARKS

The Southwest of Winnipeg contains various nature parks and significant parkland identified by the City of Winnipeg, but there is a hidden opportunity not recognized by the City within their assessment of parks, open spaces, and ecological opportunities. Many landscapes exist in Winnipeg that form indispensable patterns but are not captured by City datasets. As part of this practicum, a landscape inventory was created to reveal this hidden opportunity of neglected landscapes that coincide with infrastructure corridors and underutilized vacant lands in proximity to major parks, river corridors, riparian areas, and major redevelopment sites.

Above: Existing public and private parks in the Southwest of Winnipeg.

Right: City-wide inventory of private and public parks officially recognized by the City of Winnipeg Park Strategy.

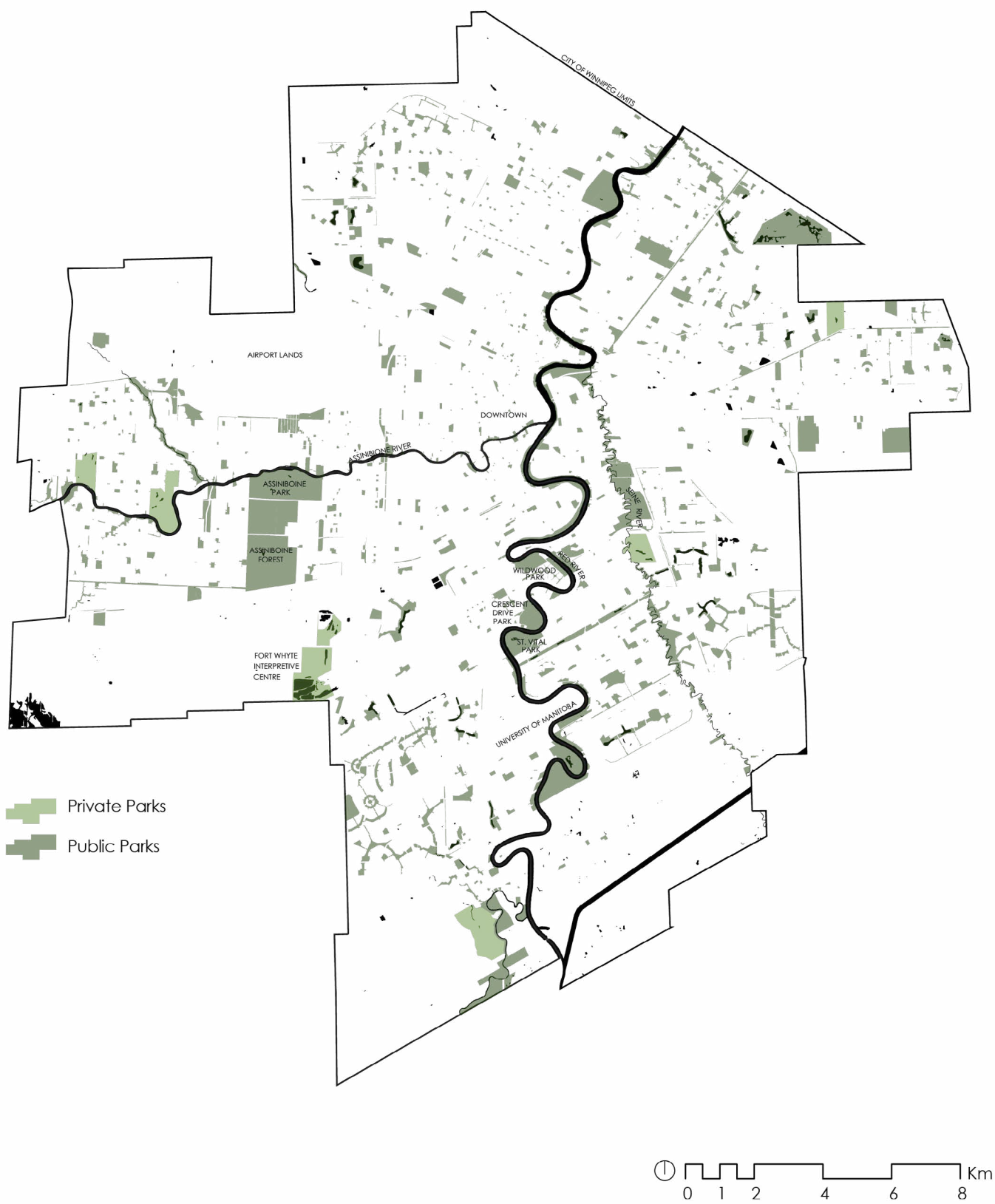
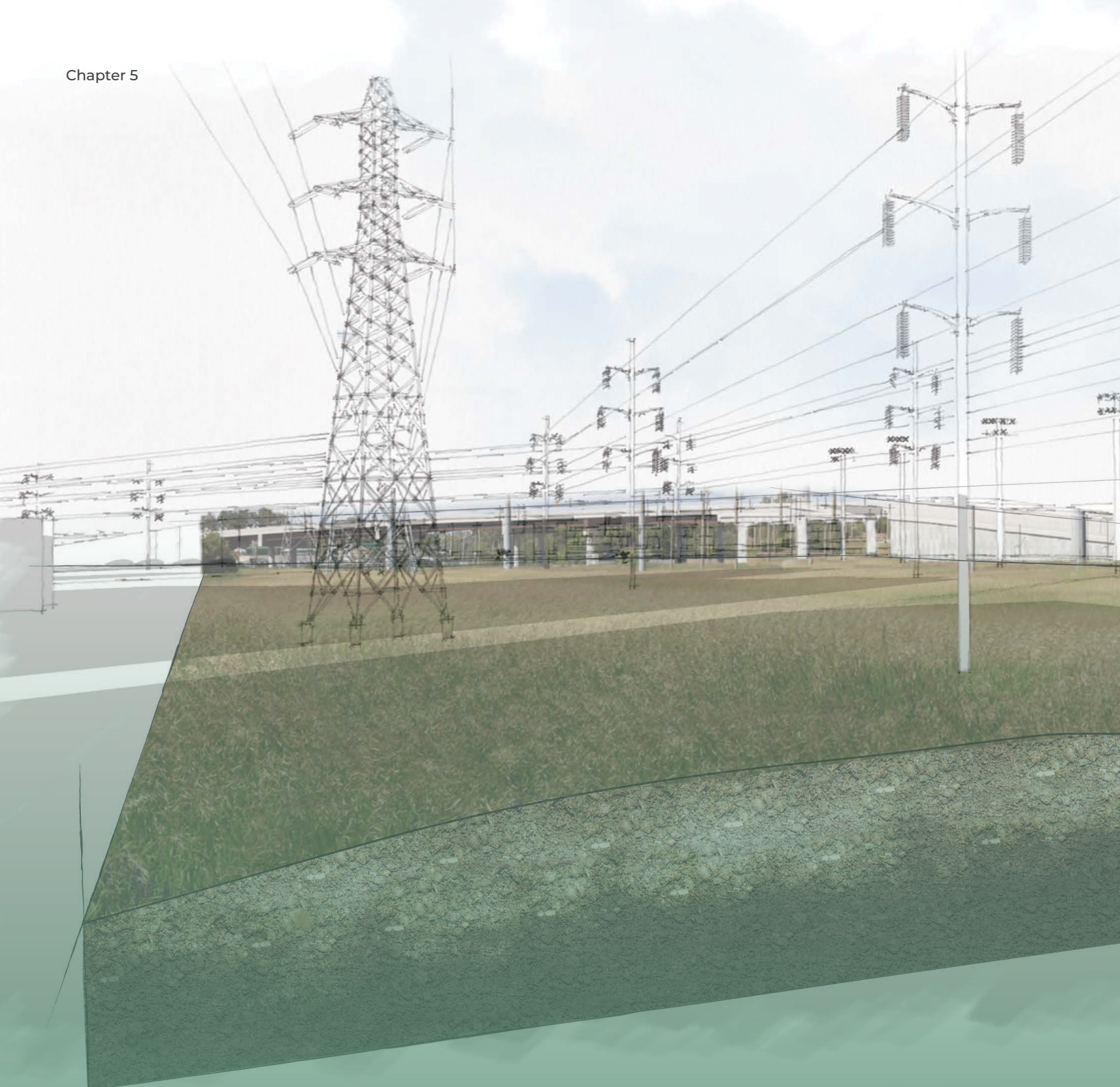


Figure 31: City-wide Existing Parks

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CHAPTER 05

IN SITU + GEOSPATIAL MODELING

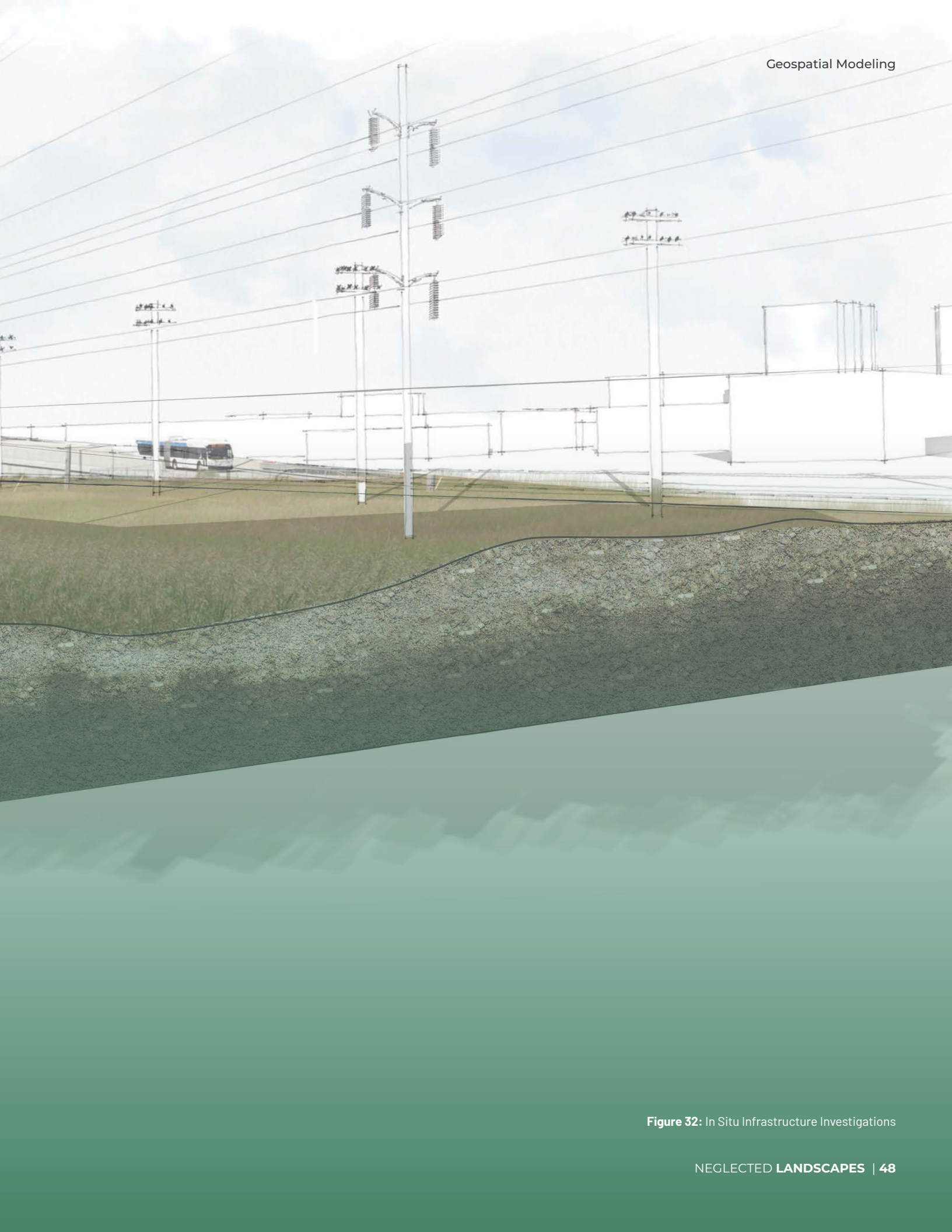


Figure 32: In Situ Infrastructure Investigations



Photography by: Aaron Bomback

IN SITU

Site visits were conducted in September 2019 and July 2022, whereby the Southwest of Winnipeg was explored with a focus on documenting and archiving conditions along major infrastructure types, including hydro, rail, and major roadways. Walking the sites helped to identify key indispensable patterns and key locations to inform decisions on landscape influences and evaluating the potential ecological benefits that infrastructure corridors can contribute to creating a cohesive network for transformative change. Through field investigations, it was possible to evaluate and diagram existing spatial components and characteristics that can be building blocks to forming a landscape framework in the Southwest of Winnipeg and strategies that can be applied at a city or regional scale. Revealing these hidden opportunities and neglected landscapes where critical to conducting site visits and in situ investigations as part of the research methods.

Above: Site visits and field investigations conducted during September 2019 and July 2022.



Figure 33: Site Investigations illustrating Existing Infrastructure Conditions

1 - Abinojii Mikanah Road Verge

Date: July 6, 2022
Time: 11:07 AM
Weather: 24°C, Clear
GPS: 49° 49' 15.82" N 97° 9' 27.92" W

Site visit to uncultivated agricultural lands within the Abinojii Mikanah road verge (formerly Bishop Grandin Boulevard).

2 - CN Rail at Portage Junction and Letellier Sub

Date: July 6, 2022
Time: 1:30 PM
Weather: 25°C, Mostly Clear
GPS: 49° 50' 56.38" N 97° 9' 14.43" W

Walking along the CN railway at Portage Junction and CN Letellier Sub-branch.

3 - Manitoba Hydro Transmission Corridor

Date: July 6, 2022
Time: 2:22 PM
Weather: 25°C, Mostly Clear
GPS: 49° 50' 40.43" N 97° 10' 12.57" W

Exploring the Manitoba Hydro Corridor adjacent to the Southwest Bus Rapid Transitway.

1	2	3
4	5	6

4 - Manitoba Hydro Transmission Corridor

Date: September 20, 2019
Time: 1:00 PM
Weather: 23°C, Clear
GPS: 49° 49' 28.08" N 97° 9' 25.94" W

Walking the Manitoba Hydro corridor adjacent to the Manitoba Sugar Beet Company and redevelopment site. Overlooking the Southwest Transitway and Letellier BRT overpass.

5 - SW Transitway Beaumont BRT Station Area

Date: September 20, 2019
Time: 1:45 PM
Weather: 23°C, Clear
GPS: 49° 50' 56.35" N 97° 9' 57.60" W

Evaluating the existing site conditions adjacent to BRT station areas that abut the Manitoba Hydro corridors and vacant uncultivated agricultural lands.

6 - Abinojii Mikanah Road Verge near Fort Garry Bridge

Date: September 20, 2019
Time: 2:30 PM
Weather: 24°C, Clear
GPS: 49° 49' 18.66" N 97° 8' 43.49" W

Reviewing the large road verges that are often have high maintenance and connect infrastructure corridors to the Red River corridor.



Manitoba Hydro Corridors near Future Parker Lands Redevelopment Site



Manitoba Hydro Corridors adjacent to the Southwest Transitway and Multi-use Pathways



Manitoba Hydro Corridors near Future Taylor Lands Redevelopment Site



Manitoba Hydro Corridors adjacent to the Future Sugar Beet Lands Redevelopment Site



Manitoba Hydro Corridors and Vacant Underutilized Industrial lands near McGillivray Boulevard Overpass

Figure 34: Hydro Studies



Manitoba Hydro Corridors adjacent to the Southwest Transitway and Multi-use Pathways

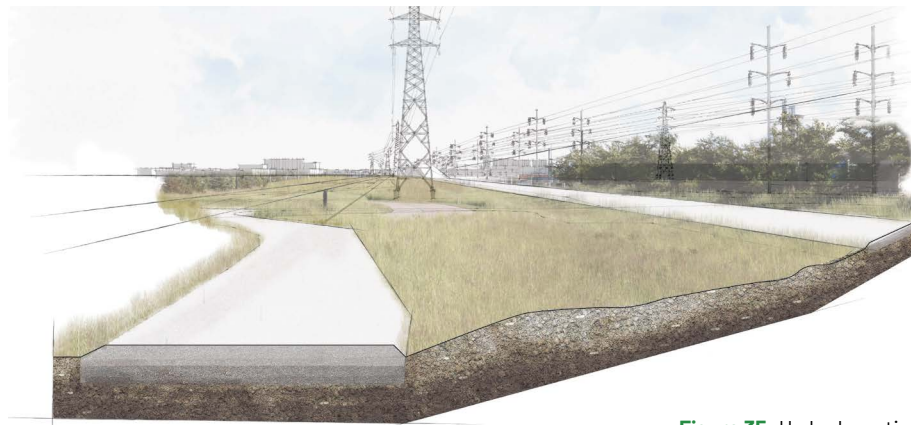


Figure 35: Hydro Investigations

FIELD INVESTIGATIONS - HYDRO

Above: Diagrammatic explorations of existing hydro conditions, corridors, and adjacencies.

From the field investigations, Manitoba Hydro corridors create a relatively straight delineation in the landscape, which also illustrates a consistent width and even distribution of disturbance through the corridor, often characterized by people or vehicles. In the Southwest of Winnipeg, trails and roads are adjacent to hydro corridors, but very few formal trails intersect these landscapes as they are often restricted and have limited access. Management of these hydro electric transmission corridors focuses on preventing tall tree growth that could interfere with the electrical lines, and herbicides, cutting, and occasional fire. There is an opportunity to introduce shrublands that may require minimal tree removal and low-profile plantings, small tree or large shrubs, and agricultural uses that can create ecological benefits and herbaceous landcover. From the site visits, it was evident that hydro corridors function for animal movement, which can be further enhanced by applying shrub cover, curvilinear soft edges, and vegetated connections between opposite sides of corridors.



Decommissioned Railway near
Industrial Lands



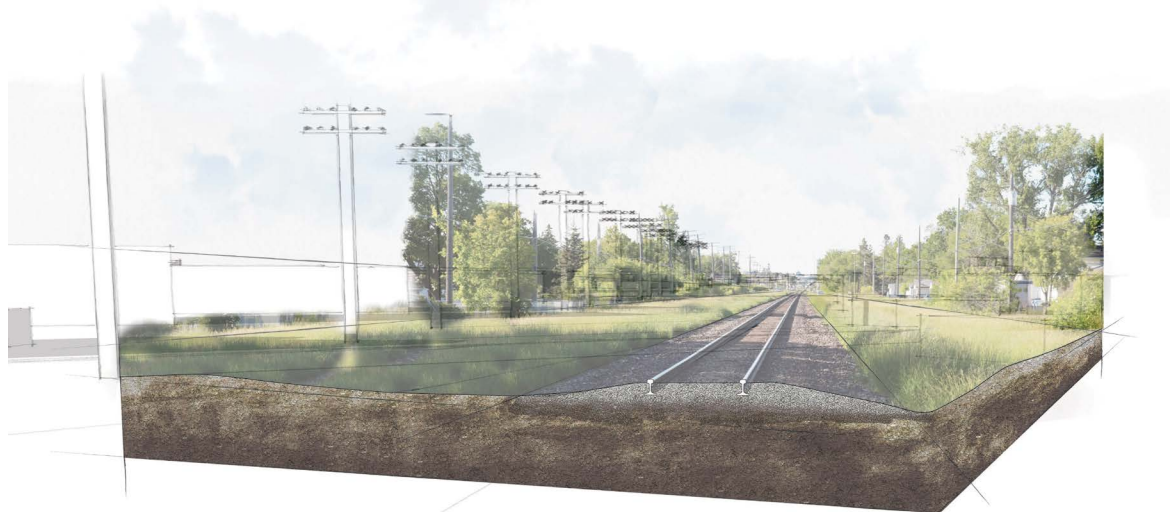
Railway Corridors intersecting
Southwest Transitway Overpass



Decommissioned Railway near
Manitoba Sugar Beet Company



Railway Corridors at Portage
Junction



CN Railway Letellier Sub Branch Spur
adjacent to Industrial and Residential

Figure 36: Rail Studies



CN Railway Letellier Sub Branch
adjacent to Southwest Transitway

Figure 37: Rail Investigations

FIELD INVESTIGATIONS - RAIL

Above: Diagrammatic explorations of existing rail conditions, corridors, and adjacencies.

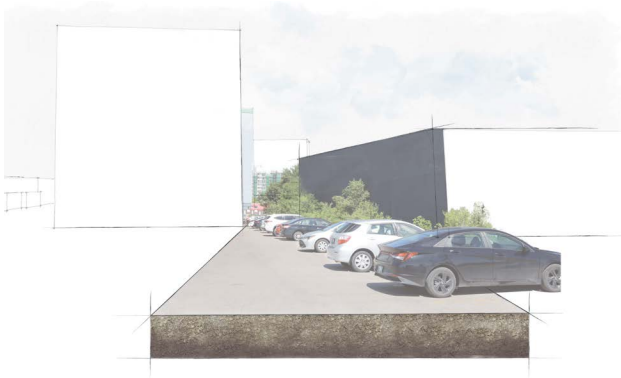
Due to the expansive urban footprint over time, most of the vegetation in many landscapes have been impacted or removed due to development or conversion to alternative land uses for cultivation, pasture, plantation or accommodating the establishment of roadways and other construction for major transitways. Railway corridors in Winnipeg are like roadway corridors but illustrate straighter characteristics in the landscape and pose unique opportunities for remnants of native grassland to persist or to identify these spaces as potential greenways for native grassland and re-vegetation strategies. Since these locations have limited access, these corridors create unique opportunities for introducing greenways to enhance ecological benefits for wildlife movement and seed dispersal for re-vegetation strategies. Railways no longer needed over time have potential to be re-purposed and reclaimed as boardwalks, greenways, or a tree allée within former industrial areas.



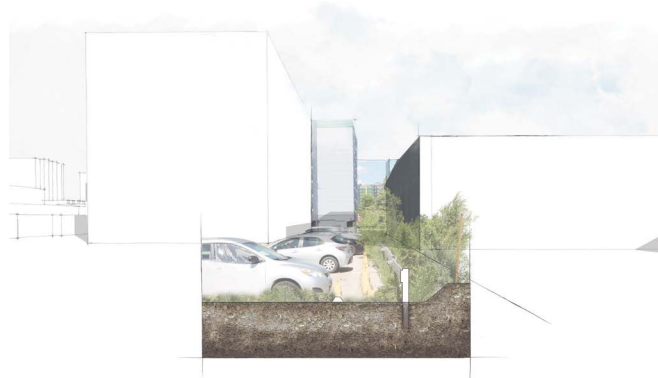
Southwest Transitway near Manitoba Hydro



Southwest Transitway Overpass Conditions



Urban Parking Areas Suitable for Greenways



Urban Parking Areas Suitable for Tree Allée



Uncultivated Agricultural Road
Verges adjacent to Abinojii Mikanah



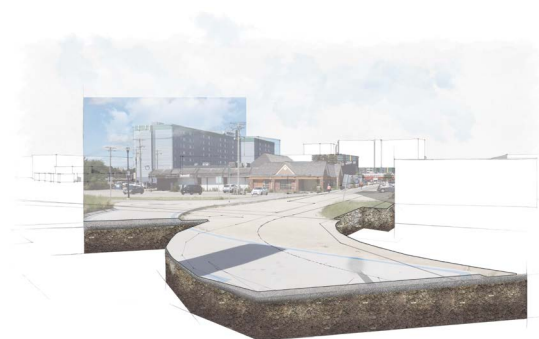
Uncultivated Agricultural Road
Verges adjacent to Sugar Beet Lands
Redevelopment Site



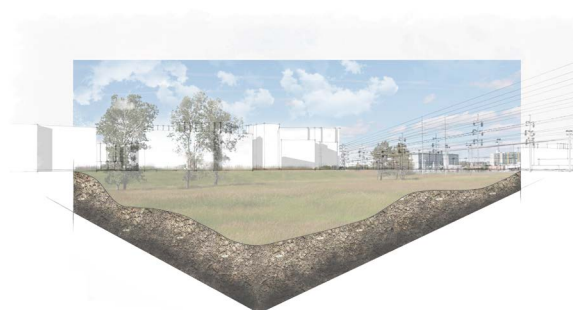
Southwest Transitway near
Fort Rouge Rail yards



Underutilized Parking Lots near
Plaza BRT Station



BRT Station Areas Suitable for
Green Infrastructure



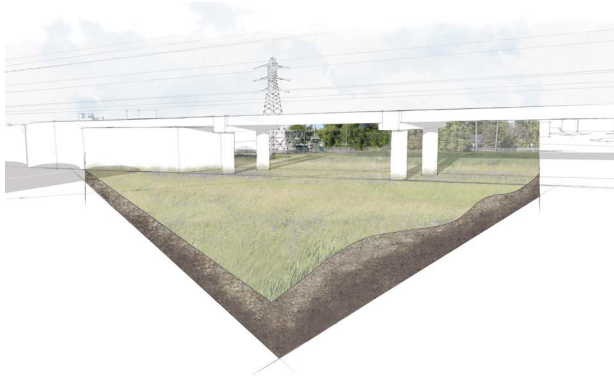
Uncultivated Agricultural
Road Verges

Figure 38: Vehicle Investigations

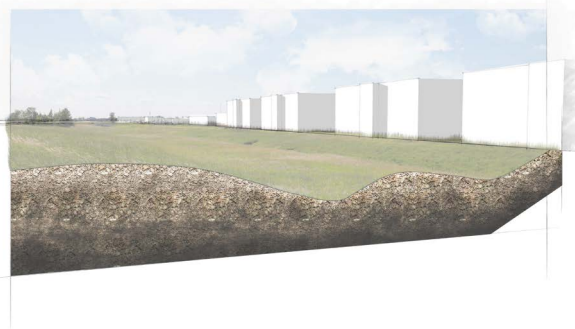
FIELD INVESTIGATIONS - VEHICLE

Above: Diagrammatic explorations of existing road conditions and lands and road verges adjacent to major transportation corridors.

Field investigations for infrastructure types included the evaluation of road corridors or road reserves, which often includes a vegetated parallel strip of roadside verges that are often maintained within corridors that adjoin the road. In the Southwest of Winnipeg, these roadside strips and parallel vegetation is often manicured with heavy maintenance regimes but are also neglected spaces for overgrown vegetation to take root between fences, ditches, soil banks, cliffs, walls, and median strips. By evaluating the existing road types, it was possible to identify key locations and large patches with potential to contribute to a ecological network and landscape framework. Road corridors offer multiple



Southwest Transitway Overpass near
CN Railway Spurs



Uncultivated Agricultural Road Verges adjacent
to Sugar Beet Lands Redevelopment Site



Intersections and Junctions along
the Southwest Transitway



Southwest Transitway Overpass near
Manitoba Hydro Corridor

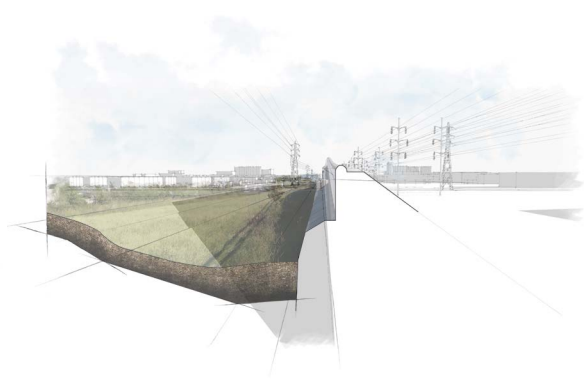
Figure 39: Vehicle Studies

ecological functions including habitat, conduits, filters, sinks, and sources for habitat species, which are also prominent components in the Southwest of Winnipeg.³² Road corridors create unique opportunities for habitat species based on their patchiness along corridors, but materials originating from existing roadsides can have negative impacts from automobiles due to oil, salt, dust, heavy metals, and debris.³³ Identifying significant roadside natural strips and large patches was important for delineating the potential to act as conduits for mammals, birds, and other species within an ecological network in the Southwest of Winnipeg.

Above: Diagrammatic explorations of existing road conditions and adjacencies.



Southwest Transitway Overpass Manitoba
Hydro and Thompson in the Park Funeral
Home and Cemetery



Southwest Transitway Overpass near
underutilized vacant Industrial Lands



Abinojii Mikanah Road Verge near Fort Garry Bridge



River Corridor adjacent to Fort Garry Bridge



Underutilized Storm water drains adjacent to
Pembina Highway Interchange

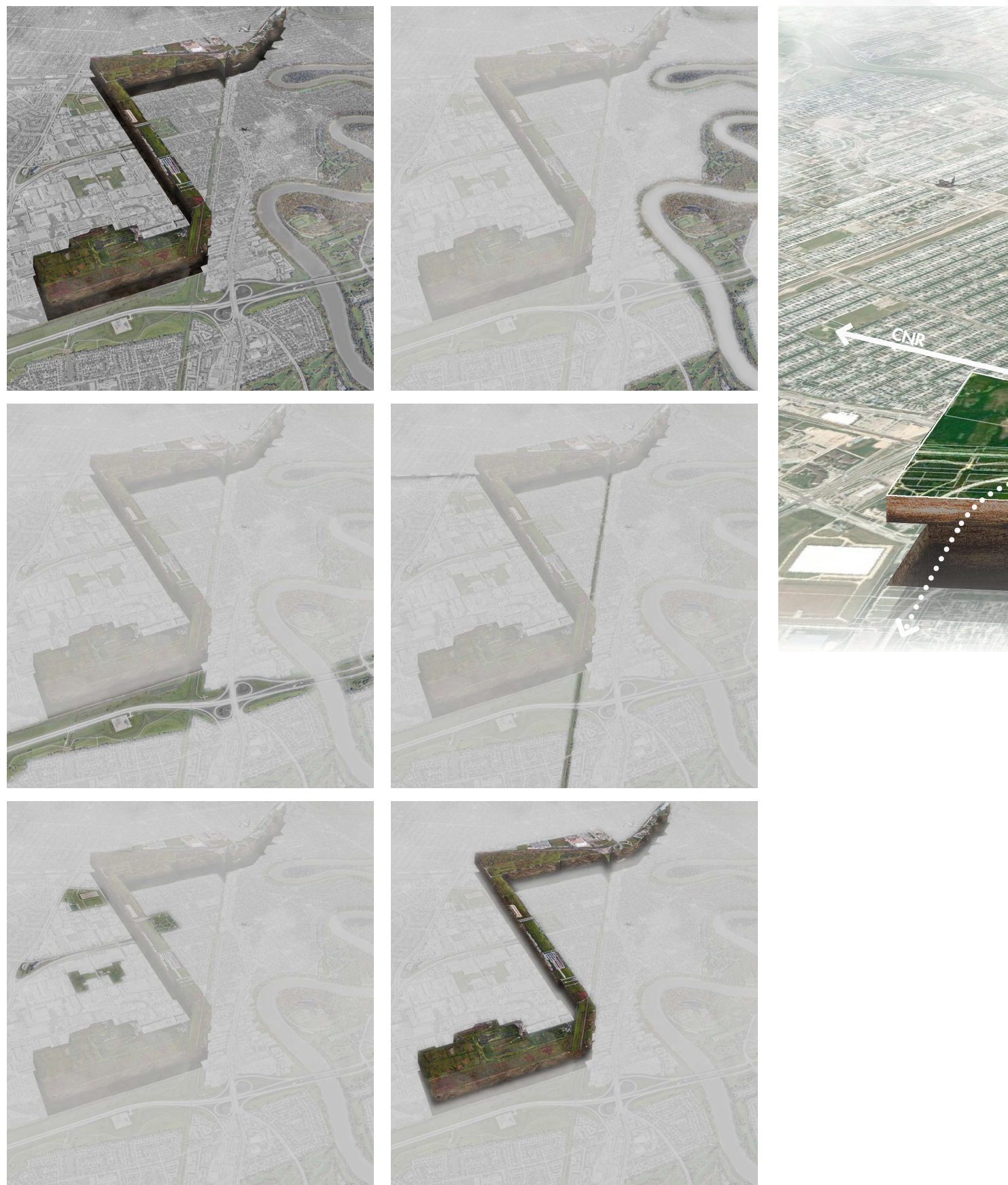


Figure 40: Landscape Components

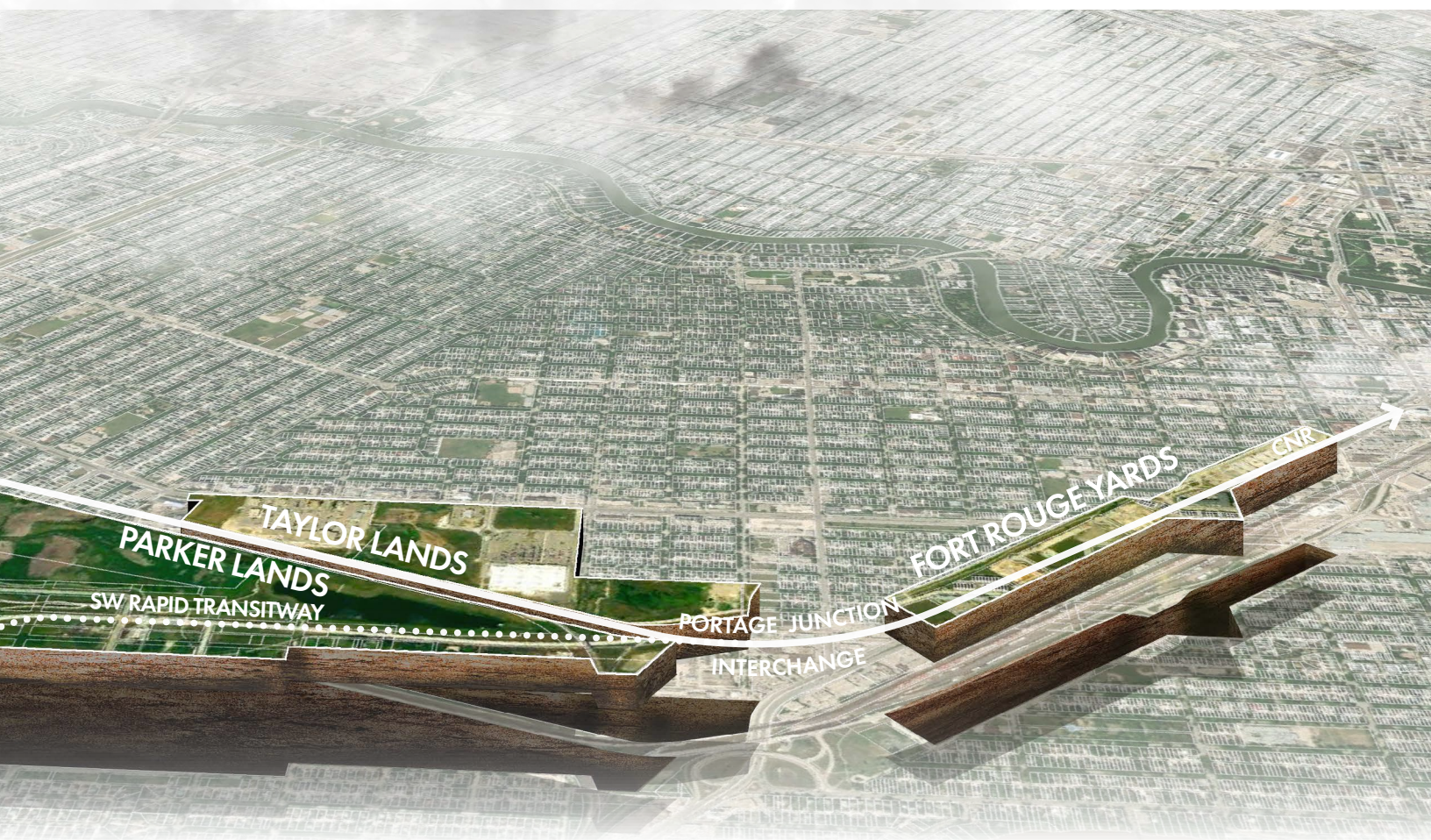


Figure 41: Integrating Redevelopment Opportunities

LANDSCAPE COMPONENTS

Above: Potential future transformative lands and synergies.

Left: Exploring key landscape components including Red River and riparian area, roadway verges, rail lines, adjacent parks and open spaces, and future opportunities for infrastructure merging with ecology and redevelopment.

Field investigations concluded with identifying key landscape components and indispensable patterns that have a significant influence on the study area in the Southwest of Winnipeg. Initial investigations explored the relationships between the Red River Corridor and its proximities, adjacent roadways, and verges along Abinojii Mikanah (formerly Bishop Grandin Boulevard), rail lines and principle branches and spurs, and existing parks and open spaces adjacent to vacant lands within infrastructure corridors. By assessing these patterns in the landscape, the vacant lands under power lines and within neglected infrastructure corridors present potential opportunities to create a connected network for transformative areas in the Southwest of Winnipeg.

By considering landscape components and indispensable patterns, hidden landscape opportunities for ecological networks are revealed that have the potential for design strategies to be applied on a regional and sub-regional scale.



Figure 42: Parker Lands

PARKER LANDS

The Parker Lands consist of approximately 54 hectares (133 acres) formerly used as industrial lands to accommodate the operation of the adjacent CNR Rivers Mainline and CNR Letellier Principle Branch line.³⁴ The CNR River Mainline binds the site to the north, Parker Ave and Heatherdale Ave to the south, Hurst Way and Hurst Waterworks property to the west, and the CNR Letellier Principle Branch Line and CN Portage Junction to the east. The Master Plan for the Parker Lands proposes key policy areas, including an Urban Neighbourhood, Limited Use, Rapid Transit Station Node, Green and Open Spaces, and Railway Corridor.³⁵ The Parker Lands has been identified as a site for future redevelopment with the intent to develop the lands to support the principles of the Winnipeg Transit-Oriented Development Handbook to align with the development policies outlined in *OurWinnipeg Development Plan* and *Complete Communities*. Despite its strategic location to the Southwest Bus Rapid Transitway and opportunities as a transformative site for future Neighbourhood Medium Density TOD characterized in the TOD Handbook, the site has many constraints that limit accessibility and the potential for mixed land uses due to hard edge conditions posed by the CNR River Mainline and the CNR Letellier Principle Branch Line.³⁶ The constraints to accessibility and land isolation due to the railway lines pose a challenge for redevelopment, but with limited site contamination and proximity to existing utility corridors owned by Manitoba Hydro, opportunities exist to integrate green corridors with the Parker Lands in the Southwest of Winnipeg.

Above: Exploration of Parker Lands Area Master Plan.

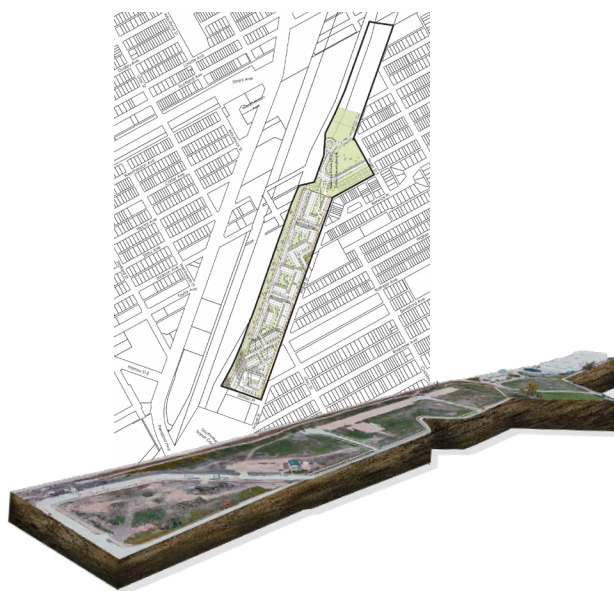


Figure 43: Fort Rouge Yards

FORT ROUGE YARDS

Above: Exploration of Fort Rouge Yards Area Master Plan.

The Fort Rouge Yards consist of 7.3 hectares (18 acres) of land on the former CN Rail yards. The Fort Rouge Yards are located on the western portions of land in the neighbourhood of Lord Roberts and is bound by Berwick Field and Jubilee Avenue to the south, the Southwest Rapid Transit Corridor right-of-way to the west, Argue Street to the east, and Berwick Place to the north. The Yards at Fort Rouge Area Master Plan intends to be the first Transit-Oriented Development (TOD) in Winnipeg which will take the former industrial parcels, currently zoned Manufacturing District – M2 (Manufacturing General), and rezone to high-density multi-family with the possibility for commercial development near the planned rapid transit stations.³⁷ The proposed redevelopment of the Fort Rouge yards would introduce densification in a century old neighbourhood, which has long served as the location for industry shops, train marshalling and maintenance, blacksmithing, and warehouse facilities for Winnipeg's working class neighbourhoods through the 1900s.³⁸ Development in the Fort Rouge Yards is to align and support the principles of the Winnipeg TOD Handbook and to align with the development policies outlined in *OurWinnipeg Development Plan* and *Complete Communities*. Its unique characteristics as a Major Redevelopment Site located near the Southwest Bus Rapid Transitway supports Winnipeg's goal to create a future Urban Neighbourhood. Opportunities exist within the Area Master Plan to take advantage of the synergies to existing infrastructure of the derelict brownfield and the Rapid Transit Corridor to support plans for future bike and pedestrian pathways that will connect existing and future parks and open spaces, green streets, pocket parks, and the proposed greenway along its western portions of the site.



Figure 44: Taylor Lands

TAYLOR LANDS

The Taylor Lands is approximately 17.8 hectares (44 acres) of vacant industrial land that is currently within the Manufacturing District–M1(Manufacturing Light)and M2(Manufacturing General), as well as a Commercial District – C3 (Commercial Corridor).³⁹ The lands are located within the Grant Park neighbourhood and bound by Grant Avenue to the north, the CNR mainline to the south, Stafford Street to the east, and Cambridge Street to the west. The lands are surrounded by major commercial centres, including the Grant Park Shopping Centre, and in close proximity to nearby educational and recreational institutions such as Pan-AM Pool, Charles A. Barbour Arena, Grant Park High School, and Grant Park Athletic Ground.⁴⁰ The history of the Taylor Lands includes the use as a former industrial site for the Grand Trunk Pacific Railroad and was an informal Métis settlement area for Rooster Town residents who located in close proximity to present day Grant and Corydon Avenue.⁴¹ A long history can be traced along the branch line of the Grand Trunk Pacific railroad as it provided transportation in and out of Rooster Town during the 1950s.⁴² Development of the Taylor Lands is to align and support the principles of the Winnipeg TOD Handbook and to align with the development policies outlined in *Our Winnipeg Development Plan* and *Complete Communities* through the creation of the proposed district areas in the Taylor Redevelopment Master Plan. The Taylor Lands is a unique opportunity to establish key character areas for the Major Redevelopment Site, and proposes four key districts, including the Powersmart Pavilions, Grant Park Row, Grant Park Mews, and The Meeting Place. Opportunities within the Master Plan suggests the possibility of a future pedestrian pathway connecting to the Parker Lands, located south of the CNR Mainline.

Above: Exploration of Taylor Lands Area Master Plan.

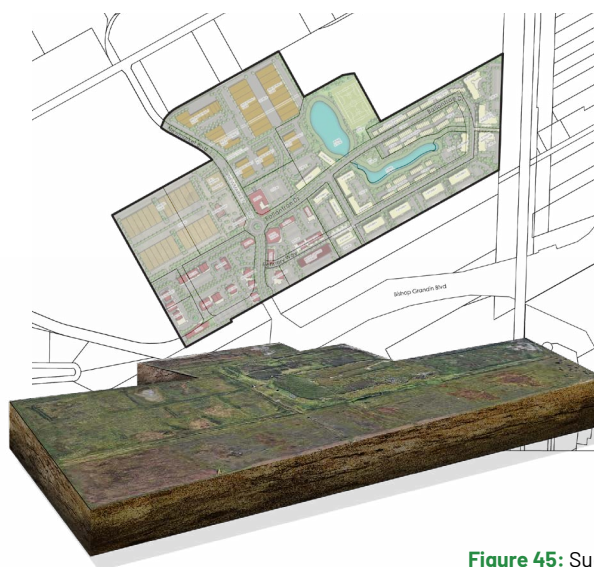


Figure 45: Sugar Beet Lands

SUGAR BEET LANDS

Above: Exploration of Sugar Beet Lands Area Master Plan.

The Sugar Beet Area Master Plan is approximately 53 ha (113 ac) of vacant industrial land in the General Manufacturing District – M2. The zoning to the west and north is predominately general manufacturing. The lands are undeveloped and were formerly used for stockpiling the lime and mud residue from the Manitoba Sugar Beet Company's sugar refining process.⁴³ Chevrier Boulevard bounds the lands to the north, the Manitoba Hydro properties and Southwest Transitway to the east, Abinojii Mikanah (formerly Bishop Grandin Boulevard) to the south, and Waverley Street and Scurfield Boulevard to the west. The lands are proposed for redevelopment to accommodate medium to high-density residential housing with commercial, office, and hotel opportunities buffered by landscaping from adjacent industrial land uses.⁴⁴ The redevelopment strategy proposes park and community facilities, including a neighbourhood park, that includes opportunities for recreation, such as baseball and soccer fields, play structures and pedestrian and cycling connections to the nearby Abinojii Mikanah (formerly Bishop Grandin) Greenway. The Area Master Plan identifies a park and open space strategy for parks and plazas focused on passive recreational opportunities that connect open space networks that feed directly to the Plaza BRT Station. The large verges of vacant agricultural lands adjacent to the Sugar Beet Lands pose an opportunity to interconnect ecological networks with planned and existing park and open space strategies that can also incorporate sustainable design elements, including renewable energy, naturalized retention ponds, and creating unique landform opportunities by re-using on-site mounds of spent lime mud residues from historic stockpiling which remains today on most of the central and east areas of the site.

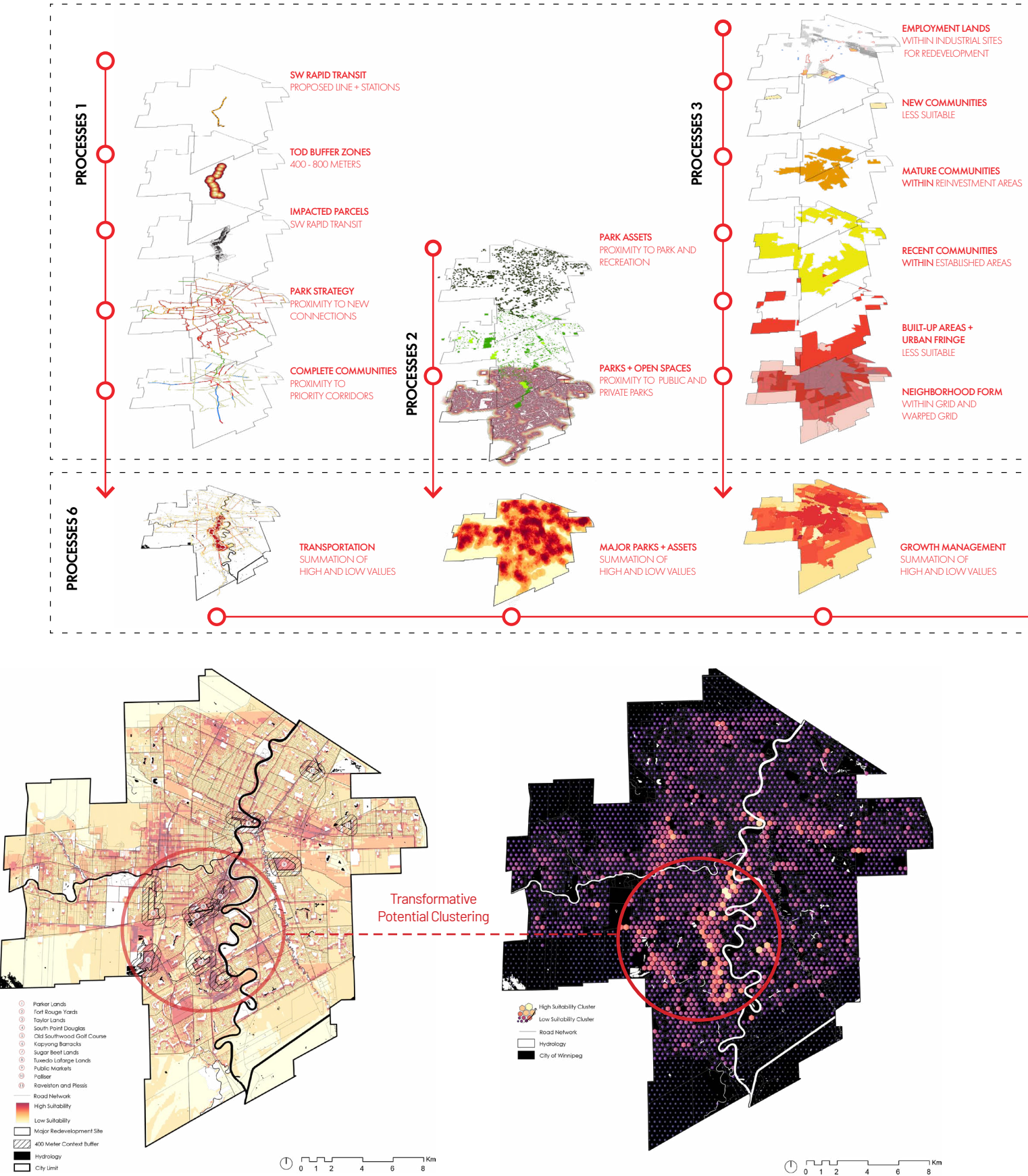


Figure 46: Transformative Opportunities

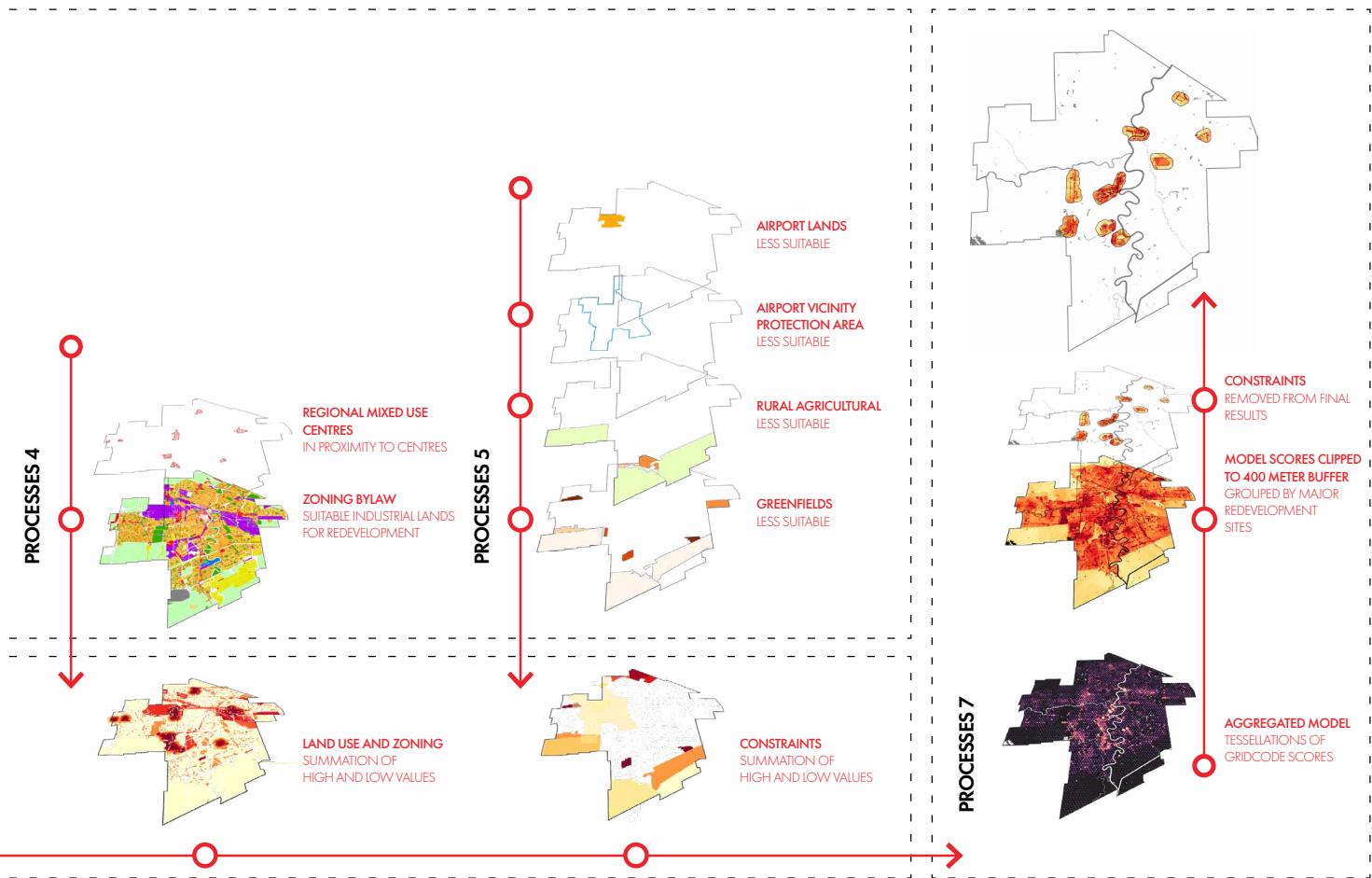


Figure 47: Geospatial Modeling for Transformative Change

MODELING TRANSFORMATIVE OPPORTUNITIES

Above: Geospatial modeling baseline analysis for identifying areas of future strategies for transformative change based on land use metrics.

Left: Modeling results for identifying opportunities for linking synergies for transformative change based on clustering of high values and suitability on City investment.

Using ArcGIS, a suitability model was generated to assist with determining transformative opportunities in Winnipeg, with particular emphasis on evaluating major redevelopment sites within the city's urban structure, refer to **Fig. 47**. This geospatial model was used to create parameters evaluating transformative opportunities for future landscape strategies with a higher preference for areas near existing and planned transportation infrastructure, lands within proximity to transformative land uses, including future planning for regional mixed-use centres, corridors, multi-use pathways and park trails. The analysis identified high potential synergies in the Southwest, connecting key major redevelopment sites. However, additional analysis was required to create a custom inventory of landscape influences for a landscape framework currently unavailable for the City of Winnipeg.

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CHAPTER

06

LANDSCAPE FRAMEWORK

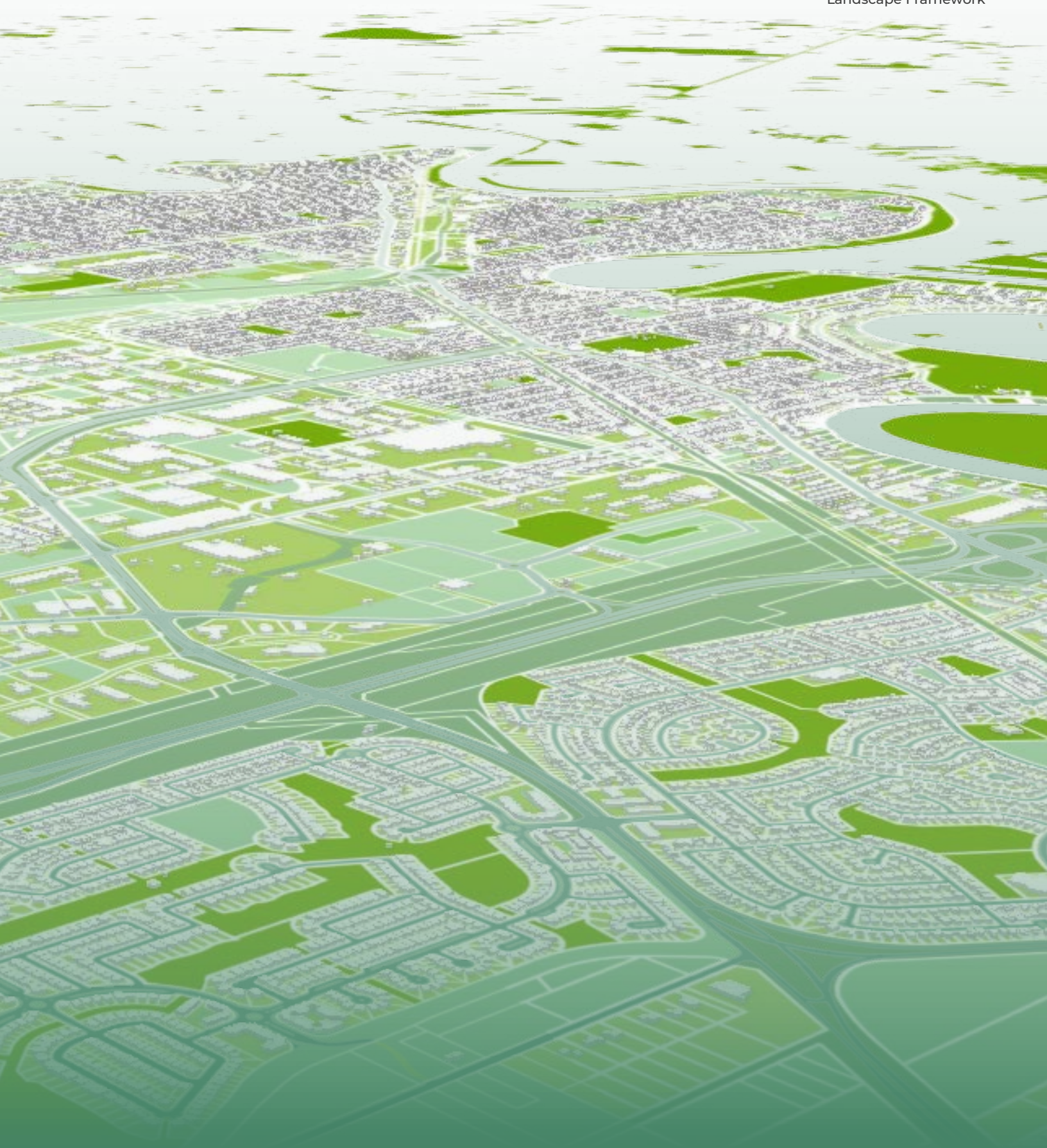


Figure 48: Landscape Framework

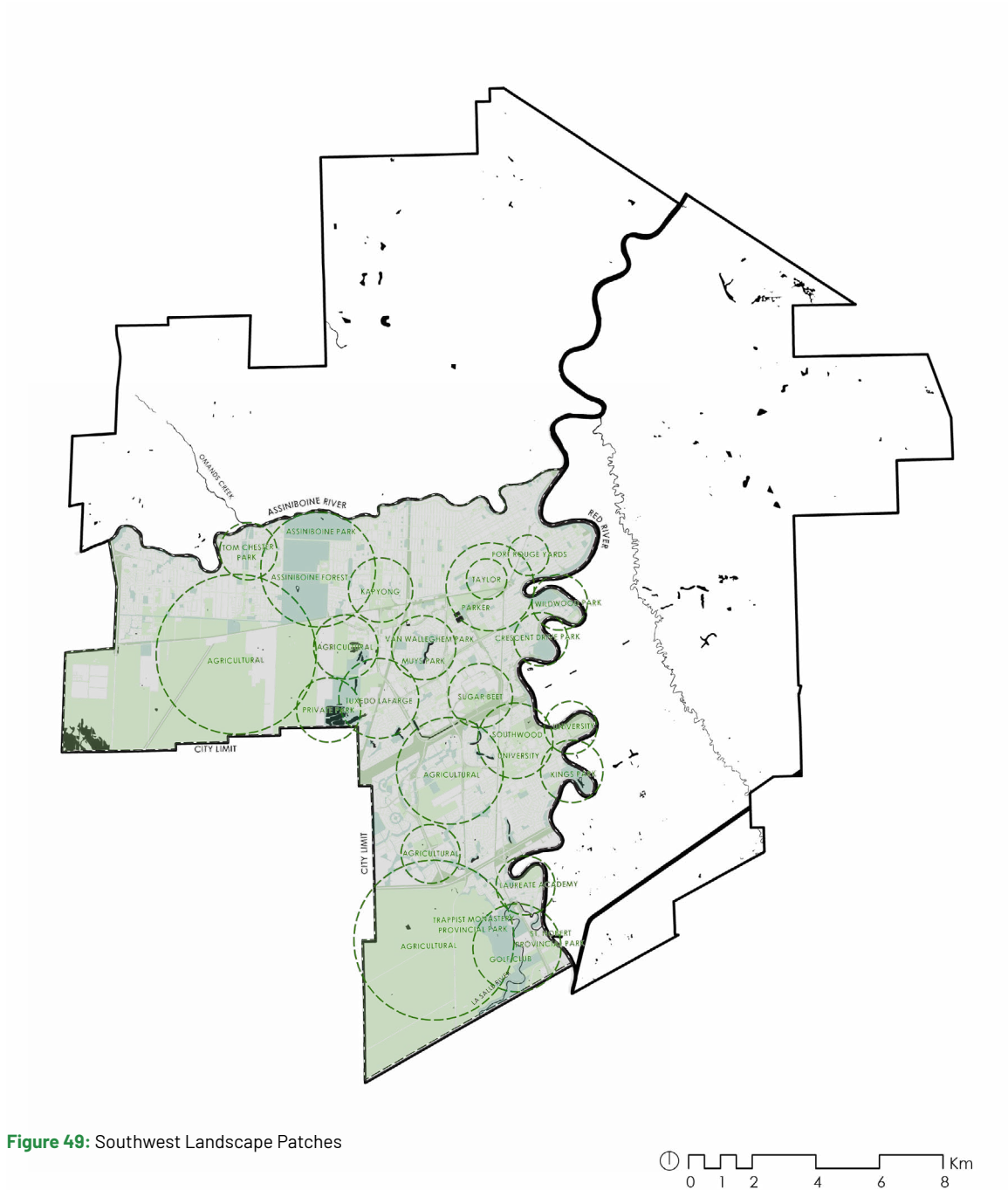


Figure 49: Southwest Landscape Patches

PATCHES

A cluster of key patches and nodes represent the key significant areas within the spatial framework. Nodes can include patches of forested areas, agricultural lands, parks, riparian areas, and redevelopment areas with significant existing habitat. Process work focused on identifying key areas in the Southwest of Winnipeg and grouping these patches and nodes into families with unique spatial characteristics.⁴⁵

Above: Detailed landscape analysis in the Southwest of Winnipeg.

Right: Initial grouping and families of key nodes and existing parkland, agricultural lands, and redevelopment sites.

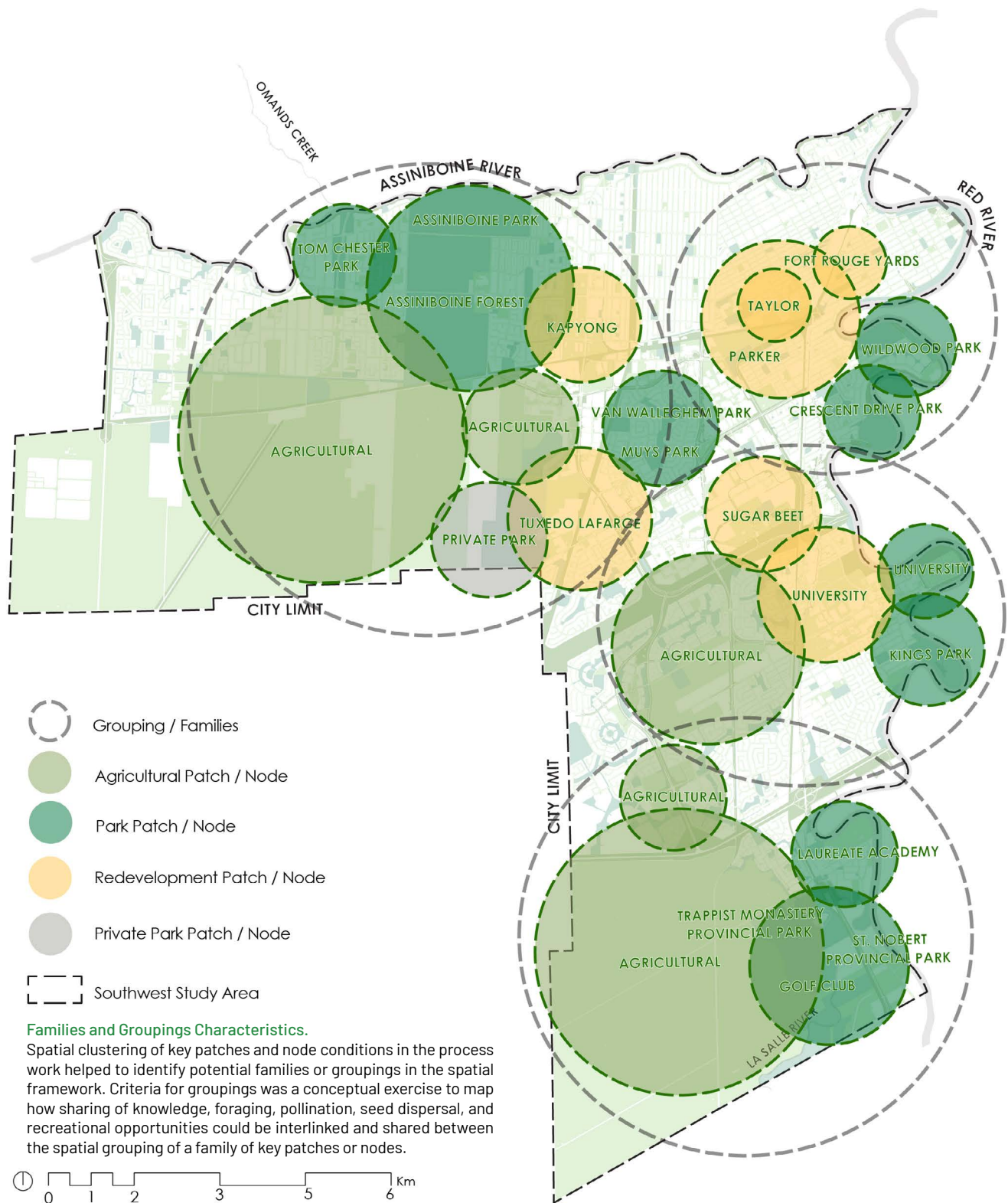


Figure 50: Southwest Patch and Node Conditions



Figure 51: Major Transportation Infrastructure

CORRIDORS

Linear corridors in the form of major transportation, infrastructure corridors, and existing and proposed trails direct the flow of vehicles, pedestrians, and cyclist mobility. These corridors are organized along existing and proposed corridors. Process work focused on identifying key corridors bounding the patches and nodes within the spatial framework for the Southwest of Winnipeg.

Above: Detailed analysis of significant transportation connections as key corridors in the Southwest of Winnipeg.

Right: City of Winnipeg Parks Strategy existing and proposed mobility networks, regional trails, and future park connections.

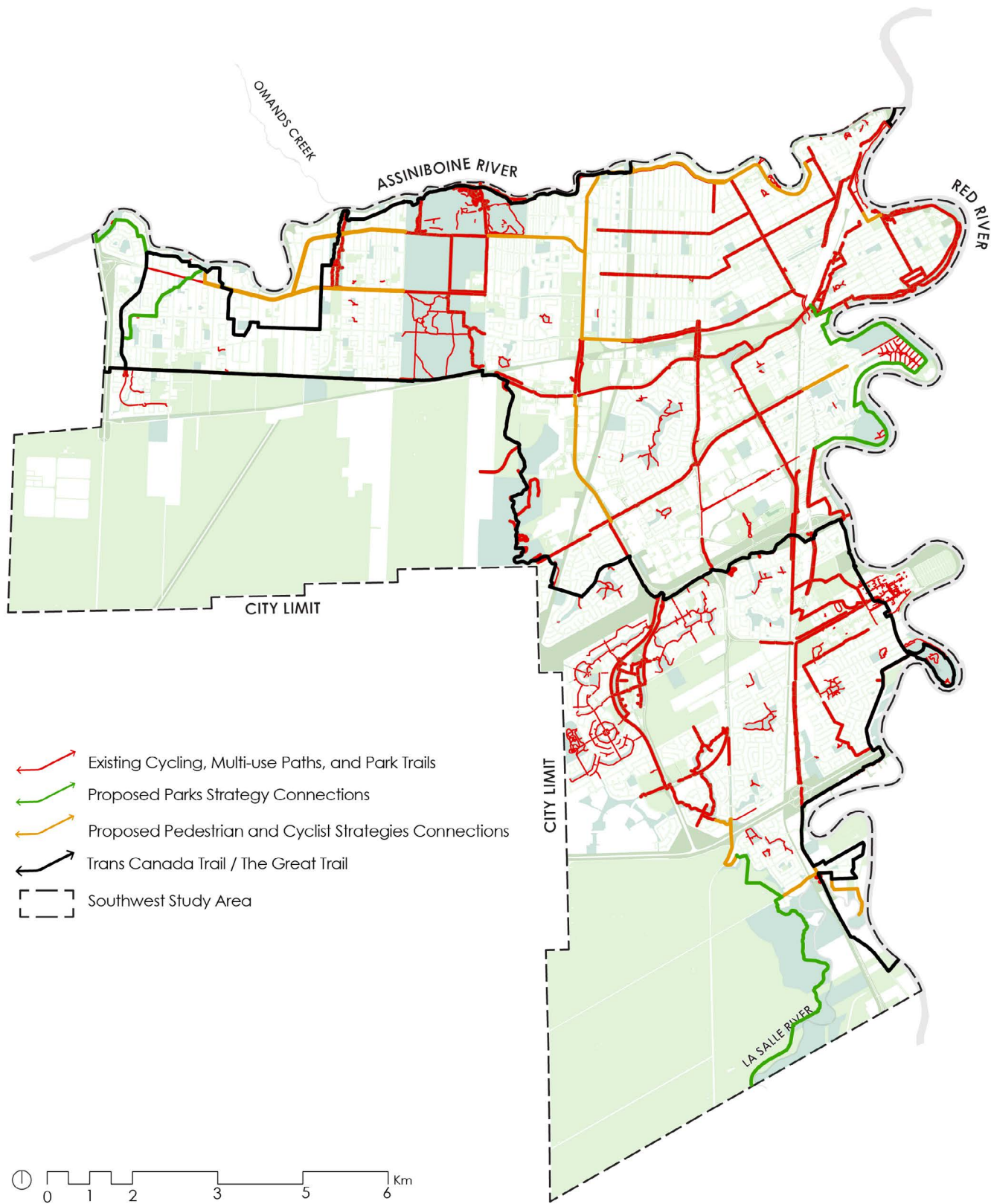


Figure 52: Existing and Proposed Trails and Connections

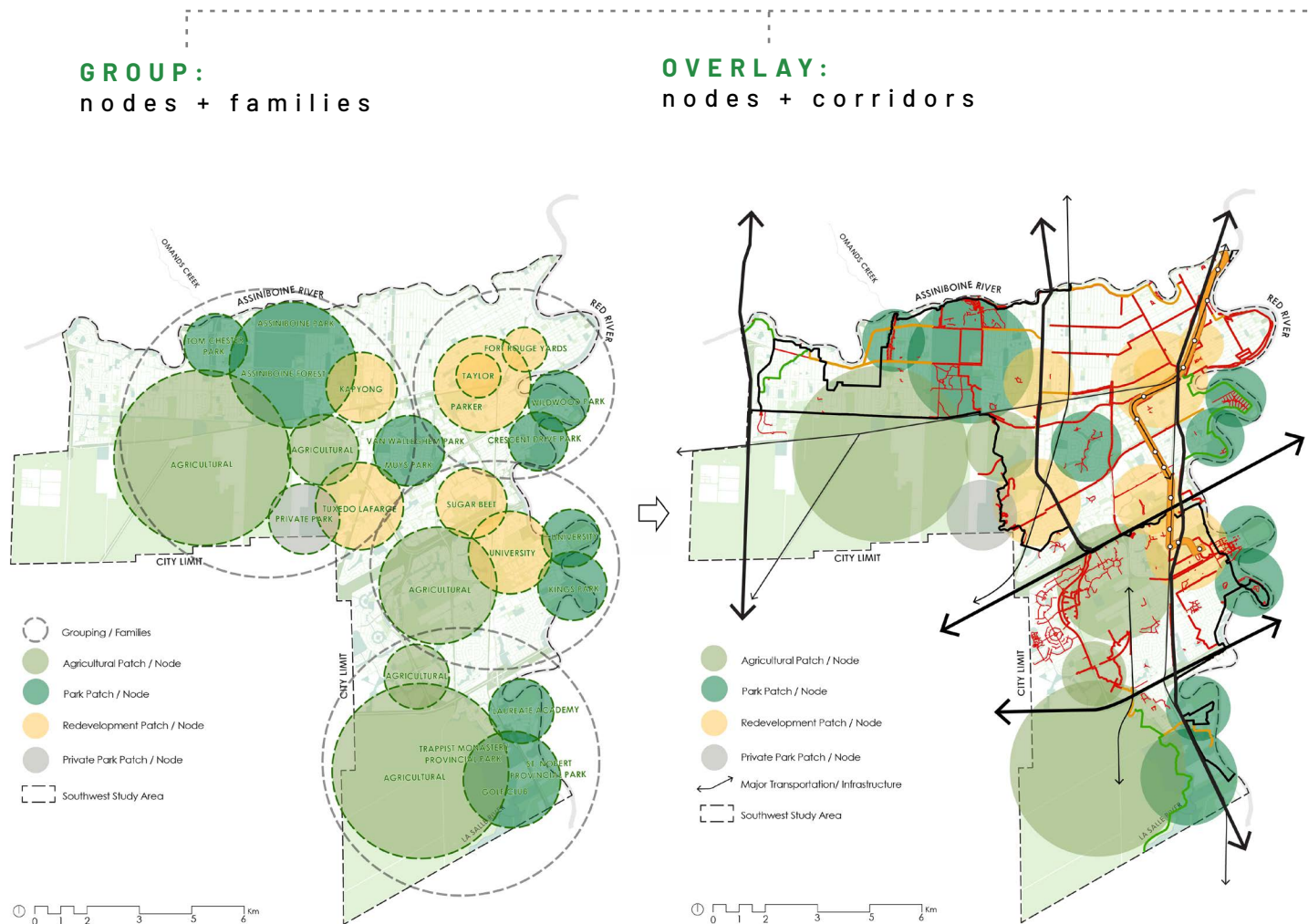


Figure 53: Patch / Nodes / Corridor Relationships

PATCH AND CORRIDOR RELATIONSHIPS

Spatial clustering of key patches and node conditions in the process work was used to identify potential families or groupings in a simplified spatial framework. Process work began to think about how sharing of knowledge, foraging, pollination, seed dispersal, and recreational opportunities could be interlinked and shared between a grouping or family of key nodes and corridors.

Above: Process of merging identified nodes with corridors to review potential spatial relationships that can inform a Landscape Framework.

DISSOLVE:
nodes + corridors

SIMPLIFY:
spatial framework

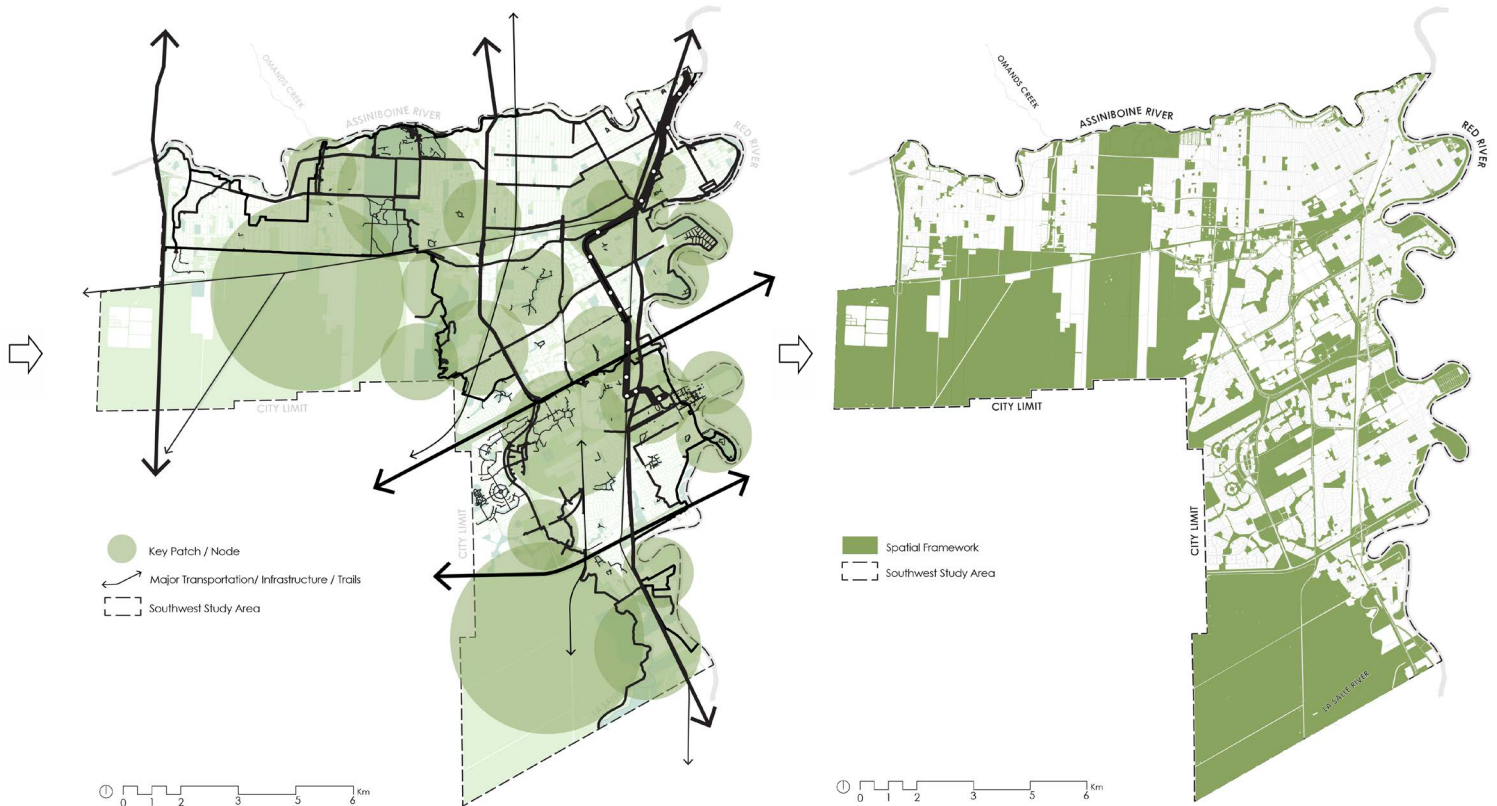


Figure 54: Landscape Framework

Above: Applying a simplified spatial network to inform a Landscape Framework for analysis and selection of sites.

A simplified landscape framework delineates the boundaries of the proposed study area extent, and provides a variety of spaces for different infrastructure types to be studied that circulate, distribute, and link movement, goods, energy, flora, and fauna.

Patch-Corridor-Matrix Model

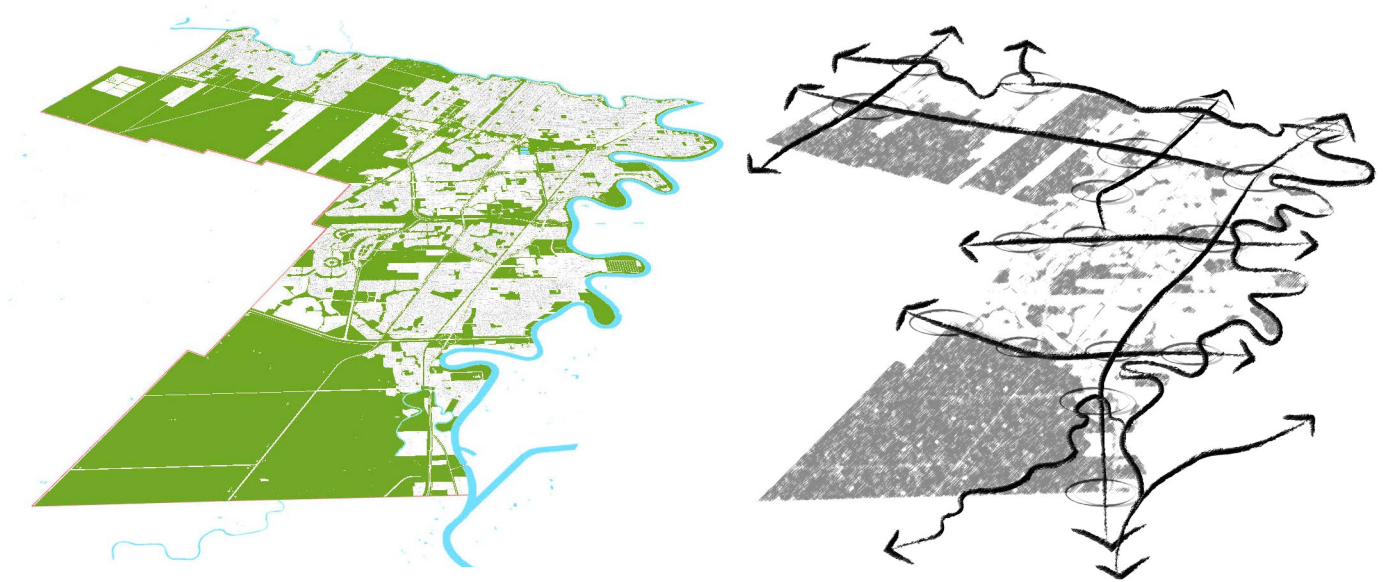


Figure 55: Spatial Framework

CREATE A FRAMEWORK

When applying Richard Forman's principles for analyzing a whole landscape, there are four key indispensable patterns that were considered a priority when evaluating the Southwest of Winnipeg, including:

1. Maintaining a few large patches of natural vegetation;
2. Maintain wide vegetation corridors along major water courses;
3. Maintain connectivity for movement of key species among large patches, and wide continuous corridors form a key component for creating a major green network with clustering of stepping stones; and
4. Maintain heterogeneous portions of nature throughout human-developed areas.⁴⁶

Reviewing a landscape framework in the Southwest of Winnipeg relied on creating a inventory of patches and corridors that formulate the existing mosaic sequence in the landscape to determine the potential for a future sequence where an aggregate-with-outliers principle can be applied.

Above: Applying the Patch-Corridor-Matrix Model for a landscape framework.

Right: Reviewing the simplified landscape framework to derive criteria for ecologically optimum network potential.



Figure 56: Simplified Spatial Framework



Figure 57: Applying the Aggregate-with-Outliers' Design Principle

ECOLOGICAL NETWORKS

After identifying indispensable patterns that are essential foundations to any landscape, selected sites were determined in the Southwest of Winnipeg using the Aggregate-with-Outliers Principle.⁴⁷ In order to determine the existing and future potential for optimum arrangement for land uses in a landscape, land uses were aggregated (natural vegetation, agriculture, and built area, etc.) and corridors and patches were maintained, and key locations identified, refer to **Tables 1-2**.

The Aggregate-with-Outliers Principle was used to inform the approach for ecological patches and corridors that interface with infrastructure as a case study in the Southwest of Winnipeg for neglected landscapes.

Above: Applying Forman's Aggregate-Outliers' Design Principle in the Southwest of Winnipeg.

Right: Identifying indispensable patterns and key locations within a landscape for the Southwest of Winnipeg.

Table 1: Indispensable Patterns

Pattern 1	Maintain a few large patches of natural vegetation.
Pattern 2	Wide vegetation corridors along major water courses. Almost all natural resources and human activities in a landscape depend in some measure on stream and river systems.
Pattern 3	Maintain connectivity for movement of key species among the large patches. Wide continuous corridors forming a major green network are considered best. A second best alternative is a cluster of stepping stones.
Pattern 4	Maintain heterogeneous portions of nature throughout the human-developed areas. This provides some connectivity for movement of most other species over all portions of the landscape.

Table 2: Key Locations within a Landscape

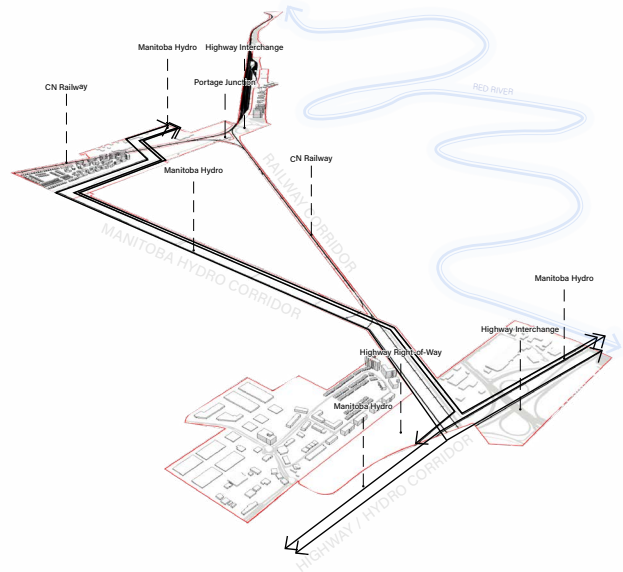
Key Location 1	Locations that are strategic because of their contents and their source effect , such as large natural-vegetation areas, cities, and unusual features (e.g., a single major river).
Key Location 2	Locations where change is the issue , such as especially sensitive areas, and places that if damaged or destroyed, have a long recovery time.
Key Location 3	Locations or ' flux centers ' where flows or movements are concentrated . These may include steep slopes, stream and river corridors, intersection nodes in a network.
Key Location 4	Unusual features that act as important sources and sinks . Protecting elements with the highest species richness is efficient for landscape-wide biodiversity conservation.
Key Location 5	Large nodes in networks have unusual importance due to their ramifying connections.
Key Location 6	Gaps in major corridors are keys to movements along, and flows across, a corridor.
Key Location 7	Focus on strategic points to control flows and protection from external forces.

LANDSCAPE FRAMEWORK

1ST ORDER: patches + corridors



2ND ORDER: infrastructure strata



LANDSCAPE ECOLOGY

A landscape matrix for the Southwest of Winnipeg was created to take an inventory and ranking of landscape elements recognized at the scale of a landscape mosaic, which includes patches, corridors, and a matrix network. These landscape elements were used to identify ecological significance in proximity to infrastructure types.

INFRASTRUCTURE CASE STUDY

Infrastructure types for Manitoba Hydro, railway, and vehicle movement were delineated along corridors to examine their major functions for movement efficiency and protecting the landscape matrix. Corridors interact with ecological patches identified from the 1st Order of the landscape matrix to review their functions as habitat, conduits, filters, sources, and sinks for movement of energy, people, and wildlife. Spatial synergies from future major redevelopment sites and existing built development types inform future possibilities for landscape strategies.

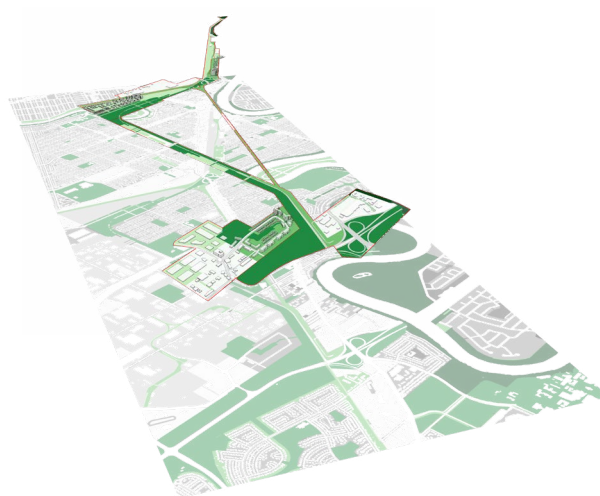
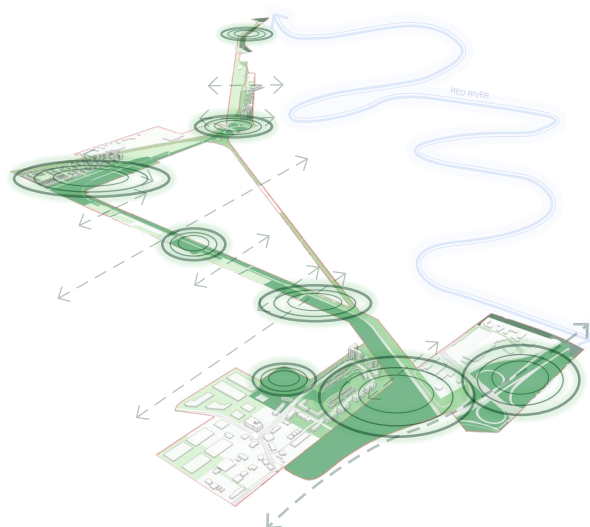
THE APPROACH

The landscape framework was created to transition between scales from a sub-regional scale in the Southwest of Winnipeg, which contains numerous open spaces and nature parks to patches, corridors, and matrix networks of neglected landscapes that are ecologically optimum for land transformation to suitable selected sites to apply design strategies.

Above: Modeling approach for using the landscape framework to identify ecological synergies with existing infrastructure.

3RD ORDER:

ecological patches/corridors +
infrastructure strata

**NEGLECTED LANDSCAPES CASE STUDY**

Neglected landscapes are patches and corridors that intersect with ecologically optimum lands and existing infrastructure to re-imagine transformative opportunities for design strategies. Future transformations include strategies and selected sites to provide biodiversity protection, enhance water management, support agroforestry and silviculture, create opportunities for recreation corridors, wildlife movement, native plant regeneration, and renewable energy generation.

Figure 58: Southwest Landscape Framework

Above: Deriving and applying landscape influences for neglected landscapes based on potential for contributing to an ecological networks, linked to infrastructure and redevelopment sites.

Using a methodology from Richard T.T. Forman's Patch-Corridor-Matrix Model, key infrastructure types, including hydro, rail, and vehicle were selected to create design strategies to enhance ecological integrity where people and wildlife inhabit and dwell within neglected landscapes in the future.

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CHAPTER 07

SELECTED SITES

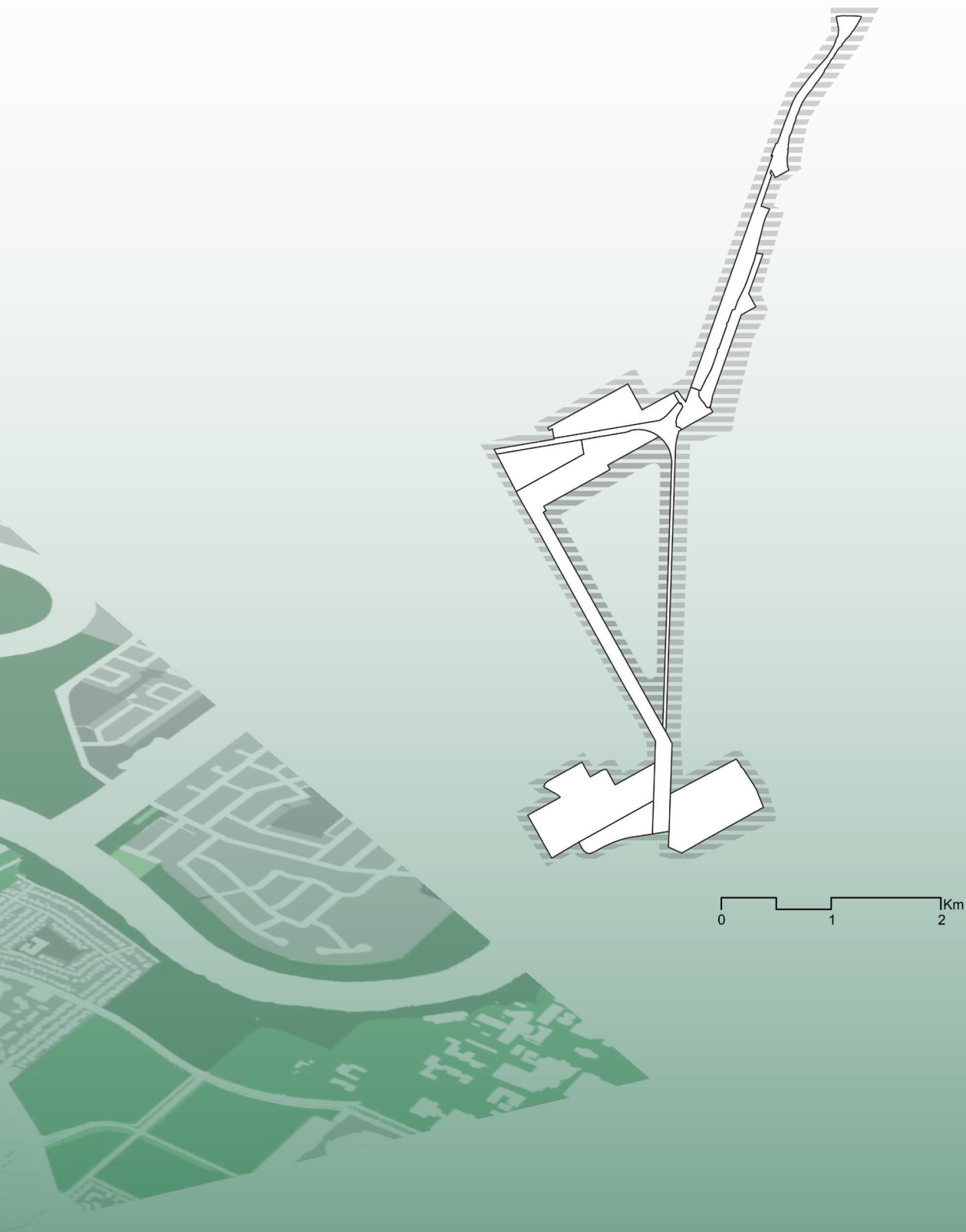


Figure 59: Selected Sites



Figure 60: Patch and Corridor by Landscape Influences

PATCH-CORRIDOR-MATRIX

The Aggregate-with-Outliers Principle was applied to the Southwest of Winnipeg to create a ranked mosaic sequence of aggregated land uses derived from the general principles of landscape and regional ecology. The Patch-Corridor-Matrix was used as a method to arrange the landscape patches and corridors that contribute to a matrix that constitutes the landscape in the

Above: Landscape modeling by patch, corridor, and matrix to evaluate ecologically optimum network potential in the Southwest of Winnipeg.

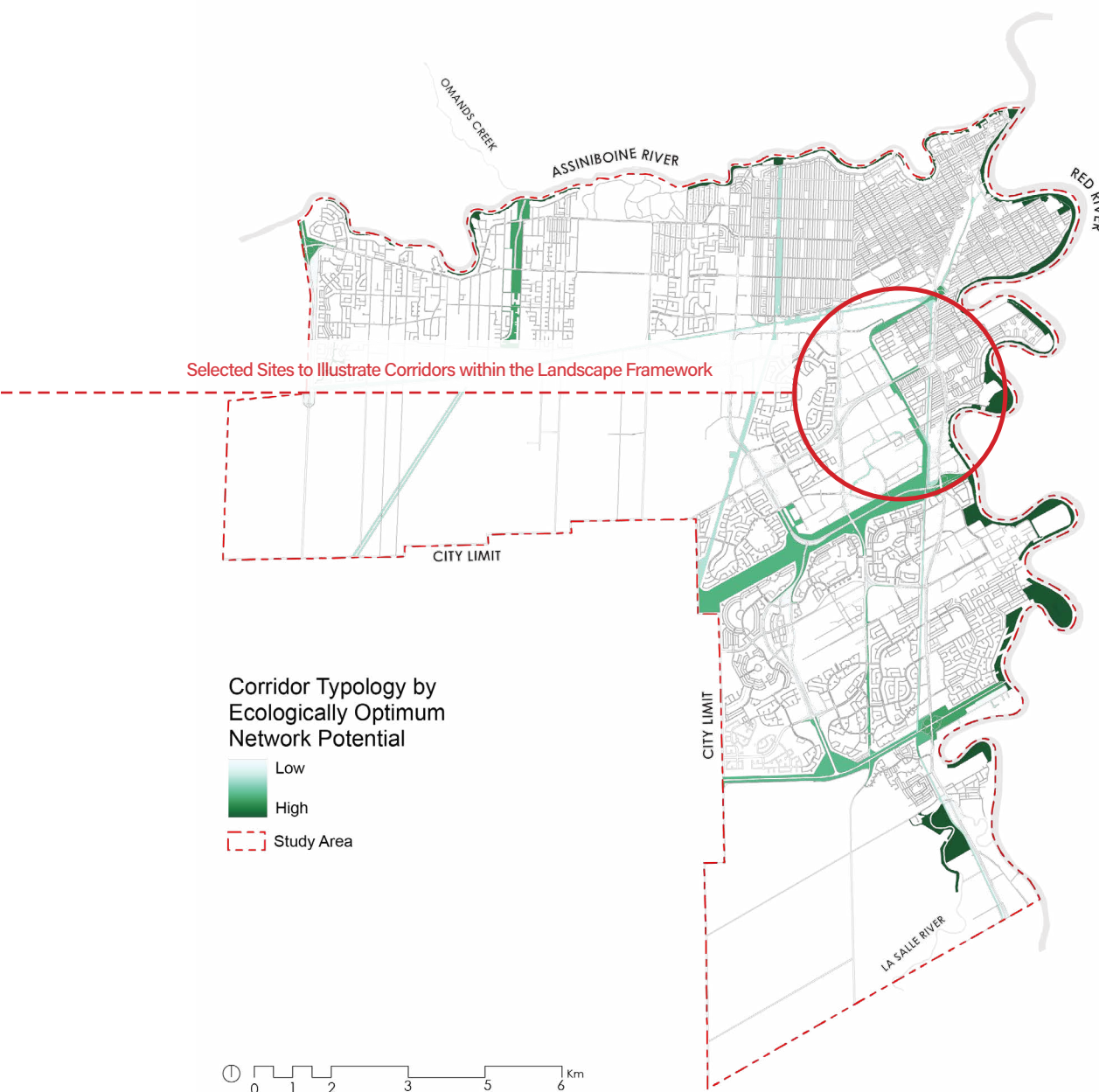


Figure 61: Selected Sites by Landscape Influences

Above: Applying landscape influences to evaluate potential for corridors for transformative opportunities and contributing to an ecological network.

Southwest of Winnipeg based on major patterns for functional flows, movements, and creating an inventory of the patterns incurred over time.⁴⁸ Applying this process to corridors was used to identify the ecologically optimum network potential for selected sites based on additional synergies with land uses and infrastructure.



Indispensable patterns in planning a landscape.

- 1= a few large patches of vegetation
- 2= major stream or river corridor
- 3= connectivity with corridors and stepping stones between large patches
- 4= heterogeneous bits of nature across the matrix.

Figure 62: Indispensable Patterns in the Landscape

GUIDING PRINCIPLES

For the case study in the Southwest of Winnipeg, the indispensable patterns in the landscape were used to inform the selected sites focusing on the large patches maintained within the hydro electric transmission and railway corridors, and large roadway verges that have the potential for contributing to an ecologically optimum land transformation.⁴⁹ Connectivity between infrastructure corridors is interspersed with stepping stones and smaller patches that create a diversity of heterogeneous bits of nature across the matrix adjacent to future redevelopment sites.

Above: Applying and identifying indispensable patterns in the Southwest of Winnipeg.

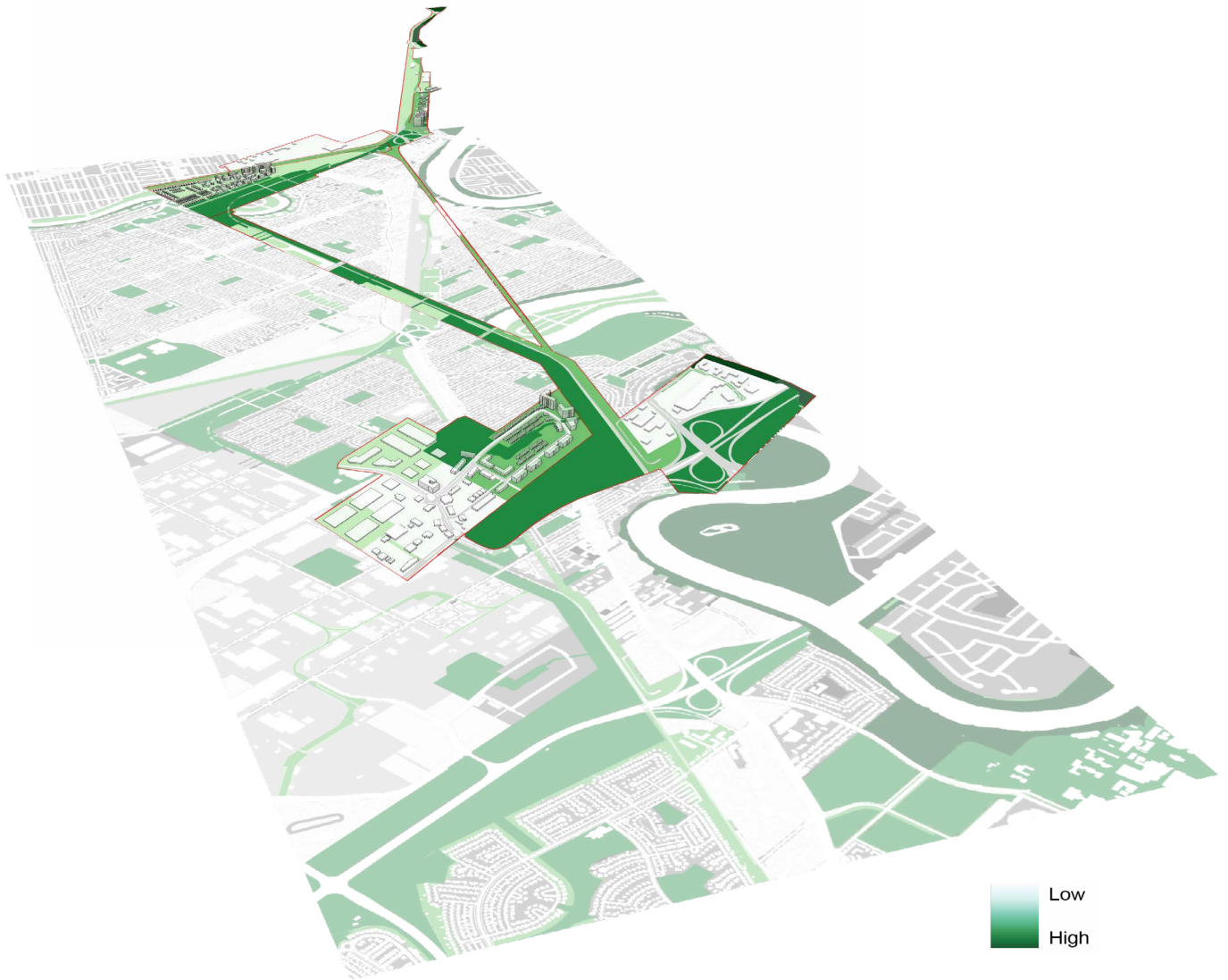


Figure 63: Site Suitability by Landscape Influences

LANDSCAPE CRITERIA

Above: Indispensable patterns that link future redevelopment sites and existing infrastructure that can contribute to transformative change and future strategies for landscape.

Landscape influences were applied using Forman's principles (refer to **Figures 66 & 69**). Key influences included land use, location, function, edge effects, movement, patch and corridor size, and disturbance types.^{50, 51} Using urban ecology as a method, ranking of selected sites were used to identify optimum patches and corridors for land transformation through design strategies.



Figure 64: Patches by Land Uses

CRITERIA FOR PATCHES

The first step to determining landscape influences for patches was creating an inventory of landscape patches in the Southwest of Winnipeg to identify the indispensable patterns that are essential to the landscape within the study area. The second step involved applying the Aggregate-with-Outliers Principle, where land uses are aggregated for review and patches are maintained throughout the developed areas.⁵² Outliers are identified that are spatially arranged along the study area boundaries. The final step was applying the patch-corridor-matrix model with ranked influences for patches, which focused on key aspects of the landscape matrix, including land use, location, function, edge

Above: Evaluation of land based patch types by major use.

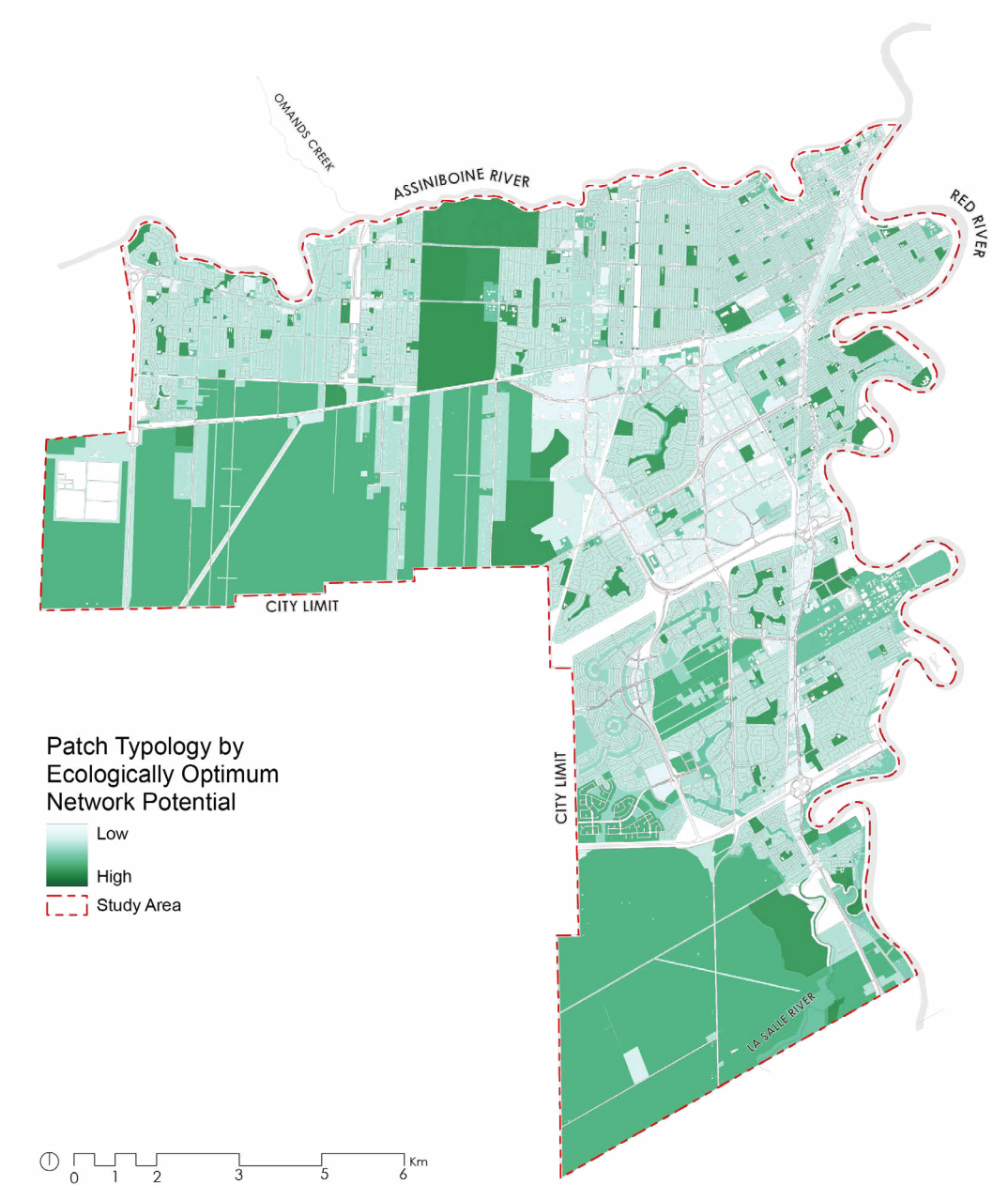


Figure 65: Patch Typologies by Landscape Influences

Above: Applying Forman's Patch-Corridor-Matrix Model to patches using landscape criteria.

effects, patch size, and level of disturbance based on human development patterns over time.⁵³ For detailed description of key influences applied in the ranked Patch-Corridor-Matrix Model (refer to **Figure 66**). This urban ecology approach to the selected sites enabled the ranking of key landscape patches that have high potential for contributing to transformative change and enhancing an ecologically optimum network in the Southwest of Winnipeg adjacent to key infrastructure synergies.

NEGLECTED LANDSCAPES - PATCHES

landscape ecology + infrastructure

ranked (1-3) sum for *Ecologically Optimum Land Transformation (EOLT)* potential for neglected landscapes.

$$U + F + S + L + E + D = EOLT$$



U

LAND USE (U) INFLUENCE

Land use adjacencies and proximity have a direct impact on the level of disturbance and ranking of the ecologically optimum land transformation. Built forms have levels of permanency versus natural environments for change. Built areas pose the least potential for change due to existing urban development, while patches of land classified as agricultural and vacant landscapes have more potential for future transformation.

- U1 Built Area (Rank value: 1)
- U2 Recreation (Rank value: 2)
- U3 Open Space (Rank value: 3)
- U4 Environ. Storm water Mgmt. (Rank value: 3)
- U5 Agricultural (Rank value: 3)
- U6 Wild / Vacant (Rank value: 3)



L

LOCATION (L) INFLUENCE

Patch location can influence the probability of isolation as a function of distance and characteristics of resistance. A patch located in close proximity to other patches will have a higher chance of re-colonization. Unusual or distinctive characteristics are important due to their high sensitivity to human impact, such as riparian areas and proximity to river corridors.

- L1 Extinction Isolation (Rank value: 1)
- L2 Recolonization Close Proximity to Others (Rank value: 2)
- L3 Unusual Characteristics (Rank value: 3)



F

FUNCTION (F) INFLUENCE

Patches can originate in five key ways and can change diurnally, seasonally, and successional. Disturbance patches result from alteration or disturbance of an area, often through urban development. Remnant patches appear when an area escapes disturbance surrounding it. Remnant and disturbance patches change relatively rapidly reflecting the rate of succession. Environmental patches is caused by the patchiness of the environment, and change slowly. Regenerated patches resembles a remnant, but has regrown on a previously disturbed site. Introduced patches are created by people such as planting trees or grain, erecting buildings, etc.

- F1 Disturbance (Rank value: 2)
- F2 Remnants (Rank value: 3)
- F3 Environ. Conservation (Rank value: 3)
- F4 Regenerated (Rank value: 3)
- F5 Introduced (Rank value: 3)



E

EDGE (E) INFLUENCE

Each landscape element contains an edge, the outer area exhibiting the edge effect. The influence of the edge is the portion of an ecosystem near its perimeter, where influences of the surroundings prevent development of interior environmental conditions. Natural edges that have the presence of vegetation plant compositions have greater potential for an ecologically optimum land transformation.

- E1 Admin. Boundary (Rank value: 1)
- E2 Hard Edges (Rank value: 1)
- E3 Edge Width (Rank value: 2)
- E4 Ecological Boundary (Rank value: 2)
- E5 Edge as Filter (Rank value: 2)
- E6 Edge Abruptness (Rank value: 2)
- E7 Long Axis (Rank value: 2)
- E8 Human Edges (Rank value: 2)
- E9 Straight Edges (Rank value: 2)
- E10 Soft Edges (Rank value: 2)
- E11 Curvilinear Boundary (Rank value: 3)
- E12 Coves and Lobes (Rank value: 3)
- E13 Natural Edges (Rank value: 3)
- E14 Perpendicular to Dispersers (Rank value: 3)
- E15 Vegetation Plant Compositions (Rank value: 3)

This practicum created a methodology that could be applied to any portion of the City of Winnipeg that would illustrate the future potential of lands that could serve to bridge needs for urban ecology with areas along infrastructure types that have varying degrees of underutilization or neglect. This analysis was applied at the **property scale**, creating a customized dataset that adds up ranked criteria derived from Richard Forman's Patch-Corridor-Matrix and guiding principles for indispensable patterns in a landscape.⁵⁴ High ranked (darker green) areas were most optimum for creating an ecologically optimum land transformation through landscape strategies.

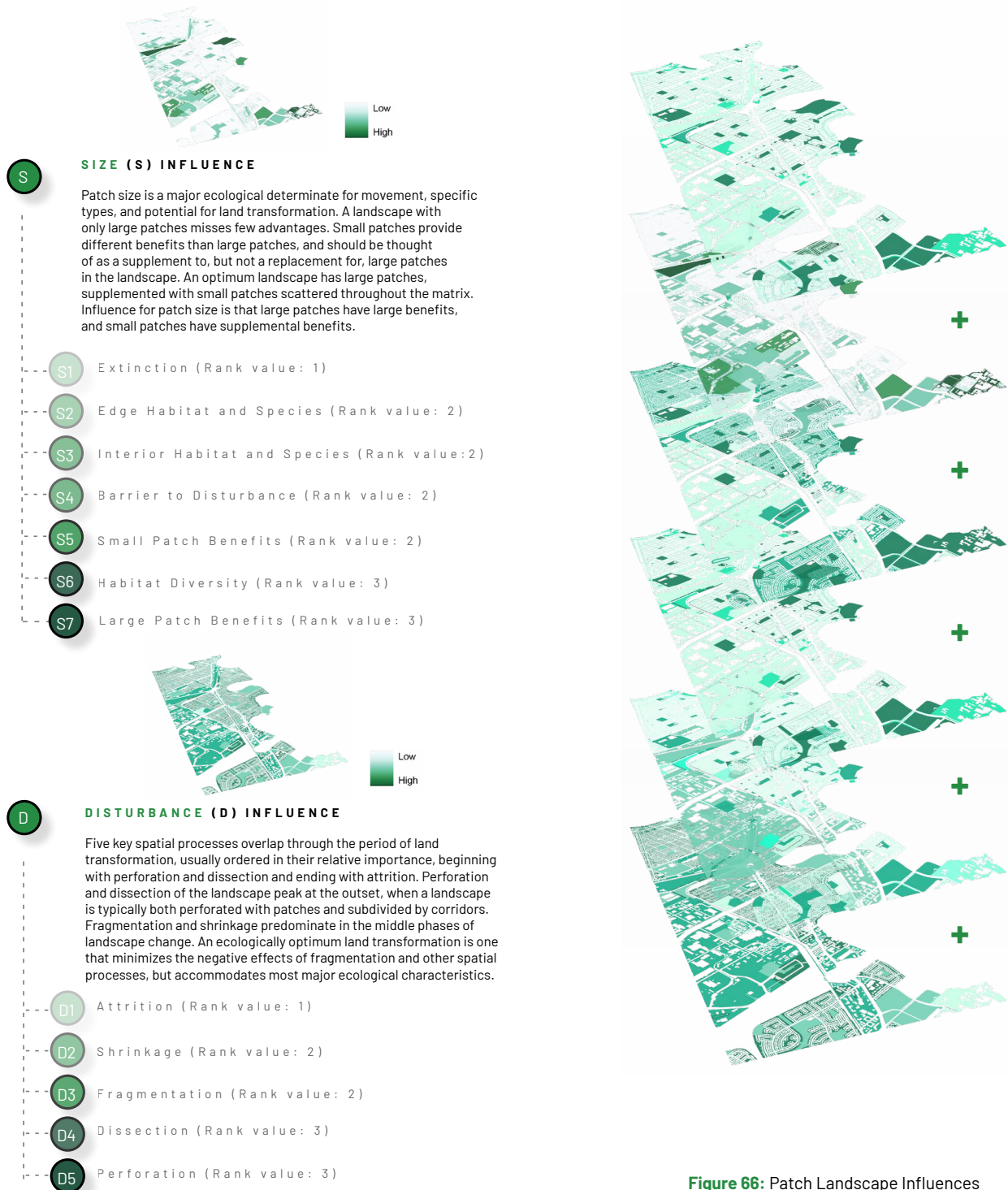


Figure 66: Patch Landscape Influences

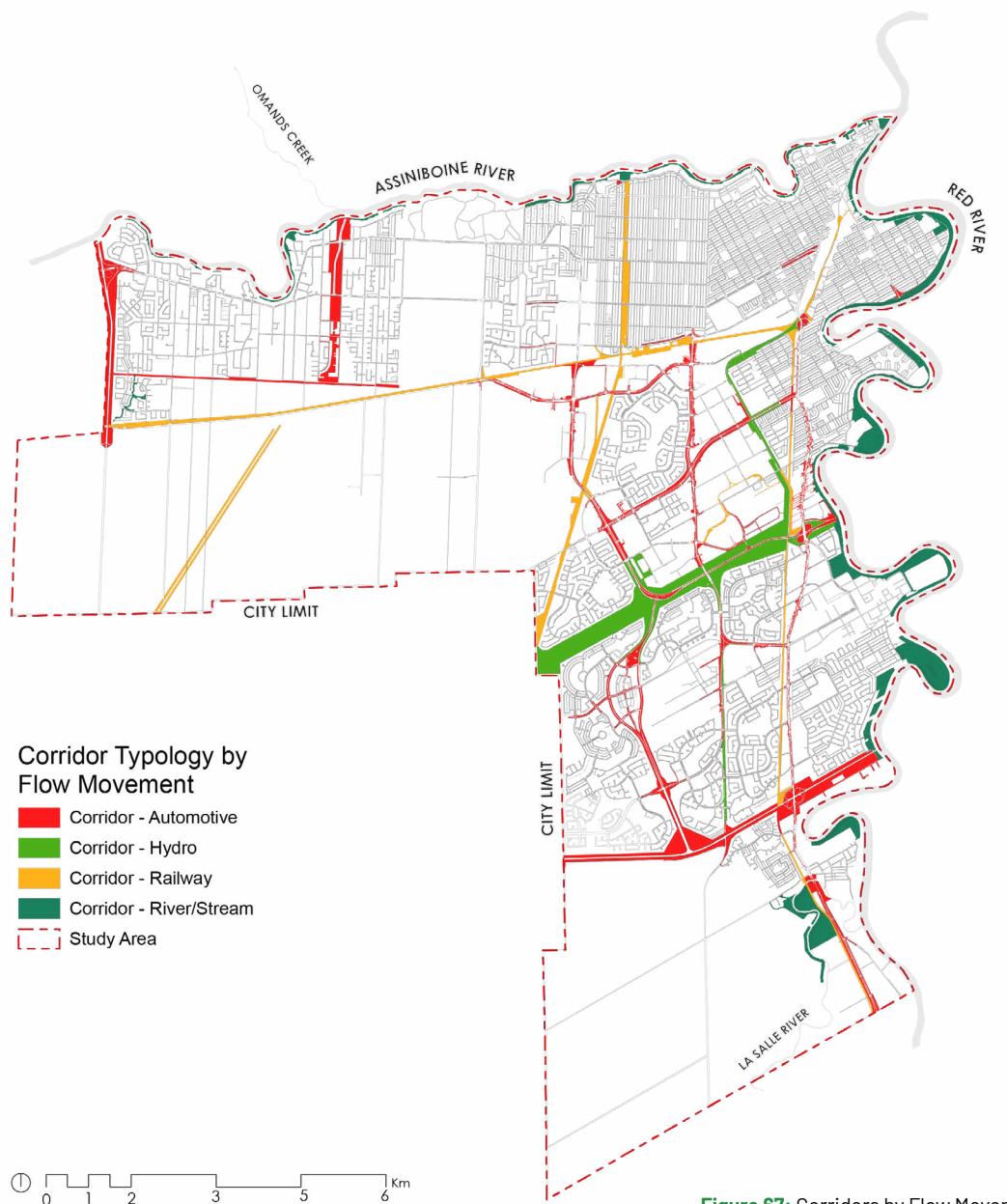


Figure 67: Corridors by Flow Movement

CRITERIA FOR CORRIDORS

A similar approach was applied for corridors by creating an inventory in the Southwest of Winnipeg to identify the indispensable patterns that are essential to the landscape within the study area. The second step involved applying the Aggregate-with-Outliers Principle to land uses where corridors are maintained throughout the developed areas, and identifying any outliers that are spatially arranged along the study area boundaries.⁵⁵

Above: Evaluation of land based corridor types by flow movement.

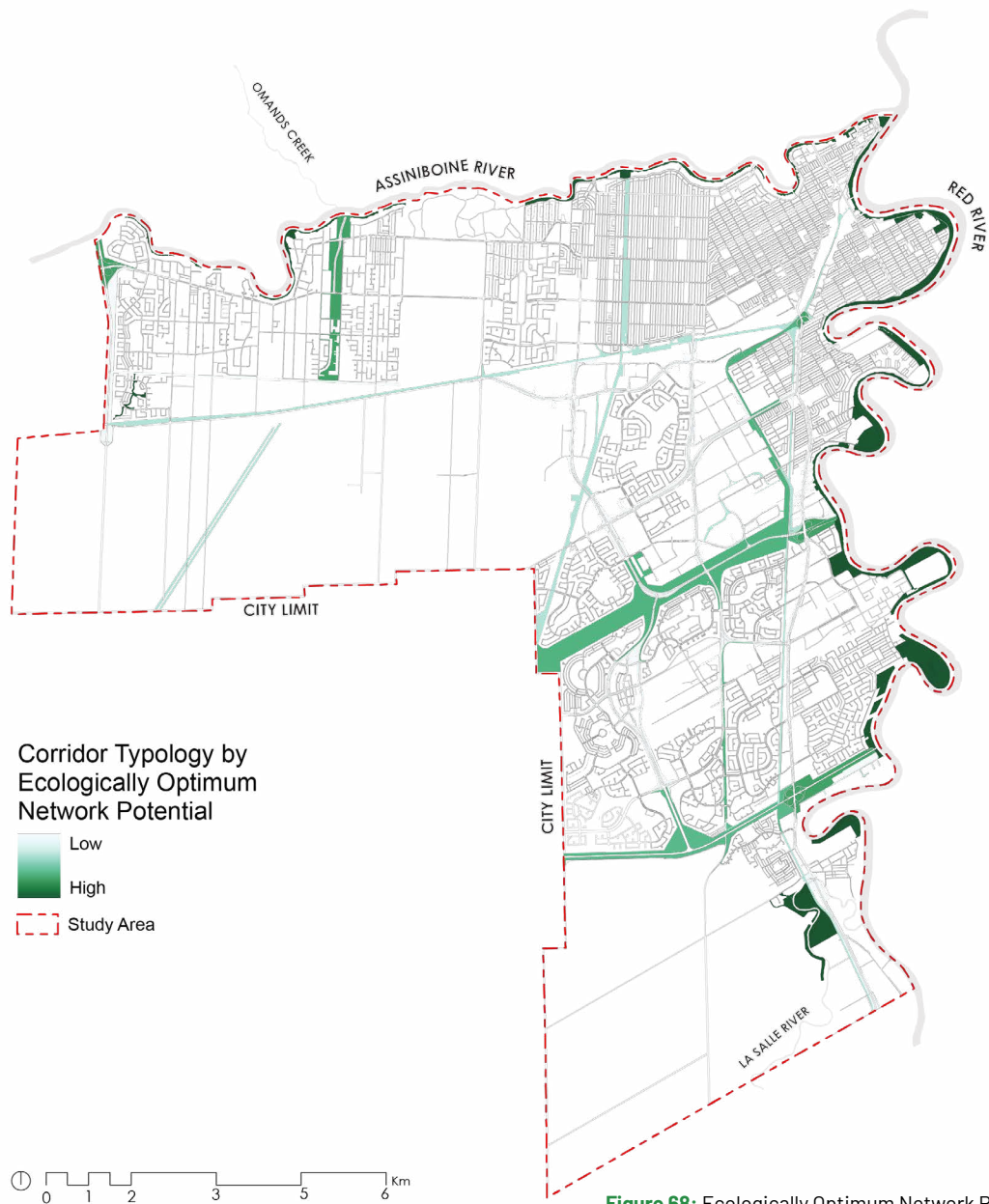


Figure 68: Ecologically Optimum Network Potential

Above: Applying Forman's Patch-Corridor-Matrix Model to corridors using landscape criteria.

The final step was applying the Patch-Corridor-Matrix Model with ranked criteria for corridors, which focused on key influences on the landscape matrix, including land use, location, function, movement types, corridor size, and level of disturbance based on human development patterns over time.⁵⁶ For detailed description of key influences applied in the ranked Patch-Corridor-Matrix Model (refer to **Figure 69**). Applying urban ecology as a method to the selected sites enabled the ranking of key corridors that have high potential for contributing to transformative change and enhancing an ecologically optimum network in the Southwest of Winnipeg.

NEGLECTED LANDSCAPES - CORRIDORS

landscape ecology + infrastructure

ranked (1-3) sum for *Ecologically Optimum Land Transformation (EOLT)* potential for neglected landscapes.

$$U + F + S + L + M + D = EOLT$$



U LAND USE (U) INFLUENCE

Land use adjacencies and proximity have a direct impact on the level of disturbance and ranking of the ecologically optimum land transformation. Built forms have levels of permanency versus natural environments for change. Built areas pose the least potential for change due to existing urban development, while corridors of land classified as agricultural and vacant landscapes have more potential for future transformation.

- U1 Built Area (Rank value: 1)
- U2 Recreation (Rank value: 2)
- U3 Open Space (Rank value: 3)
- U4 Environ. Storm water Mgmt. (Rank value: 3)
- U5 Agricultural (Rank value: 3)
- U6 Wild / Vacant (Rank value: 3)



L LOCATION (L) INFLUENCE

Corridor location can influence the probability of isolation as a function of distance and characteristics of resistance. A corridor located in close proximity to other corridors will have higher connectivity. Unusual or distinctive characteristics are important due to their high sensitivity to human impact, such as riparian areas and continuous river corridors.

- L1 Extinction Isolation (Rank value: 1)
- L2 Recolonization Close Proximity to Others (Rank value: 2)
- L3 Unusual Characteristics (Rank value: 3)

F FUNCTION (F) INFLUENCE

Five major functions of corridors can help to re-imagine levels of neglected landscapes based on their ability to facilitate movement along an network, where people, wildlife, and renewable energy cross paths to create unique synergies. Corridors perform functions in landscapes as habitat, conduits, filters, sources, and sinks. An optimum landscape will support corridors that can create habitat and act as conduits for people, flora, and fauna.

- F1 Filter (Rank value: 2)
- F2 Source (Rank value: 2)
- F3 Sink (Rank value: 2)
- F4 Habitat (Rank value: 3)
- F5 Conduit (Rank value: 3)

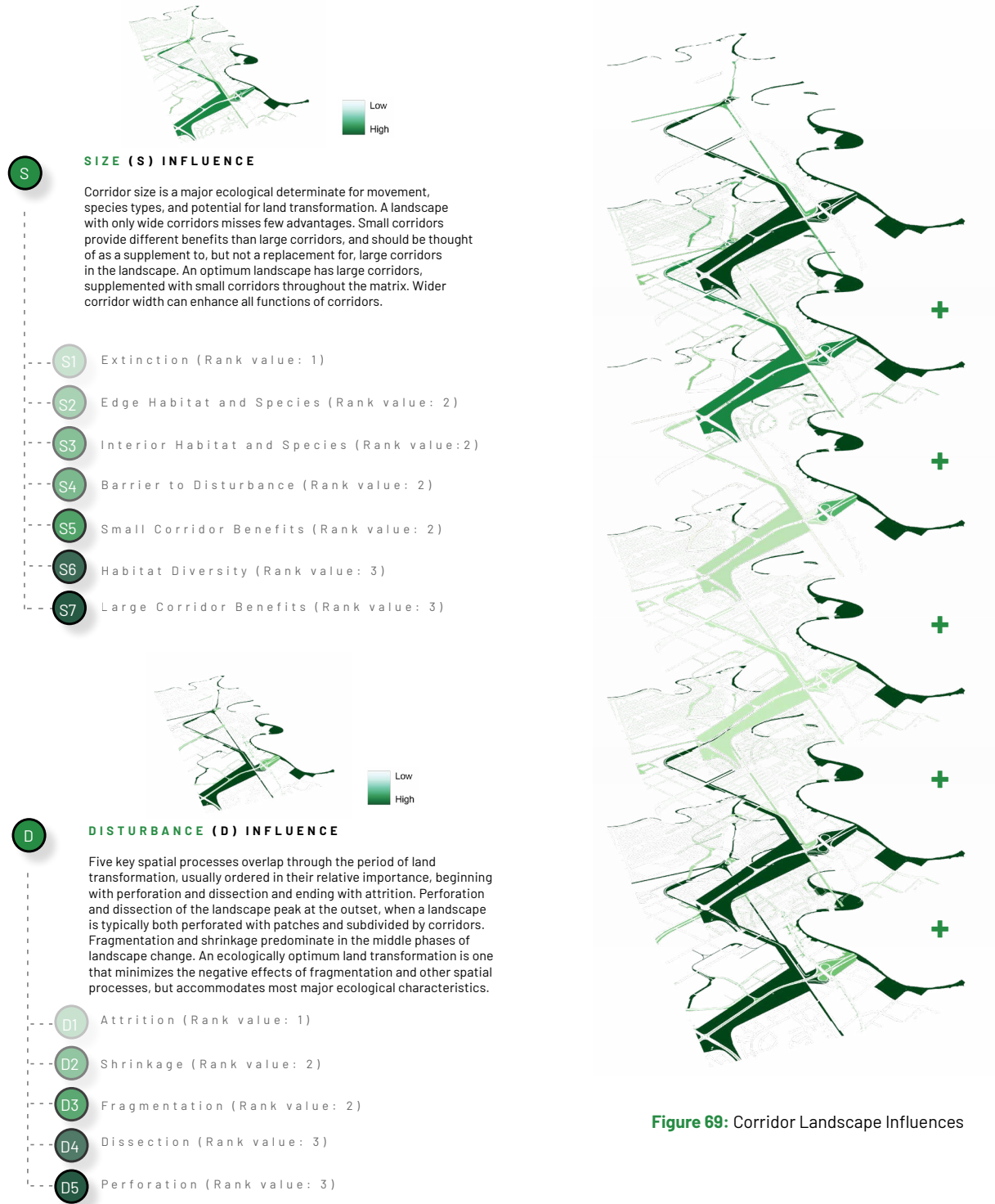


M MOVEMENT (M) INFLUENCE

Corridors facilitate efficient movement of objects throughout the matrix. Corridors can be conduits for people, goods, water, sediment, nutrients, energy, wind, and wildlife that move in, or adjacent to, many other corridors. Many structural attributes influence the movement along and within corridor types. Proximity to significant environmental corridors or patches influence the potential contribution of an ecologically optimum land transformation to the overall matrix network.

- M1 Automotive (Rank value: 1)
- M2 Passive Recreation (Rank value: 1)
- M3 Energy Transmission (Rank value: 2)
- M4 Corridor Gaps (Rank value: 2)
- M5 Barrier to Wildlife (Rank value: 2)
- M6 Barrier to Humans (Rank value: 2)
- M7 Wind Erosion/Exposure (Rank value: 2)
- M8 Vegetation/Plant Compositions (Rank value: 3)
- M9 Stepping Stones (Rank value: 3)
- M10 Clustering (Rank value: 3)
- M11 Upland Species (Rank value: 3)
- M12 Floodplain/Wetland Species (Rank value: 3)
- M13 Continuous Vegetated (Rank value: 3)

Similar to patches, the same methodology was applied to illustrate the future potential of lands that could serve to bridge needs for urban ecology with areas along infrastructure types that have varying degrees of underutilization or neglect. This analysis was applied at the **corridor scale**, creating a customized dataset that adds up ranked criteria derived from Richard Forman's Patch-Corridor-Matrix and guiding principles for indispensable patterns for corridors.⁵⁷ High ranked (darker green) areas were most optimum for creating an ecologically optimum land transformation through landscape strategies.



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CHAPTER
08

SITE + CONTENT ANALYSIS

SITE AND CONTENT ANALYSIS - LAYERING STRATA

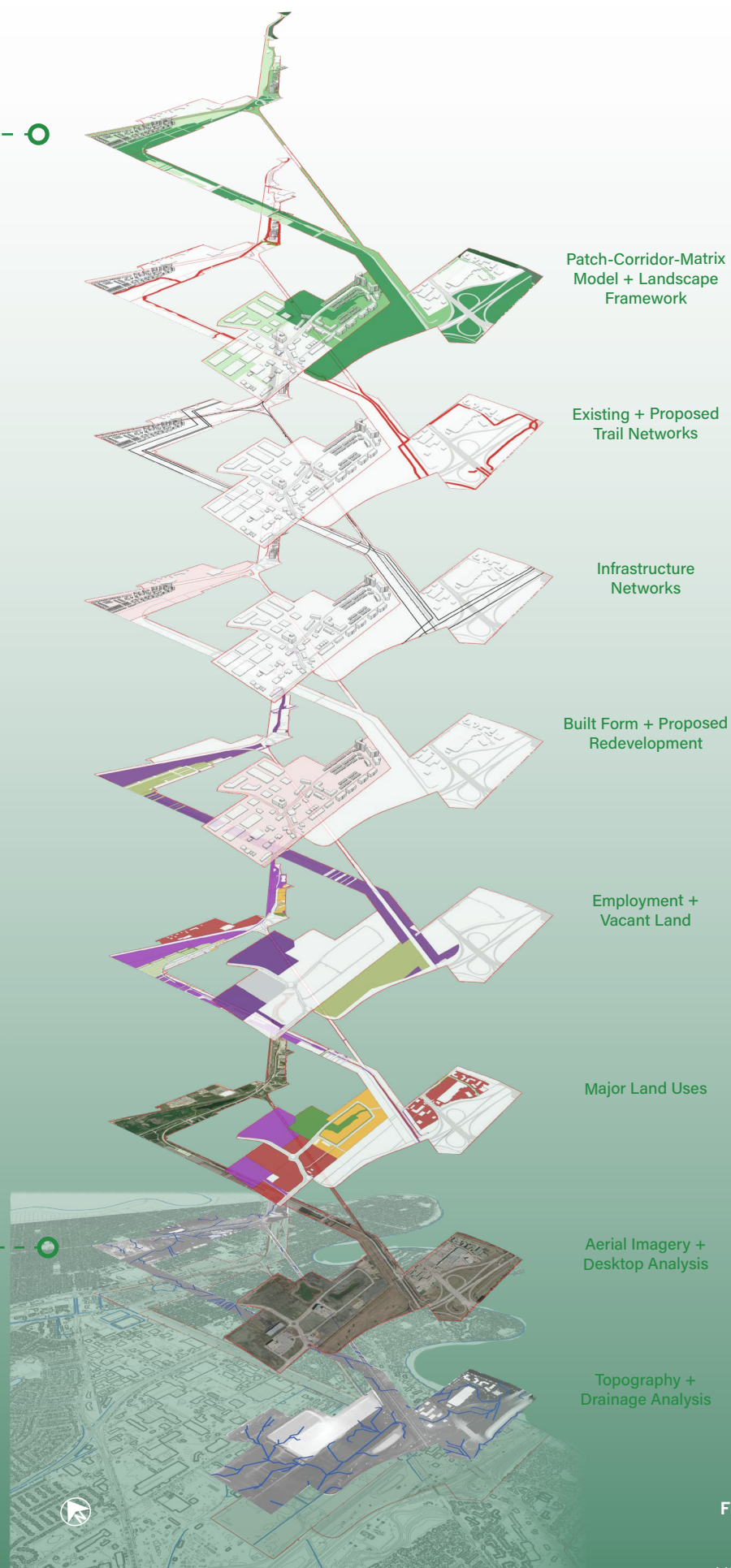


Figure 70: Site and Content Analysis

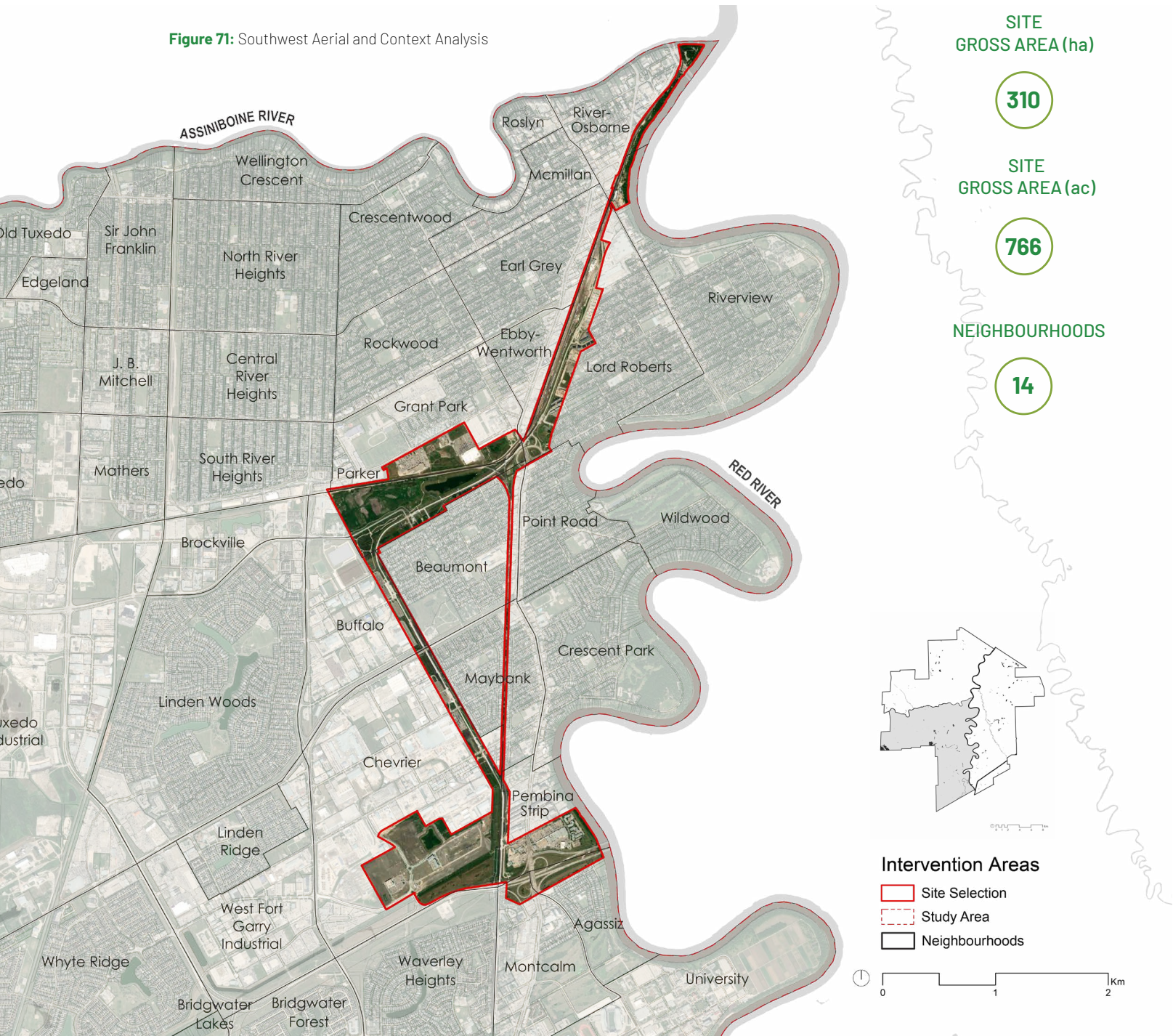
CONTEXT

The selected sites consist of a total gross area of 310 ha (766 ac). An analysis of the aerial imagery of the sites was conducted in addition to the land uses and built form along the site boundaries and adjacent neighborhoods. The sites are adjacent to a total of 14 neighborhoods.

Below: Aerial analysis of adjacent neighbourhood context.

Right: Aerial analysis of selected sites.

Figure 71: Southwest Aerial and Context Analysis





- **To the north** is Parker, Grant Park, Ebby-Wentworth, and Earl Grey.
- **To the south** is Waverly Heights, Montcalm, and Agassiz.
- **To the west** is Chevrier and Buffalo.
- **To the east** is Pembina Strip, Maybank, Beaumont, Crescent Park, Point Road, Wildwood, Lord Roberts, and Riverview.

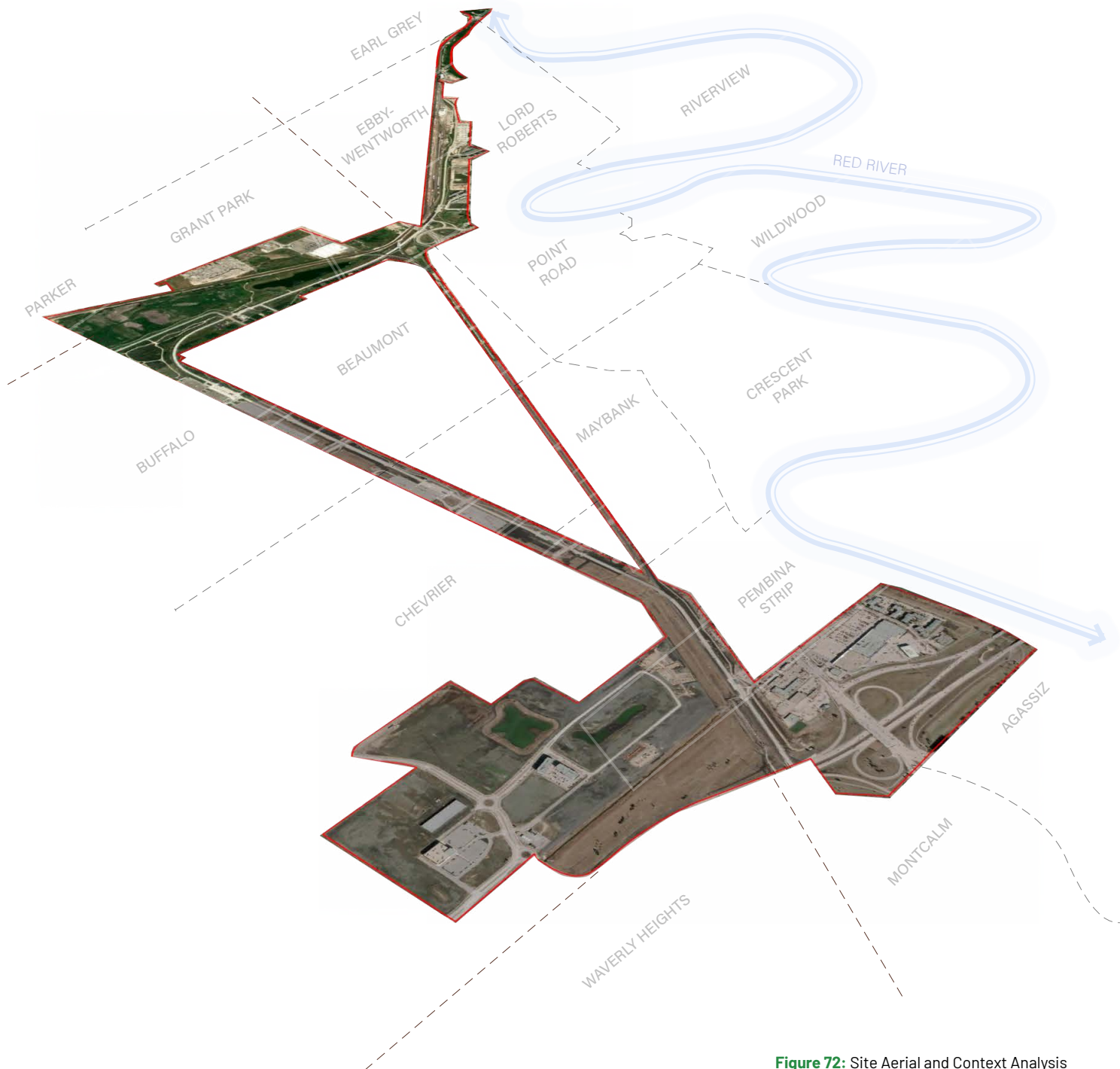


Figure 72: Site Aerial and Context Analysis

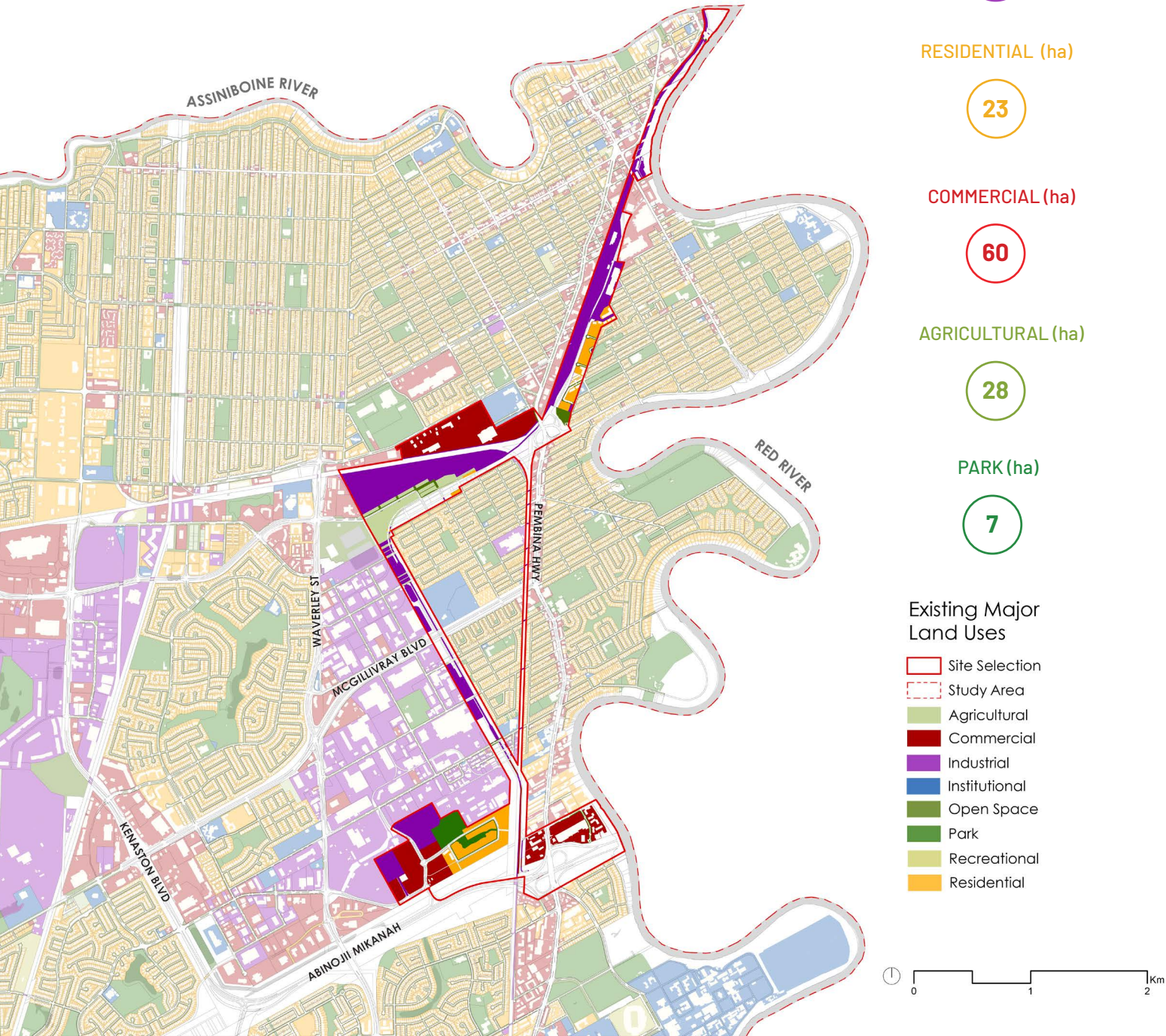
MAJOR LAND USES

The selected sites were reviewed to assess the potential land uses that may contribute to transformative opportunities based on existing underutilized lands and where ecological networks may contribute to adjacent land uses along infrastructure corridors. Within the sites, the majority of the lands are designated as

Below: Land use analysis of adjacent neighbourhood context.

Right: Site analysis of land use and existing conditions.

Figure 73: Southwest Major Land Use Analysis





industrial (136 ha), commercial (60 ha), agricultural (28 ha), residential (23 ha), and future planned parkland (7 ha). Based on this analysis of major land uses, opportunities exist to use former industrial and commercial lands to re-imagine how urban ecology can be interfaced with infrastructure and land uses.

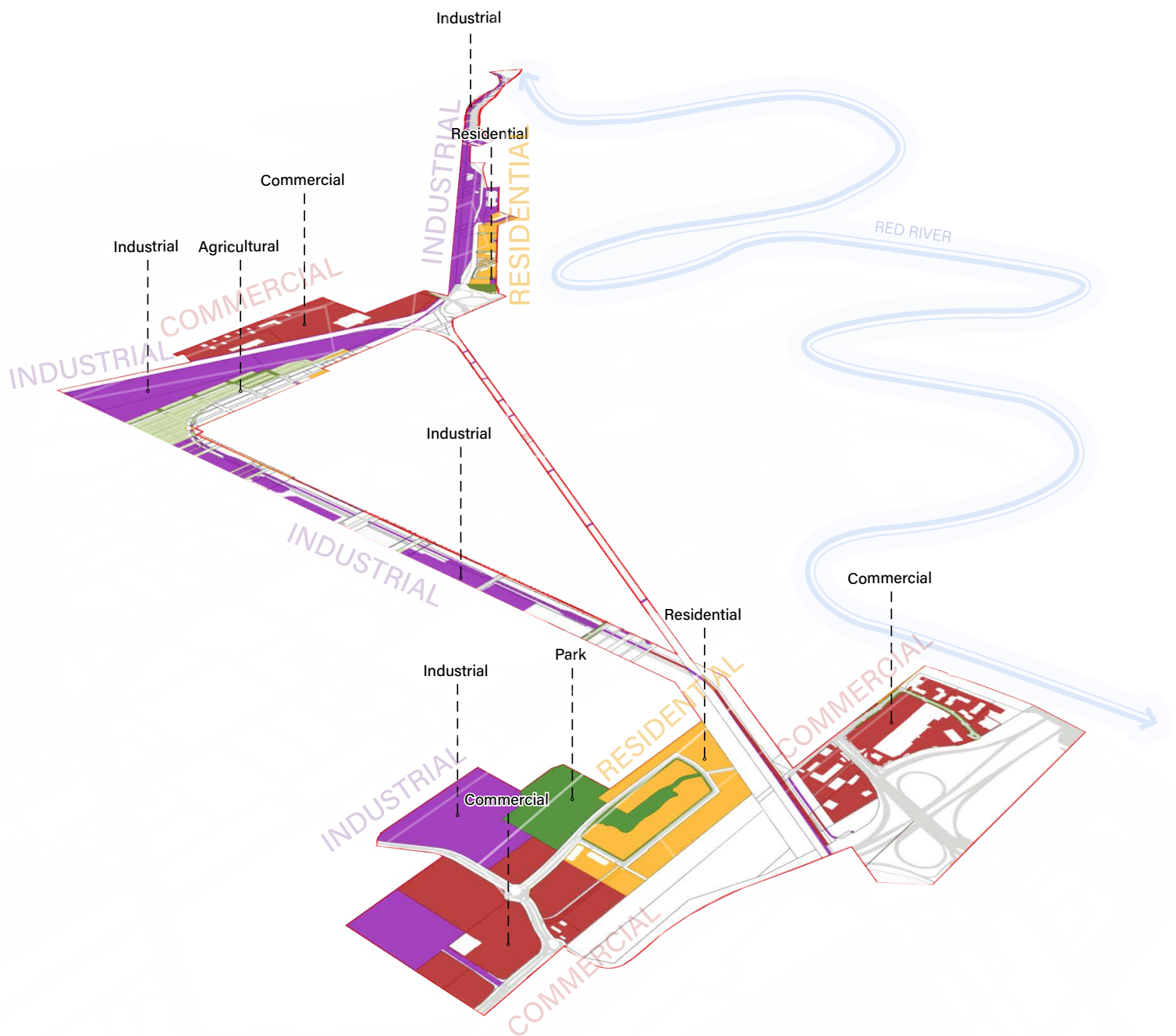


Figure 74: Site Major Land Use Analysis

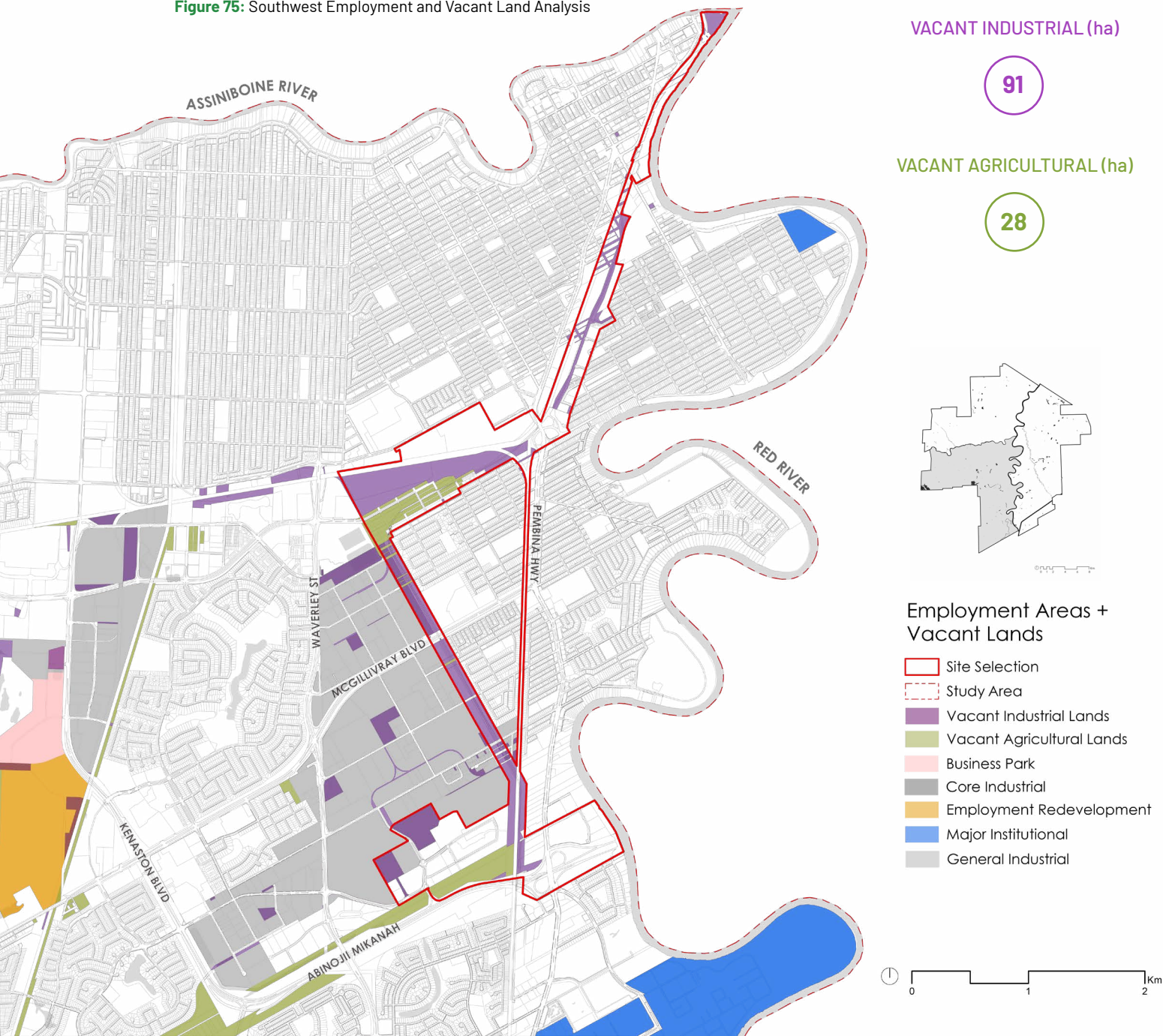
EMPLOYMENT + VACANT LANDS

A review of vacant land supply in the Southwest of Winnipeg included vacant industrial lands (91 ha) and vacant agricultural lands (28 ha), which corresponds to key infrastructure corridors along the Manitoba Hydro corridors and adjacent major roadway verges. These vacant lands will form suitable locations to further investigate transformative opportunities and re-imagining neglected landscapes along Winnipeg's infrastructure

Below: Employment and vacant land analysis of adjacent neighbourhood context.

Right: Exploring the synergies for existing employment and vacant lands for future transformative opportunities.

Figure 75: Southwest Employment and Vacant Land Analysis





corridors. Opportunities also exist to look towards sustainable opportunities to incorporate former industrial and agricultural uses into synergistic land uses that could contribute to the ecological network between the selected sites.

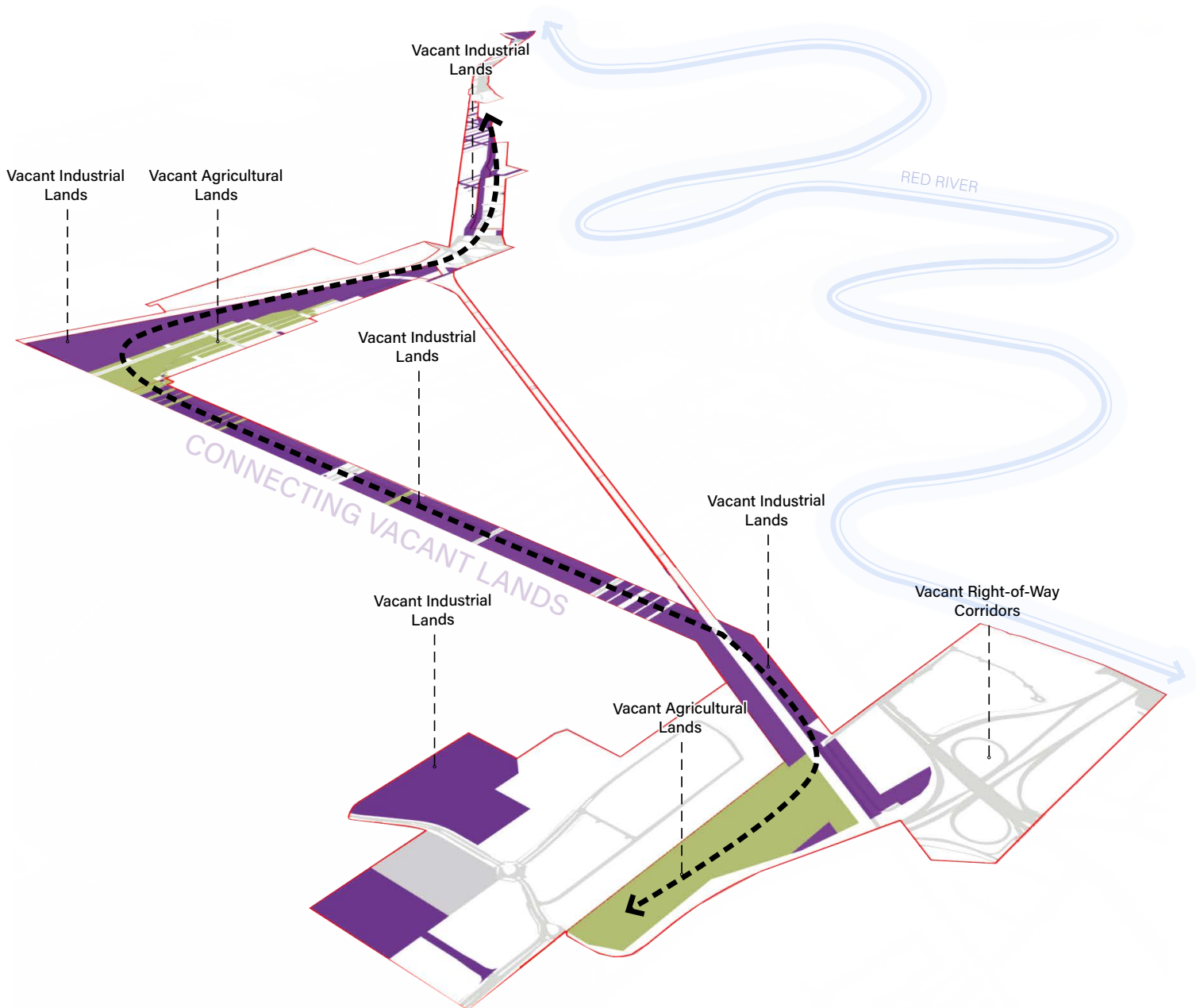


Figure 76: Site Employment and Vacant Land Analysis

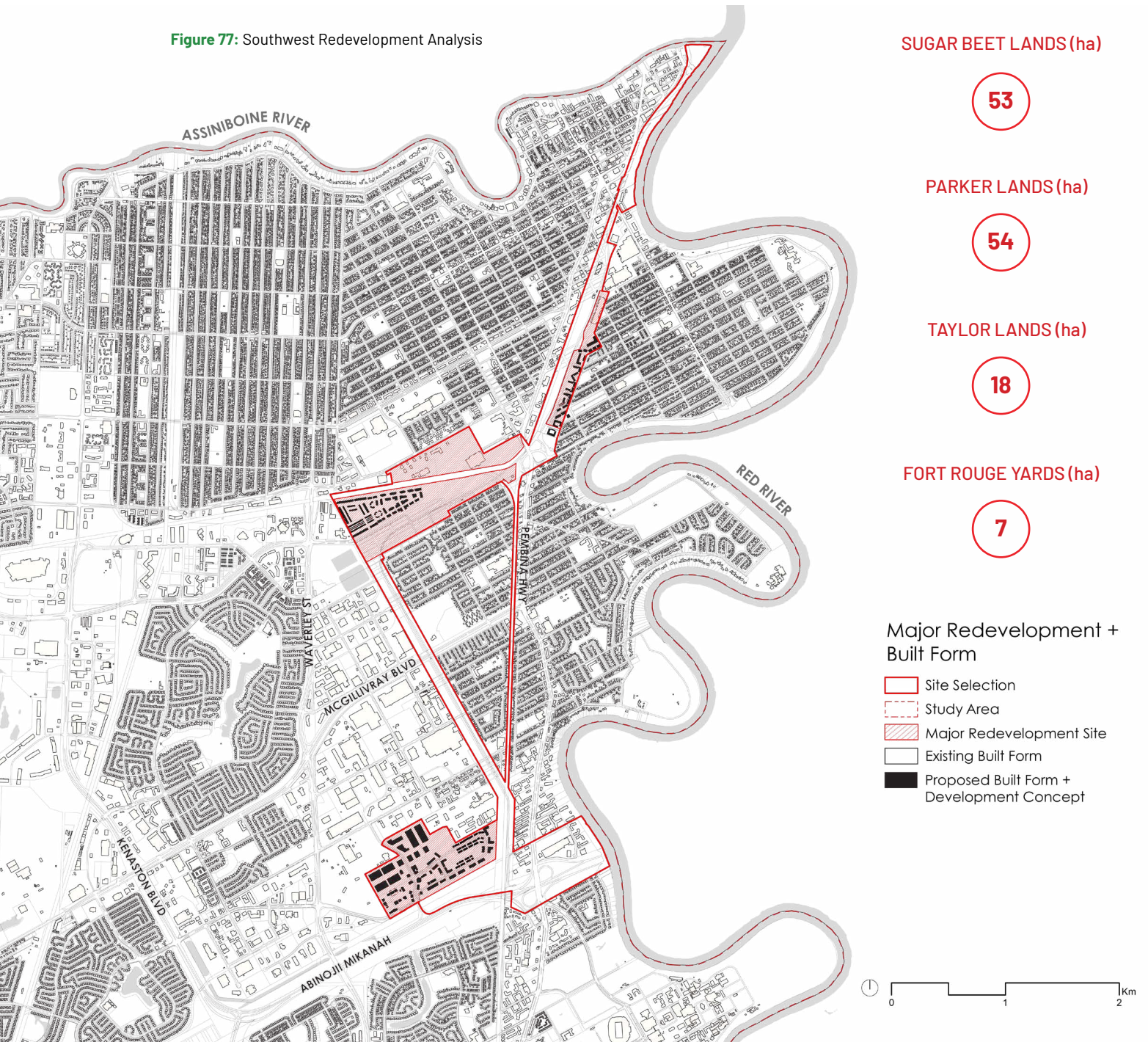
BUILT FORM + REDEVELOPMENT

A key aspect for the selection of sites included the potential for interfacing urban ecology and infrastructure corridors with Transformative Areas identified by the City of Winnipeg through *OurWinnipeg 2045 Development Plan* and *OurWinnipeg Direction Strategy 2.0* for infill and redevelopment.^{58, 59}

Below: Built form analysis of existing and proposed redevelopment and adjacencies.

Right: Site analysis of existing and planned redevelopment to support and trigger transformative opportunities with infrastructure and urban ecology.

Figure 77: Southwest Redevelopment Analysis





Four (4) major redevelopment sites are interlinked by site infrastructure that has the potential to create unique network synergies, including the Area Master Plans for the Sugar Beet Lands (53 ha), Parker Lands (54 ha), Taylor Lands (18 ha), and the Fort Rouge Yards (7 ha), each with unique landscape opportunities.

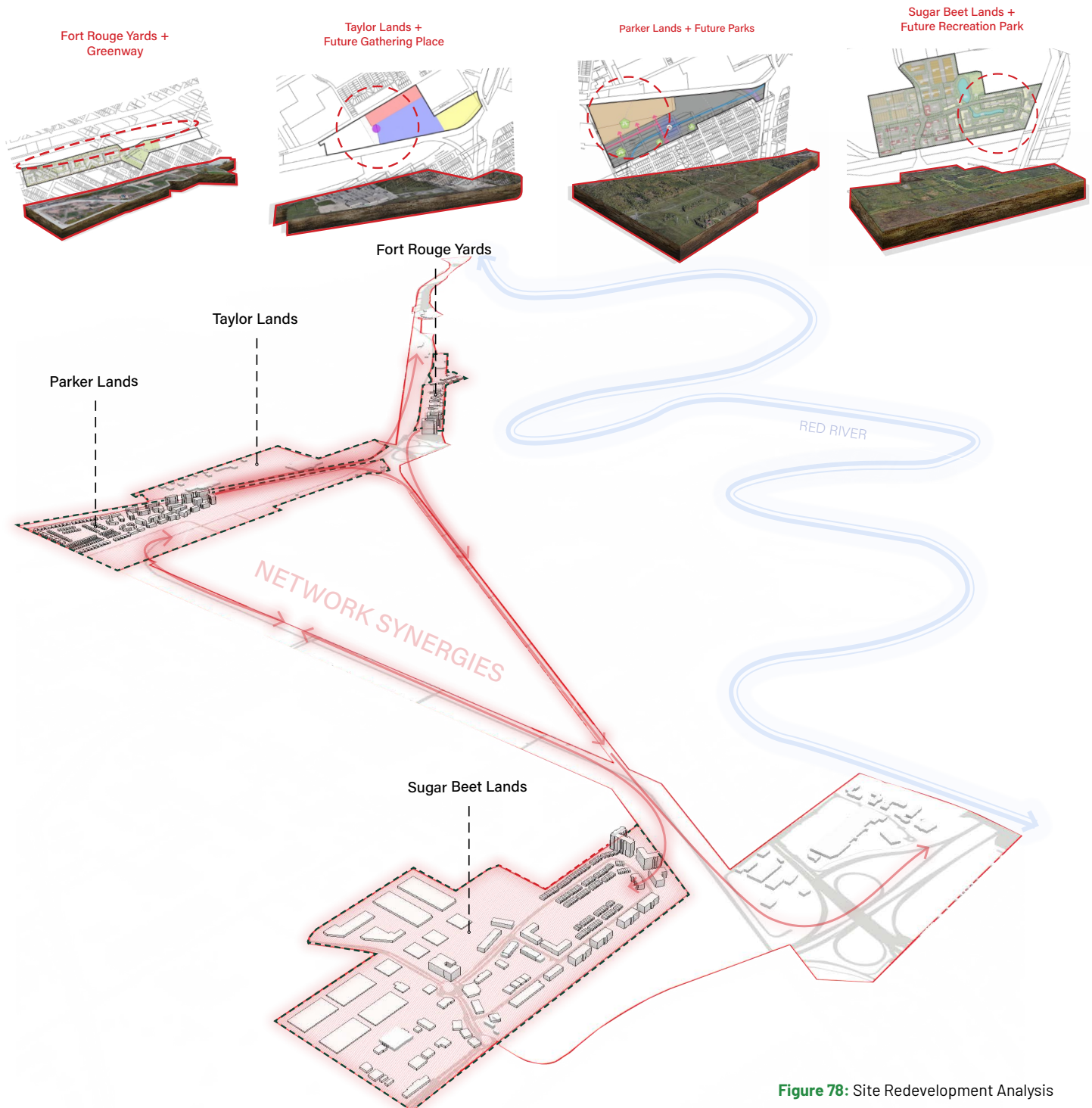


Figure 78: Site Redevelopment Analysis

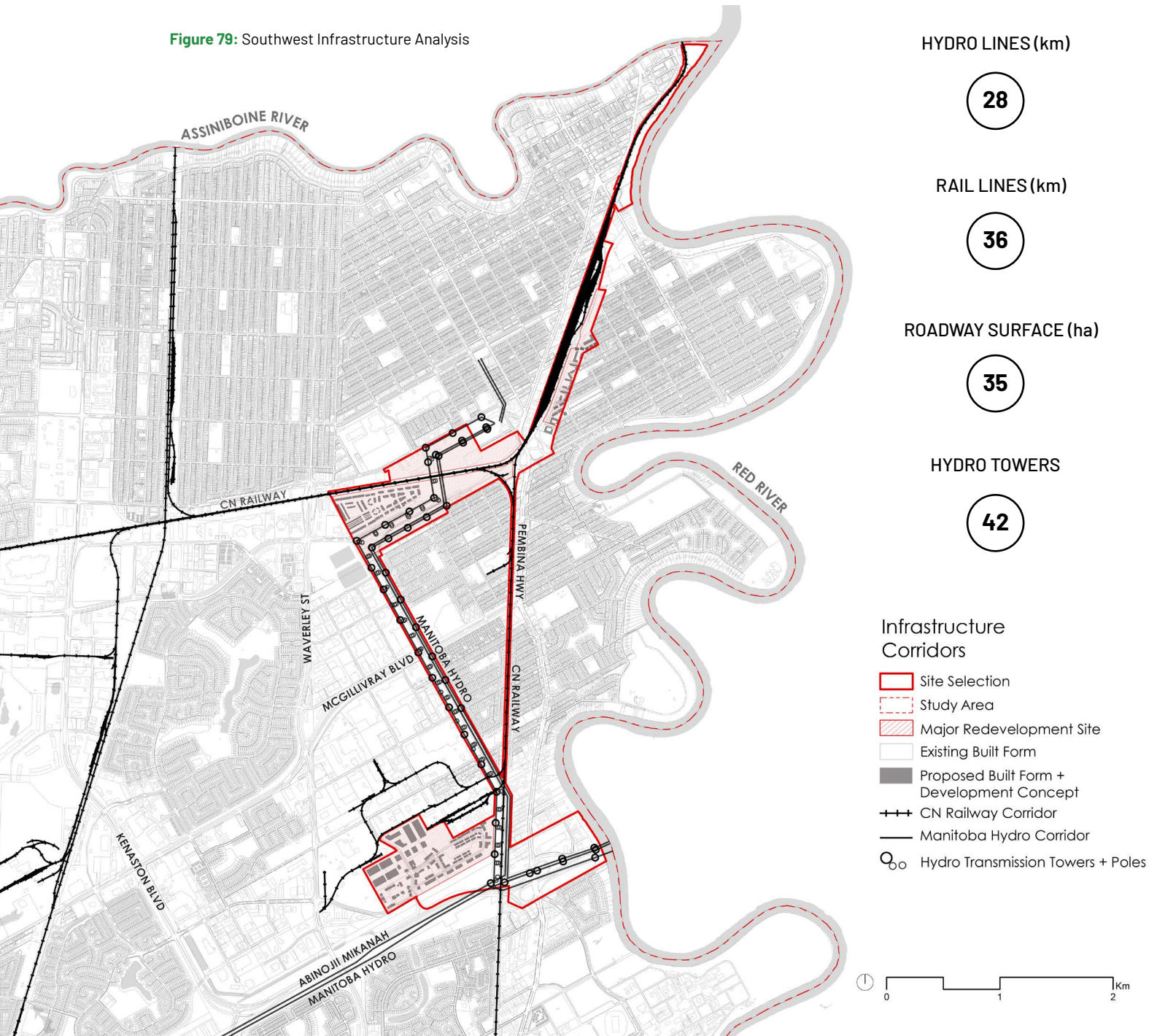
EXISTING INFRASTRUCTURE

The selected sites consist of three (3) types of linear infrastructure that have the potential to contribute to transformative opportunities, including Manitoba's Hydro corridors (approx. 28 km), railway spurs and branches (approx. 36 km), and major roadway surfaces (approx. 35 ha). A total of 42 Hydro Electric towers exist within the selected sites, creating unique overhead challenges for landscape strategies.

Below: Neighbourhood analysis of existing infrastructure in the Southwest of Winnipeg.

Right: Site analysis of existing infrastructure and connections linking redevelopment sites and vacant lands.

Figure 79: Southwest Infrastructure Analysis



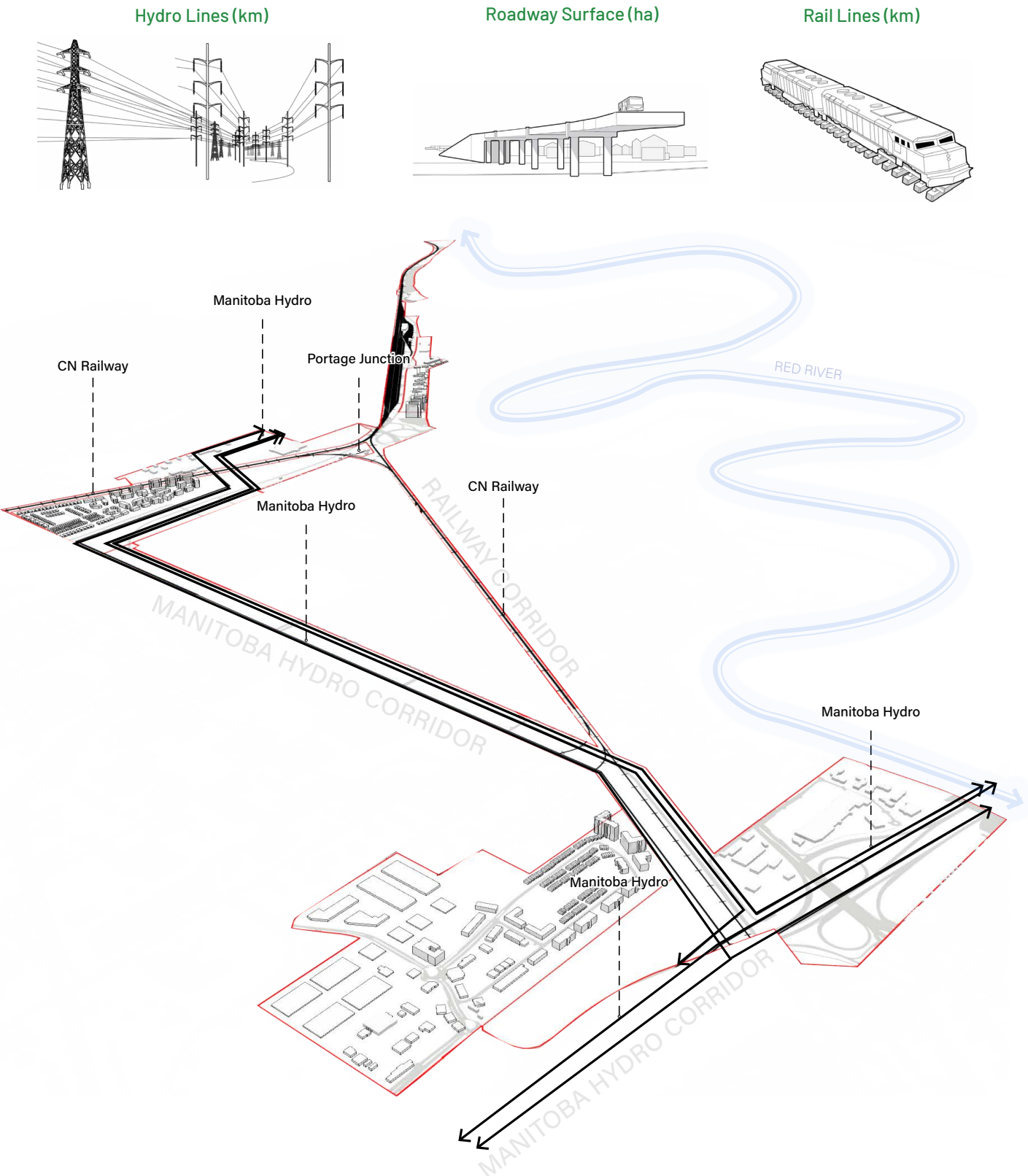


Figure 80: Site Infrastructure Analysis

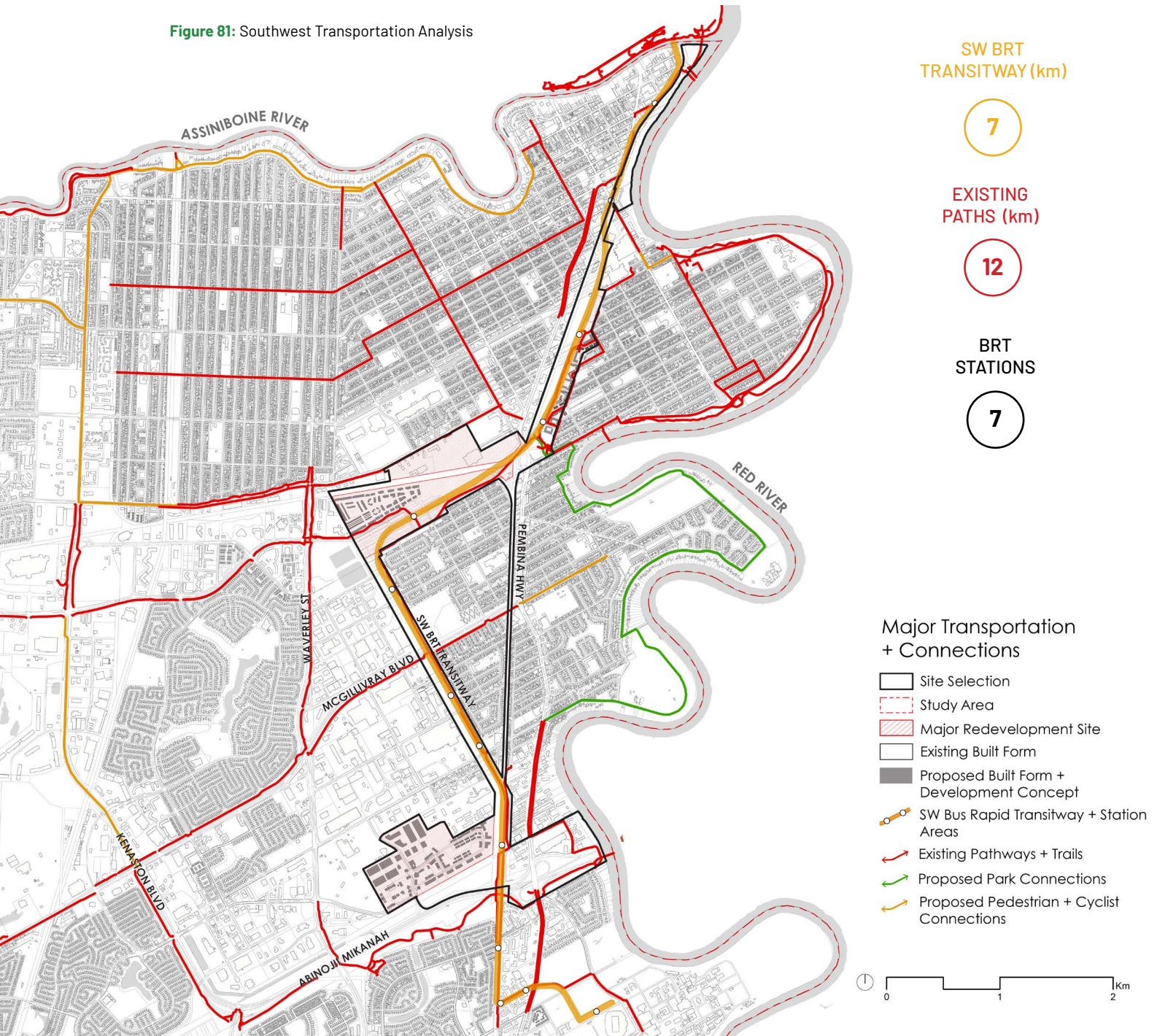
TRANSPORTATION CONNECTIONS

Existing and proposed pathways and connections intersect the selected sites, including existing pathways and trails (12 km), Southwest Bus Rapid Transitway (7km), and seven (7) key BRT station areas. The selected sites have the potential to integrate existing pathways and trails along transitways with infrastructure corridors as part of future strategies for transformative change.

Below: Neighbourhood analysis of existing and future planned trail and transportation connections.

Right: Site analysis of key intersections and mobility connections.

Figure 81: Southwest Transportation Analysis



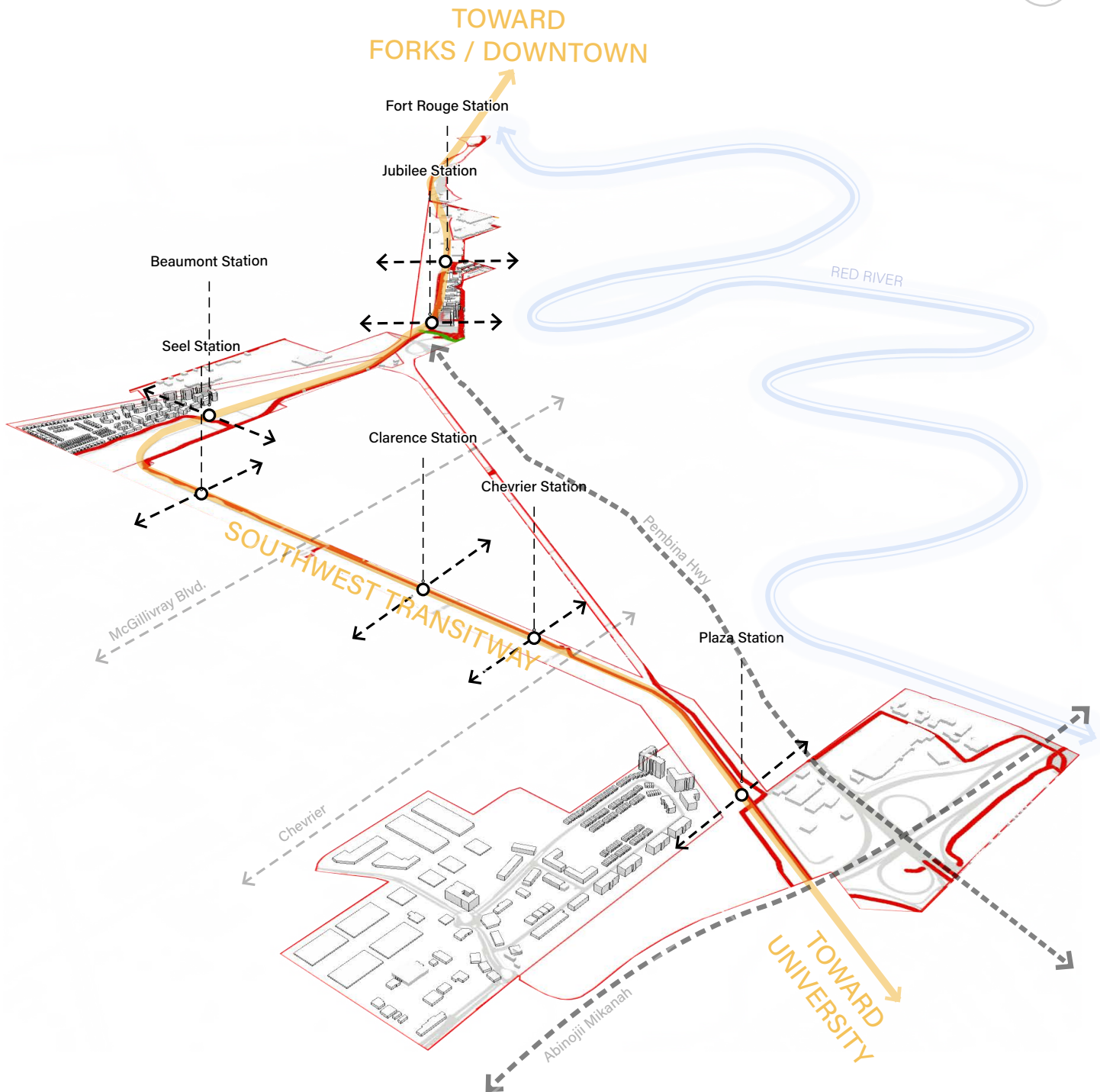


Figure 82: Site Transportation Analysis

TOPOGRAPHY + DRAINAGE

The selected sites have low and high areas, including the lowest contour points at 224 m and the highest contour points at 249 m. The lower elevation areas are located along the Red River and riparian areas, while the highest points are located along key infrastructure crossings for roadways, transitways, and elevated grades around existing developed areas. Predicted drainage for the site flows south and southeast towards the Red River, which flows through a major drainage ditch that carries storm water from Whyte Ridge, Linden Ridge and the west of Fort Garry Industrial Area to the Red River.

Below: Neighbourhood analysis of topography and digital elevation model.

Right: Site analysis of key drainage connections and outflow locations into the Red River.

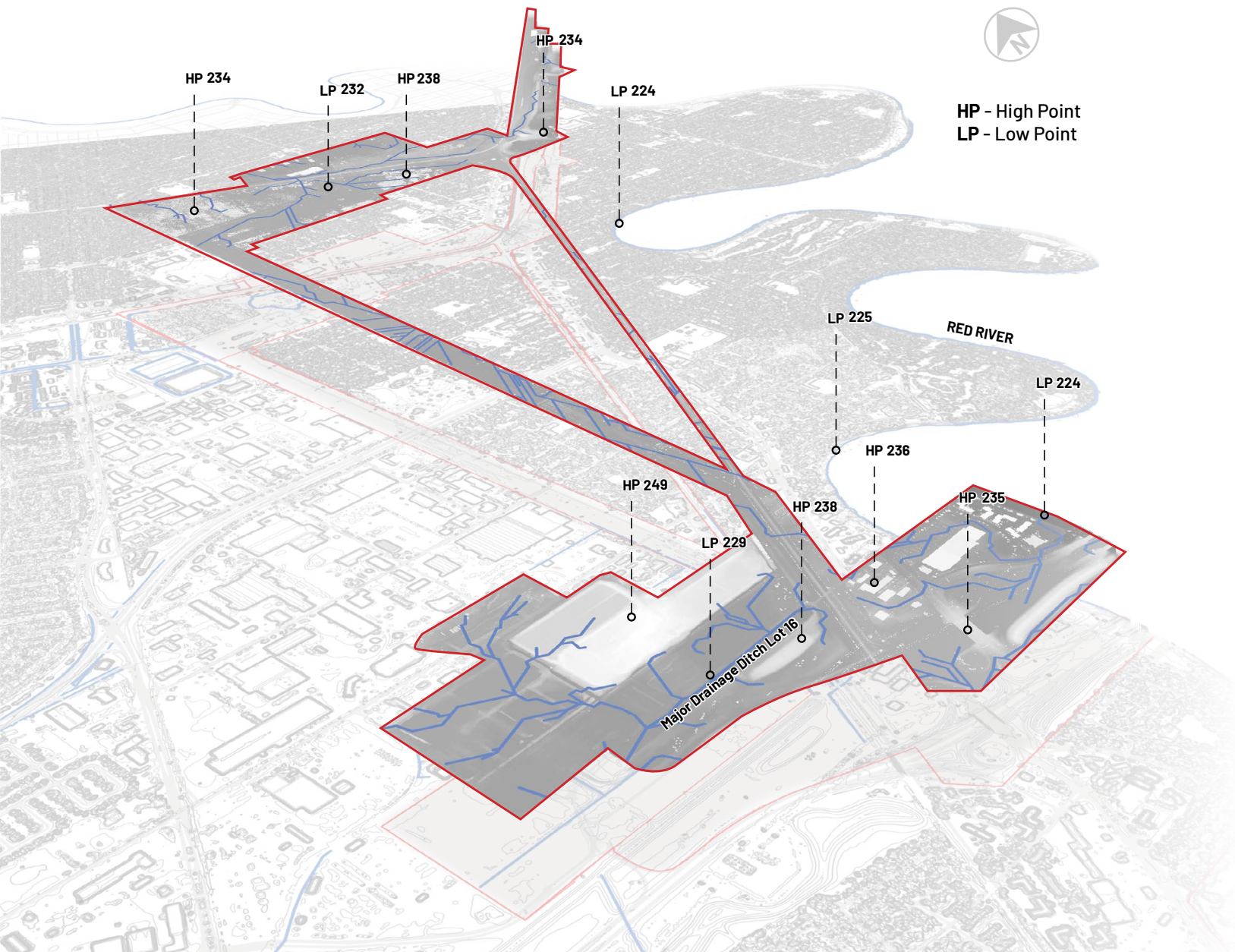


Figure 83: Southwest Topography and Drainage Analysis

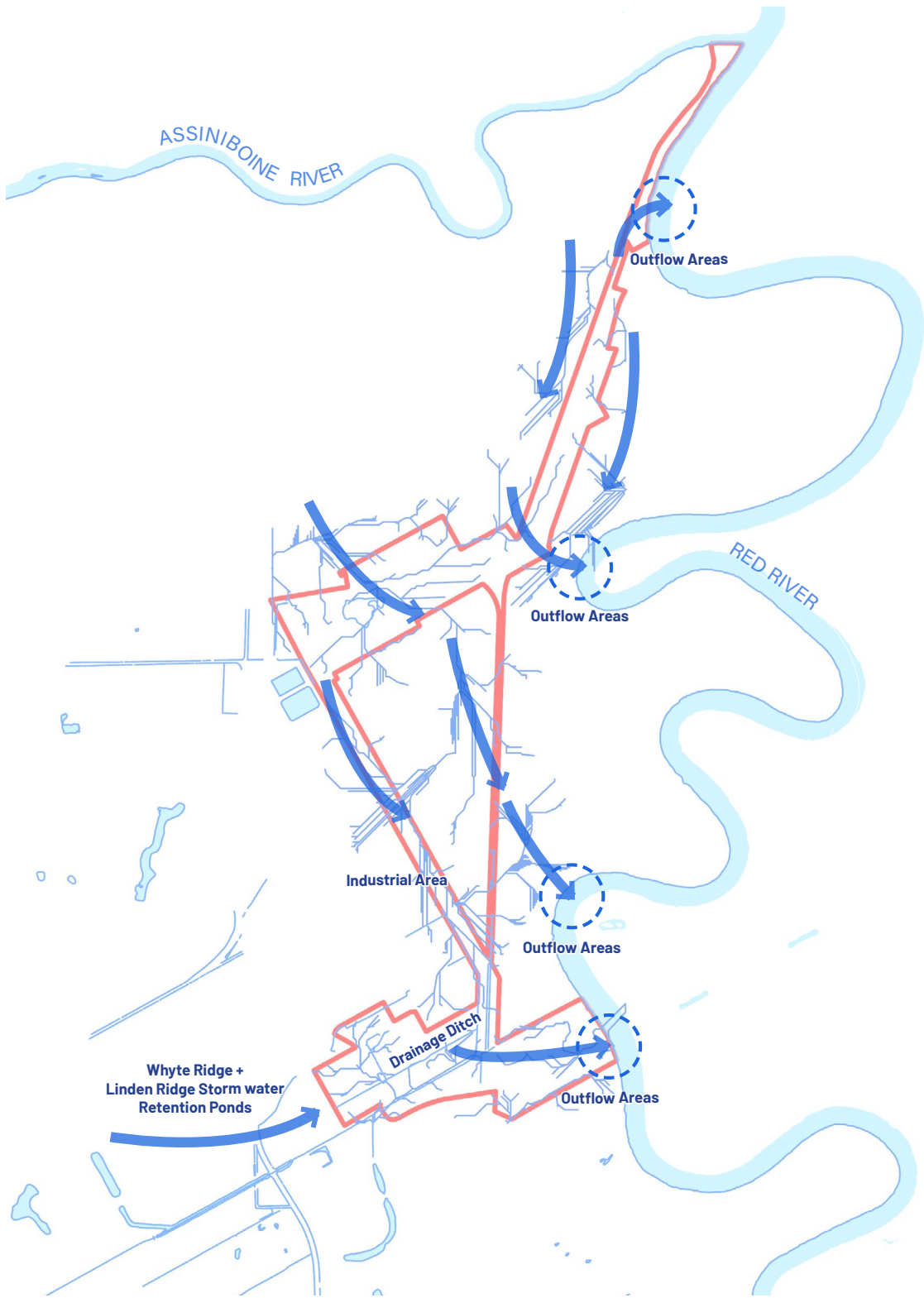


Figure 84: Site Topography and Predicted Drainage Analysis

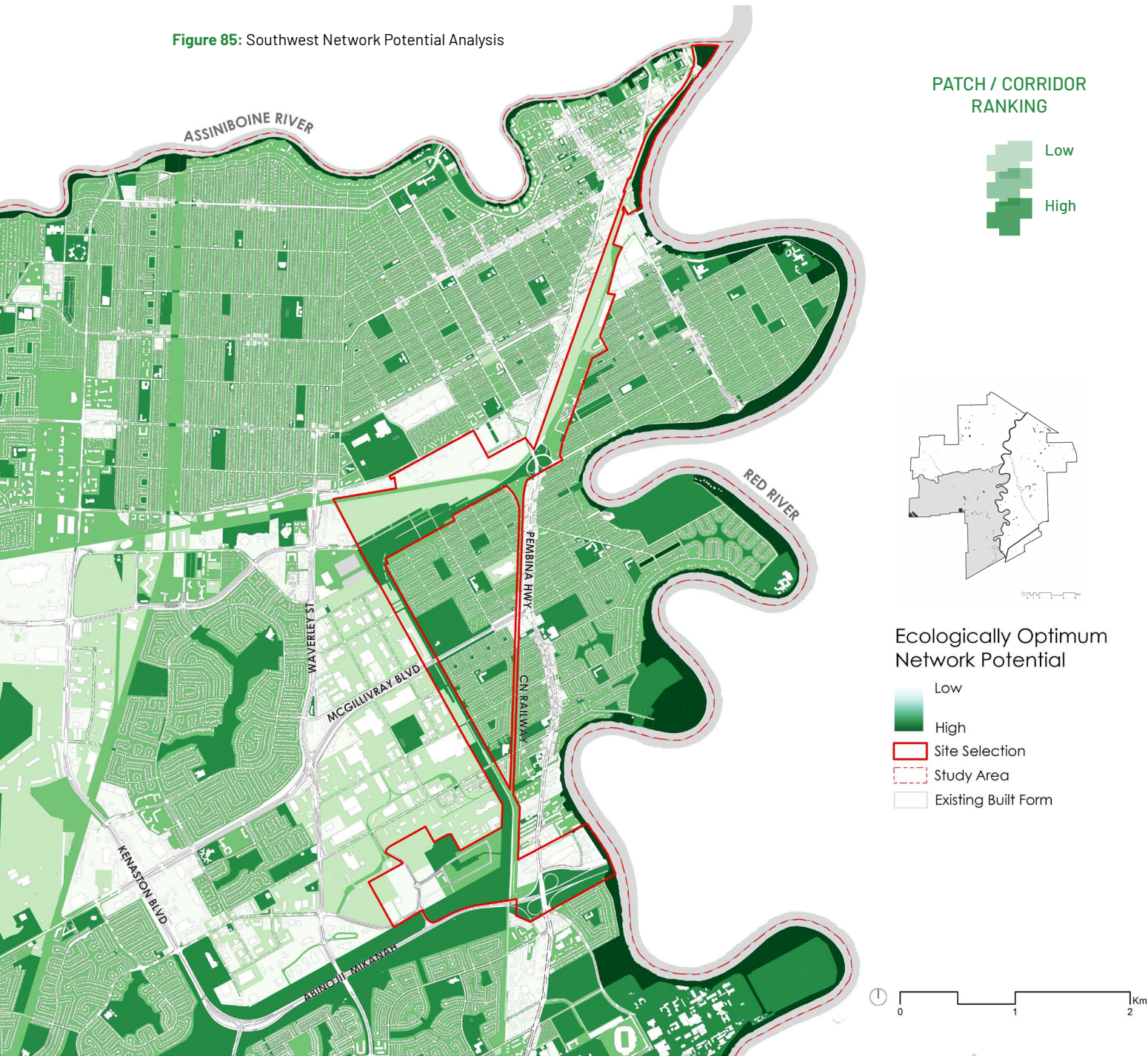
PATCH-CORRIDOR-MATRIX

The landscape influences for patches and corridors were applied to the selected sites to determine which areas and infrastructure corridors demonstrate the lowest and highest network potential for applying strategies to enable transformative change. Key areas that demonstrated highest ranking, identified as darker green, was posed most suitable for integrating infrastructure with urban ecology.

Below: Neighbourhood analysis of applying Patch-Corridor-Matrix model to assess transformative opportunities to contribute to an ecological network.

Right: Site analysis of areas of high network potential for integrating infrastructure with urban ecology.

Figure 85: Southwest Network Potential Analysis



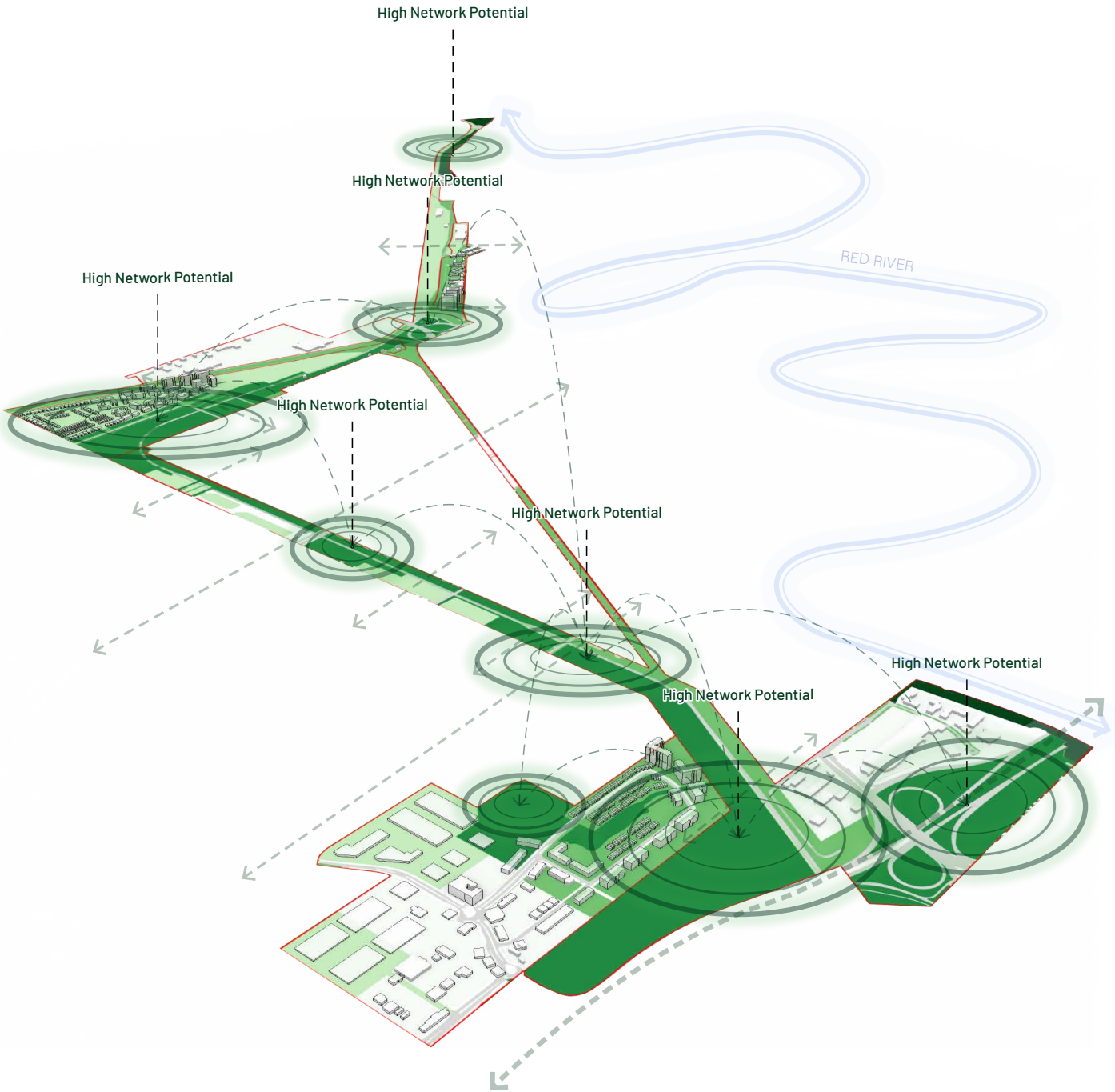


Figure 86: Site Network Potential Analysis

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CHAPTER

09

PROCESS WORK



Figure 87: Conceptual Sketches

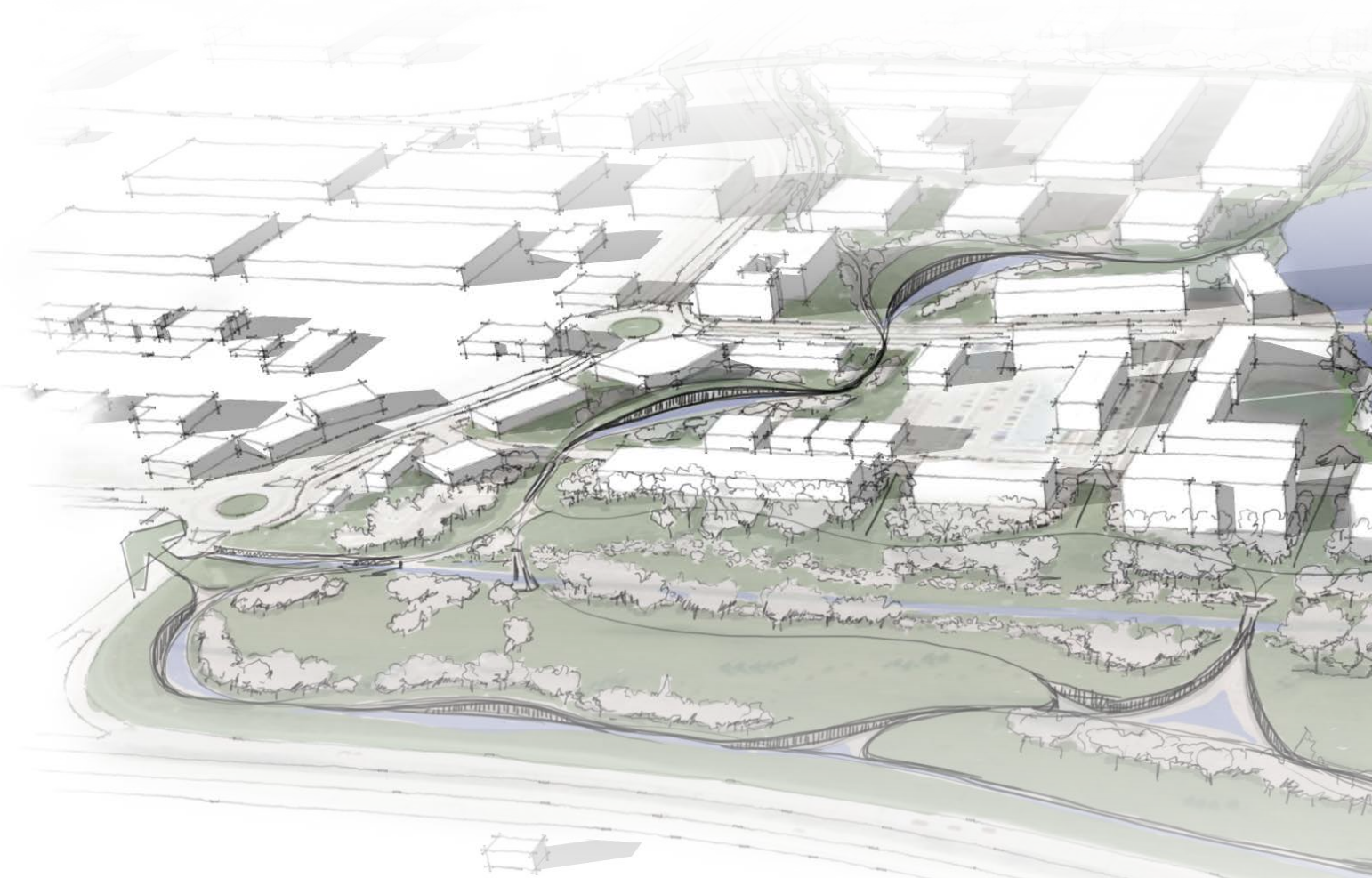


Figure 88: Initial Design Explorations

SYNERGIES

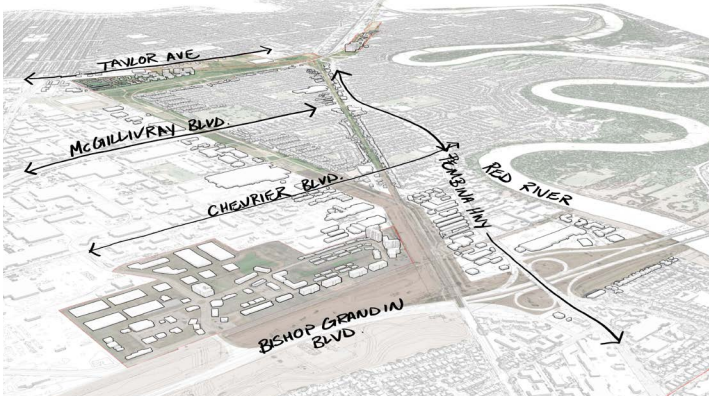
As part of the design process, initial work on spatial synergies was undertaken to explore the potential of interfacing landscape and urban ecology with infrastructure corridors that can contribute to an ecological network interfaced with Winnipeg's Transformative Areas for redevelopment. There is potential for enhancing the ecological benefits of large patches within infrastructure corridors that can be further supported by City re-investment for transformative change. Initial process work explored how design strategies could be developed for infrastructure types, including hydroelectric transmission lines, railway spurs and branches, roadway verges, and natural strips designated as vacant agricultural lands in Winnipeg.

Above: Initial sketches and ideas.

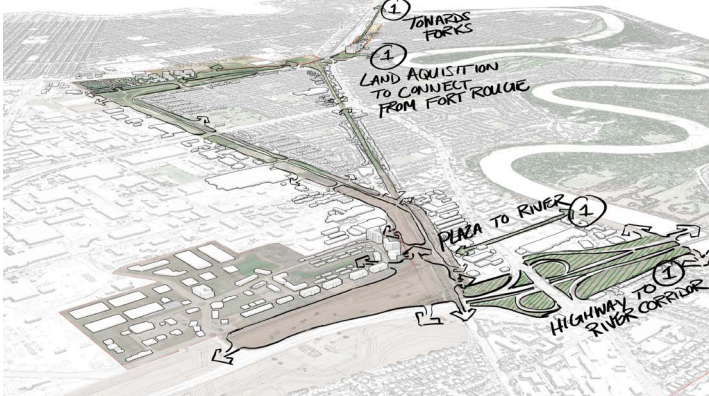
Right: Conceptual process work.



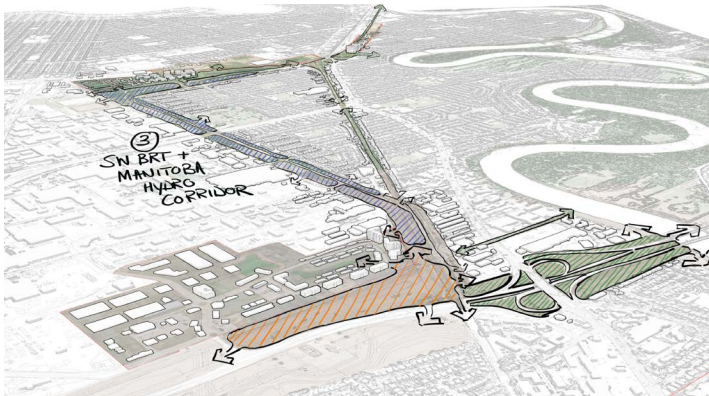
Step 1: Identification of key areas and infrastructure types.



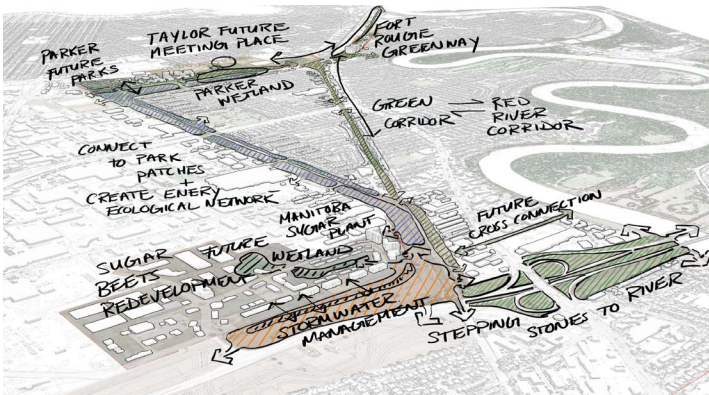
Step 3: Connect + bridge with Red River Corridor.



Step 5: Interlink Hydro + Transitway as Green Corridor.



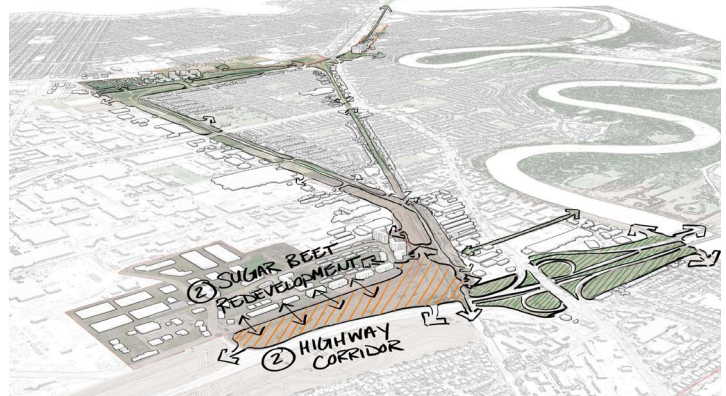
Step 7: Seek Transformative Opportunities for Urban Design.



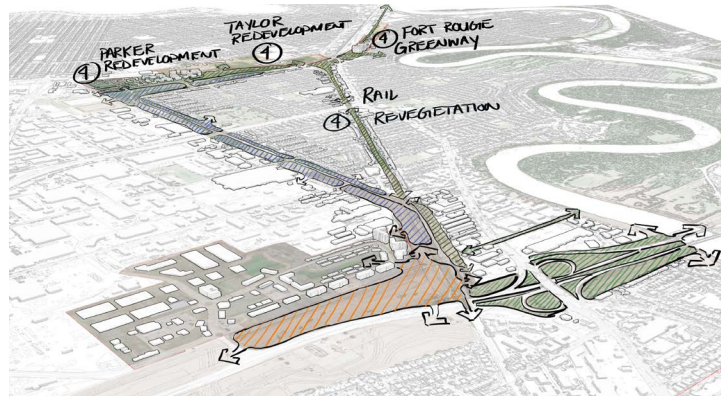
Step 2: Detailed site design / test plot area.



Step 4: Integrate highway corridor with adjacent redevelopment site.



Step 6: Re-vegetate Railway Corridors, Greenways, Future Wetland Areas.



Step 8: Apply Circular Design of Inputs, Outputs, Feedback Loops.

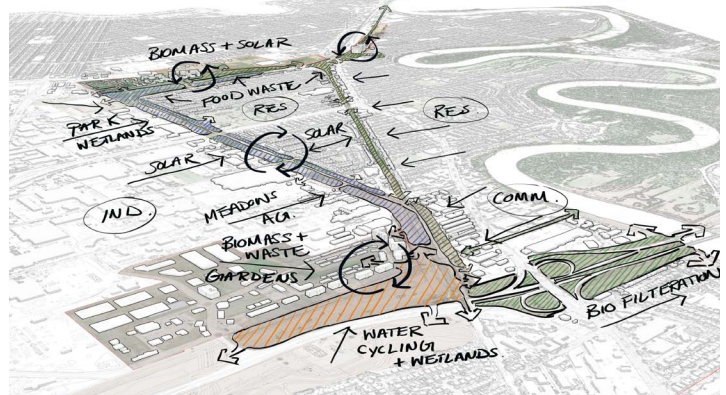


Figure 89: Transformative Opportunities and Potential for Synergies

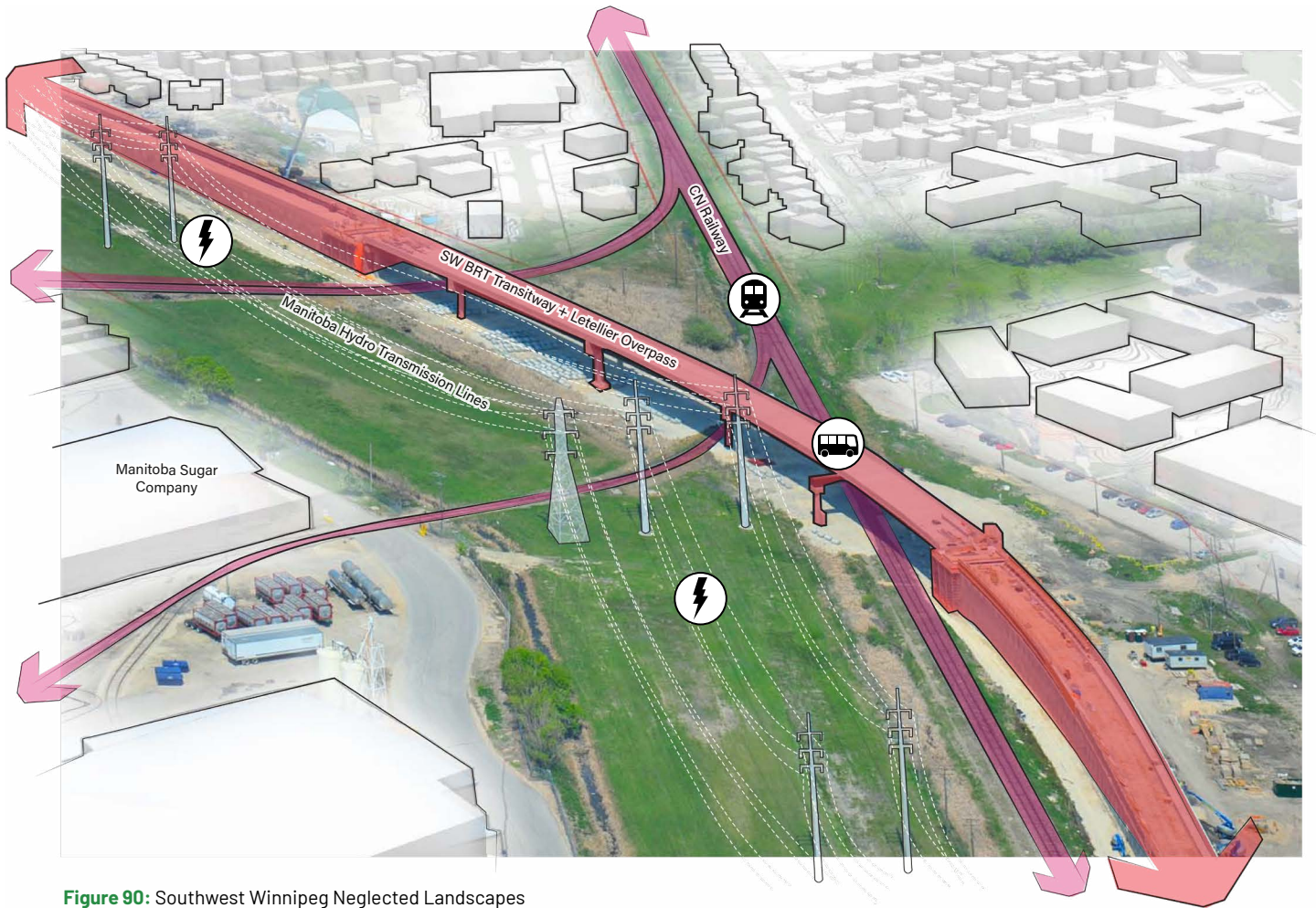


Figure 90: Southwest Winnipeg Neglected Landscapes

NEGLECTED LANDSCAPES

Above: Identifying key infrastructure synergies and corridors including rail, hydro, and roadways.

Left: Initial process work and steps for breaking down a design process for preliminary future strategies for transformative change.

Initial process work explored key areas for opportunities and constraints and the synergies that can be applied to forming connections to adjacent river corridors, integrating highway and major roadways with adjacent redevelopment sites, interlinking hydro corridors with transitways to create green corridors, and re-vegetation opportunities along railways for future greenways, wetlands, and areas for environmental protection. The process work allowed identification of transformative opportunities for urban design where the application of circular design of inputs, outputs, and feedback loops could be applied to inform strategies.

Through the process work, neglected landscapes are defined as ecologically optimum patches and corridors that are in proximity to major infrastructure that have potential for transformative change to enhance and maintain ecological integrity. To maintain ecological integrity, the categories of productivity, biodiversity, soil, and water will be key considerations.⁶⁰ A sustainable approach to designing neglected landscapes needs to entail concentrating on food, water, and health, and habitat, as well as energy.

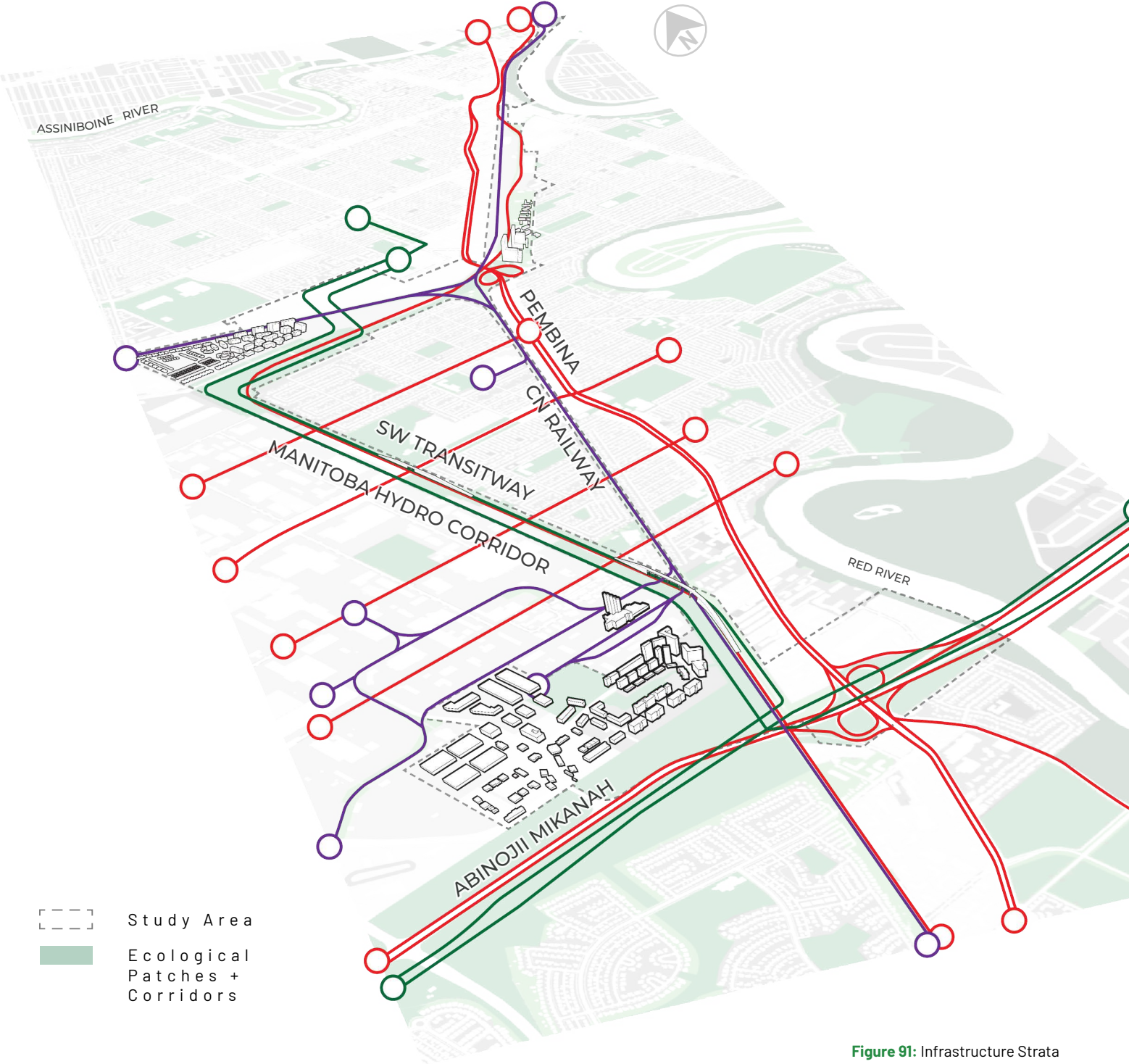


Figure 91: Infrastructure Strata

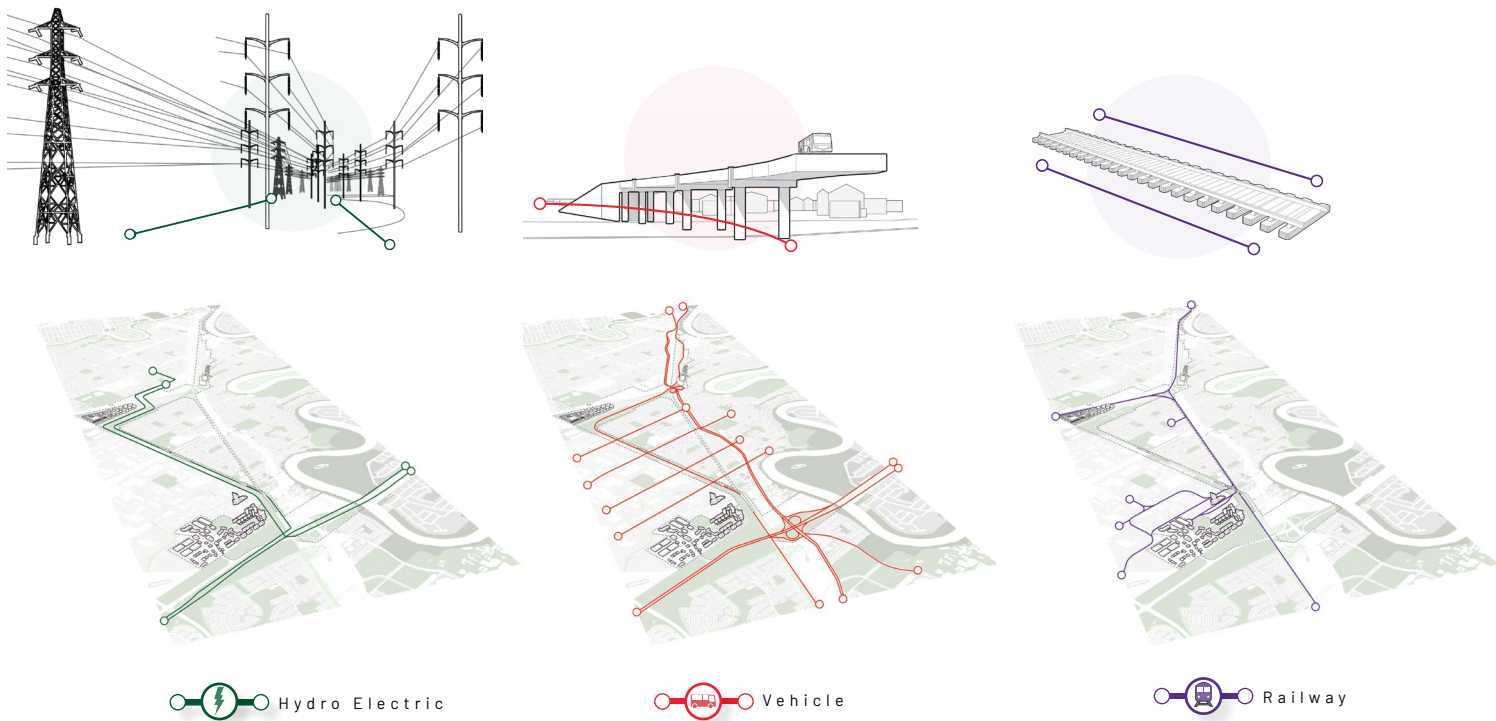


Figure 92: Study of Infrastructure Types

INFRASTRUCTURE TYPES

By overlaying the infrastructure types for the study area, key network connections, disconnections, and functions between infrastructure types and adjacencies can be identified and delineated.

Corridors perform five major functions in landscapes: habitat; conduit; filter; source; and sink.⁶¹

These five major functions of corridors can help to re-imagine levels of neglected landscapes based on their ability to facilitate movement along an ecological network, where people, wildlife, and renewable energy and food production can cross paths to create unique opportunities for transformative change.

Above: Detailed analysis of infrastructure types and connections.

Left: Overlapping infrastructure strata for synergies and opportunities for integrating urban ecology.

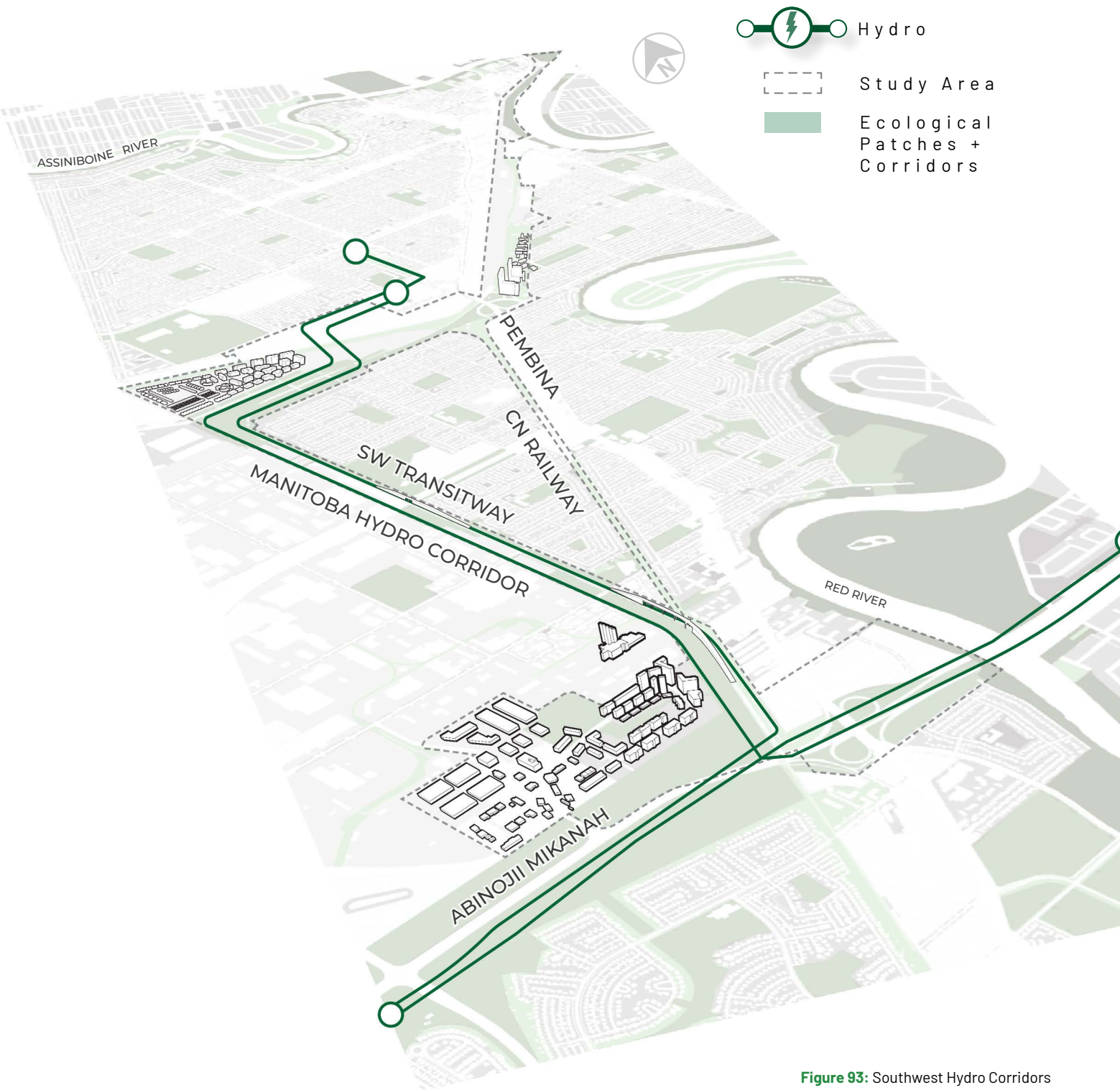


Figure 93: Southwest Hydro Corridors

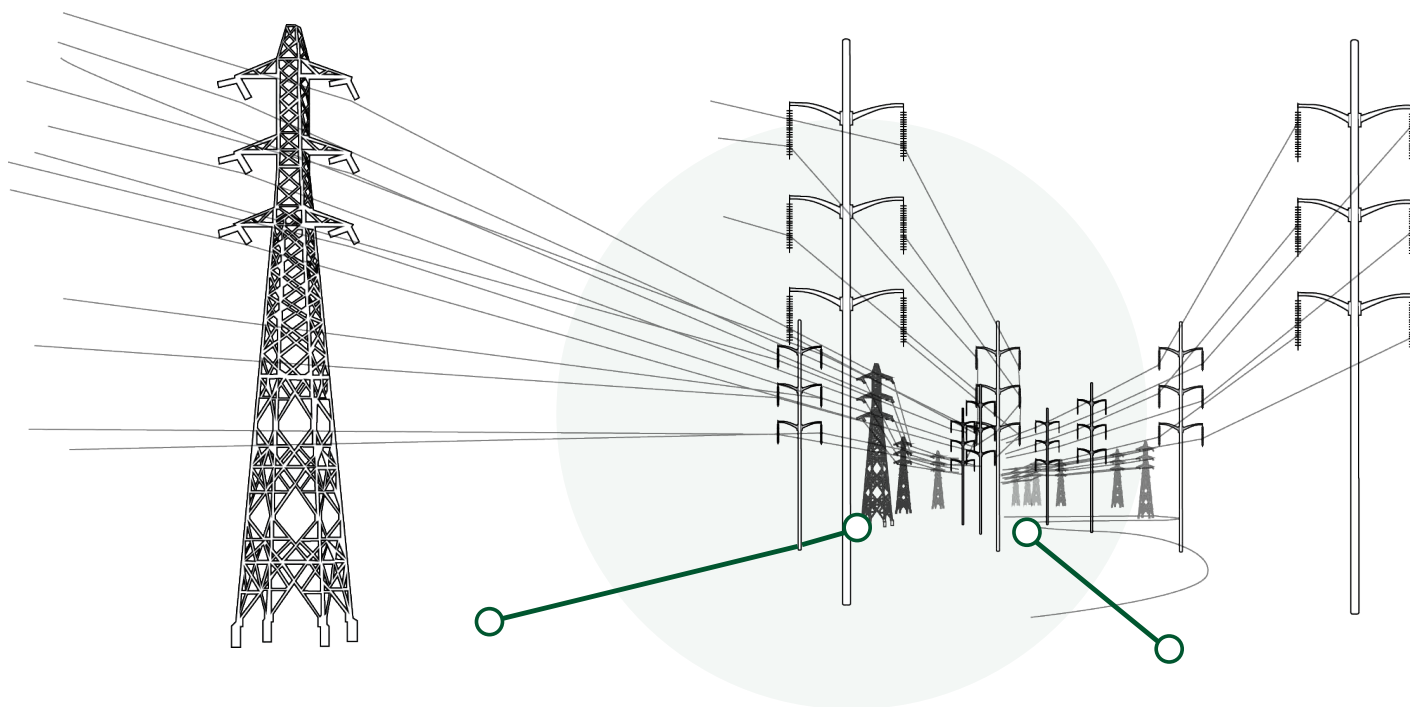


Figure 94: Manitoba Hydro Infrastructure

HYDRO

The Manitoba Hydro Transmission Towers and the Right-of-Way create a unique opportunity to re-imagine the neglected landscapes underneath the power lines. These long, relatively straight, constant in width corridors are disturbed relatively evenly over their whole width and maintained with herbicides, cutting, and clearing methods including machine clearing, mulching by rotary drums, selective clearing by feller bunchers, and hand clearing as primary techniques for maintenance. Power line corridors create a unique transformative opportunity for integrating ecology with design by enhancing shrub cover, curvilinear soft edges, and vegetated connections across the corridors. Power lines in Winnipeg often act as filters reducing the ability for conduit functions, but pose an opportunity to integrate trails, productive landscapes, and wildlife crossings to improve the corridor as a conduit function for people, flora, fauna, and energy.⁶²

Above: Identifying key spatial components of hydro infrastructure.

Left: Exploring Manitoba Hydro network and connections.



Right: Applying corridor buffer zones for height restrictions to inform landscape plantings and future strategies.

As part of reviewing infrastructure types, the transmission lines have unique constraints for towers, conductors, and electrical overhead lines. Manitoba Hydro requires ground clearance to meet or exceed the requirements of *Overhead Systems, C22.3 Standard No. 1-10 Canadian Standards Association (CSA) 2010*. Minimum clearances include railways (9.3 m), roads and highways (6.325 m), underground pipelines (6.1 m), and minimum ground clearances at grade (5.5 m).⁶³ Manitoba Hydro specifies planting guidelines for shorter trees and small to large shrubs in proximity to power lines and hydro poles, including a no planting zone at least 2m (6.5 feet) away, medium height trees setback at least 6m (20 feet), and taller trees setback at least 10m (33 feet). Manitoba Hydro advises never planting trees within 2m (6.5 feet) of hydro poles to ensure access to power lines.⁶⁴ These zones were used for planting guidance.

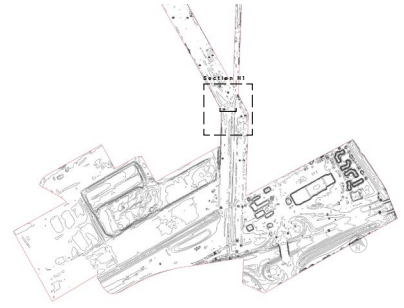
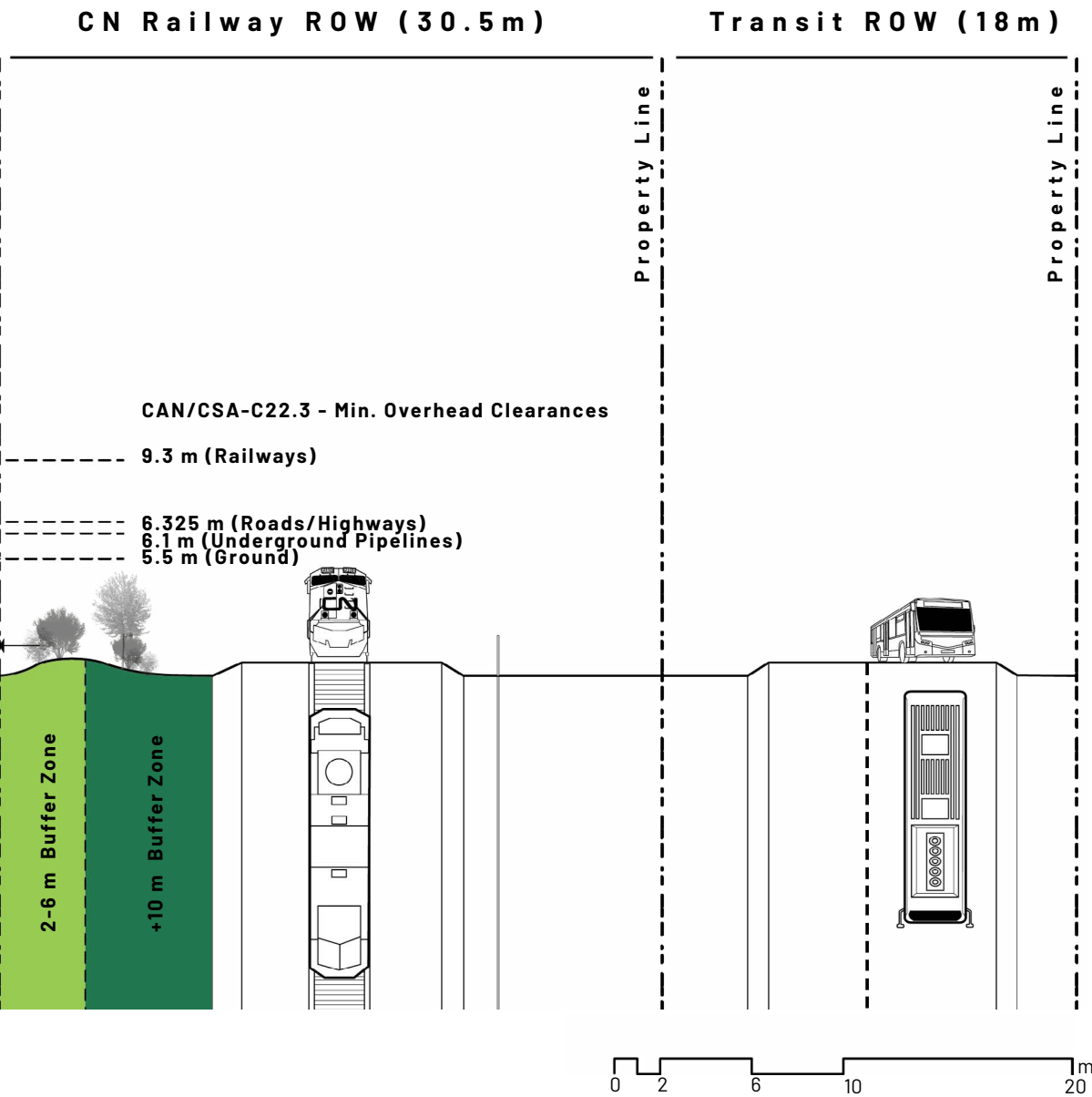
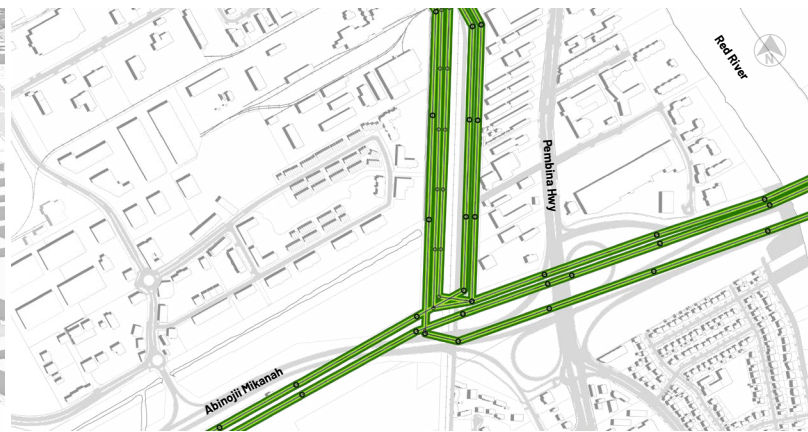


Figure 96: Hydro Corridor Buffer Zones



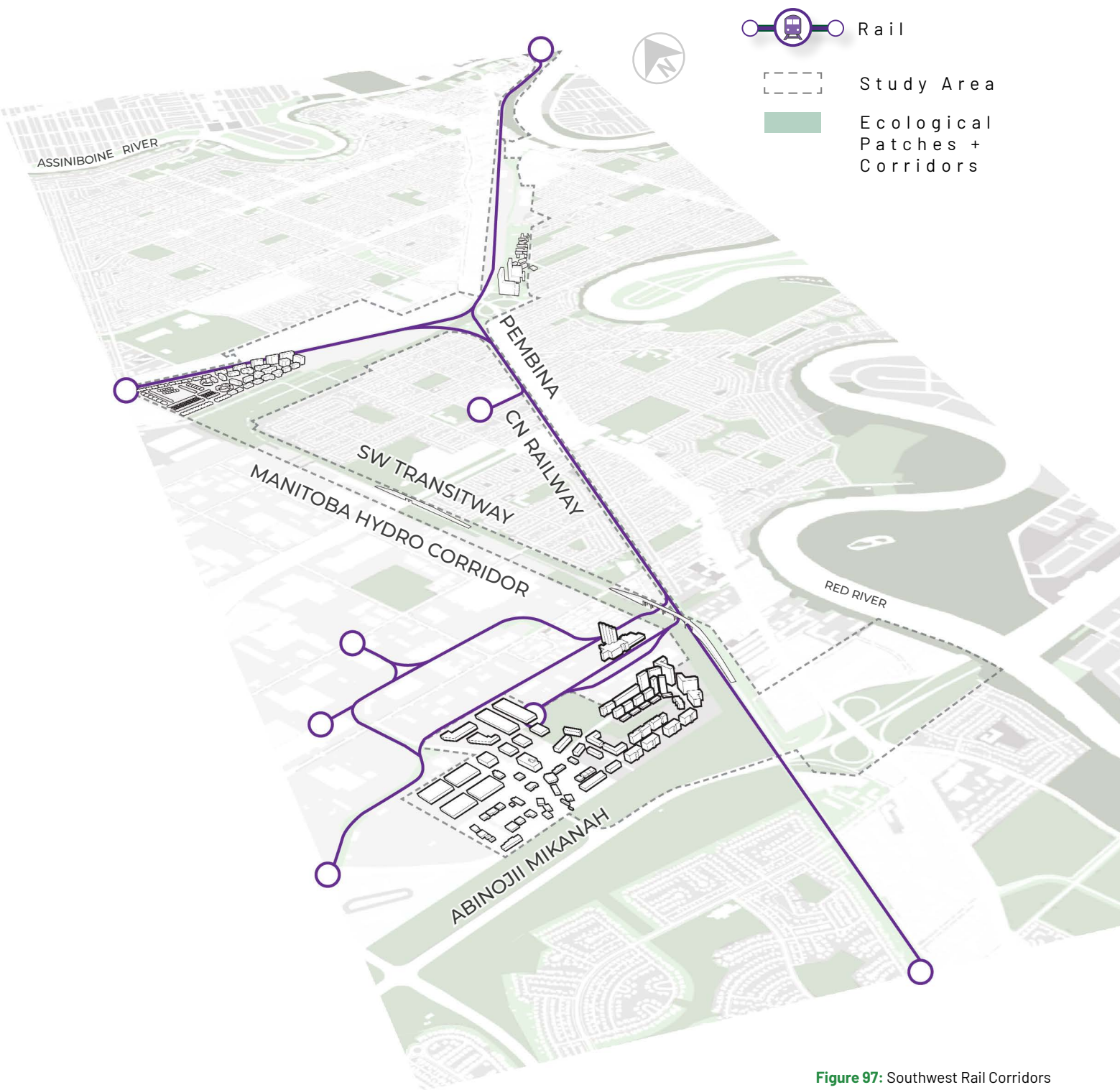


Figure 97: Southwest Rail Corridors

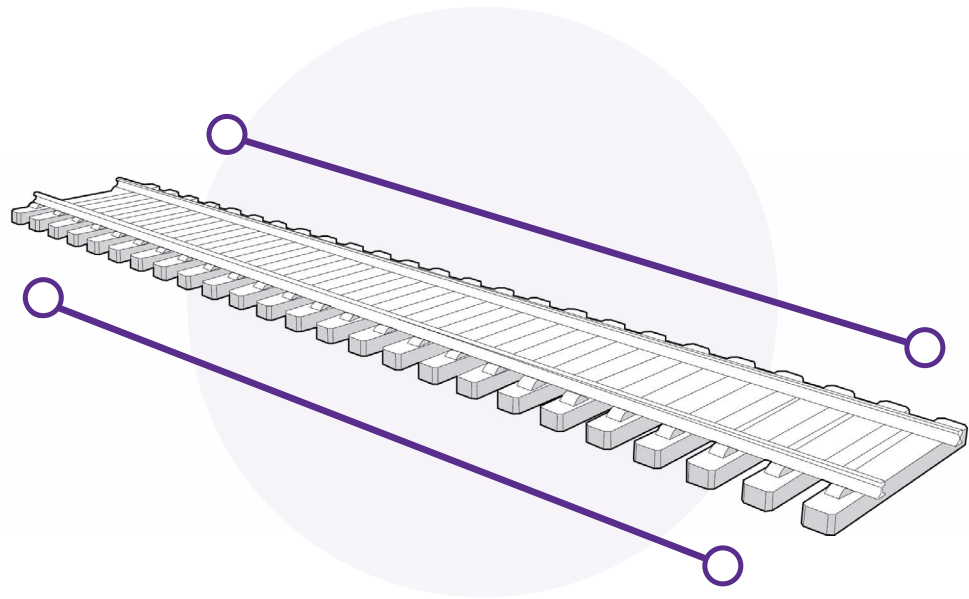


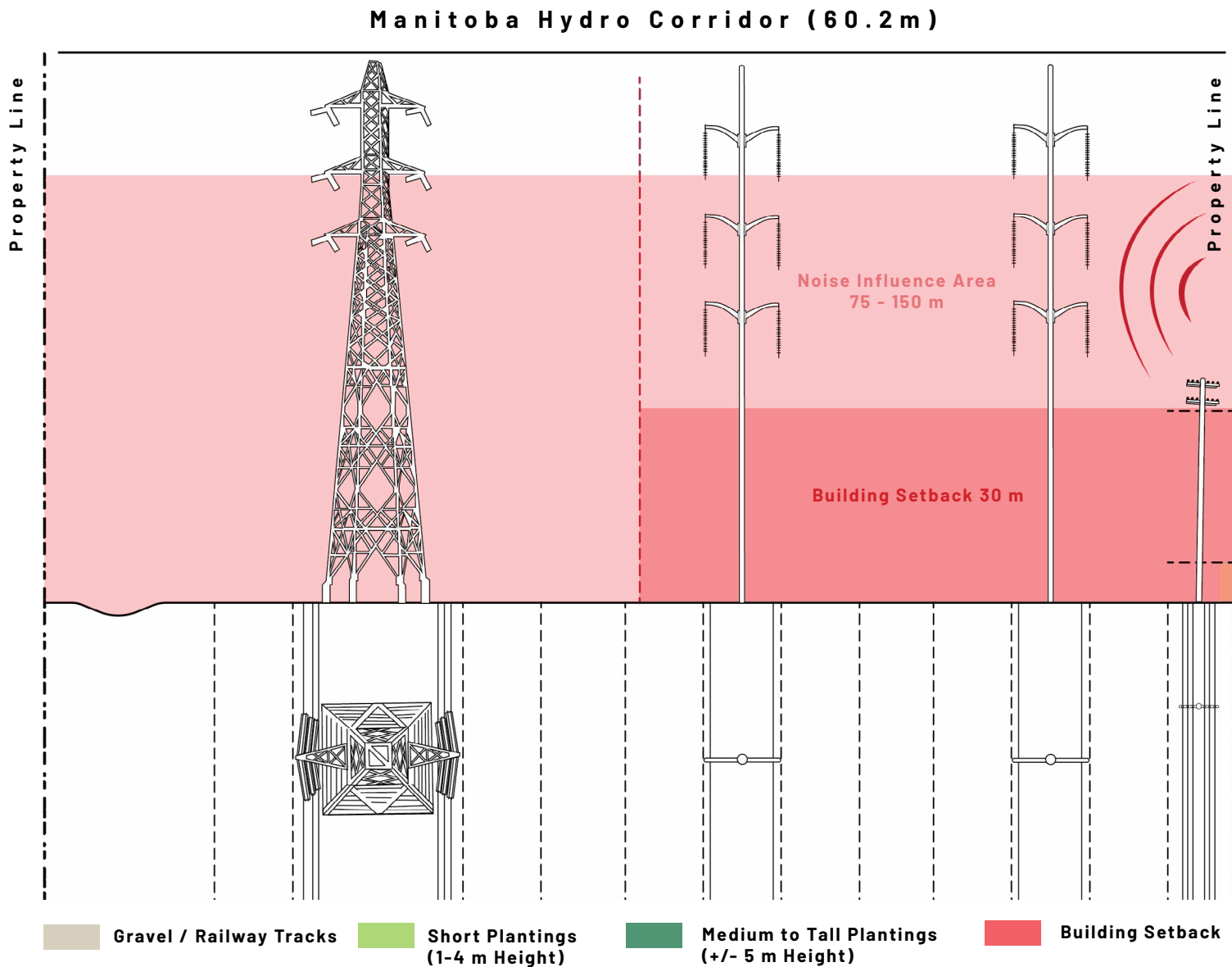
Figure 98: Rail Infrastructure

RAIL

Railway corridors in Winnipeg tend to be linear infrastructure that has potential to spread particles widely over the adjacent matrix. Trains carrying grains and other goods that spread seeds, insects, and small mammals widely along the corridor. In Winnipeg's prairie landscapes, agriculture and urban development have replaced native grassland. Remnants of native vegetation may only persist in neglected landscapes. Railway corridors pose unique opportunities for creating green tracks and vegetated strips. Maintenance activity is focused within the corridor and can be re-imagined to support raiiside re-vegetation strategies that can have major positive ecological effects for storm water retention, mitigating heat island effects, absorption and retention of pollutants, noise reduction, and increased biodiversity.⁶⁵

Above: Identifying key spatial components of rail infrastructure.

Left: Exploring rail line network and connections.



RAIL CONSTRAINTS

Figure 99: Rail Corridor Constraints

Guidelines for *New Development in Proximity to Railway Operations* was reviewed for the constraints applicable to residential conversions, infill projects, and former industrial and commercial lands. Building setbacks of 30 m is a standard recommendation for Principle Main Lines and Secondary Main Lines.⁶⁶ The recommended minimum noise influence areas for railway corridors is 150 m for Principal Branch Lines and a minimum of 75 m for Secondary Branch and Spur Lines.⁶⁷ Minimum setbacks of 5 m can be achieved with mitigating measures, including berms that are 2 to 2.5 m above grade with side slopes not steeper than 2.5 to 1.⁶⁸ Mitigation measures for railways can include minimum setbacks, earthen berms, security fencing, and sound or vibration attenuation walls. Guidelines were used as a starting point to identify opportunities for re-vegetation strategies with berming.

Above: Reviewing Rail Corridor constraints.

Right: Applying corridor buffer zones for setback restrictions and noise influence areas for future strategies.

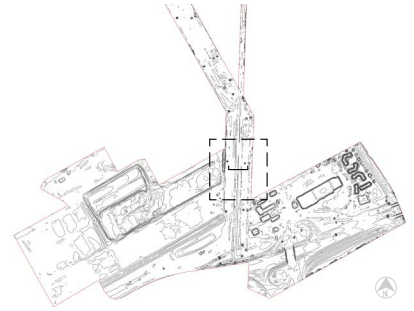
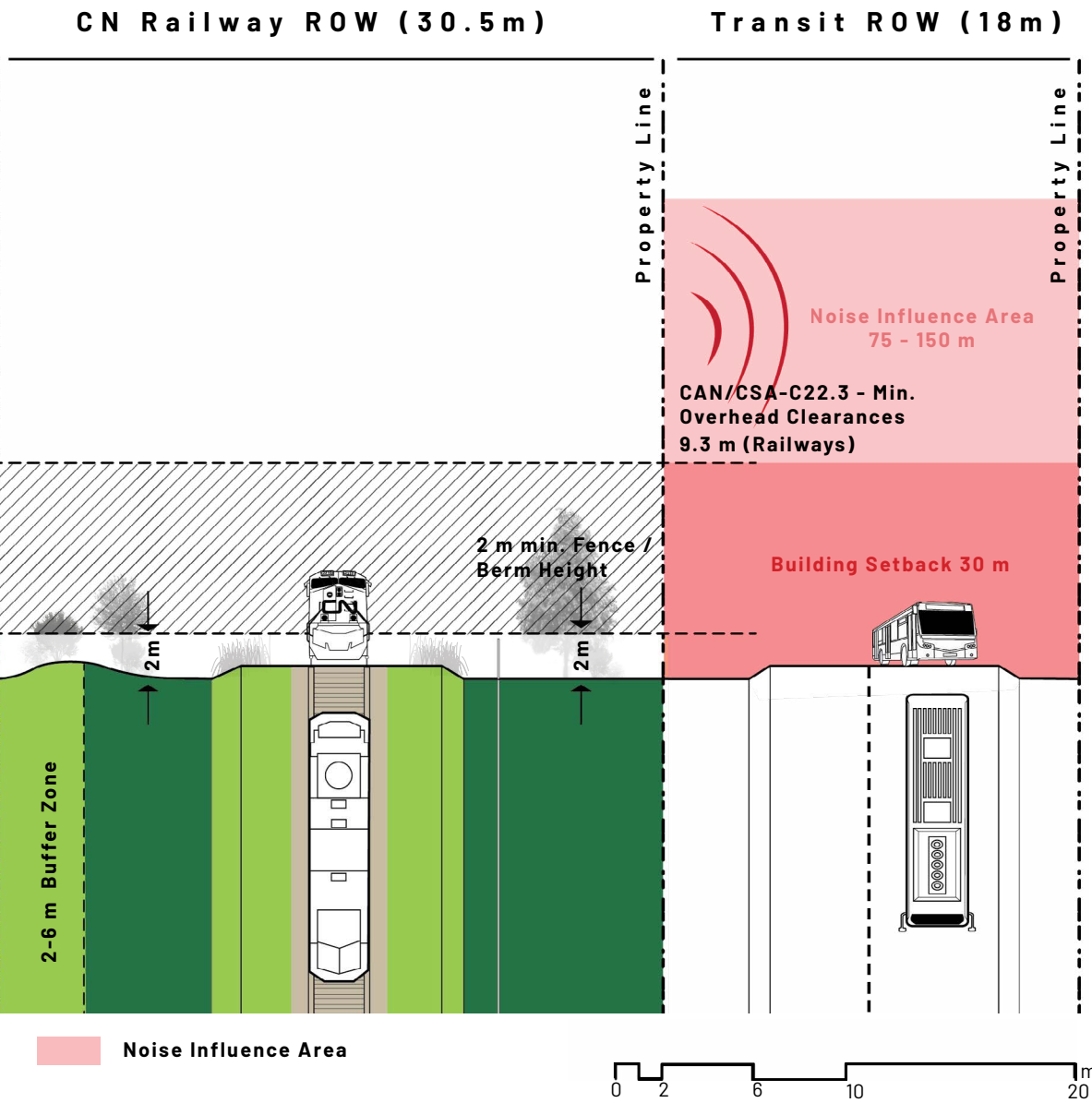
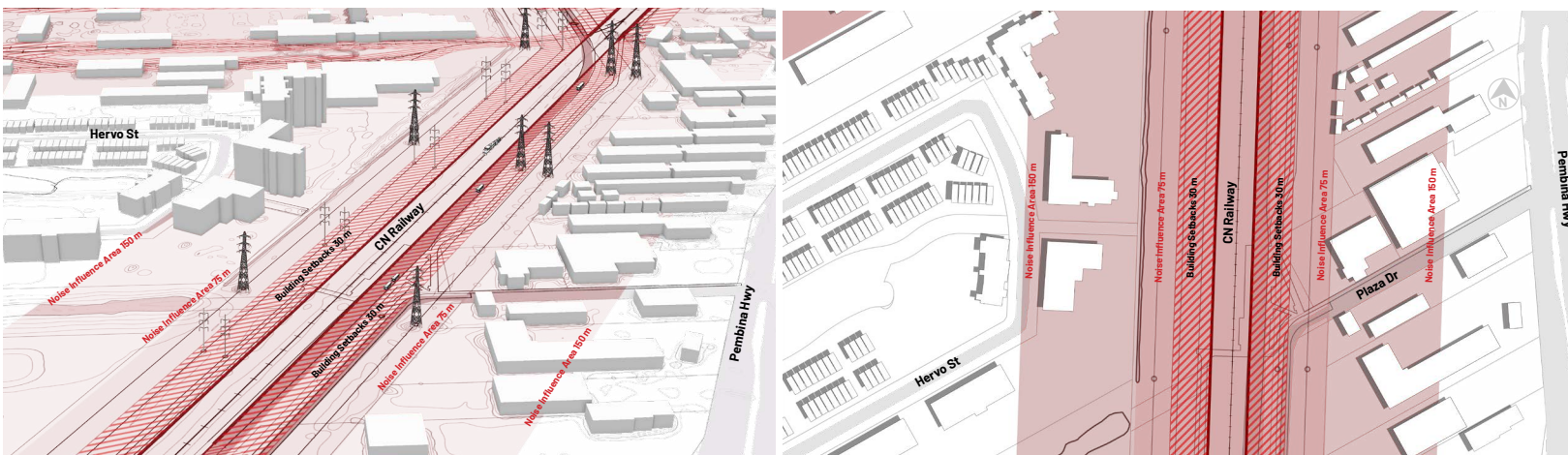


Figure 100: Rail Corridor Buffer Zones



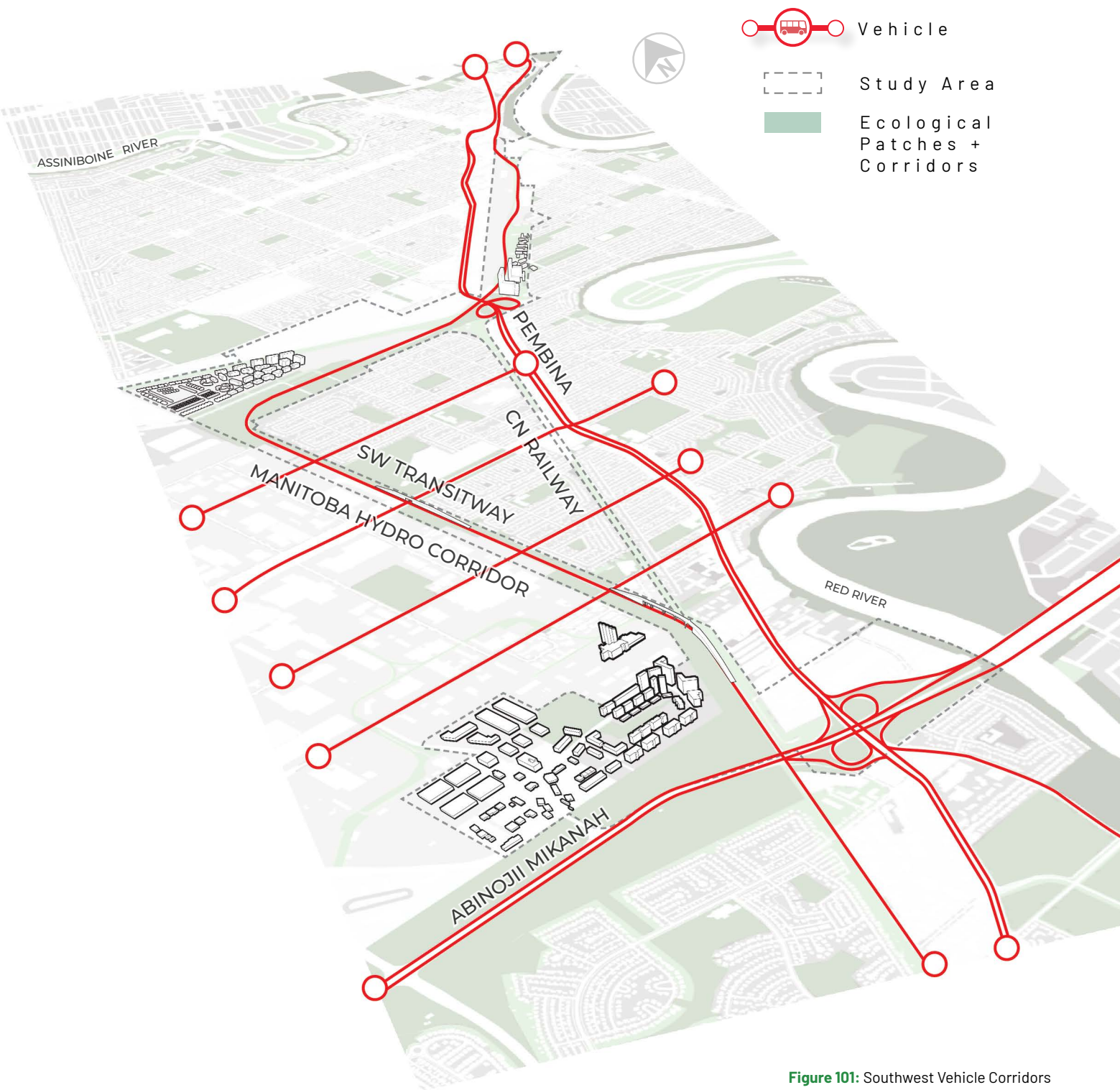


Figure 101: Southwest Vehicle Corridors

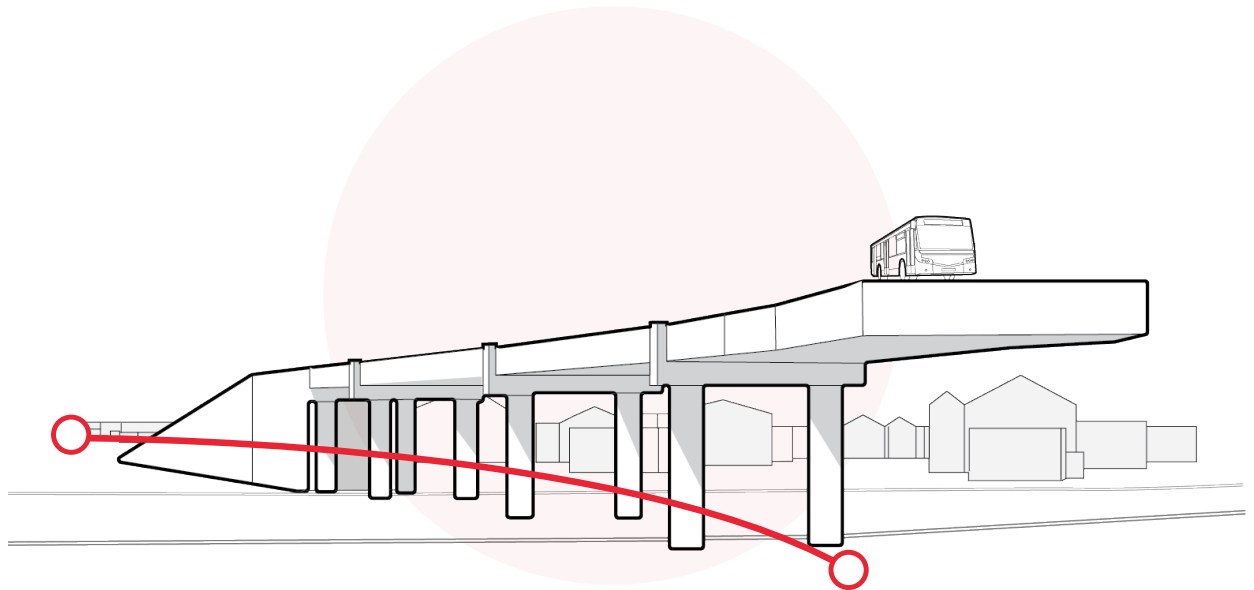


Figure 102: Vehicle Infrastructure

VEHICLE

Vehicle corridors are primarily used for car movement and associated with vegetated parallel strips or roadside verges and medians. Vehicle corridors have a strong transport or conduit function, with objects moving between attached nodes. Roadside natural strips and underpasses can be important conduits for wildlife to mitigate the sink function of roads due to the potential for collision. For this study, overpasses can create unique opportunities for re-imagining wildlife crossings, while creating transformative opportunities for urban design strategies in these neglected landscapes. Roadside verges are typically managed or disturbed regularly to maintain open, often grassy strips; however, these landscapes can form a giant green network with wide strips on major highways and adjacent to rapid transit corridors.⁶⁹

Above: Identifying key spatial components of vehicle infrastructure.

Left: Exploring roadway network and connections.

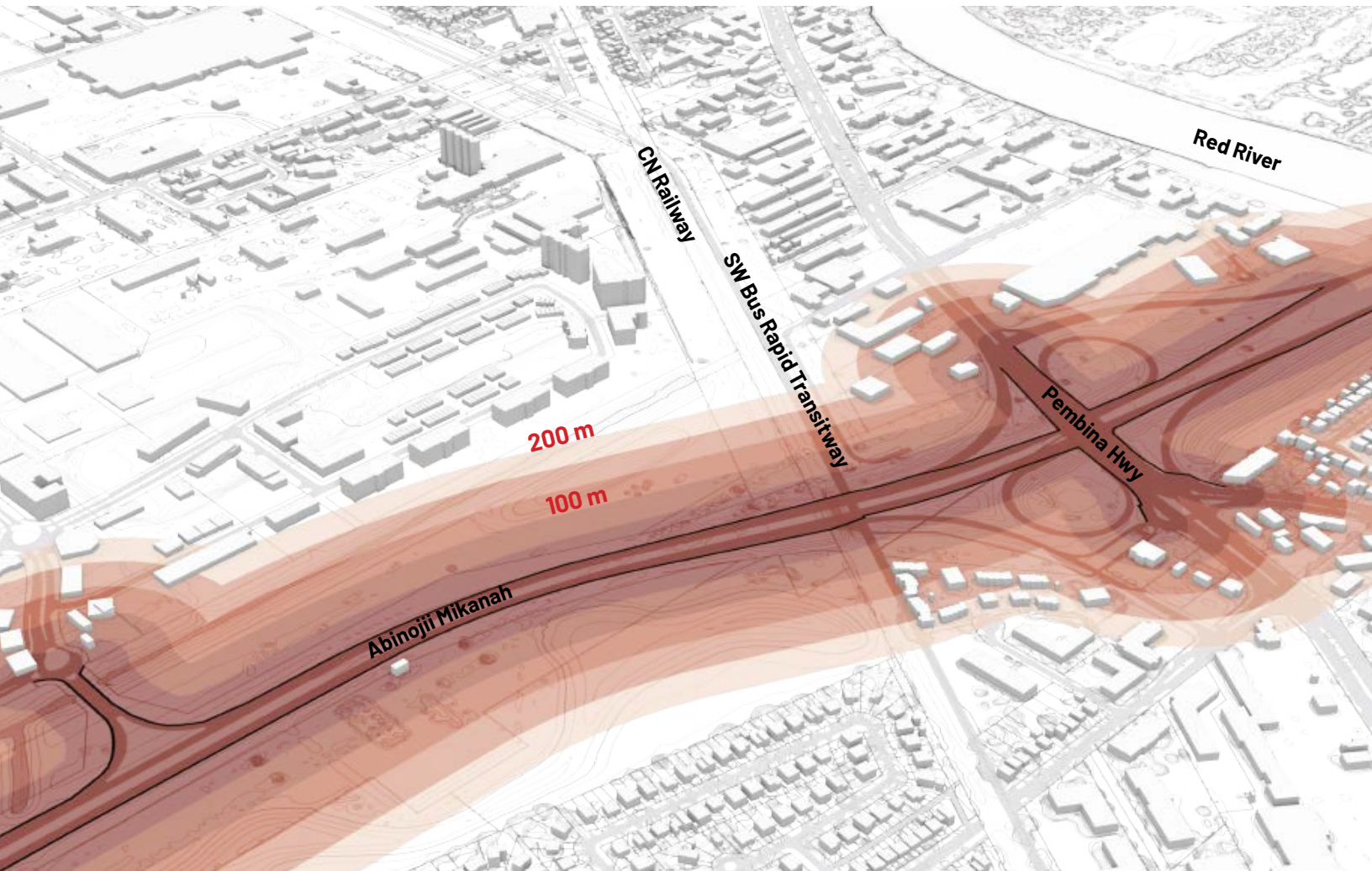


Figure 103: Vehicle Corridor Constraints

VEHICLE CONSTRAINTS

Vehicle corridors can pose impacts on the landscape matrix through the dispersal of pollutants, water, noise, and particulate and chemical run-offs.⁷⁰ Although the impact may not be experienced exactly linear, effects from the roadside edge can be increased and decreased from the source. Roadside effects can decrease the presence of wildlife and native plantings, while others can increase including impacts to hydrologic effects and air quality. Constraints imposed by vehicles can be mitigated with landscape strategies for bio-filtration for chemical run-off and salts and natural vegetation to filter air pollution and dust.⁷¹ Landforms can be used to mitigate roadside noise that can impact the presence of wildlife and birds due to high traffic volumes along major boulevards (e.g., Kenaston Boulevard, Abinojii Mikanah, and Pembina Highway).

Above: Reviewing Road Corridor constraints and key setback distances.

Right: Applying corridor buffer zones for roadside effects that influence areas for future strategies between 20 to 200 plus meters.

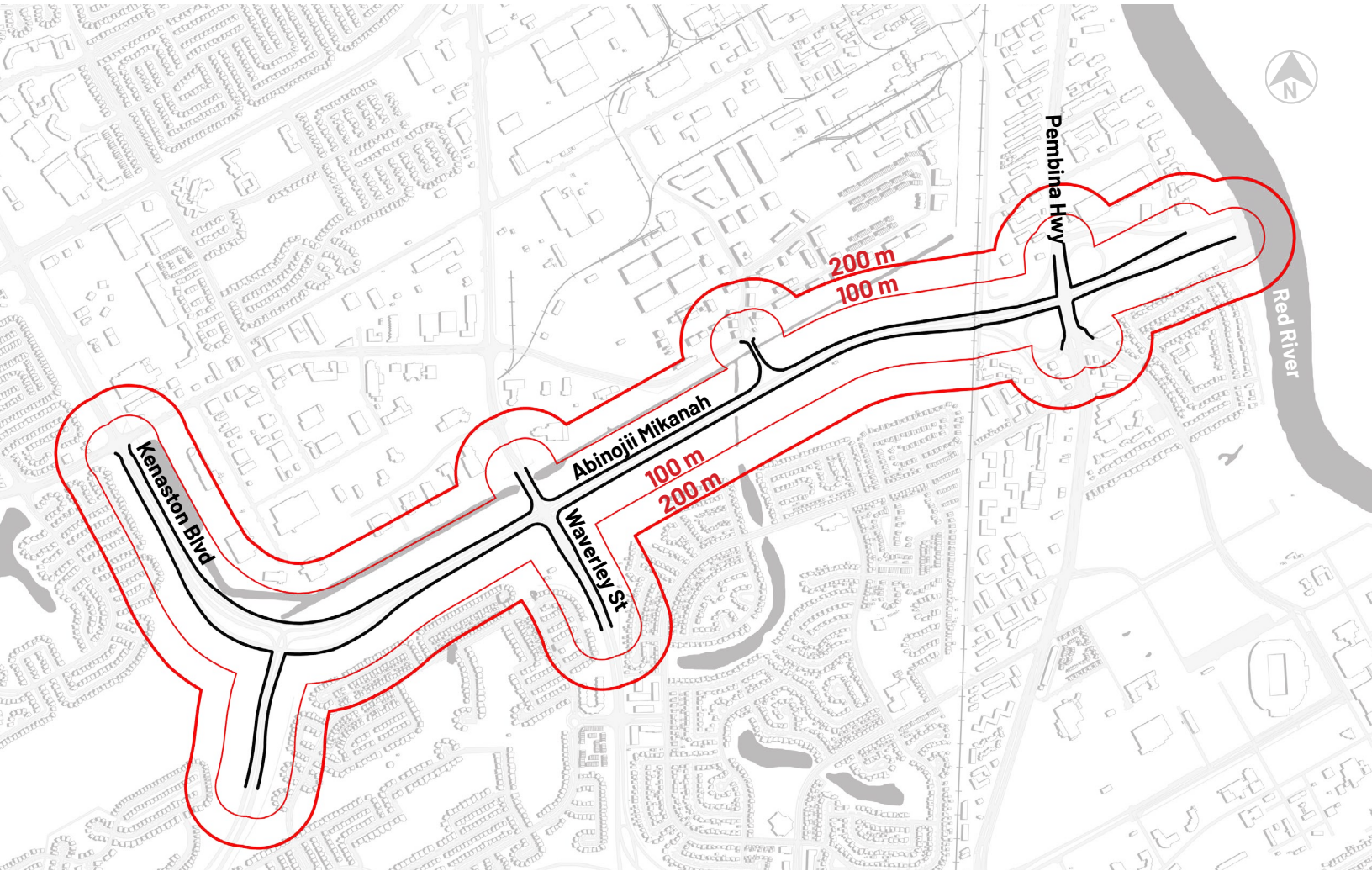
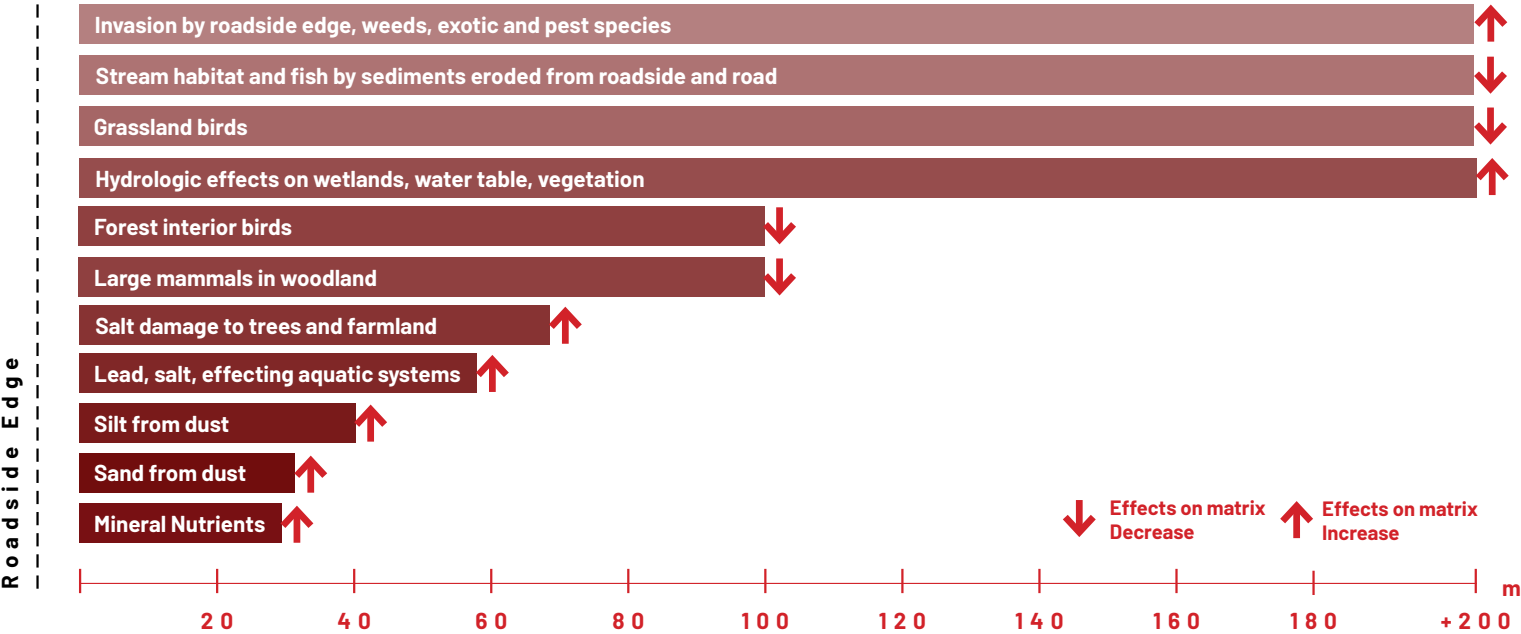


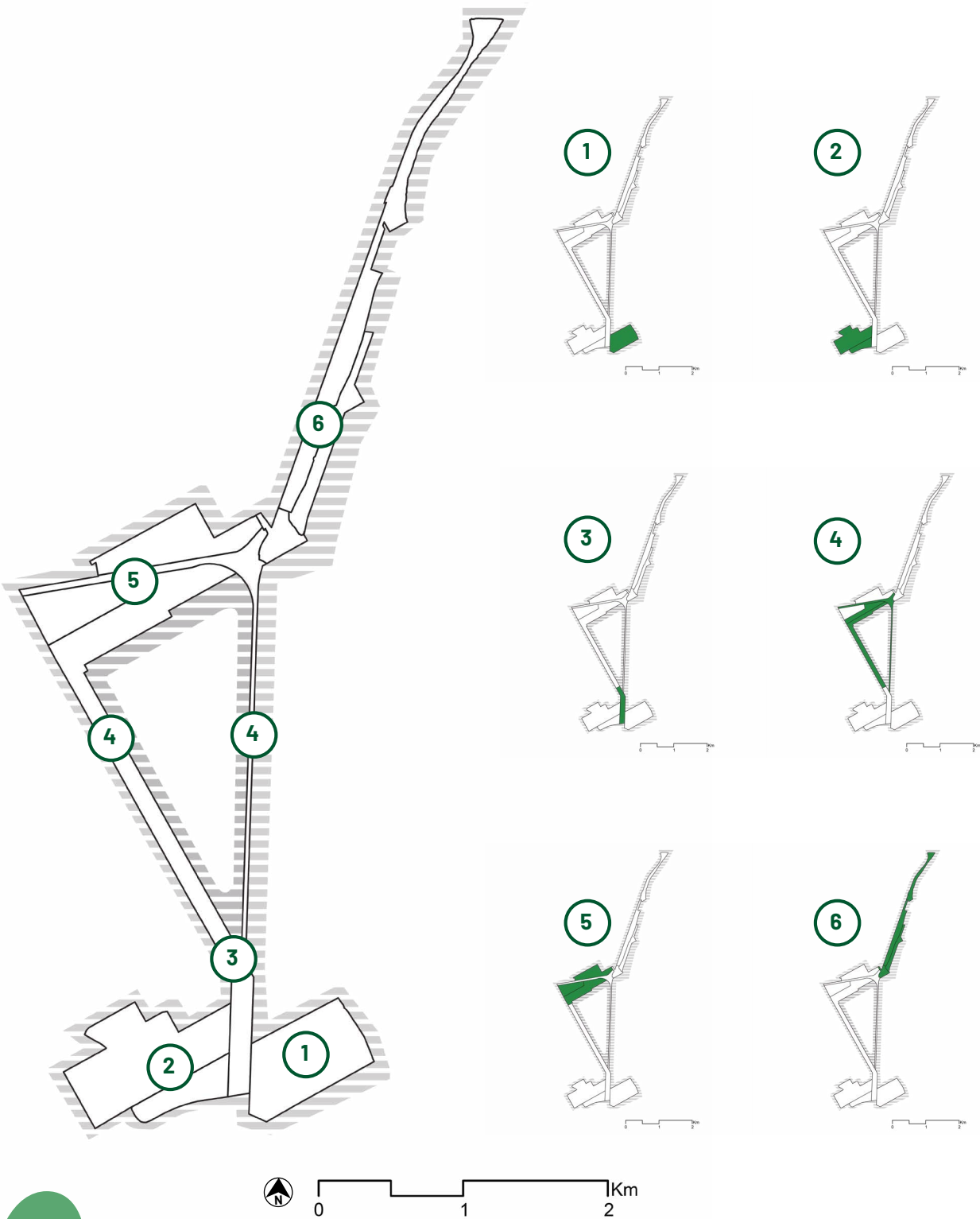
Table 3: Roadside Effects - Distance from Road Edge (m)

Figure 104: Vehicle Corridor Buffer Zones



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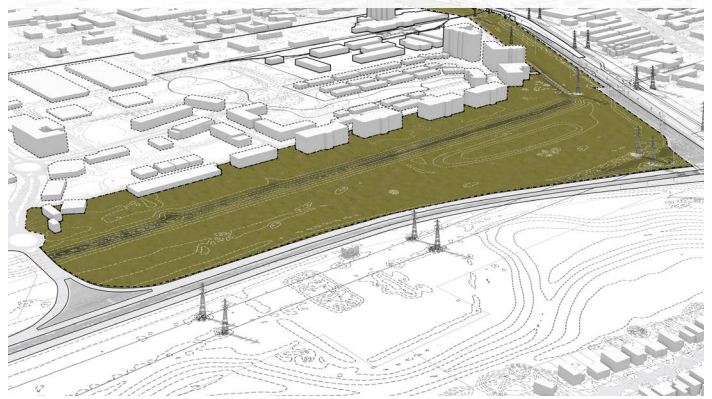


CHAPTER **10** NEGLECTED LANDSCAPES

1 Abinojii Mikanah to the Red



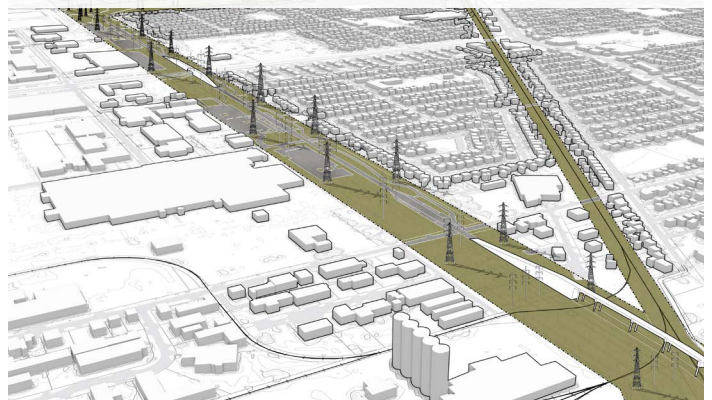
2 Sugar Beet Nature Verge



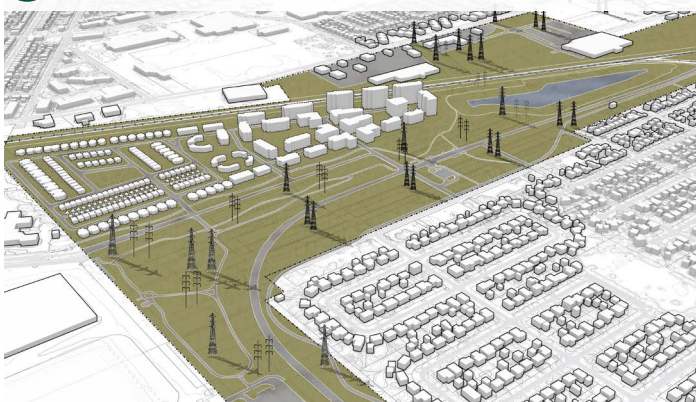
3 Biodiversity Corridors and Greenways



4 The Green Loop



5 Parker and Taylor Hydro Farming



6 Fort Rouge Greenway Extension



Figure 105: Future Strategies for Selected Sites

- (E1) Lack of Bio-retention + Storm water Filtering
 (E2) Lack of Woodland + Tree Canopy
 (E3) Opportunity for Re-vegetation
 (E4) Lack of Stepping Stones + Connections
 (E5) Opportunity for Greenways + Allée to River

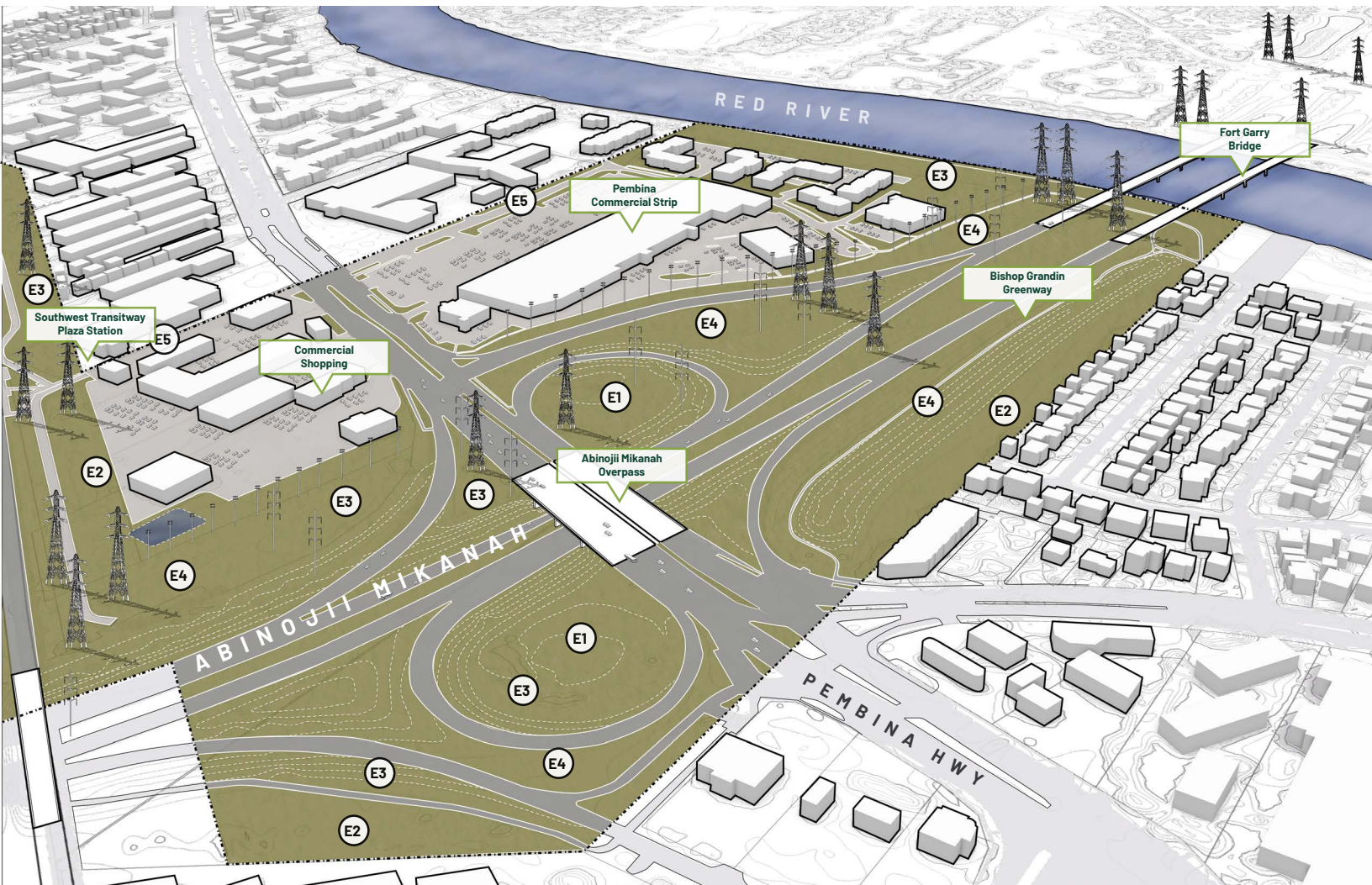


Figure 106: Abinojii Mikanah (E) xisting Conditions

ABINOJII MIKANAH TO THE RED

The proposed strategies for Abinojii Mikanah (formerly Bishop Grandin Boulevard) include opportunities for transformative change by enhancing the ecological potential of the major roadway, road verges, and green strips. Abinojii Mikanah to the Red River identifies areas for re-vegetation along edges with wildflower and prairie meadows of native grasses, allowing a transition in maintenance and mowing whereby edges closer to roadways are more maintained. At the same time, further away and closer to the river, a neglected approach is applied with less maintenance, allowing a mix of cool and warm-season grasses to be grown and overgrown, acting as stepping stones for flora, fauna, and pollinators. Edges will also include the re-vegetation of woodland to create more opportunities for patchiness to facilitate biodiversity along these large corridors.

Above: Assessment of existing conditions for Abinojii Mikanah.

Right: Applying Forman's principles for supporting indispensable patterns and key locations in the landscape.

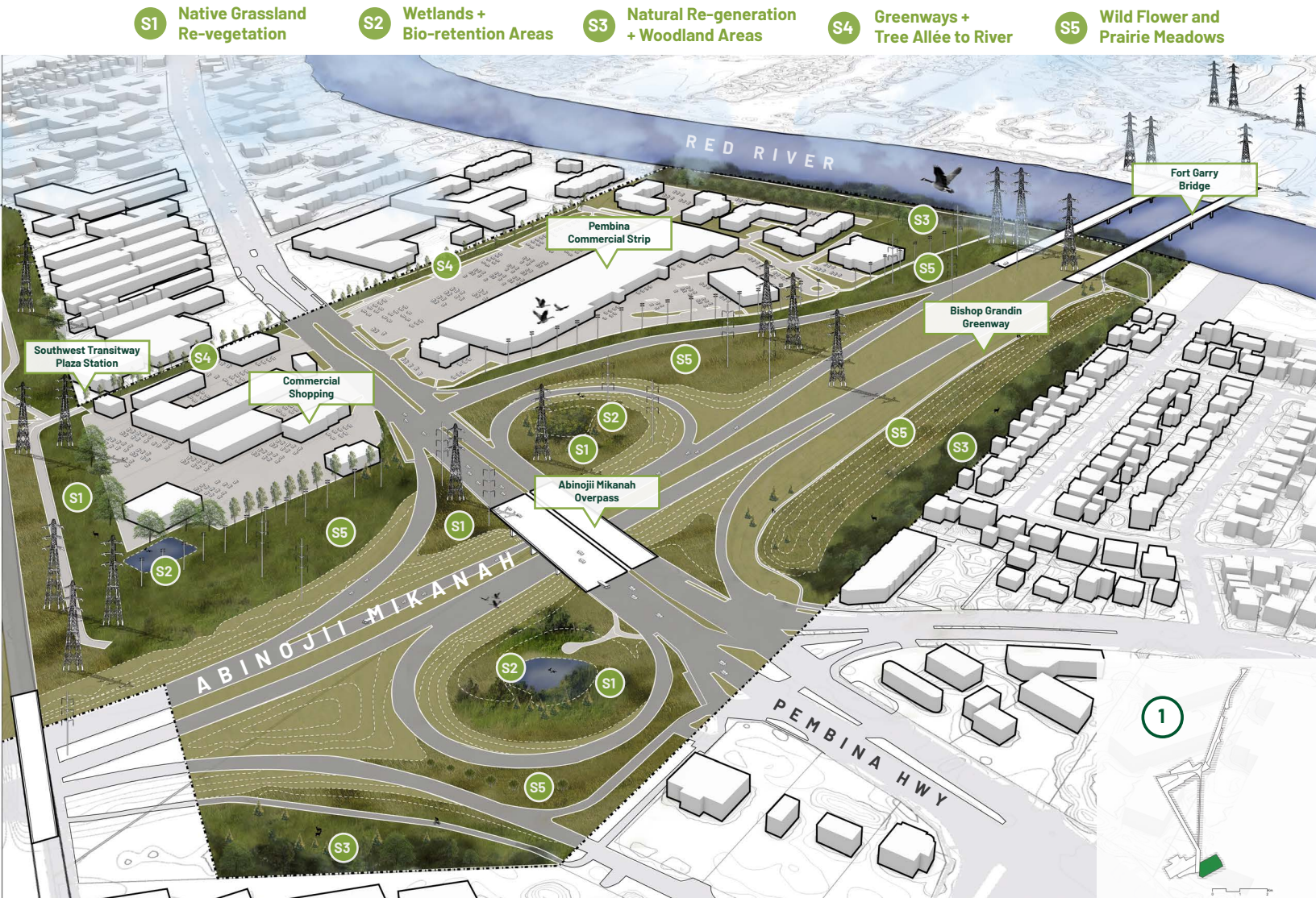
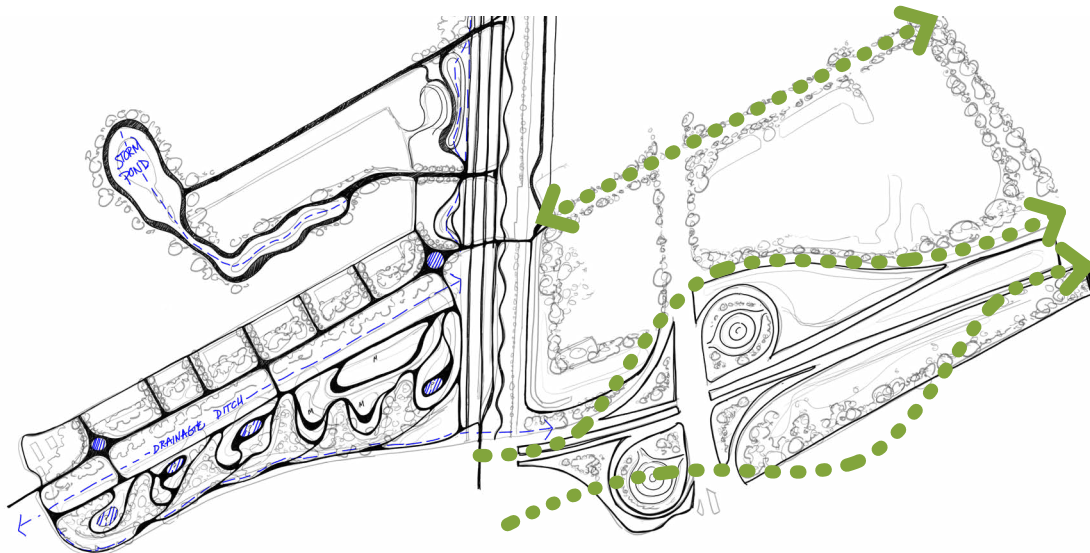


Figure 107: Abinojii Mikanah Future (S) strategies



ABINOJII MIKANAH TO THE RED SITE PLAN

- 1 Native Grassland Re-vegetation
- 2 Wetlands and Bio-retention Areas
- 3 Natural Regeneration of Woodland Areas
- 4 Greenways and Tree Allée to Red River
- 5 Wild Flower and Prairie Meadows

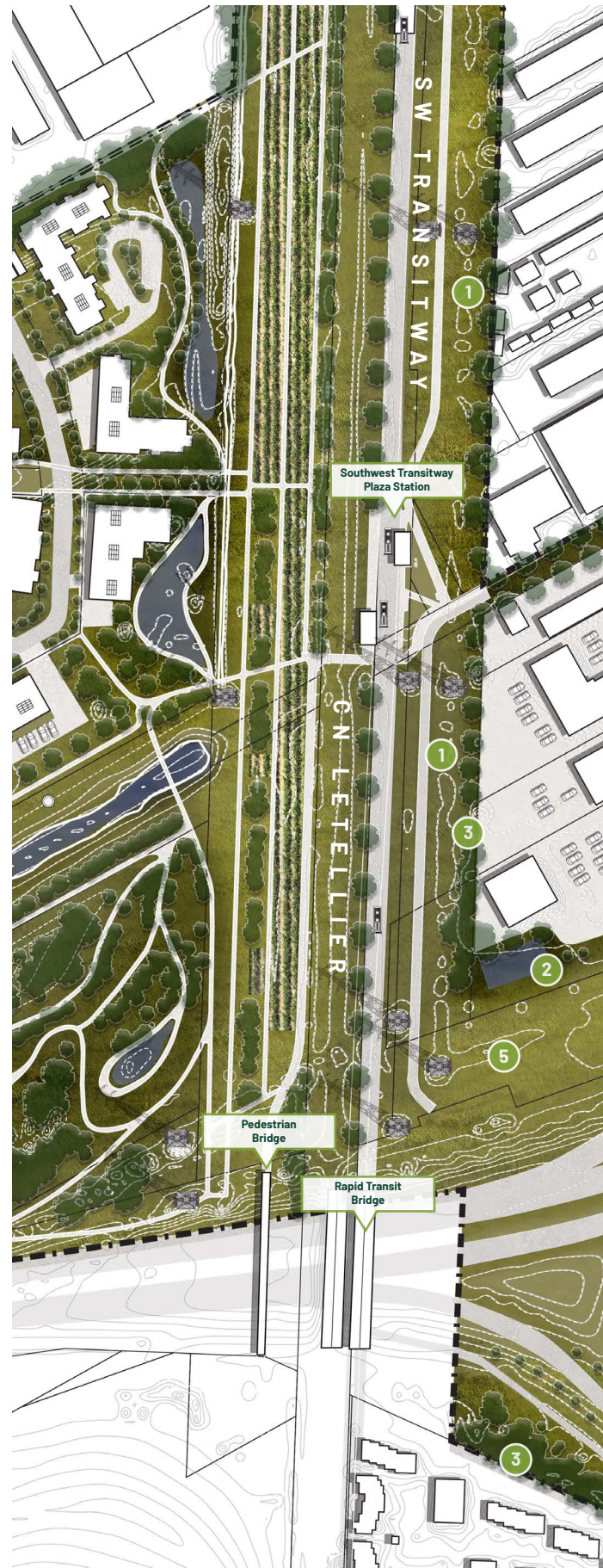
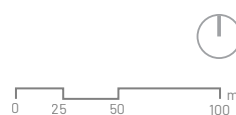


Figure 108: Abinojii Mikanah to the Red Site Plan



ABINOJII MIKANAH TO THE RED STRATEGY ZONES

- 1 Native Grassland Re-vegetation
- 2 Wetlands and Bio-retention Areas
- 3 Natural Regeneration of Woodland Areas
- 4 Greenways and Tree Allée to Red River
- 5 Wild Flower and Prairie Meadows

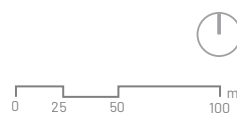


Figure 109: Abinojii Mikanah Strategy Zones



- E1** Lack of Bio-retention + Storm water Filtering
 E2 Lack of Woodland + Tree Canopy
 E3 Opportunity for Re-vegetation
 E4 Lack of Stepping Stones + Connections
 E5 Opportunity for Greenways + Allée

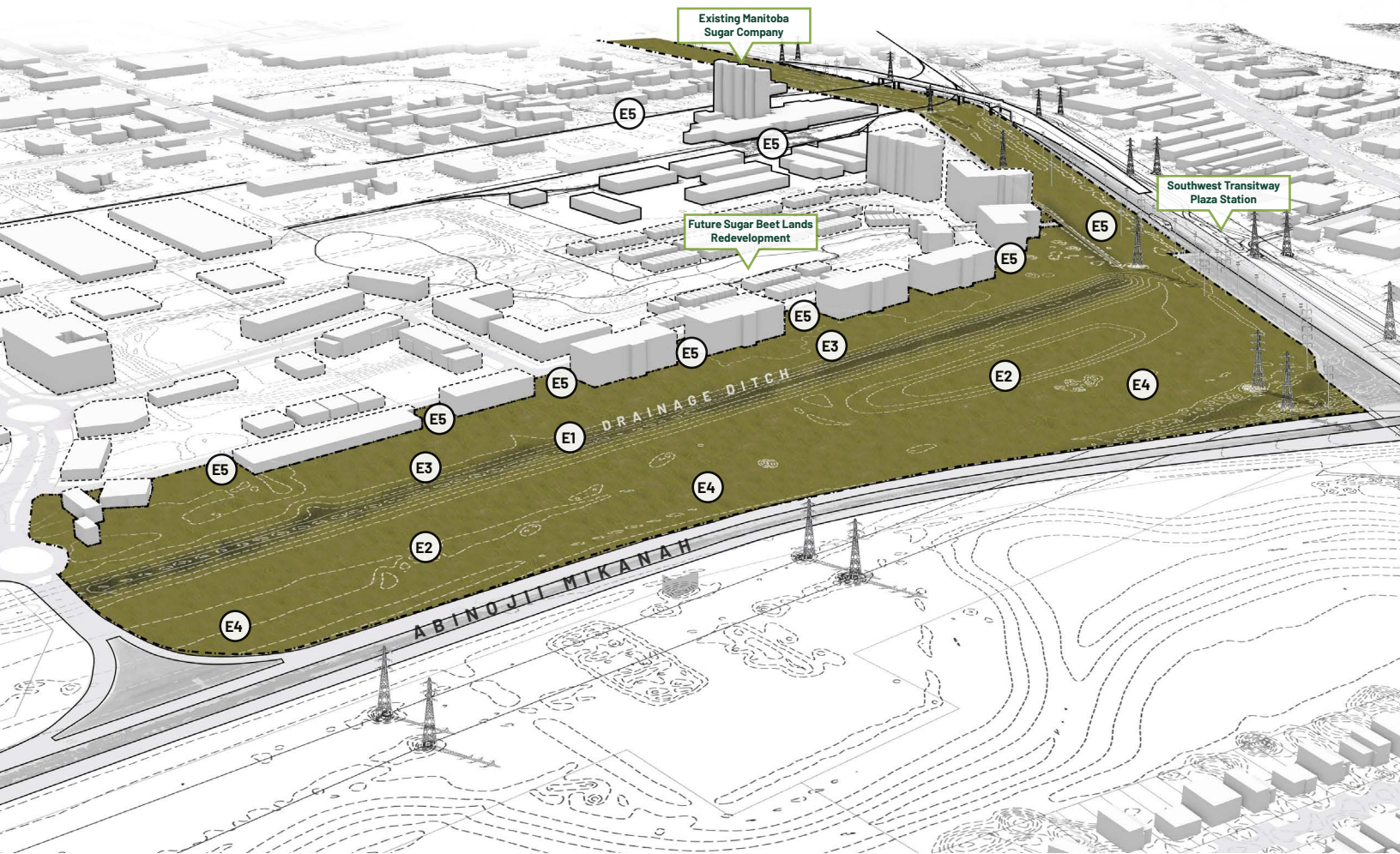


Figure 110: Sugar Beet (E) existing Conditions

SUGAR BEET NATURE VERGE

The proposed strategies for the Sugar Beet Nature Verge are to create a series of mounds and berms for noise mitigation by re-using on-site spent lime mud residues from the adjacent redevelopment site, create new wetlands for bio-retention and bird habitat, and form a green edge of woodland that addresses wind, dust, and particulate effects from the nearby Abinojii Mikanah (formerly Bishop Grandin Boulevard). The approach will create a neglected landscape into a Nature Verge that creates an ecological transition zone between the significant roadway effects while interfacing with the future redevelopment by enhancing the existing drainage ditch as a central amenity with renewable energy, urban agriculture, greenways, and treed alleys that link the Nature Verge with opportunities for passive recreation. A key focus of this transformative change is incorporating redevelopment with the landscape rather than disconnecting it.

Above: Assessment of existing conditions for major road verges and vacant agricultural lands as opportunities for integrating Sugar Beets redevelopment with urban ecology.

Right: Applying Forman's principles for supporting indispensable patterns and key locations in the landscape.

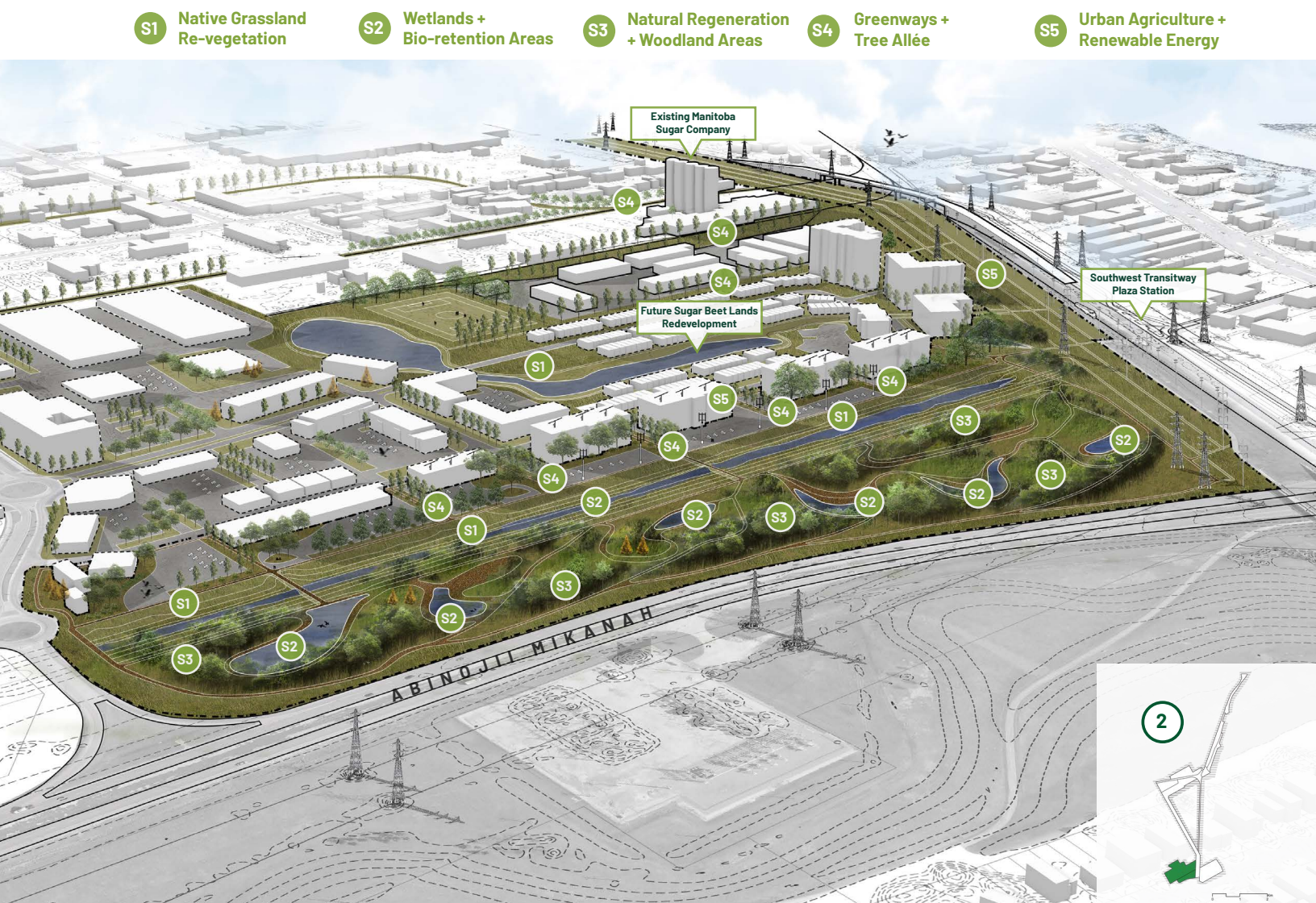
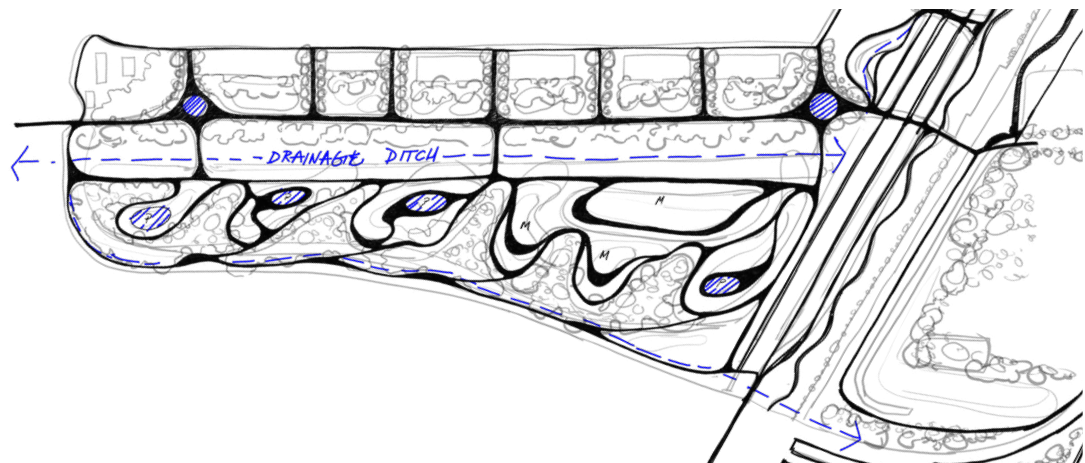
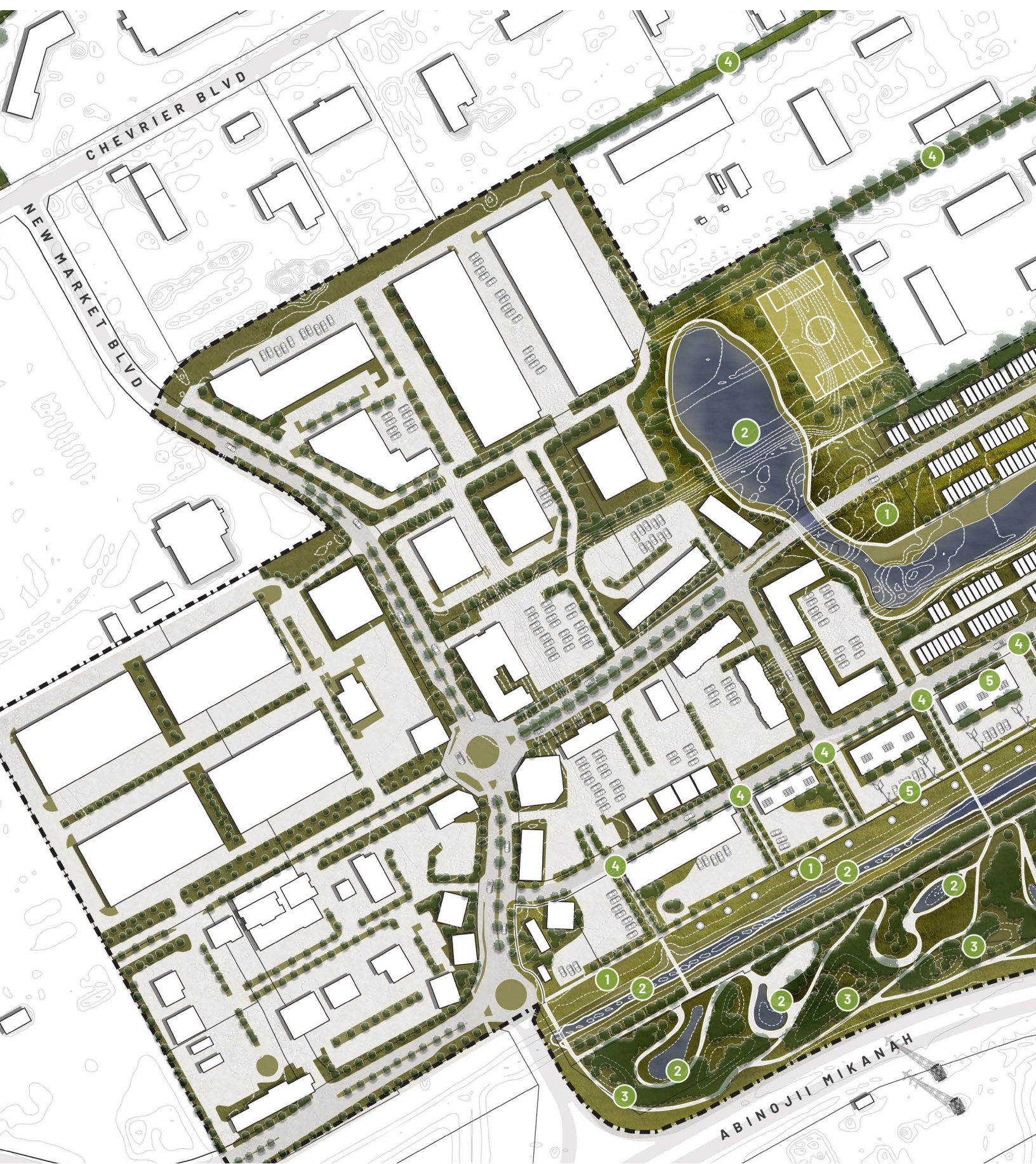


Figure 111: Sugar Beet Future (S) strategies







NATURE VERGE SITE PLAN

- 1 Native Grassland Re-vegetation and Prairie Meadows
- 2 Wetlands and Bio-retention Areas
- 3 Natural Regeneration of Woodland Areas and Lime Mud Mounds / Berms
- 4 Greenways and Tree Allée
- 5 Urban Agriculture and Renewable Energy

Figure 112: Sugar Beet Nature Verge Site Plan





NATURE VERGE STRATEGY ZONES

- 1 Native Grassland Re-vegetation and Prairie Meadows
- 2 Wetlands and Bio-retention Areas
- 3 Natural Regeneration of Woodland Areas and Lime Mud Mounds / Berms
- 4 Greenways and Tree Allée
- 5 Urban Agriculture and Renewable Energy

Figure 113: Sugar Beet Nature Verge Strategy Zones

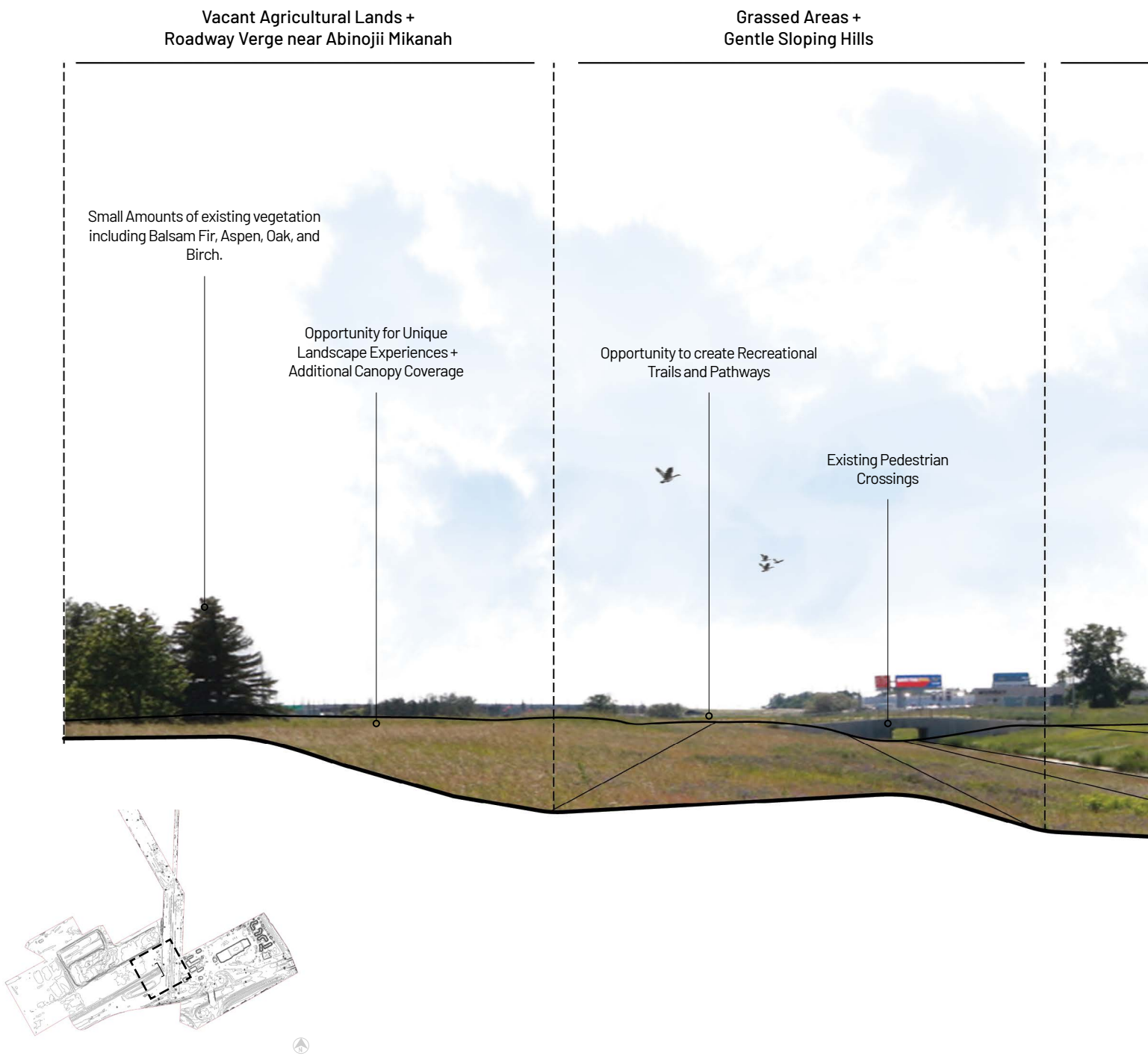
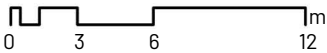
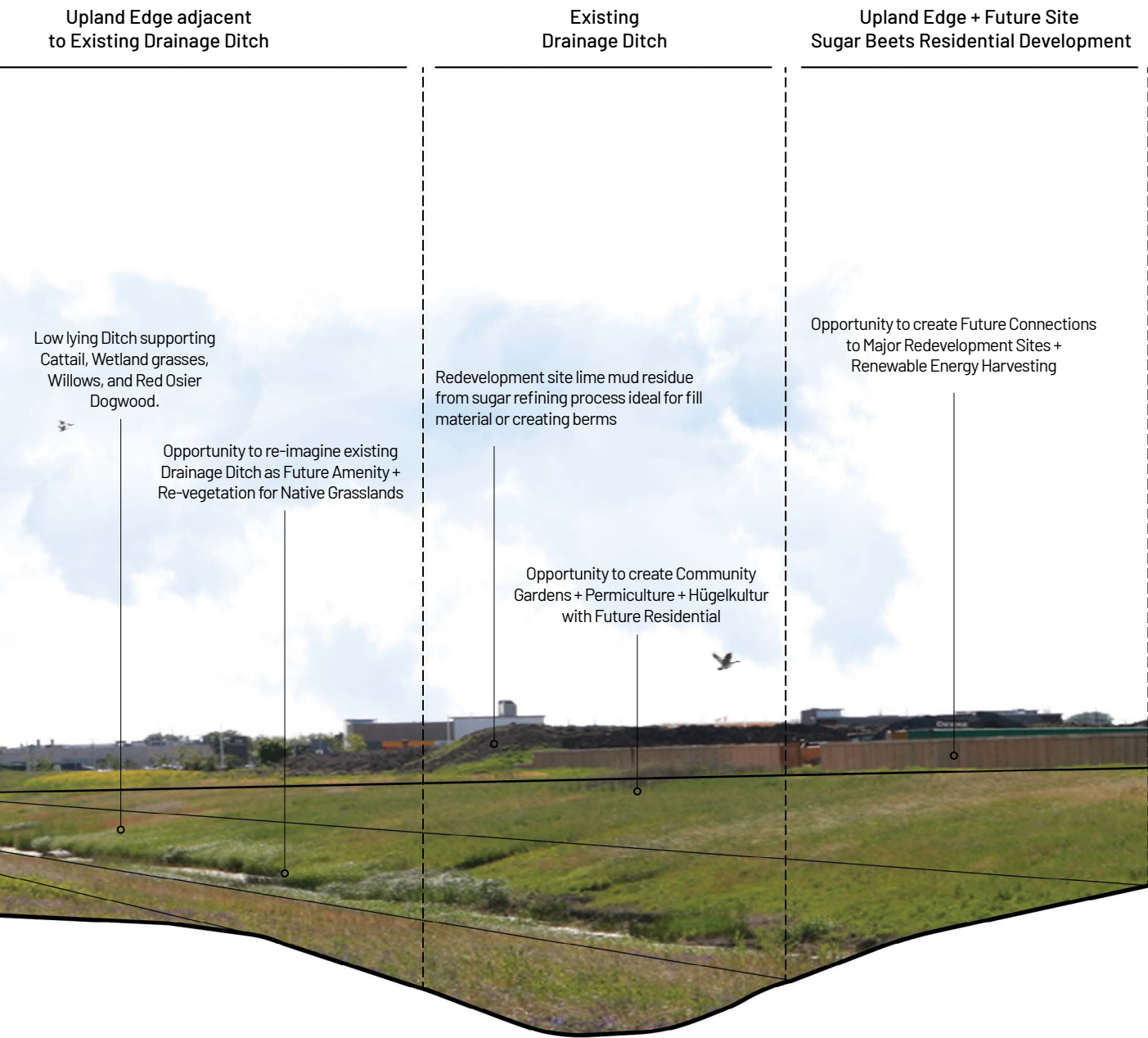


Figure 114: Sugar Beet Lands - Existing Conditions



NEGLECTED LANDSCAPES - VEHICLE CORRIDORS
landscape criteria addresses (refer to **Table 4**)

D3 D4

M6 M1 F4 F3 M9
U2 L1 U6 F2 M10

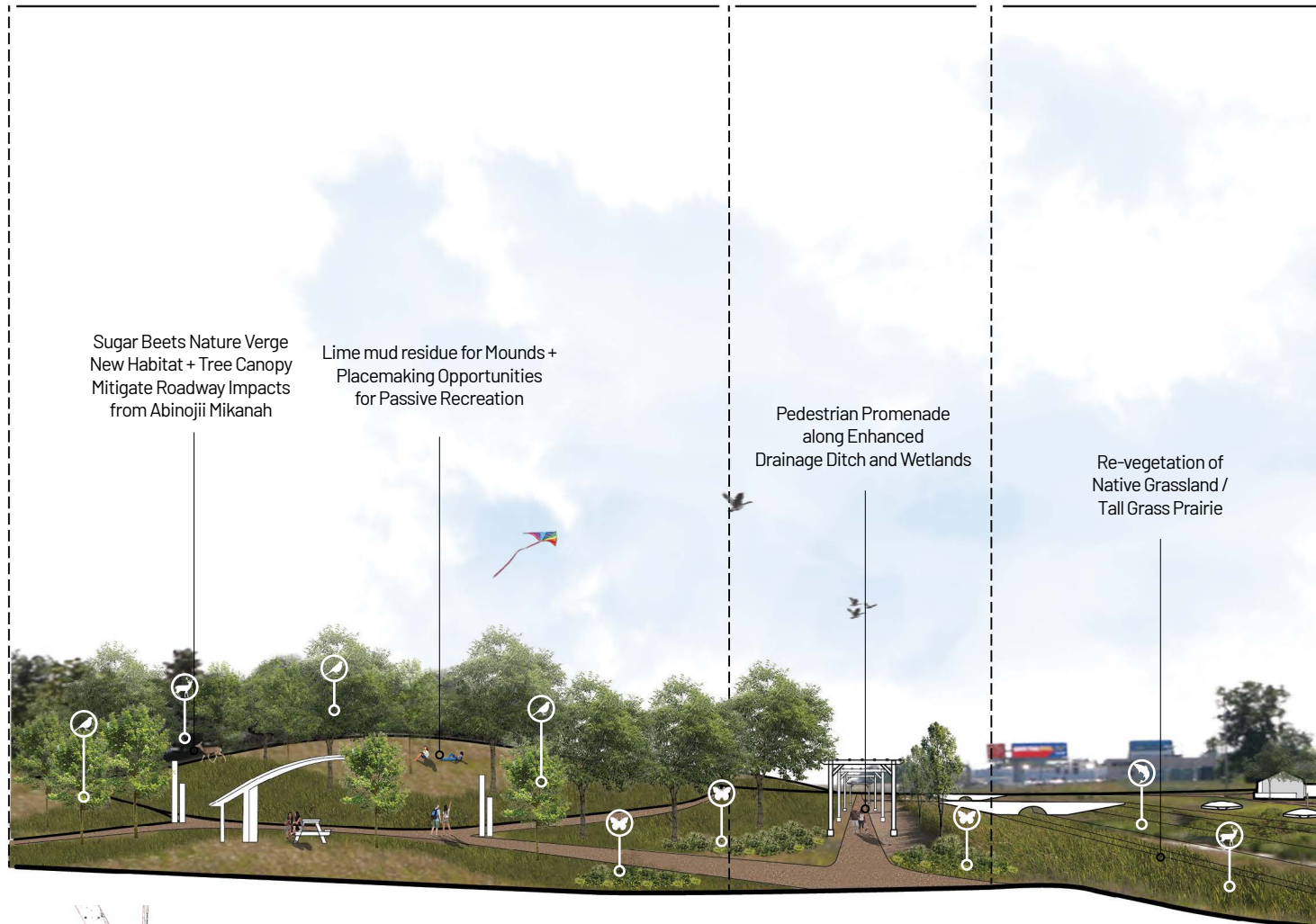
**Nature Verge + Wetlands + Trail Pathways +
Landform Mounds Re-using Lime Mud from Redevelopment Site**

M4
U2 M2

**Pedestrian
Promenade**

U3 M8

**Grassland and
Meadows**

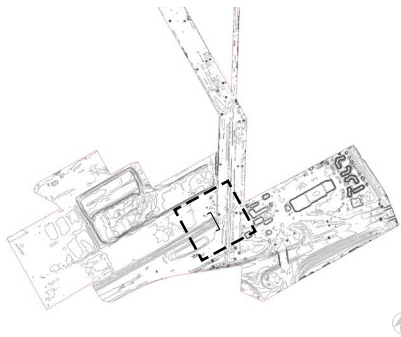


Sugar Beets Nature Verge
New Habitat + Tree Canopy
Mitigate Roadway Impacts
from Abinojii Mikanah

Lime mud residue for Mounds +
Placemaking Opportunities
for Passive Recreation

Pedestrian Promenade
along Enhanced
Drainage Ditch and Wetlands

Re-vegetation of
Native Grassland /
Tall Grass Prairie



SECTION A-A

Figure 115: Sugar Beet Lands - Future Strategies

NEGLECTED LANDSCAPES - CORRIDORS
landscape ecology + infrastructure

Ranked sum for *Ecologically Optimum Land Transformation (EOLT)* potential for neglected landscapes.

$$U + F + S + L + M + D = \text{EOLT 62 (MEDIUM-HIGH)}$$



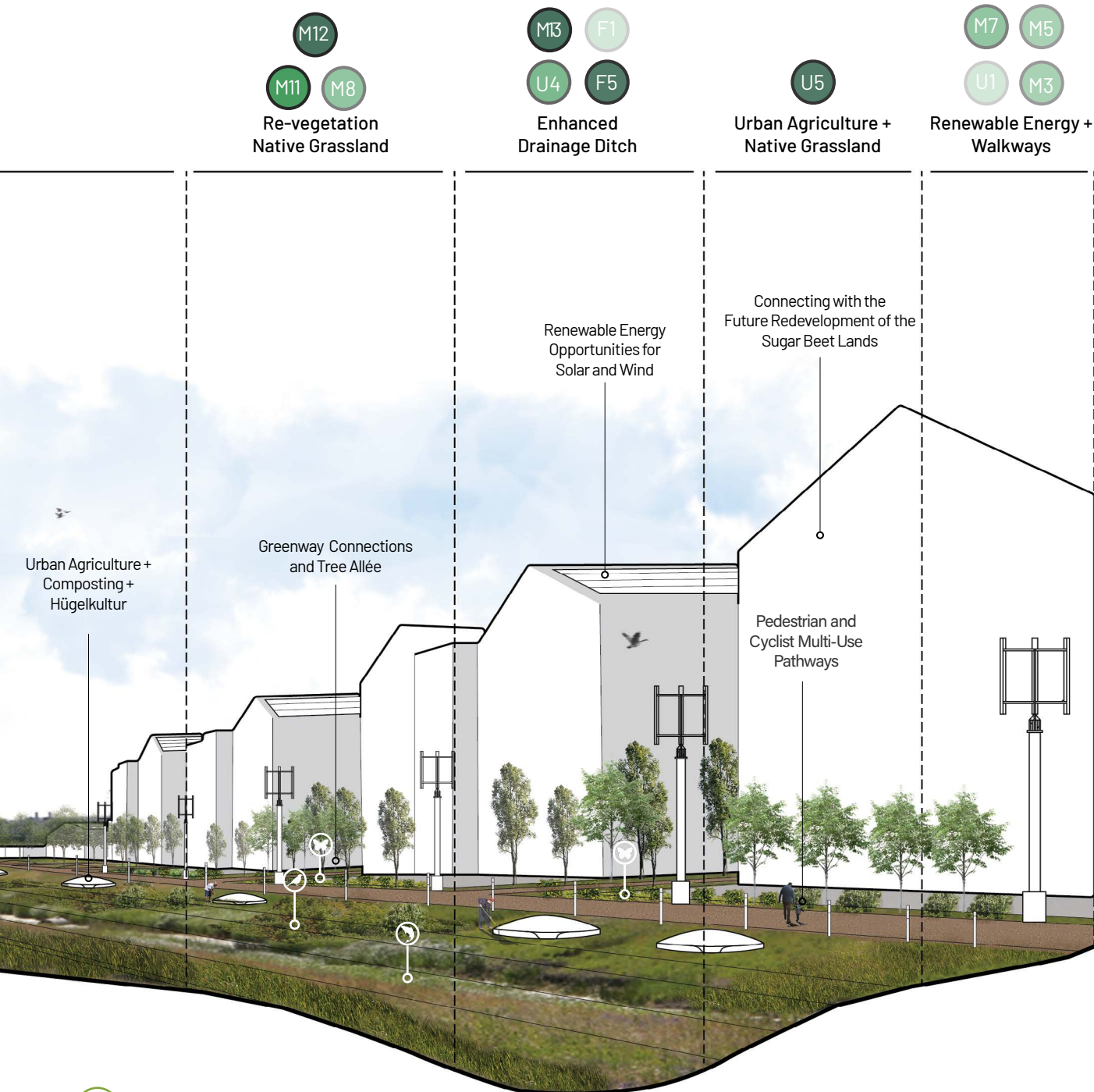
New Plantings and Nesting for Pollinators

Wild Bees / Honey Bees, Monarch Butterflies, Moths, Beetles, Flies



New Habitat for Aquatic Biota

Brook Stickleback, Common Carp, and Flathead Minnow. Identified within Lot 16 Drainage Ditch.



New Habitat for Birds *Various Species

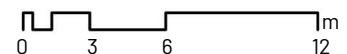
Song Birds: Black-capped Chickadees, Blue Jays, American Crow, Nuthatches. Resident species that will remain year round in woodlots and riparian areas.

Raptors: Barred Owl, Broad-winged Hawk, Common Nighthawk, Coopers Hawk, Great Gray Owl, Great Horned Owl, Long-eared Owl, Northern Saw-whet Owl, Peregrine Falcon, Red-tailed Hawk, Rough-legged Hawk, Sharp-shinned Hawk. Almost all are tree nesting species.



New Habitat for Mammals

White-tailed Deer, Fox, Northern Pocket Gopher, Muskrat, Beaver, Woodchuck, varies species of Squirrels, least Chipmunk, Porcupine, Eastern Cottontail, and Snowshoe Hare



LANDSCAPE MATRIX TABLE A1:

vehicle and road verge strategies (refer to **Fig.69** on **p.98** for influence definitions)

Table 4: Landscape Matrix - Vehicle Corridors

Influence	Characteristics	Source
<i>Land Use (U)</i>	U1 U2 U3 U4 U5 U6	Built Area; Recreation; Open Space; Environmental Storm water Management; Agricultural; Wild/Vacant
<i>Function (F)</i>	F1 F2 F3 F4 F5	Source; Filter; Source; Sink; Habitat; Conduit
<i>Size (S)</i>	S1 S2 S6 S7	Isolation; Edge Habitat and Species; Habitat Diversity; Large Corridor Benefits
<i>Location (L)</i>	L1	Isolation; large patch isolated from other large patches but connected through corridors and stepping stones
<i>Movement (M)</i>	M1 M2 M3 M4 M8 M9 M12 M13	Automotive proximity/road verge; Passive Recreation; Energy Transmission/ Harvesting; Corridors Gaps; Vegetation/Plant compositions; Stepping Stone Connectivity; Habitat for floodplain/wetland species; Continuous Vegetation
<i>Disturbance (D)</i>	D3 D4	Fragmentation; Dissection

U + F + S + L + M + D = EOLT 62

Description	Addresses	Planting Strategy
Vacant agricultural lands/road verges create opportunities for potential use for phytotechnology, on-site water management, productive agriculture, and re-vegetation for native plantings in alignment with future development	Addresses opportunities for future parkland and re-vegetation strategies; more tree species can trap particulate matter and prevent pollution from migrating beyond the road corridor; plants and the soil can be used to filter out pollutants from storm water by introducing bio-retention and linear filter strips	Native plants are the best choices for water-conserving landscapes, and species from local plant communities will be the most successful since they are adapted to the natural precipitation, local soils, and extremes in temperature found in Manitoba. By using native species, a sense of regional identity can be created into the proposed conditions. The inclusion of non-native plants are also considered but selected based upon their drought tolerance. The recommended plantings will consist of a selection of woody species that can add visual depth and layering to the landscape. Layered landscapes can help to soften the hard lines of the buildings and structures and form a pleasant setting. Situating layers of trees and shrubs can also help create areas for shade, privacy, and protection from wind. The recommended plantings will consist of a selection of species intended to use a range of different sizes, textures, and colors that will provide a year-round visual interest in the growing season and winter months.
Multiple large patch benefits for road verge/vacant agricultural lands in proximity to major roadways	Heavily vegetated with mix of species can prevent the spread of pollutants and particulate matter in the air from major roadways	
Single Large patch or Several Small Patches (SLOSS) – large patches improve water quality protection, connectivity for overland movement, new habitat sustained for interior species; creates micro-habitats for multi-habitat species; large patches of natural vegetation is protected and retained	Increase biodiversity in the City; retain and protect large patches for future parkland and habitat for native species and wildlife	
Large patches adjacent to roadways can redirect pollutants that have elevated effects up to 100 meters ways from roadway edges; Large patches of vacant agricultural lands/road verges can be re-imagined to improve connections within the landscape matrix connecting to ecologically significant corridors	Adjacent to major roadways on vacant agricultural lands/road verges; large swaths of land that have the potential to re-mediate roadway pollutants that can affect environments as far as 200 metres away from the road edge; offers parkland in proximity to major redevelopment site/future Sugar Beets development	
Vacant agricultural lands/road verges can be re-imagined for movement of flora and fauna, and opportunities for passive recreation, new parkland, and productive agriculture/permaculture, and renewable energy generation aligned with future development	Habitat source and stepping stones for species dispersal; passive recreation for people to address city needs for future parkland; movement for flora, fauna, and people	
Automotive road verge/vacant agricultural lands create fragmentation and dissection through built up urban areas along major roadways, creating large patches for re-vegetation strategies, passive recreation, and energy generation	Vegetated buffers along major roadways and road verges can offer contamination remediation, serve as important wildlife corridors, and address re-vegetation strategies	

- (E1) Lack of Bio-retention + Storm water Filtering
 (E2) Lack of Woodland + Tree Canopy
 (E3) Opportunity for Renewable Energy
 (E4) Lack of Stepping Stones + Connections
 (E5) Opportunity for Urban Agriculture

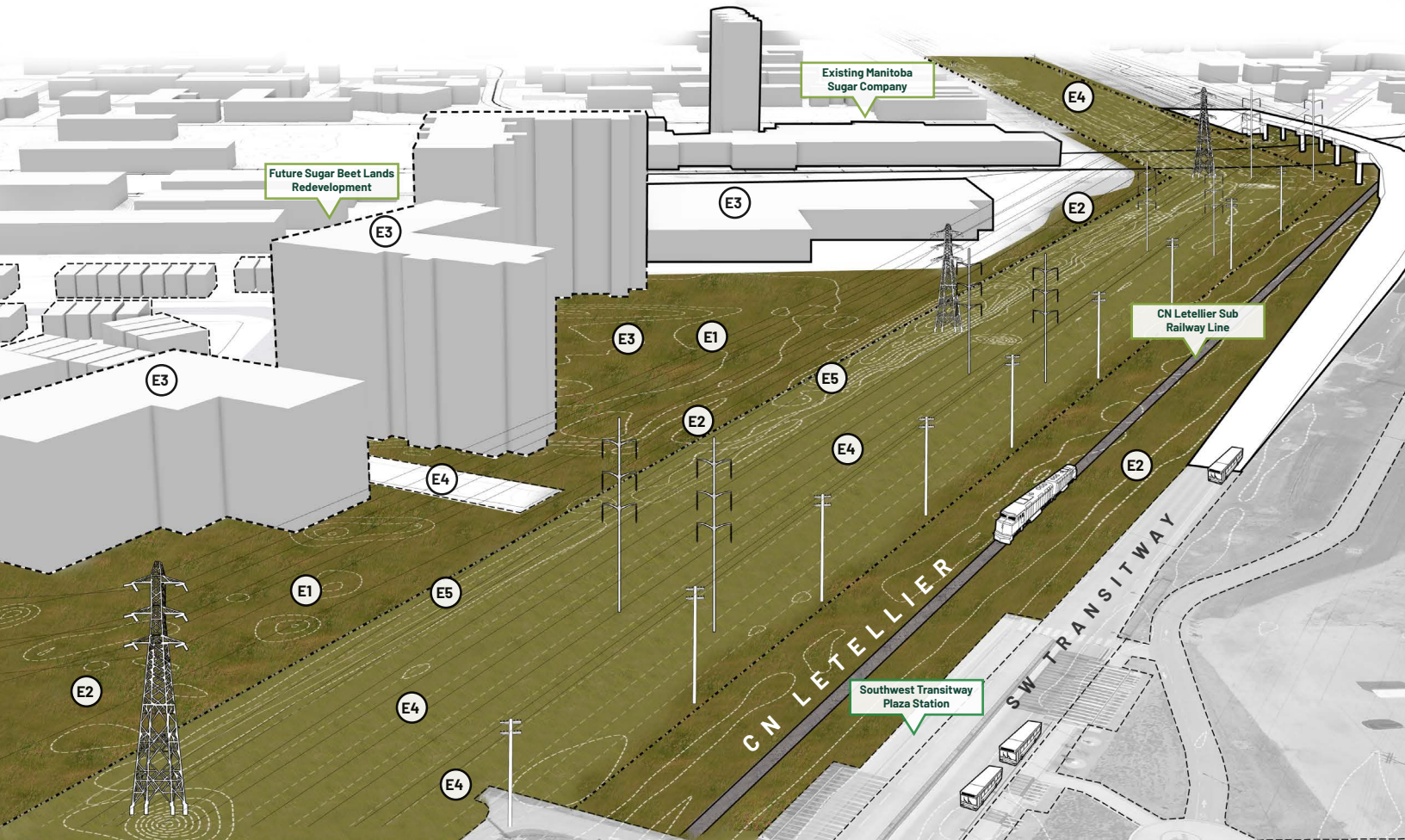


Figure 116: Hydro Corridors (E) existing Conditions

BIODIVERSITY CORRIDORS AND GREENWAYS

Future strategies for transformative change for infrastructure types include Manitoba's Hydro transmission corridors, which can be re-imagined as future ecological networks for native re-vegetation strategies, urban agriculture and community composting for city waste, and creating new inventories for passive recreation and parkland that can be applied at a local and city-wide scale to form a comprehensive network of reclaimed infrastructure into neglected landscapes for transformative change. Greenways can be integrated with prairie meadows and grassland along rail corridors, while wetlands are proposed along edges for irrigation and bio-retention. Plantings within the hydro corridor will include a combination of lower canopy trees and shrubs but predominantly native woody plants to create water-conserving, drought-tolerant, and be relatively low-maintenance for a prairie garden design within the corridors.

Above: Assessment of existing conditions for hydro corridors and railways.

Right: Applying Forman's principles for supporting indispensable patterns and key locations in the landscape.

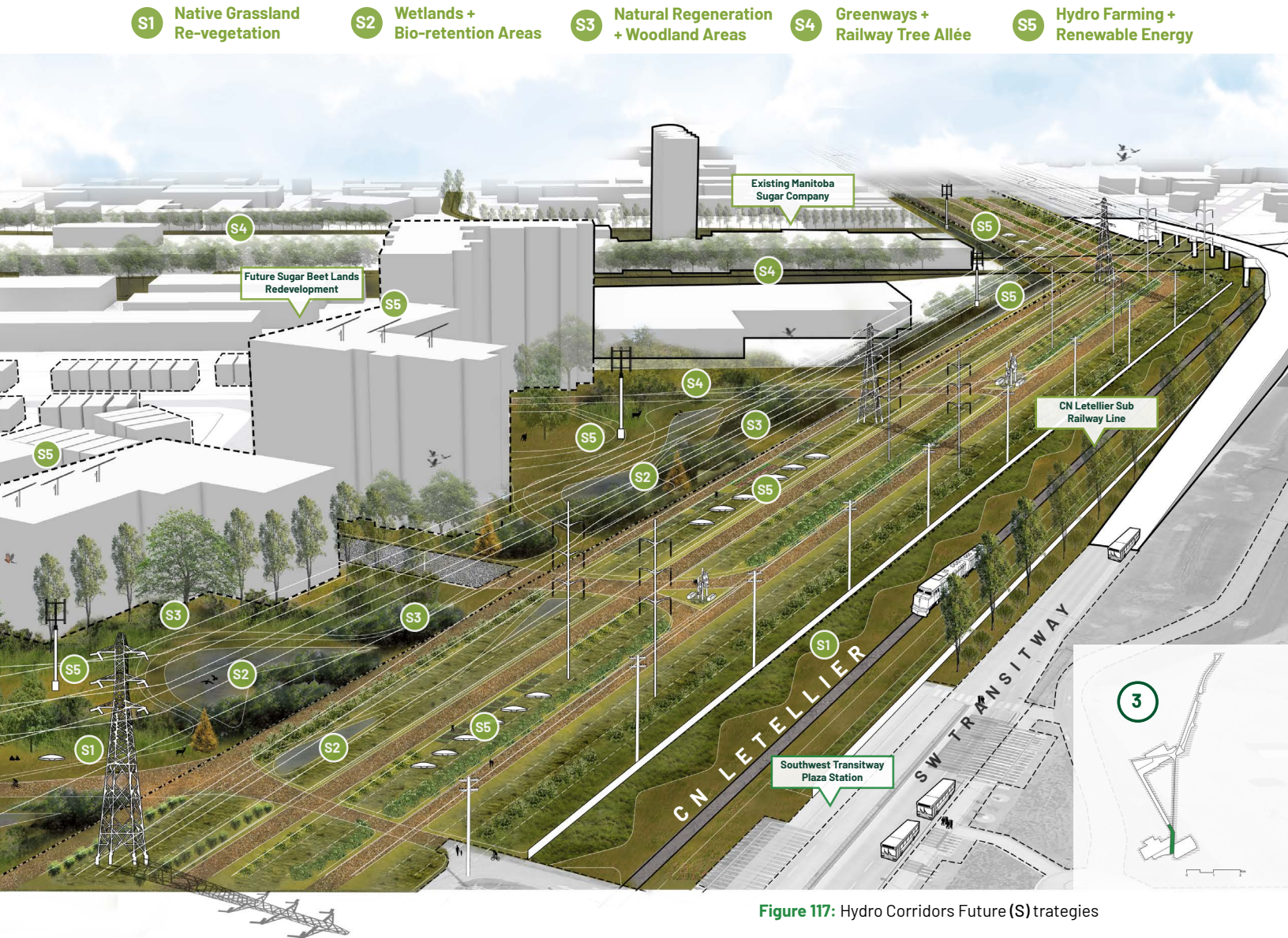
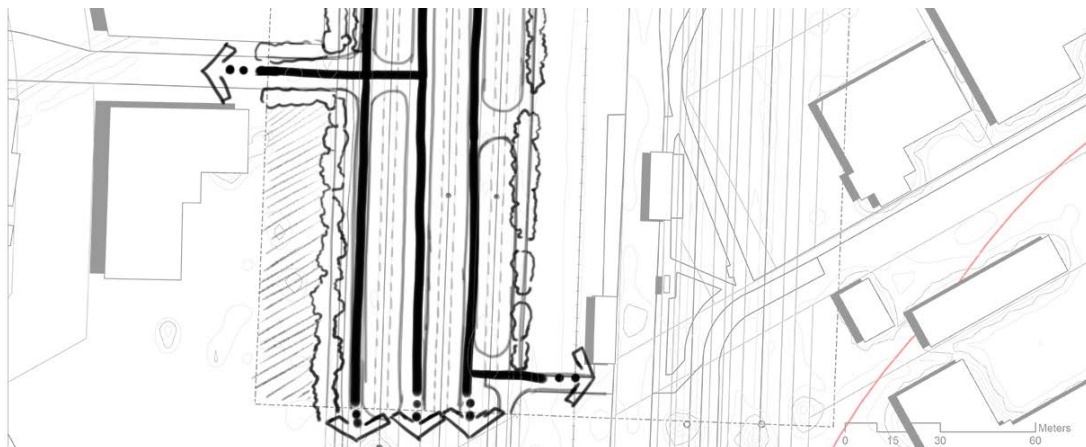


Figure 117: Hydro Corridors Future (S) strategies



BIODIVERSITY CORRIDOR AND GREENWAYS SITE PLAN

- 1 Native Grassland Re-vegetation and Prairie Meadows
- 2 Wetlands and Bio-retention Areas
- 3 Natural Re-vegetation of Woodland Areas
- 4 Greenways and Tree Allée
- 5 Hydro Farming and Renewable Energy

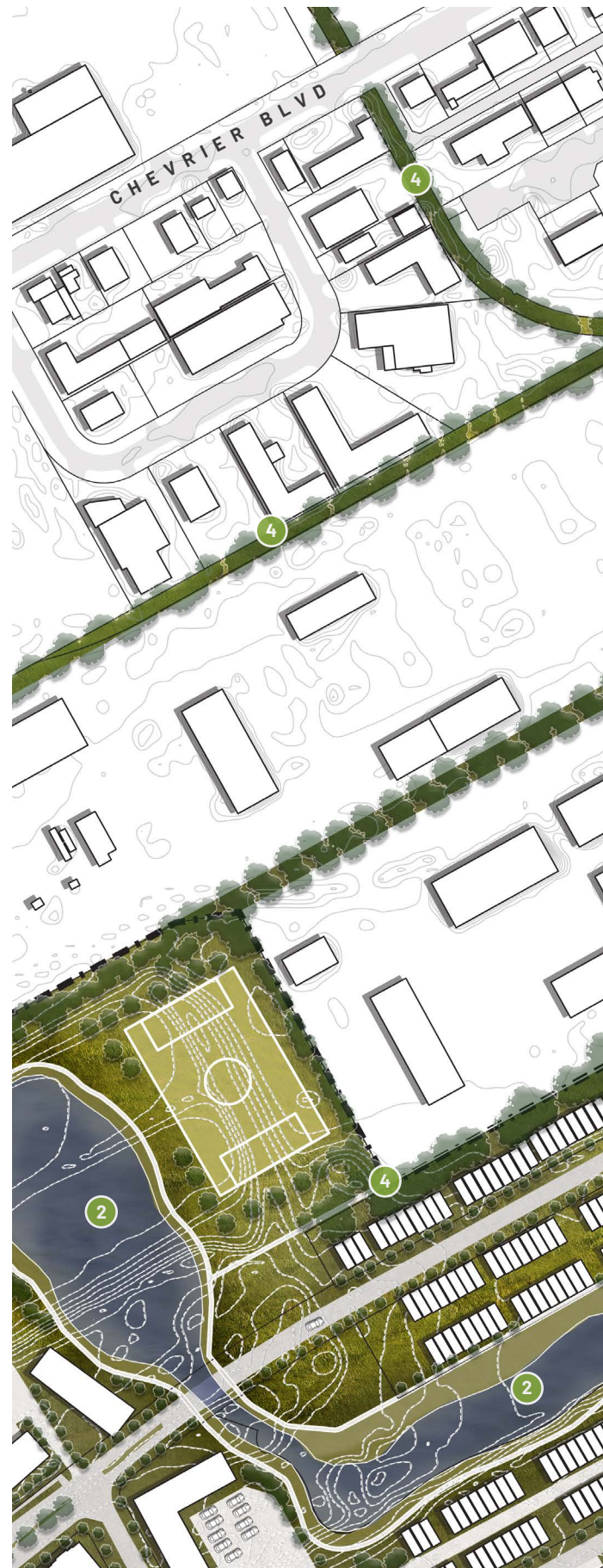
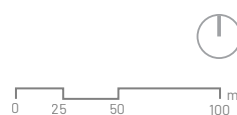


Figure 118: Biodiversity Corridors and Greenway Site Plan



BIODIVERSITY CORRIDOR AND GREENWAYS STRATEGY ZONES

- 1 Native Grassland Re-vegetation and Prairie Meadows
- 2 Wetlands and Bio-retention Areas
- 3 Natural Re-vegetation of Woodland Areas
- 4 Greenways and Tree Allée
- 5 Hydro Farming and Renewable Energy

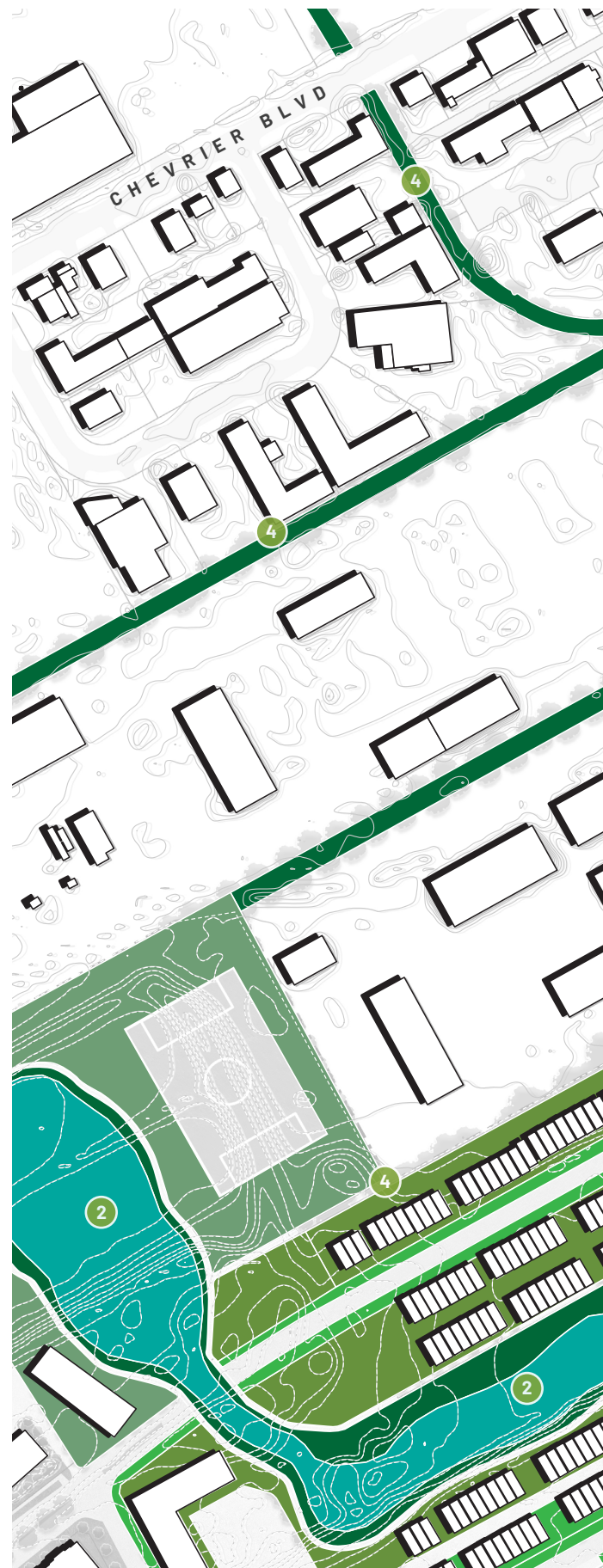
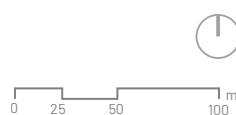
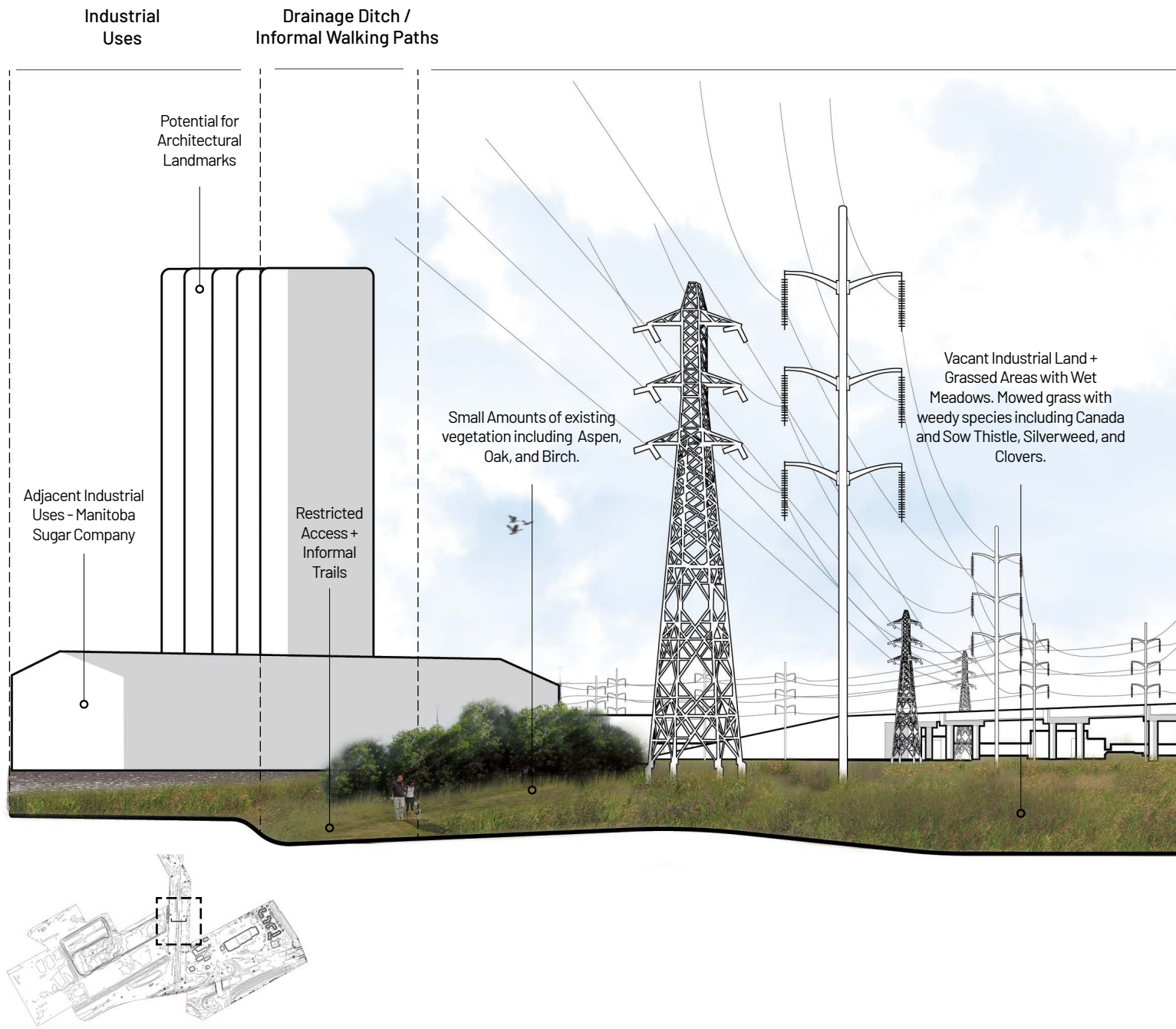


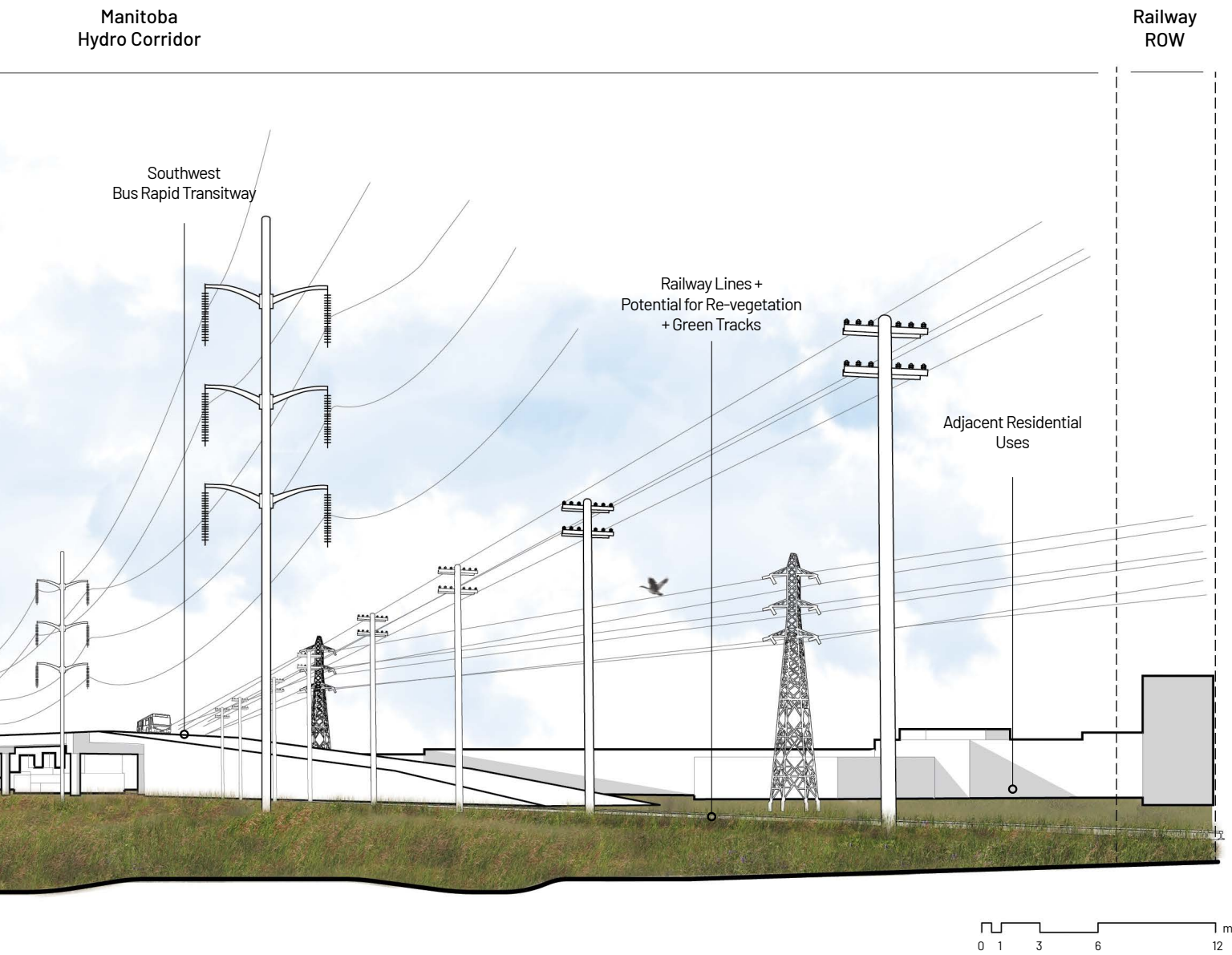
Figure 119: Biodiversity Corridors Strategy Zones



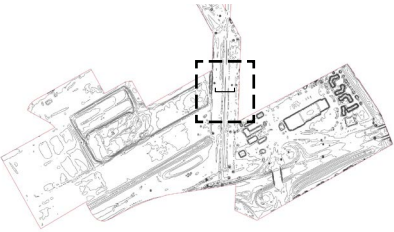
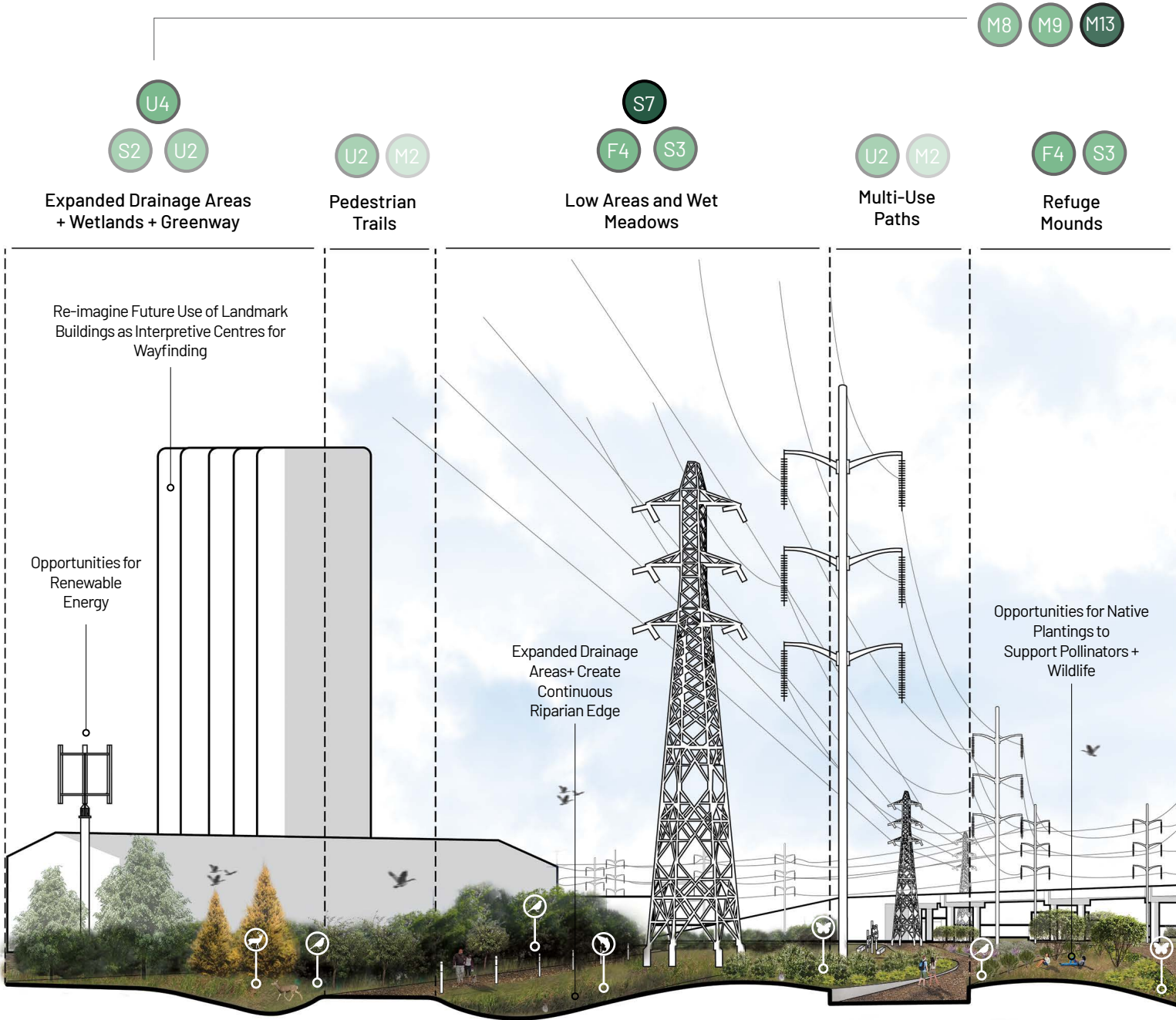


SECTION B-B

Figure 120: Hydro Corridors - Existing Conditions



NEGLECTED LANDSCAPES - HYDRO CORRIDORS
landscape criteria addresses (refer to **Table 5**)



SECTION B-B

Figure 121: Hydro Corridors - Future Strategies

NEGLECTED LANDSCAPES - CORRIDORS
landscape ecology + infrastructure

Ranked sum for *Ecologically Optimum Land Transformation (EOLT)* potential for neglected landscapes.

U + F + S + L + M + D = EOLT 58 (MEDIUM- HIGH)



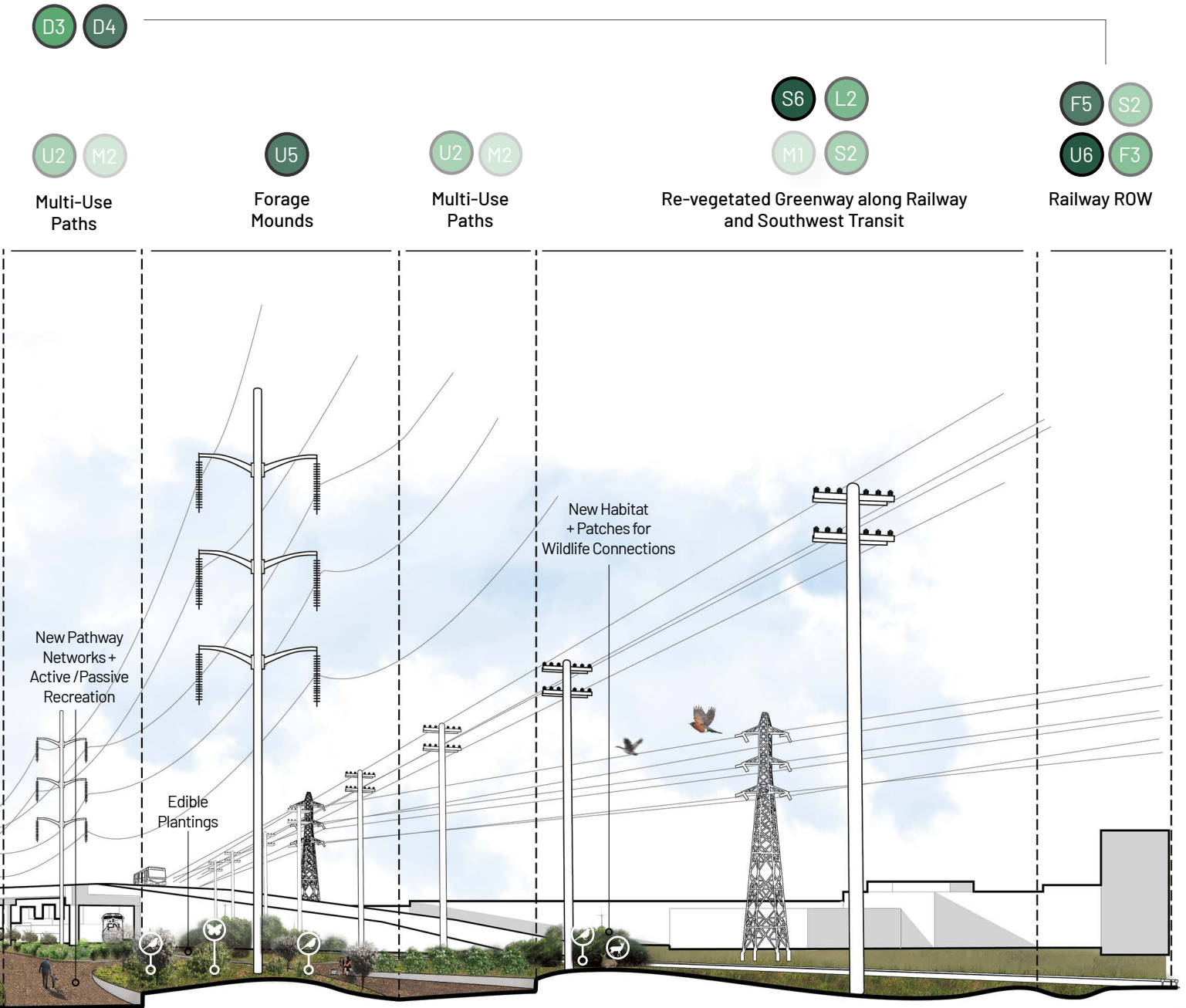
New Plantings and Nesting for Pollinators

Wild Bees / Honey Bees, Monarch Butterflies, Moths, Beetles, Flies



New Habitat for Aquatic Biota

Brook Stickleback, Common Carp, and Flathead Minnow identified within ROW.



New Habitat for Birds *Various Species

Song Birds: Black-capped Chickadees, Blue Jays, American Crow, Nuthatches. Resident species that will remain year round in woodlots and riparian areas.

Raptors: Barred Owl, Broad-winged Hawk, Common Nighthawk, Coopers Hawk, Great Gray Owl, Great Horned Owl, Long-eared Owl, Northern Saw-whet Owl, Peregrine Falcon, Red-tailed Hawk, Rough-legged Hawk, Sharp-shinned Hawk. Almost all are tree nesting species.



New Habitat for Mammals

White-tailed Deer, Fox, Northern Pocket Gopher, Muskrat, Beaver, Woodchuck, varies species of Squirrels, least Chipmunk, Porcupine, Eastern Cottontail, and Snowshoe Hare

LANDSCAPE MATRIX TABLE H1:

manitoba hydro corridor strategies (refer to **Fig.69** on **p.98** for influence definitions)

Table 5: Landscape Matrix - Hydro Corridors

Influence	Characteristics	Source
<i>Land Use (U)</i>	U2 U3 U4 U5 U6	Recreation; Open Space; Environmental Storm water Management; Agricultural; Wild / Vacant
<i>Function (F)</i>	F3 F4 F5	Source; Sink; Habitat; Conduit
<i>Size (S)</i>	S2 S3 S6 S7	Edge habitat and species; Interior habitat and species; New Habitat diversity; Large Corridor Benefits
<i>Location (L)</i>	L2	Recolonization Close Proximity to Others
<i>Movement (M)</i>	M1 M2 M4 M8 M9 M13	Automotive/Transitway; Recreation/ Pedestrian/Cyclist; Corridor Gaps; Vegetation /Plant Compositions; Stepping Stones for Connectivity; Continuous Vegetation
<i>Disturbance (D)</i>	D3 D4	Fragmentation; Dissection

$$\text{U} + \text{F} + \text{S} + \text{L} + \text{M} + \text{D} = \text{EOLT 58}$$

Description	Addresses	Planting Strategy
Vacant Industrial and Agricultural Lands/forage mounds for edible plantings	Green networking and supporting future parkland needs in built-up areas	Native plants are the best choices for water-conserving landscapes, and species from local plant communities will be the most successful since they are adapted to the natural precipitation, local soils, and extremes in temperature found in Manitoba. By using native species, a sense of regional identity can be created into the proposed conditions. The inclusion of non-native plants are also considered but selected based upon their drought tolerance. The recommended plantings list will consist of a selection of woody species that can add visual depth and layering to the landscape. Layered landscapes can help to soften the hard lines of the buildings and structures and form a pleasant setting. Situating layers of trees and shrubs can also help create areas for shade, privacy, and protection from wind. The recommended plantings will consist of a selection of species intended to use a range of different sizes, textures, and colors that will provide a year-round visual interest in the growing season and winter months.
New Habitat Creation; Greenways; Connectivity for wildlife	Facilitates movement of people and habitat and connecting to adjacent ecological areas and river corridors	
Manitoba Hydro Corridor - large corridor widths with vegetated edge conditions	Large corridors connecting new patches of habitat increases overall connectivity for species movement	
New Corridor connections within the landscape matrix connecting to ecologically significant patches	Addresses lack of continuous patches and greenway corridors to facilitate active/passive recreation and improve ecological diversity	
New Corridor design for movement of people, flora, and fauna	New conduits in the landscape matrix and creates stepping stones between patches	
Manitoba Hydro Corridor creates fragmentation and dissection through built up urban areas, creating green networks for re-vegetation strategies	Addresses the underutilization of neglected infrastructure rights-of-way for future parkland strategies, edible food opportunities, and re-vegetation strategies for native plantings	

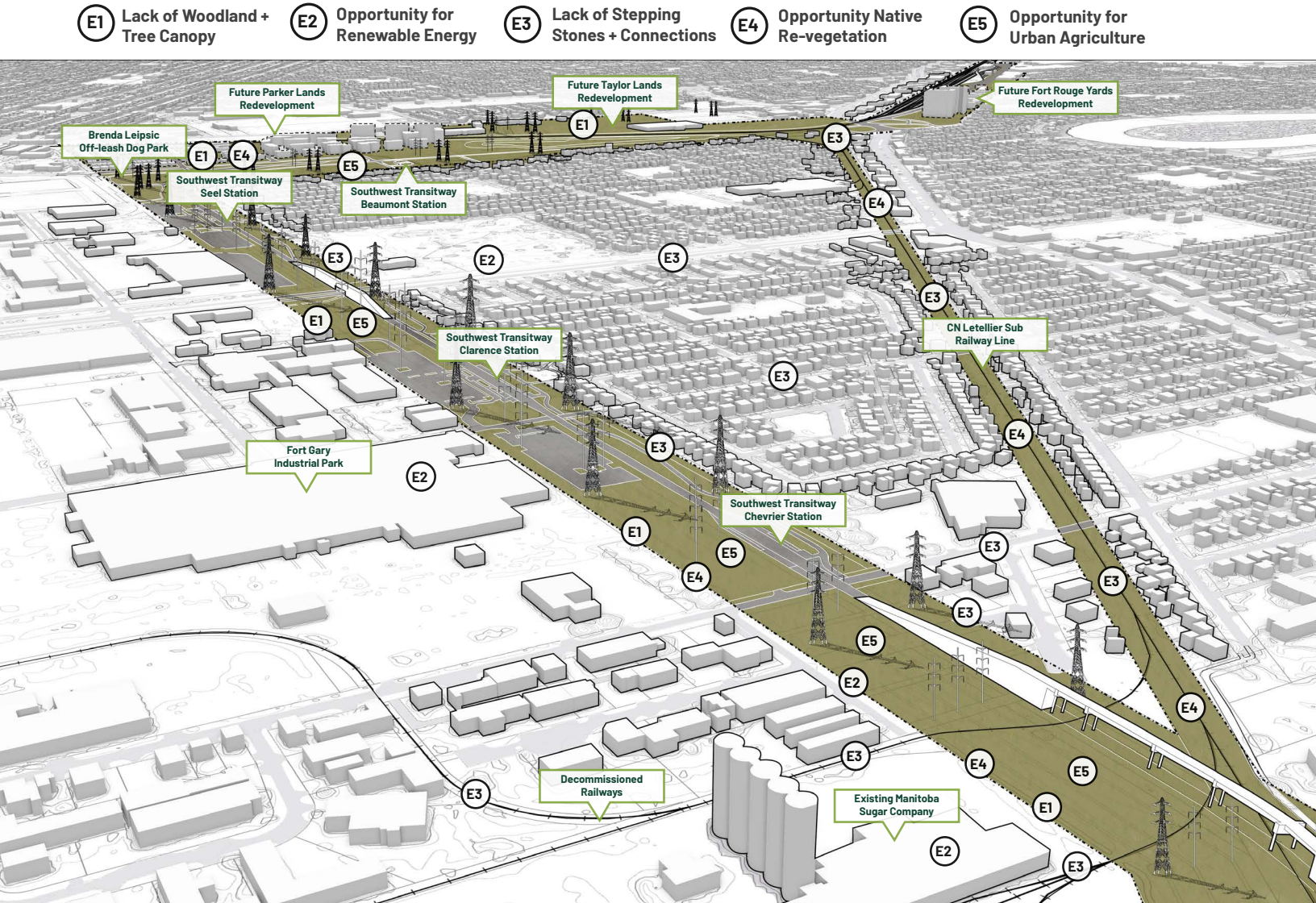


Figure 122: Rail Corridors (E) existing Conditions

THE GREEN LOOP

Future strategies with the looping of the Manitoba Hydro transmission and railway corridors create opportunities for extending greenways along these neglected landscapes and integrating opportunities for renewable energy, re-vegetation for wildflowers and prairie meadows, urban agriculture and hydro farming, and turning decommissioned railway lines into connective networks for boardwalks and a tree allée. These connective tissues form a Green Loop, interconnecting major redevelopment sites for transformative change while acting as conduits and stepping stones for ecological benefits for flora, fauna, and pollinators. The Green Loop also includes opportunities for passive recreation for multi-use pathways on both sides of the corridors that intersect key transportation station areas and the Southwest Rapid Transitway.

Above: Assessment of existing conditions for hydro corridors and railways.

Right: Applying Forman's principles for supporting indispensable patterns and key locations in the landscape.

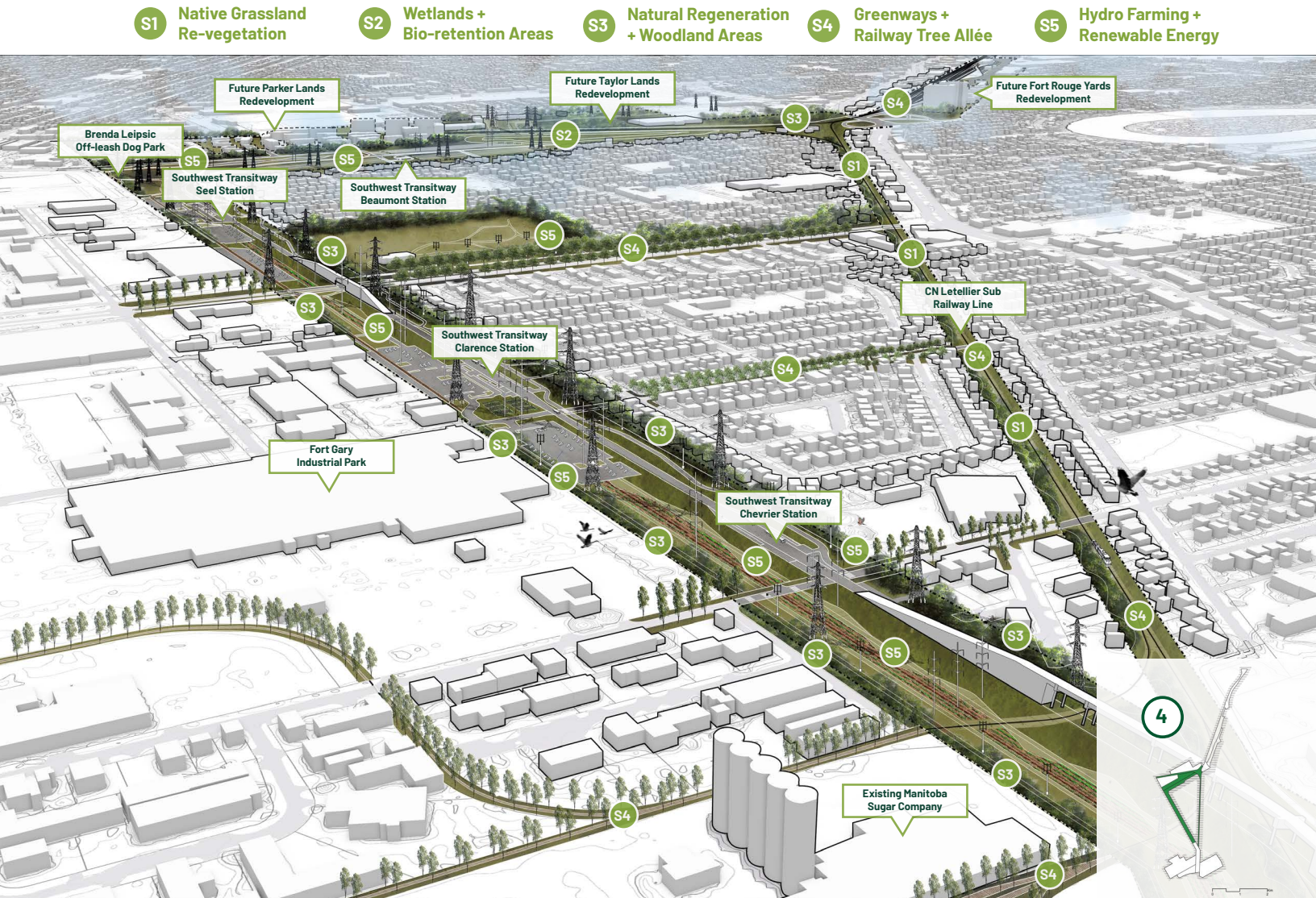
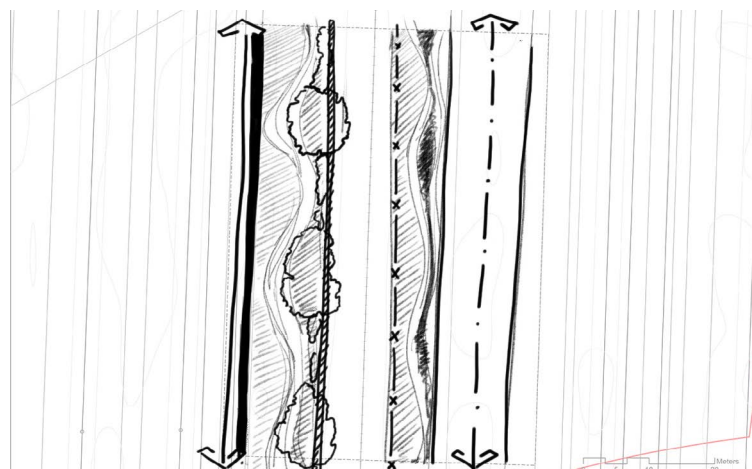
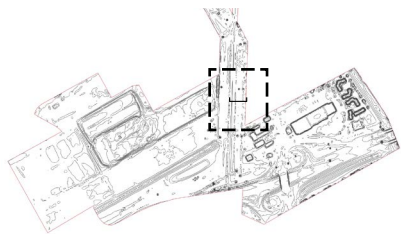
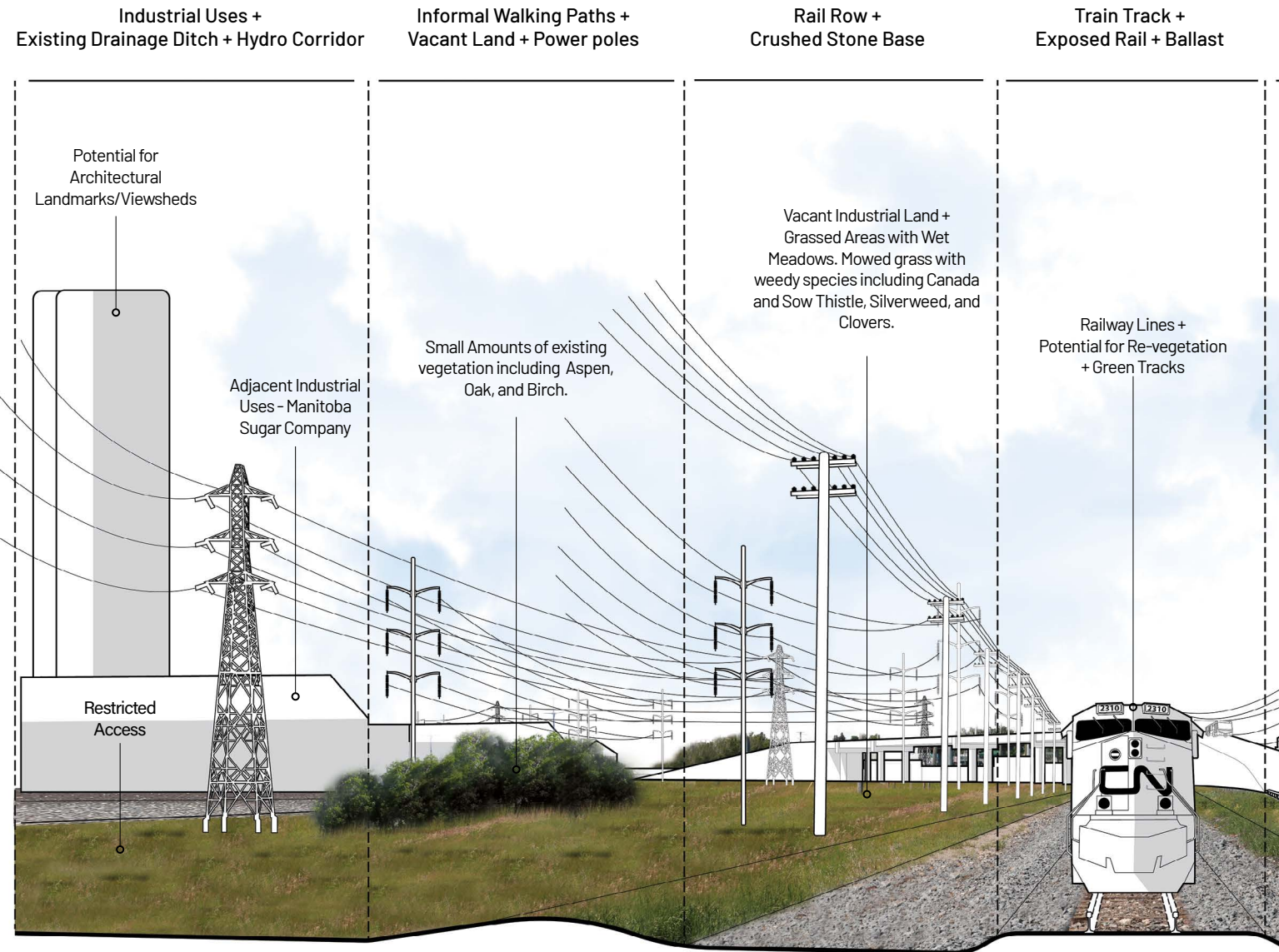


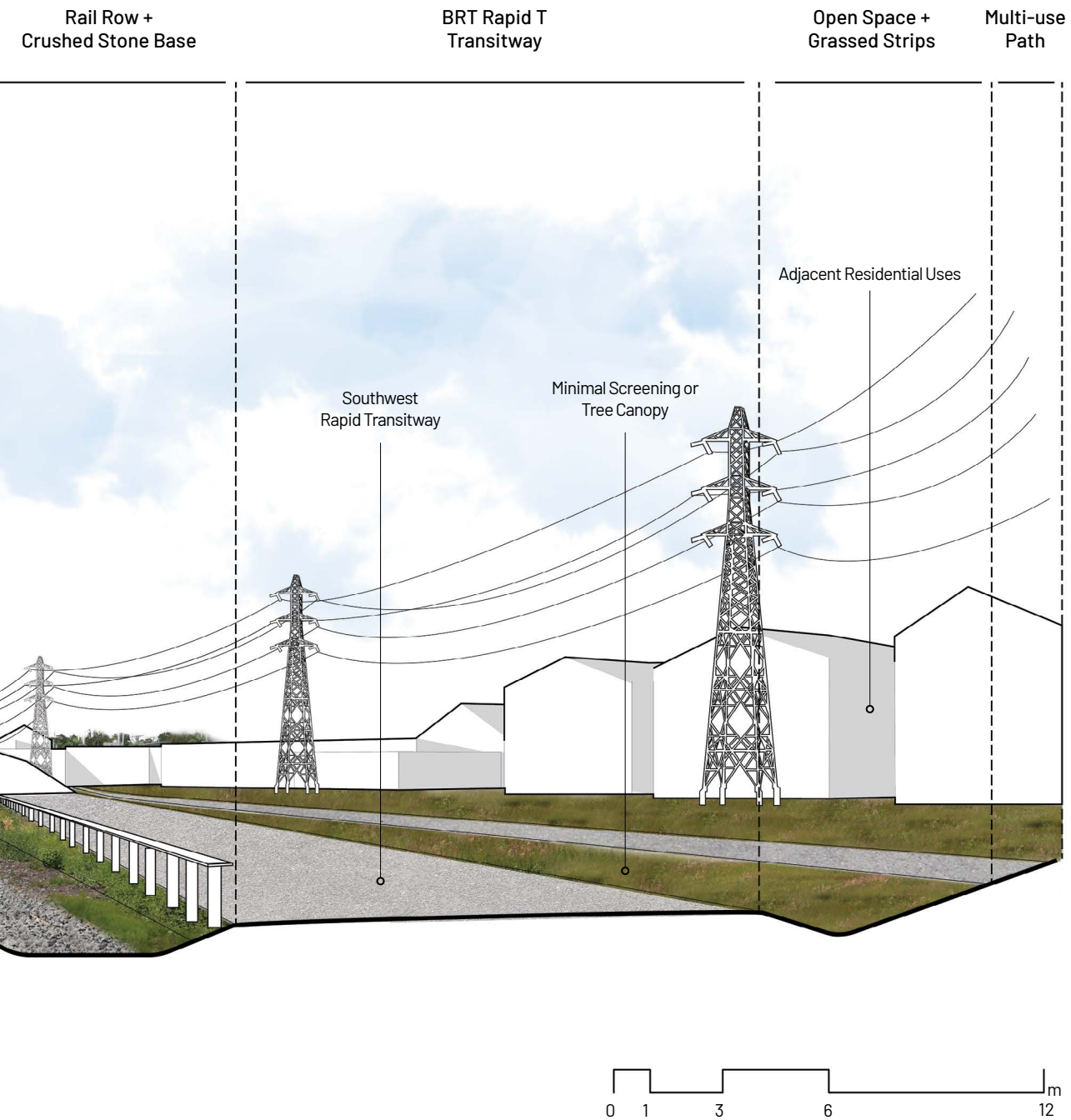
Figure 123: Rail Corridors Future (S) strategies





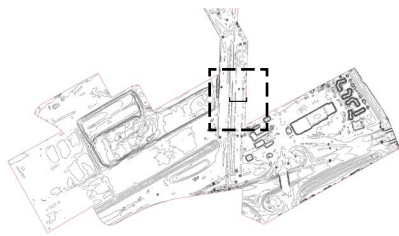
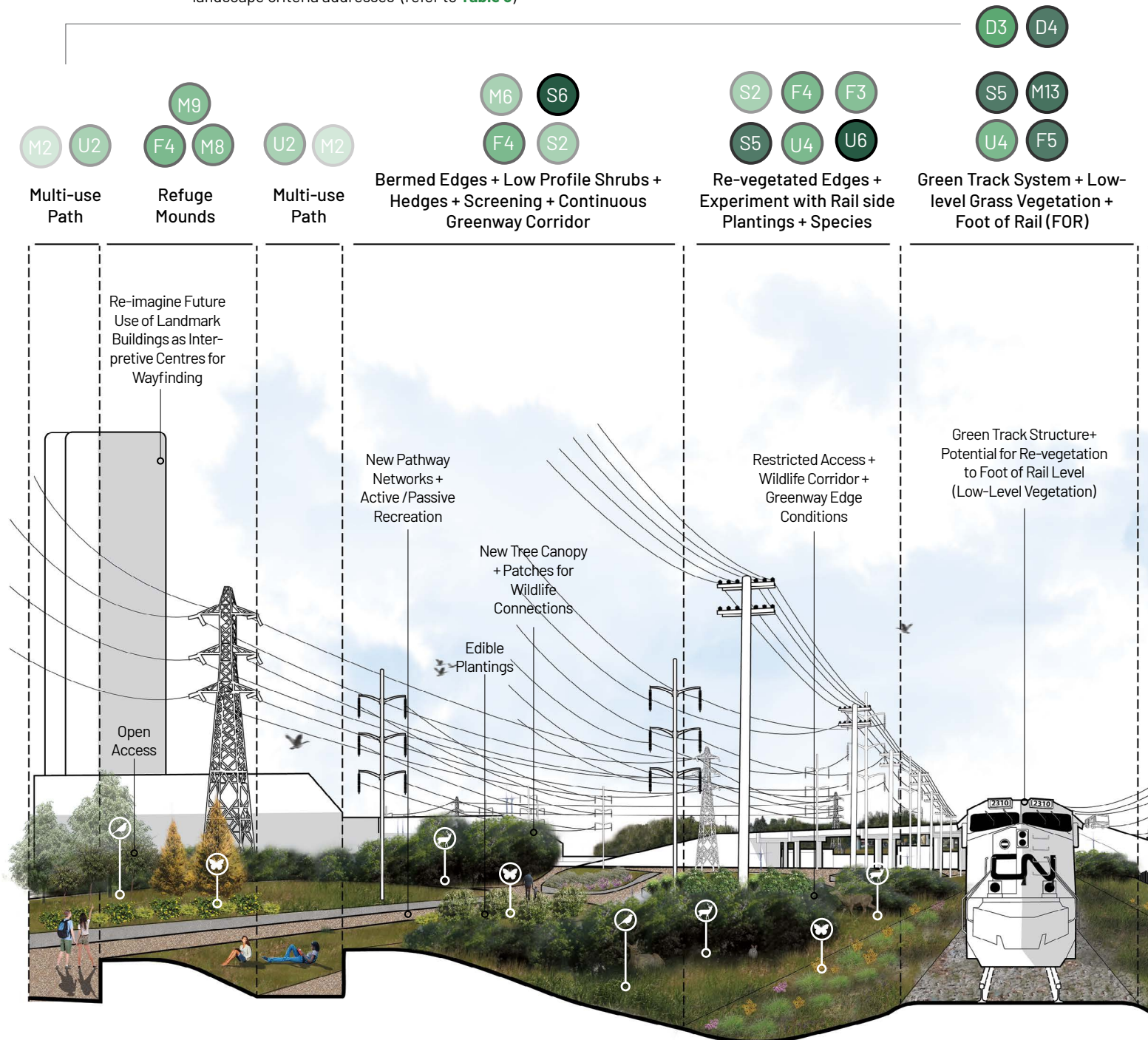
SECTION C-C

Figure 124: Railway Corridor - Existing Conditions



NEGLECTED LANDSCAPES - RAIL CORRIDORS

landscape criteria addresses (refer to Table 6)



SECTION C-C

Figure 125: Railway Corridor - Future Strategies

NEGLECTED LANDSCAPES - CORRIDORS

landscape ecology + infrastructure

ranked (1-3) sum for *Ecologically Optimum Land Transformation (EOLT)* potential for neglected landscapes.

$$U + F + S + L + M + D = \text{EOLT } 46 \text{ (LOW-MEDIUM)}$$



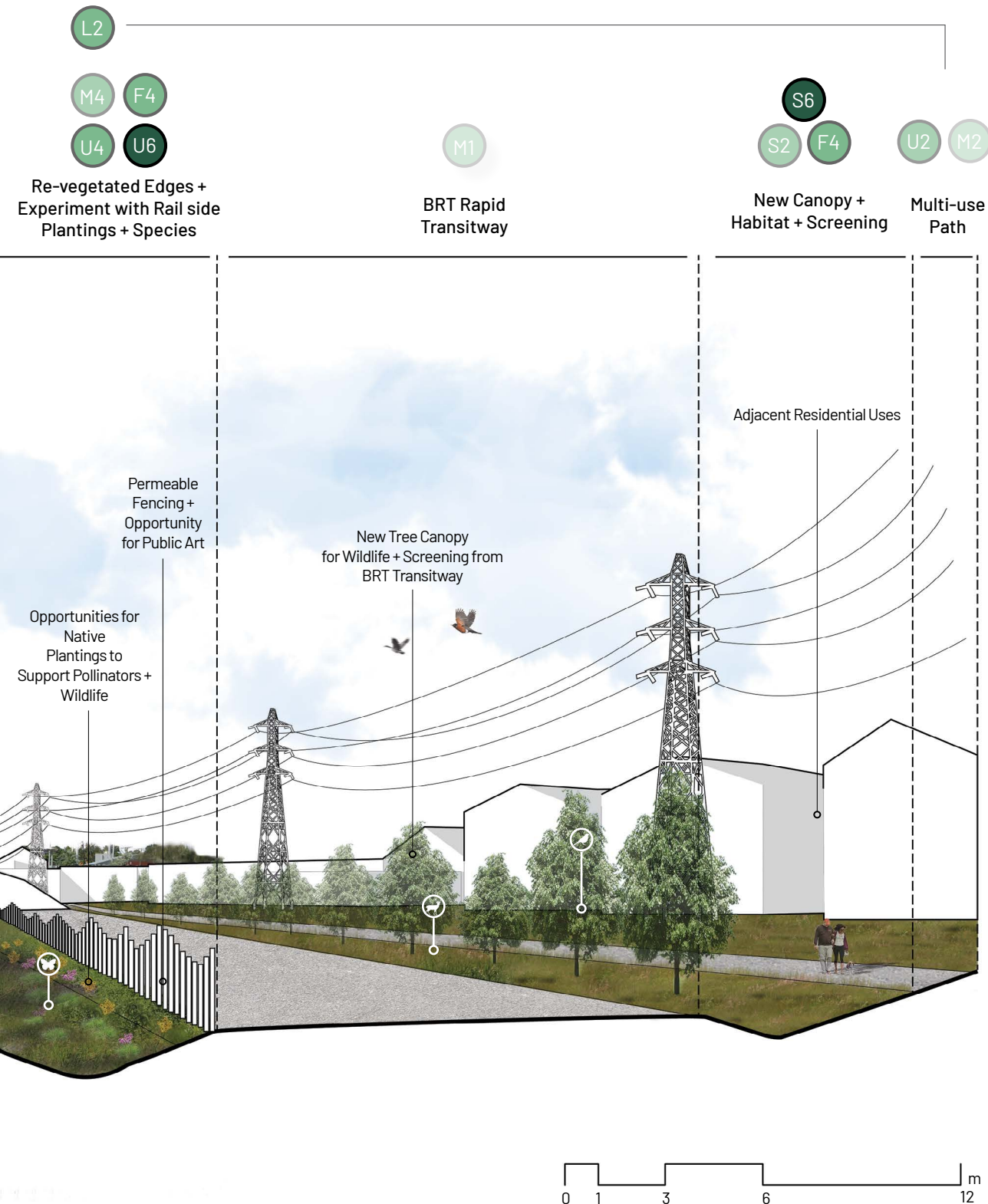
New Plantings and Nesting for Pollinators

Wild Bees / Honey Bees, Monarch Butterflies, Moths, Beetles, Flies



New Habitat for Mammals

White-tailed Deer, Fox, Northern Pocket Gopher, Muskrat, Beaver, Woodchuck, various species of Squirrels, least Chipmunk, Porcupine, Eastern Cottontail, and Snowshoe Hare



New Habitat for Birds *Various Species

Song Birds: Black-capped Chickadees, Blue Jays, American Crow, Nuthatches. Resident species that will remain year round in woodlots and riparian areas.

Raptors: Barred Owl, Broad-winged Hawk, Common Nighthawk, Coopers Hawk, Great Gray Owl, Great Horned Owl, Long-eared Owl, Northern Saw-whet Owl, Peregrine Falcon, Red-tailed Hawk, Rough-legged Hawk, Sharp-shinned Hawk. Almost all are tree nesting species.

LANDSCAPE MATRIX TABLE R1:

railway corridor strategies (refer to **Fig.69** on **p.98** for influence definitions)

Table 6: Landscape Matrix – Railway Corridors

Influence	Characteristics	Source
<i>Land Use (U)</i>	U2 U4 U6	Recreation; Environmental Storm water Management; Wild / Vacant
<i>Function (F)</i>	F3 F4 F5	Source; Sink; Habitat; Conduit
<i>Size (S)</i>	S2 S5 S6	Edge Habitat and Species; Small Corridor Benefits; Habitat Diversity
<i>Location (L)</i>	L2	Recolonization Close Proximity to Others
<i>Movement (M)</i>	M1 M2 M4 M6 M8 M9 M13	Automotive/BRT Transitway; Recreation/ Pedestrian/Cyclist; Corridor Gaps; Barrier to Humans; Vegetation/Plant Compositions; Stepping Stone Connectivity; Continuous Vegetation
<i>Disturbance (D)</i>	D3 D4	Fragmentation; Dissection

$$\text{U} + \text{F} + \text{S} + \text{L} + \text{M} + \text{D} = \text{EOLT 46}$$

Description	Addresses	Planting Strategy
Vacant Industrial Lands; Green Tracks offer better storm water retention in the track structure; mitigation of heat island effect in Green tracks	Improved water retention with grass vegetation system and improved storm water quality	Native plants are the best choices for water-conserving landscapes, and species from local plant communities will be the most successful since they are adapted to the natural precipitation, local soils, and extremes in temperature found in Manitoba. By using native species, a sense of regional identity can be created into the proposed conditions. The inclusion of non-native plants are also considered but selected based upon their drought tolerance. The recommended plantings will consist of a selection of woody species that can add visual depth and layering to the landscape. Layered landscapes can help to soften the hard lines of the buildings and structures and form a pleasant setting. Situating layers of trees and shrubs can also help create areas for shade, privacy, and protection from wind. The recommended plantings list will consist of a selection of species intended to use a range of different sizes, textures, and colors that will provide a year-round visual interest in the growing season and winter months.
New Habitat Creation of Greenways and Green Tracks; Connectivity for wildlife; Green Track structure can absorb and retain pollutants	Reduction in airborne particulate matter and other pollution through deposition on vegetation surface and base layer; Green tracks provide important habitats (biotopes) for biota	
CN Rail Corridor - small corridor widths with vegetated edge conditions; opportunity for protecting scattered and small habitats and rare species; native grassland may persist in places along the railroad	Increase biodiversity in the City	
New Corridor connections within the landscape matrix connecting to ecologically significant patches	Re-stitches greenways to other corridors and large patches	
New Corridor design for movement of flora and fauna	Habitat stepping stones for species dispersal	
CN Rail Corridor creates fragmentation and dissection through built up urban areas, creating green networks for re-vegetation strategies and Green Track opportunities	Vegetated buffers along rail corridors can offer contamination remediation but vegetated areas can serve as important wildlife corridors through urban built-up areas	

- (E1) Lack of Bio-retention + Storm water Filtering
 (E2) Lack of Woodland + Tree Canopy
 (E3) Opportunity for Renewable Energy
 (E4) Lack of Stepping Stones + Connections
 (E5) Opportunity for Urban Agriculture

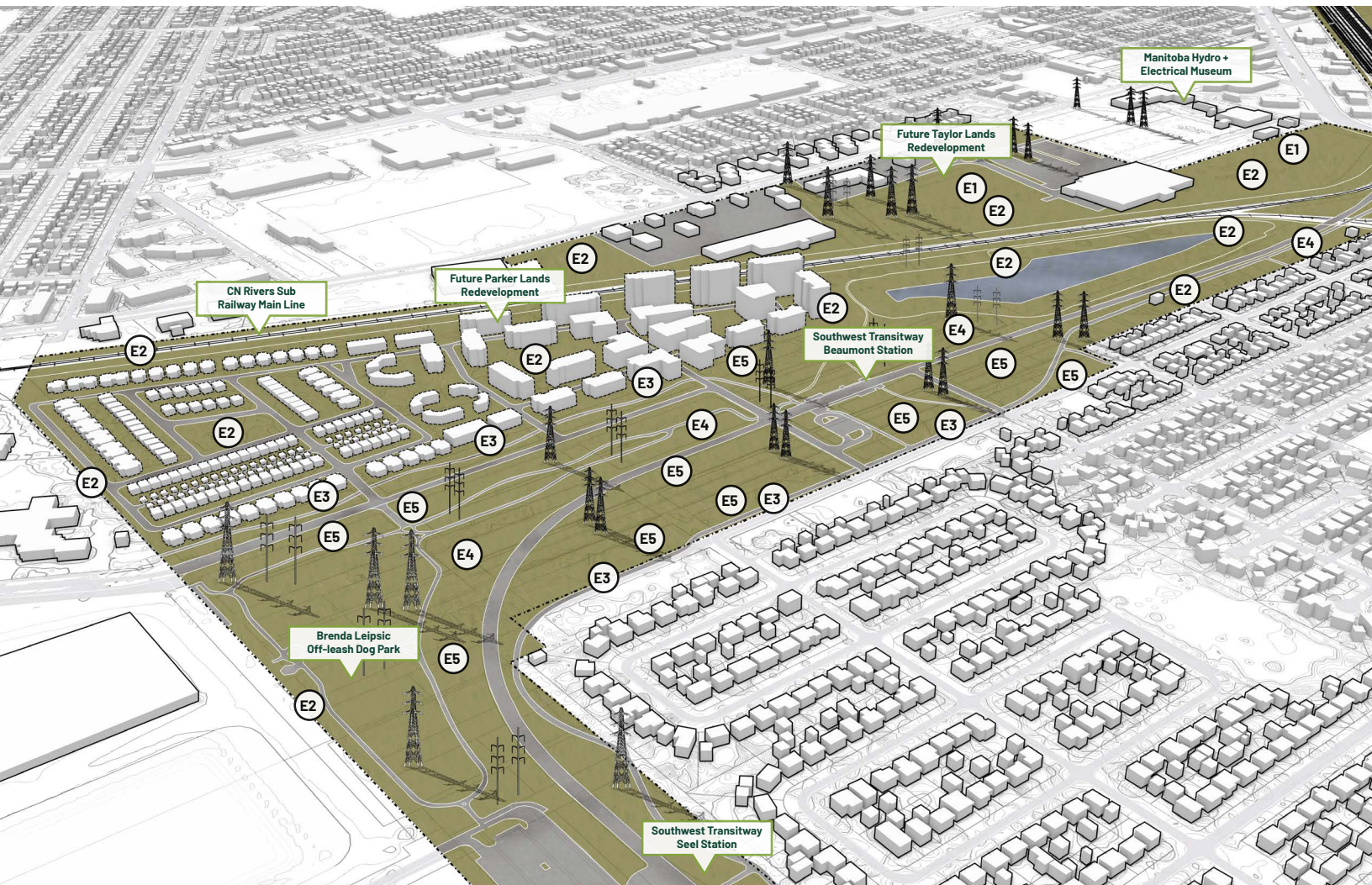


Figure 126: Parker and Taylor Lands (E) existing Conditions

PARKER AND TAYLOR HYDRO FARMING

Future strategies for the Manitoba Hydro transmission corridors adjacent to the future redevelopment of the Parker and Taylor lands include hydro farming and integrating stepping stones through re-vegetation strategies and growing areas for lower canopy woodland and shelter belts for urban agriculture, composting, and Hügelskultur beds. The large corridors create opportunities to integrate renewable energy for wind and solar power facilities for irrigation and urban agriculture while offering greenway connections to future parkland and place-making opportunities. Hydro farming can be a significant way for the City to manage, re-cycle, and grow food and biomass to directly support current and future development while forming a vital component of a more extensive ecological network as part of neglected landscapes in formerly vacant and industrial areas of Winnipeg.

Above: Assessment of existing conditions for hydro corridors.

Right: Applying Forman's principles for supporting indispensable patterns and key locations in the landscape.

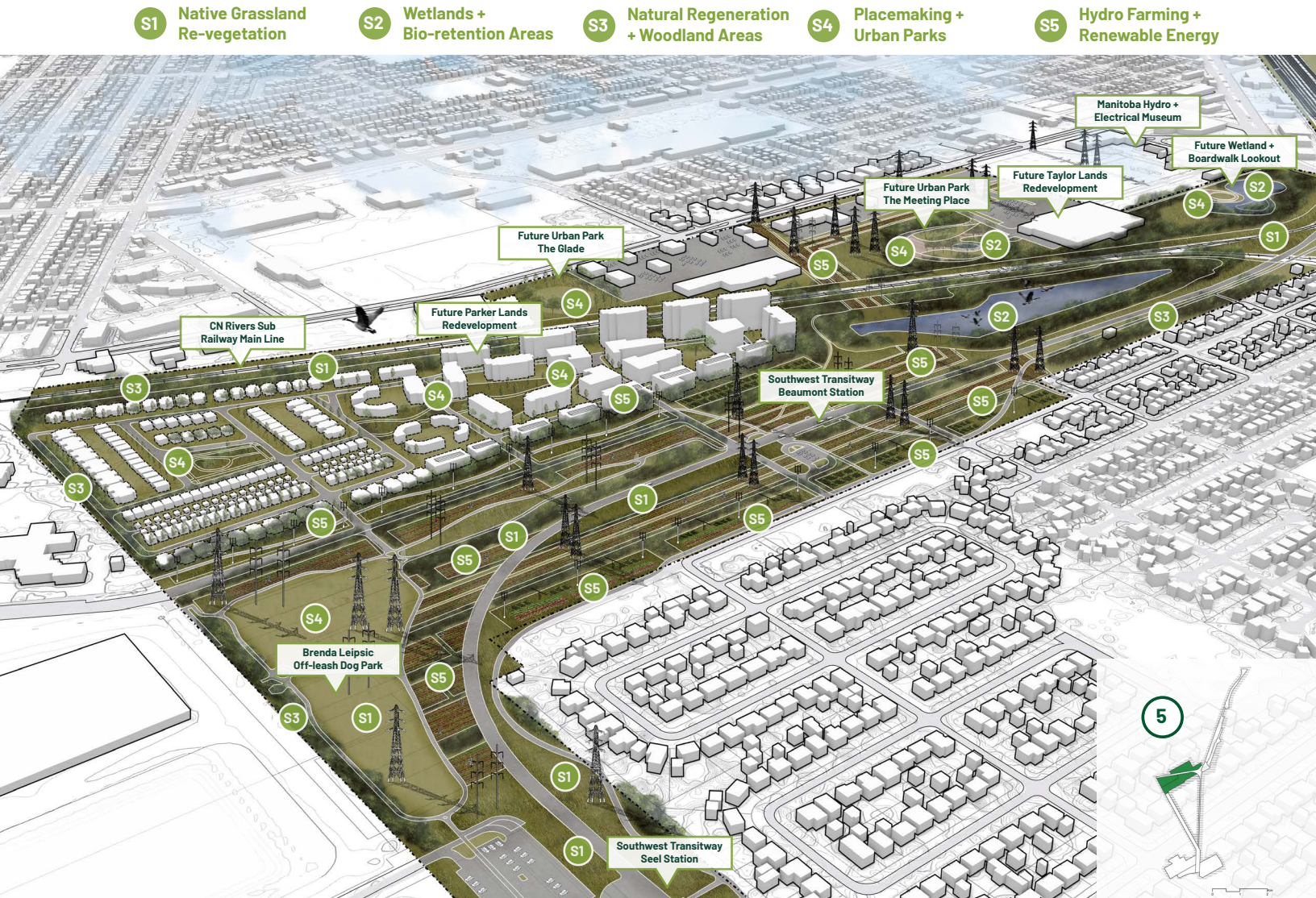
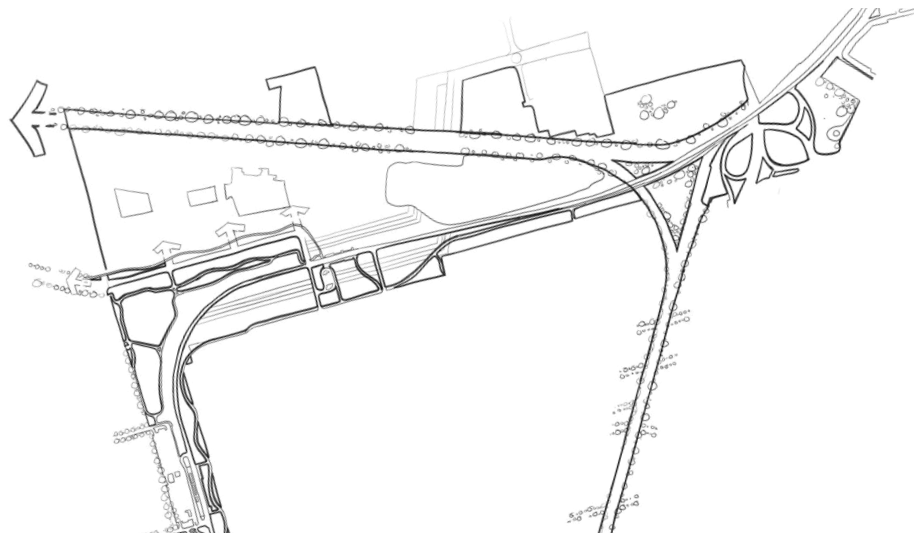


Figure 127: Parker and Taylor Lands Future (S) strategies



PARKER AND TAYLOR HYDRO FARMING SITE PLAN

- 1 Native Grassland Re-vegetation and Prairie Meadows
- 2 Wetlands and Bio-retention Areas
- 3 Natural Re-vegetation of Woodland Areas
- 4 Greenways and Tree Allée
- 5 Hydro Farming and Renewable Energy
- 6 Placemaking and Urban Parks



Figure 128: Park and Taylor Hydro Farming Site Plan



PARKER AND TAYLOR HYDRO FARMING STRATEGY ZONES

- 1 Native Grassland Re-vegetation and Prairie Meadows
- 2 Wetlands and Bio-retention Areas
- 3 Natural Re-vegetation of Woodland Areas
- 4 Greenways and Tree Allée
- 5 Hydro Farming and Renewable Energy
- 6 Placemaking and Urban Parks



Figure 129: Park and Taylor Hydro Farming Strategy Zones



- (E1) Lack of Bio-retention + Storm water Filtering
 (E2) Lack of Woodland + Tree Canopy
 (E3) Opportunity for Re-vegetation
 (E4) Lack of Stepping Stones + Connections
 (E5) Opportunity for Urban Agriculture

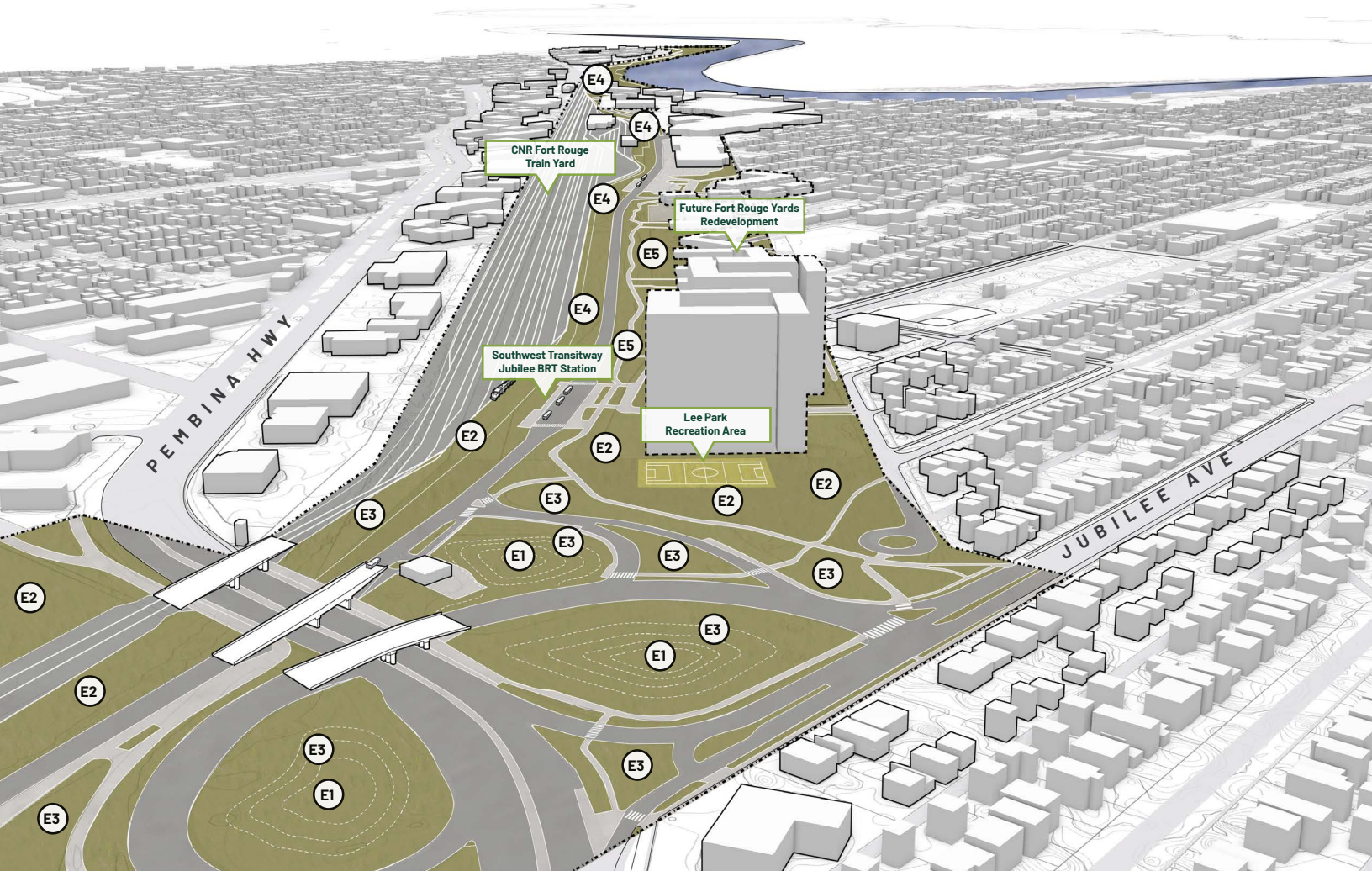


Figure 130: Fort Rouge Greenway (E) existing Conditions

FORT ROUGE GREENWAY EXTENSION

Future strategies for creating an extension of the Fort Rouge Greenway intends to create stepping stones that connect towards the Red River to the northeast while creating a connection via the greenways along the railway corridors south towards Abinojii Mikanah (formerly Bishop Grandin Boulevard) and Abinojii Mikanah Greenway. Edges along the road verges and the railway corridors will include wetlands for bio-retention and habitat and woodland regeneration to add patch diversity along these linear corridors to facilitate wildlife movement. Native plantings are proposed along these greenways to support local plant communities that

Above: Assessment of existing conditions for rail corridors.

Right: Applying Forman's principles for supporting indispensable patterns and key locations in the landscape.

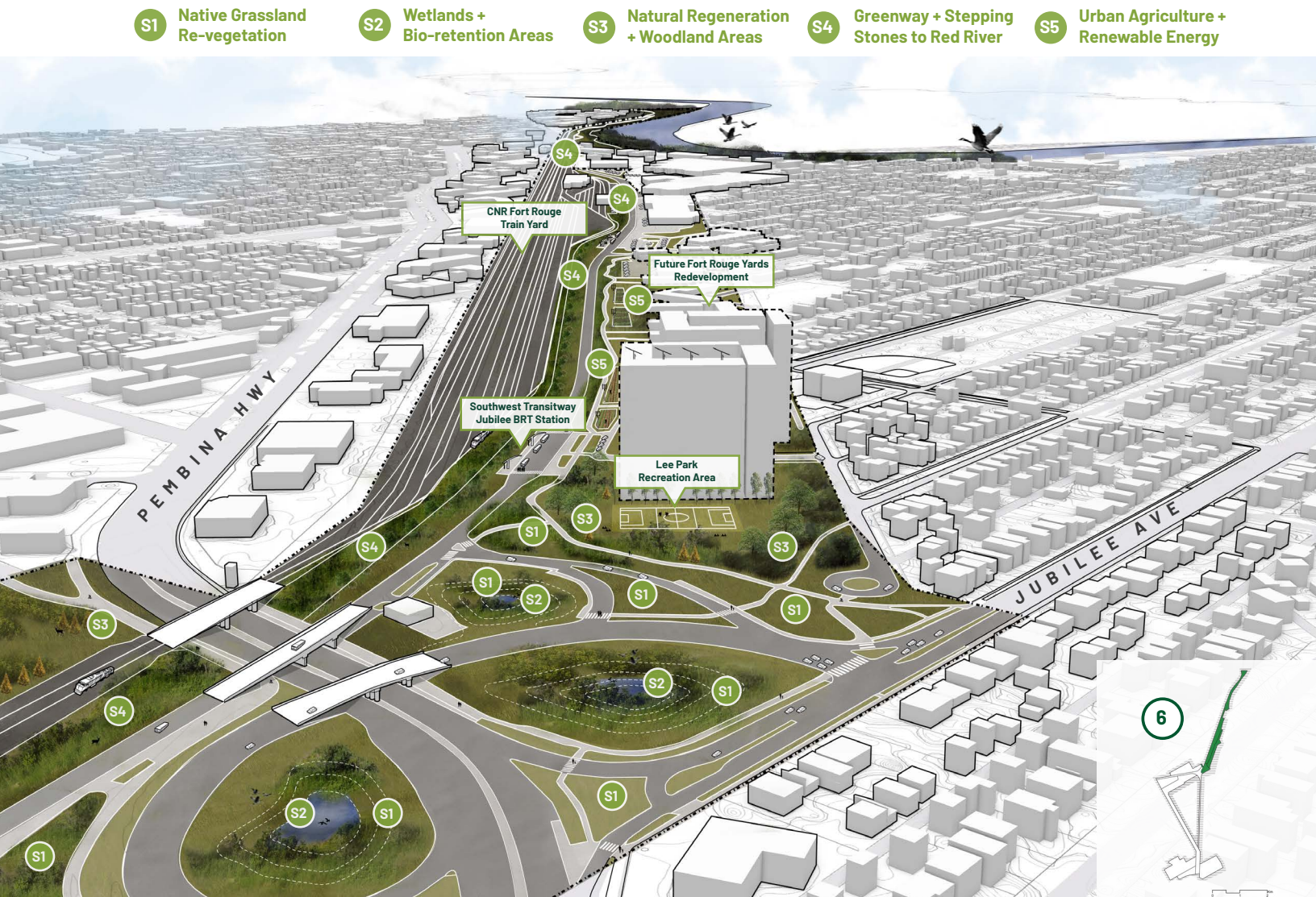
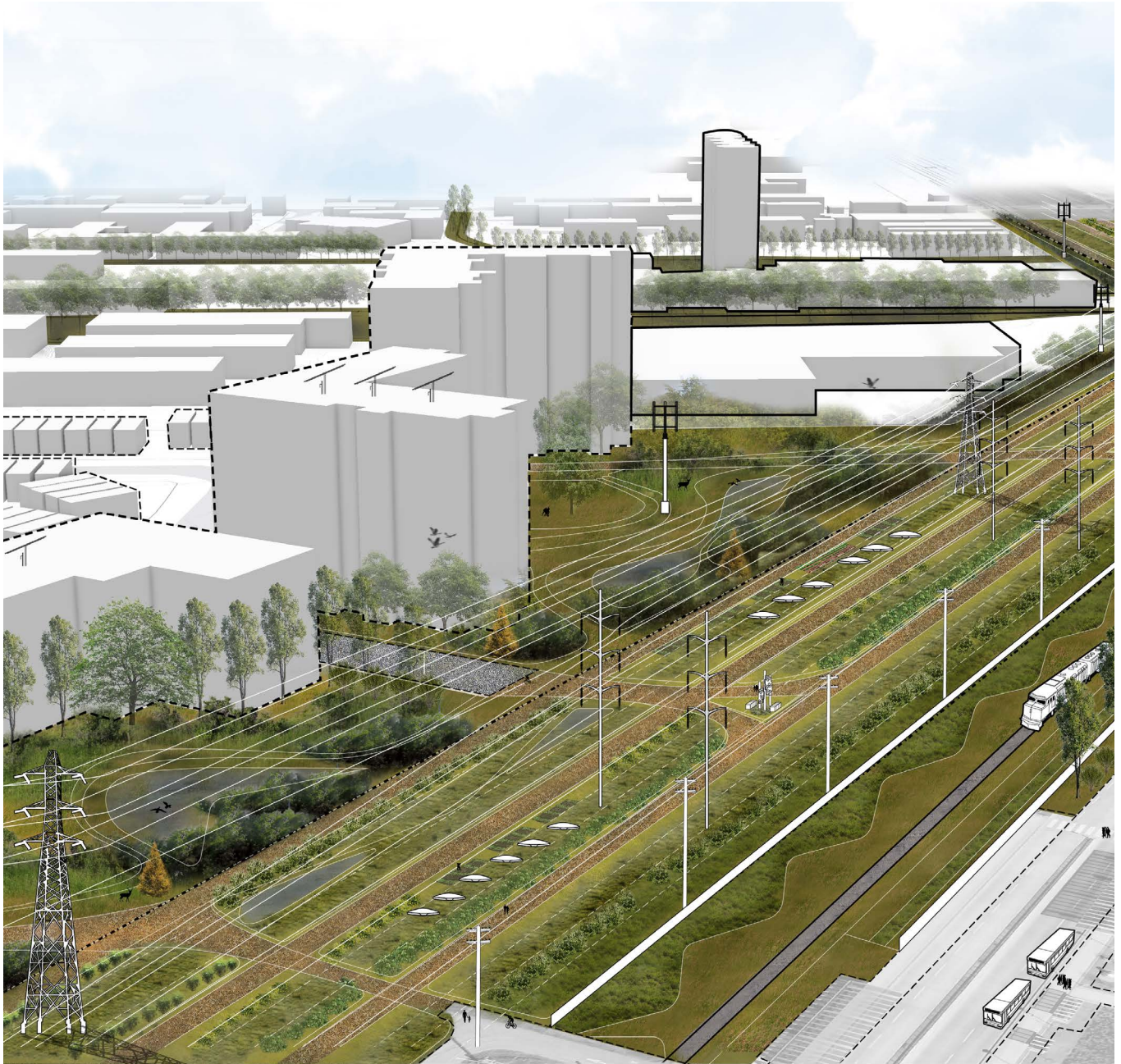


Figure 131: Fort Rouge Greenway Future (S) strategies

attract birds and pollinators. Along the edges of the Fort Rouge Yards redevelopment site, opportunities exist to enhance woodland and canopy coverage around Lee Park and introduce re-vegetation strategies for wildflowers and prairie meadows near the Southwest Transitway and station areas at Jubilee and Fort Rouge.

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CHAPTER 11

SUMMARY + REFLECTION

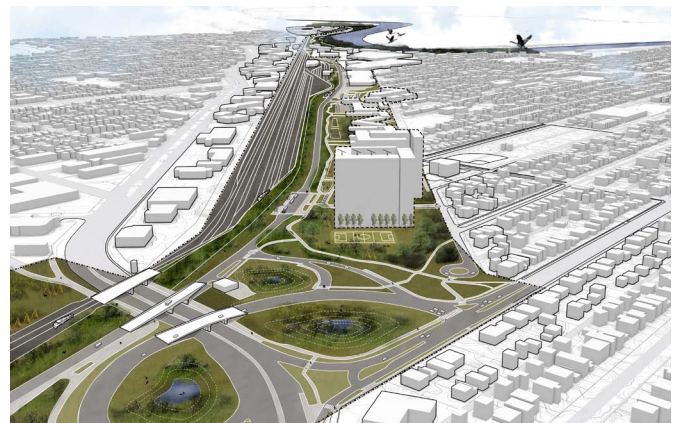
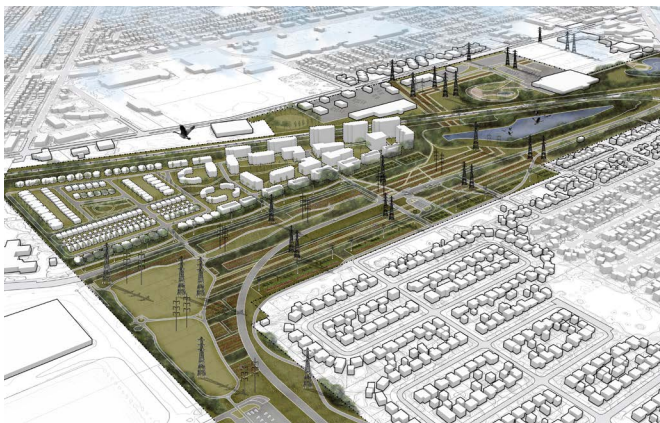
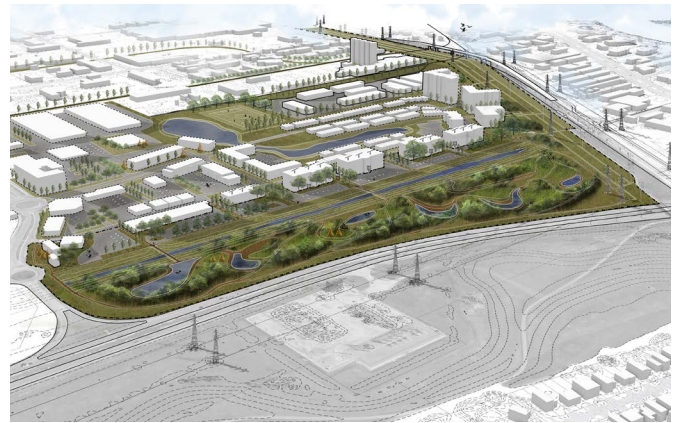
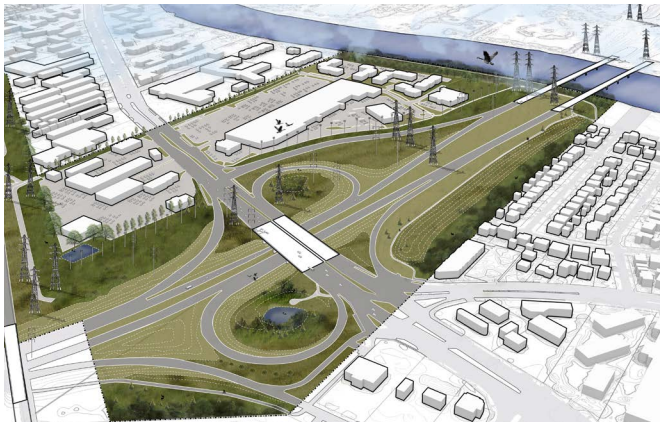


Figure 132: Re-imagining Infrastructure

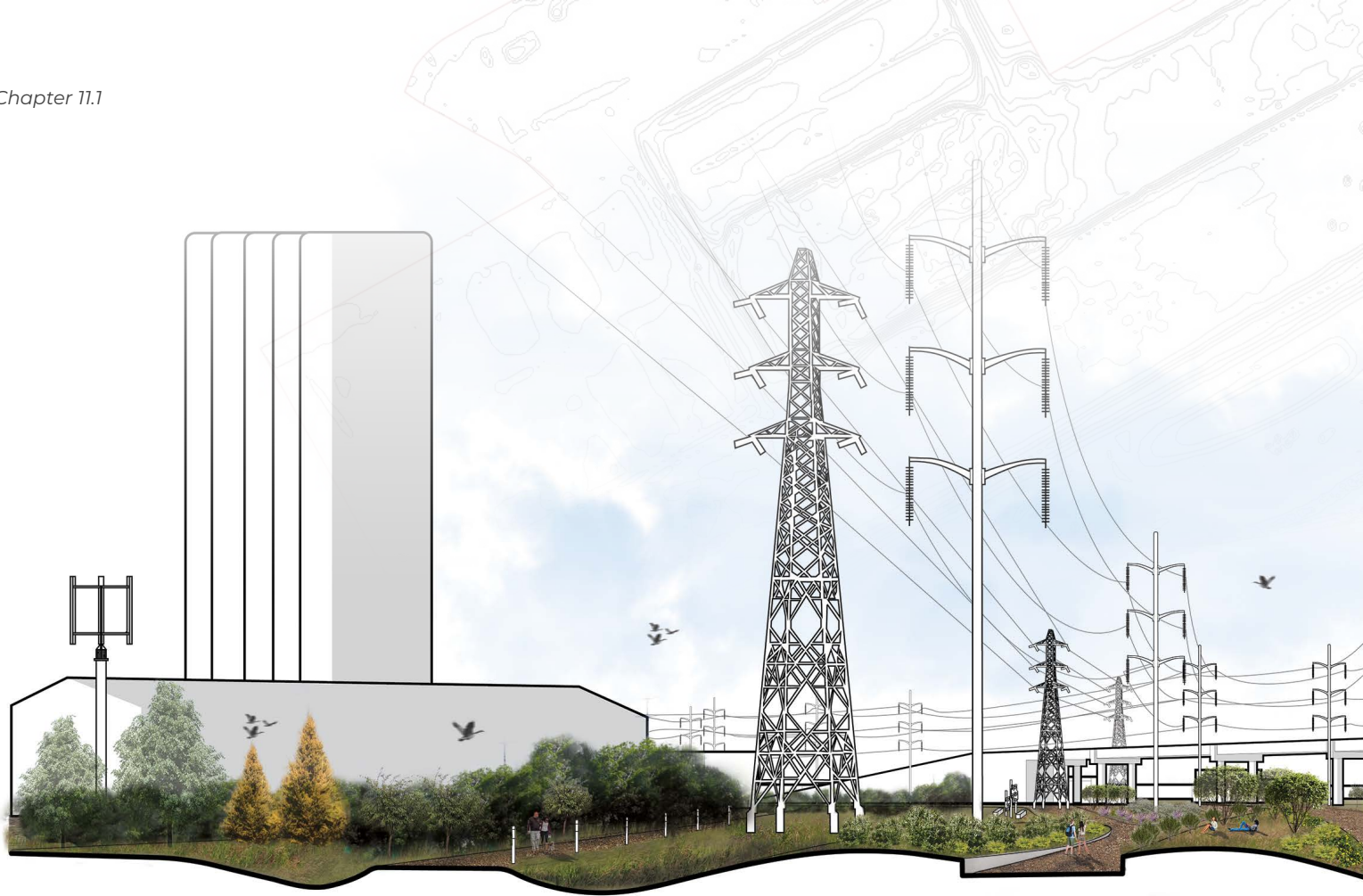


Figure 133: Re-imagining Hydro Infrastructure

A HIDDEN POTENTIAL FOR INFRASTRUCTURE

Existing infrastructure in the Southwest of Winnipeg has the potential to be applied with principles of urban ecology to inform a detailed approach to studying infrastructure types, which was used to identify landscape synergies that have a high potential for an ecologically optimum land transformation in the future. By using a reflexive approach to this practicum, it was possible to explore options and apply a landscape framework to infrastructure corridors and outline design strategies that can be used to protect biodiversity while helping to transform Winnipeg's former industrial land uses, vacant agricultural land, and infrastructure types. These underutilized spaces are often garnered as dangerous, unsafe, unkept, and undesirable due to the nature of the industrial past of these places and the physical infrastructure acting as mnemonic devices in the landscape, which has influenced how infrastructure has been perceived in the minds of people who visit and remember these places over time.

Above: Envisioning a transformative future for Winnipeg's hydro corridors.



Neglected landscapes in Winnipeg are areas avoided and often overlooked by people, which has in many ways enabled these infrastructure corridors to survive over the years, escaping the outward sprawl and development of the city, but if we can re-imagine these landscapes and establish a new type of relationship with infrastructure and urban ecology, a hidden network of untapped potential is revealed. There is an unparalleled opportunity and future potential for neglected landscapes to catalyze transformative urban design if landscape designers, engineers, and urban planners collaborate and re-invest in these spaces at a local to regional scale. Design strategies for neglected landscapes can change how industrial lands and infrastructure are perceived in the landscape and offer a glimpse of possibilities to re-imagine a future where city infrastructure and urban ecology are intentionally interlinked with a city's morphology as a new landscape category and a framework for revealing the hidden potential of ecological networks that can enhance the quality of life for people and nature in the future.



Figure 134: Re-imagining Uncultivated Agricultural Land

URBAN ECOLOGY AS A METHOD

The land-based approach to the development of the research, landscape framework, and proposed design strategies for transformative change in Winnipeg's infrastructure corridors was a useful way to explore the potential of applying principles of urban ecology from the work of Richard Forman and Michael Hough in the Southwest of Winnipeg. Urban ecology has significant potential as a methodology that can be further refined to quantify and spatially interlink site planning and reveal hidden relationships in data embedded within landscapes to inform design strategies. However, the challenge and ongoing difficulty experienced throughout this research were determining a level of detail that sufficiently captured the variations and interfaces between the spectrum of infrastructure types and landscapes. Landscapes are complex and multi-layered, and design is context-sensitive, which makes the task of creating design strategies that may be applied beyond the study area and the selected sites in the Southwest of Winnipeg difficult to translate elsewhere without considering the contextual aspects should these strategies be used as a guide for neglected landscapes throughout the city.

Above: Envisioning a transformative future for Winnipeg's industrial and vacant agricultural lands.



As a result, this work illustrates applying a patch-corridor-matrix methodology to reveal a landscape's hidden potential and assist designers with identifying considerations and influences that impact indispensable patterns in a landscape framework.

Despite the challenges and limitations acknowledged with this research, urban ecology as a method has potential for future research applications, including refinement of methodologies for identifying spatial inventories to inform a parks strategy in Winnipeg, exploring the potential of interlinking land-based analysis with suitable areas for renewable energy to supply future development of landscapes with infrastructure, and researching methods to model and predict existing and future development patterns that intentionally incorporate neglected landscapes as a unifying network, connecting urban ecology, infrastructure, and people with nature. Re-imagining a transformative future for Winnipeg's infrastructure corridors will require urban ecology as a method, and neglected landscapes can be a catalyst for this change in the future.

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END **NOTES**

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FIGURES
CITED

All images by Aaron Bomback, except as noted below:

Fig. 1: Biodiversity Corridors and Greenway

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Biodiversity Corridors and Greenway*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 2: Landscape Framework Modeling

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking.

Fig. 3: Concept Design

Generated in CC Adobe Photoshop 2022. Bomback, Aaron. *Concept Design*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 4: Design Process Work

Generated in SketchUp Pro 2022. Bomback, Aaron. *Design Process Work*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 5: Corridor Study

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; City Limit; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series.

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Fig. 6: Corridor Study

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Fig. 7: Site Inventory Diagram

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Fig. 8: Infrastructure Corridors as a Case Study

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Fig. 9: Infrastructure Corridors as a Case Study

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Fig. 10: Key Authors

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Fig. 11: Biodiversity Corridor, Borough of Saint-Laurent, Montreal, Quebec

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Fig. 12: Corridor Rendering, Borough of Saint-Laurent, Montreal, Quebec

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Fig. 13: High-level Outputs and Deliverables

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints, Ecological Networking; City Limit; Major Redevelopment Sites; Map of Assessment Parcels; Map of Parks and Open Spaces; Map of Hydro Network - NHN - Geobase Series; and Southwest Study Area.

Fig. 14: Existing Conditions Modeling

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; City Limit; Map of Assessment Parcels; Road Network; Water and Waste Lidar; and Map of Hydro Network - NHN - Geobase Series.

Fig. 15: Residential Year Built, 1870-2021

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; City Limit; and Map of Assessment Parcels.

Fig. 16: Major Redevelopment Sites

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; City Limit; Map of Assessment Parcels; Road Network; Map of Parks and Open Spaces; Map of Redevelopment Sites; and National Hydro Network - NHN- Geobase Series.

Fig. 17: Master Plans and Secondary Plans

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Fig. 18: Outward Growth Patterns

Generated in ArcGIS Pro 3.1.0. GIS files: City Limit; National Hydro Network - NHN - GeoBase Series; Road Network.

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Fig. 19: Urban Structure

Generated in ArcGIS Pro 3.1.0. GIS files: City Limit; National Hydro Network - NHN - GeoBase Series; Road Network.

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Fig. 20: City Sprawl Impacting Parkland, 1870-2021

Generated in ArcGIS Pro 3.1.0. GIS files: Map of Assessment Parcels; City Limit; National Hydro Network - NHN - GeoBase Series.

Fig. 21: Southwest Winnipeg Residential Sprawl, 1870-2021

Generated in ArcGIS Pro 3.1.0. GIS files: Map of Assessment Parcels; City Limit; National Hydro Network - NHN - GeoBase Series.

Fig. 22: Land Transformation

Generated in CC Adobe Illustrator 2022. Bombback, Aaron. *Land Transformation*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 23: Residential Year Built, 1870-2021

Generated in ArcGIS Pro 3.1.0. GIS files: Map of Assessment Parcels; City Limit; National Hydro Network - NHN - GeoBase Series.

Fig. 24: Aerial Imagery of Southwest Winnipeg, 2019

Generated in ArcGIS Pro 3.1.0. GIS files: ESRI Aerial Imagery.

Fig. 25: Initial Exploratory Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; City Limit; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series.

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Fig. 26: Southwest Railway and Hydro Infrastructure

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Manitoba Digital Topographic Mapping; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series; Map of Parks and Open Spaces; and Southwest Study Area.

Fig. 27: City-wide Railway and Manitoba Hydro Infrastructure

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: City Limit; Manitoba Digital Topographic Mapping; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series; Map of Parks and Open Spaces; Road Network; and Southwest Study Area.

Fig. 28: Southwest Employment and Vacant Lands

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: City Limit; Employment and Vacant Lands; Manitoba Digital Topographic Mapping; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series; Map of Parks and Open Spaces; Road Network; and Southwest Study Area.

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Fig. 29: City-wide Employment and Vacant Lands

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: City Limit; Employment and Vacant Lands; Manitoba Digital Topographic Mapping; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series; and Map of Parks and Open Spaces; Road Network.

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Fig. 30: Southwest Existing Parks

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: City Limit; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series; and Map of Parks and Open Spaces; Road Network; and Southwest Study Area.

City of Winnipeg. "City of Winnipeg. "Winnipeg Parks Strategy March 2022." Winnipeg Recreation & Parks. Accessed April 24, 2023. https://engage.winnipeg.ca/winnipeg_recreation_and_parks

Fig. 31: City-wide Existing Parks

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: City Limit; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series; and Map of Parks and Open Spaces; and Road Network.

City of Winnipeg. "City of Winnipeg. "Winnipeg Parks Strategy March 2022." Winnipeg Recreation & Parks. Accessed April 24, 2023. https://engage.winnipeg.ca/winnipeg_recreation_and_parks

Fig. 32: In Situ Infrastructure Investigations

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Fig. 33: Site Investigations illustrating Existing Infrastructure Conditions

Bomback, Aaron. *Site Photos*. September 2019 and July 2022. Photography. Winnipeg, Manitoba.

Fig. 34: Hydro Studies

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Fig. 35: Hydro Investigations

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Fig. 36: Rail Studies

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Fig. 37: Rail Investigations

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Fig. 38: Vehicle Investigations

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Fig. 39: Vehicle Studies

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Fig. 40: Landscape Components

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Fig. 41: Integrating Redevelopment Opportunities

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Fig. 42: Parker Lands

Generated in ArcGIS Pro 3.1.0. GIS files: Map of Assessment Parcels; Map of 2018 Orthographic Photography Tiles.

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Fig. 43: Fort Rouge Yards

Generated in ArcGIS Pro 3.1.0. GIS files: Map of Assessment Parcels; Map of 2018 Orthographic Photography Tiles.

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Fig. 44: Taylor Lands

Generated in ArcGIS Pro 3.1.0. GIS files: Map of Assessment Parcels; Map of 2018 Orthographic Photography Tiles.

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Fig. 45: Sugar Beet Lands

Generated in ArcGIS Pro 3.1.0. GIS files: Map of Assessment Parcels; Map of 2018 Orthographic Photography Tiles.

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Fig. 46: Transformative Opportunities

Generated in ArcGIS Pro 3.1.0. GIS files: City Limit; National Hydro Network - NHN - GeoBase Series; Road Network; Suitability Analysis Transformative Opportunities, and Suitability Analysis Clusters.

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Fig. 47: Geospatial Modeling for Transformative Change

Generated in ArcGIS Pro 3.1.0. GIS files: Active Transportation Network; City Limit; Map of Assessment Parcels; National Hydro Network - NHN - GeoBase Series; Neighbourhood Boundaries; Parks and Open Spaces; Park Asset Inventory; Road Network; Survey Parcel; Tree Inventory Map; Suitability Analysis Transformative Opportunities, Suitability Analysis Clusters; and Water and Waste Lidar.

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Fig. 48: Landscape Framework

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking.

Fig. 49: Southwest Landscape Patches

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; National Hydro Network - NHN - GeoBase Series; and Southwest Study Area.

Fig. 50: Southwest Patch and Node Conditions

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; National Hydro Network - NHN - GeoBase Series; and Southwest Study Area.

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Fig. 51: Major Transportation Infrastructure

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; National Hydro Network - NHN - GeoBase Series; Road Network; and Southwest Study Area.

Generated in CC Adobe Illustrator 2022. Bombback, Aaron. *Major Transportation Infrastructure*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 52: Existing and Proposed Trails and Connections

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Active Transportation Network; Ecological Networking; National Hydro Network - NHN - GeoBase Series; Road Network; and Southwest Study Area.

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Fig. 53: Patch / Nodes / Corridor Relationships

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Active Transportation Network; Ecological Networking; National Hydro Network - NHN - GeoBase Series; Road Network; and Southwest Study Area.

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Fig. 54: Landscape Framework

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Active Transportation Network; Ecological Networking; National Hydro Network - NHN - GeoBase Series; Road Network; and Southwest Study Area.

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Fig. 55: Spatial Framework

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Network; National Hydro Network - NHN - GeoBase Series; Road Network; Southwest Study Area; and Survey Parcel.

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Fig. 56: Simplified Spatial Framework

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Network; National Hydro Network - NHN - GeoBase Series; and Southwest Study Area.

Fig. 57: Applying the Aggregate-with-Outliers' Design Principle

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; Major Land Uses; National Hydro Network - NHN - GeoBase Series; and Southwest Study Area.

Fig. 58: Southwest Landscape Framework

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; National Hydro Network - NHN - GeoBase Series; Road Network; Selected Sites; and Southwest Study Area.

Fig. 59: Selected Sites

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Ecological Networking; National Hydro Network - NHN - GeoBase Series; Road Network; Selected Sites; and Southwest Study Area.

Fig. 60: Patch and Corridor by Landscape Influences

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; National Hydro Network - NHN - GeoBase Series; and Southwest Study Area.

Fig. 61: Selected Sites by Landscape Influences

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; National Hydro Network - NHN - GeoBase Series; and Southwest Study Area.

Fig. 62: Indispensable Patterns in the Landscape

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Indispensable Patterns in the Landscape*. Illustration. Winnipeg, Manitoba.

Fig. 63: Site Suitability by Landscape Influences

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; National Hydro Network - NHN - GeoBase Series; Selected Sites; and Southwest Study Area.

Fig. 64: Patches by Land Use

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Major Land Uses; National Hydro Network - NHN - GeoBase Series; and Southwest Study Area.

Fig. 65: Patch Typologies by Landscape Influences

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; National Hydro Network - NHN - GeoBase Series; and Southwest Study Area.

Fig. 66: Patch Landscape Influences

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; and Selected Sites.

Fig. 67: Corridors by Flow Movement

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Corridor Typologies; Ecological Networking; National Hydro Network - NHN - GeoBase Series; Road Network; and Southwest Study Area.

Fig. 68: Ecologically Optimum Network Potential

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; National Hydro Network - NHN - GeoBase Series; Road Network; and Southwest Study Area.

Fig. 69: Corridor Landscape Influences

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; Corridor Typologies; and Selected Sites.

Fig. 70: Site and Content Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Active Transportation Network; Ecological Networking; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; National Hydro Network - NHN - GeoBase Series; Neighbourhood Boundaries; Map of Assessment Parcels; Map of Parks and Open Spaces; Road Network; Selected Sites; Southwest Study Area; Survey Parcel; and Water and Waste Lidar.

Fig. 71: Southwest Aerial and Content Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: National Hydro Network - NHN - GeoBase Series; Neighbourhood Boundaries; Map of 2018 Orthographic Photography Tiles; Road Network; Selected Sites; and Southwest Study Area.

Fig. 72: Site Aerial and Content Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: National Hydro Network - NHN - GeoBase Series; Neighbourhood Boundaries; Map of 2018 Orthographic Photography Tiles; Road Network; Selected Sites; and Southwest Study Area.

Fig. 73: Southwest Major Land Use Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Major Land Uses; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; Selected Sites; Southwest Study Area.

Fig. 74: Site Major Land Use Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Major Land Uses; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; Selected Sites; Southwest Study Area.

Generated in CC Adobe Illustrator 2022. Bomback, Aaron. *Site Major Land Uses Analysis*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 75: Southwest Employment and Vacant Land Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: City Limit; Employment and Vacant Lands; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series; Road Network; Selected Sites; and Southwest Study Area.

Fig. 76: Site Employment and Vacant Land Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: City Limit; Employment and Vacant Lands; Map of Assessment Parcels; and Map of Hydro Network - NHN - Geobase Series; Road Network, Selected Sites; and Southwest Study Area.

Generated in CC Adobe Illustrator 2022. Bombback, Aaron. *Site Employment and Vacant Land Analysis*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 77: Southwest Redevelopment Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Major Redevelopment Sites; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; Selected Sites; Southwest Study Area.

Fig. 78: Site Redevelopment Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Major Redevelopment Sites; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; Selected Sites; Southwest Study Area.

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Fig. 79: Southwest Infrastructure Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Major Redevelopment Sites; Manitoba Digital Topography Mapping; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; Selected Sites; Southwest Study Area.

Fig. 80: Site Infrastructure Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Major Redevelopment Sites; Manitoba Digital Topography Mapping; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; and Selected Sites.

Generated in CC Adobe Illustrator 2022. Bombback, Aaron. *Site Infrastructure Analysis*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 81: Southwest Transportation Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Active Transportation Network; Major Redevelopment Sites; Manitoba Digital Topography Mapping; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; Selected Sites; Southwest Study Area.

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Fig. 82: Site Transportation Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Active Transportation Network; Major Redevelopment Sites; Manitoba Digital Topography Mapping; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; and Selected Sites.

Generated in CC Adobe Illustrator 2022. Bombback, Aaron. *Site Transportation Analysis*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 83: Southwest Topography and Drainage Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Manitoba Digital Topography Mapping; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; Selected Sites; Southwest Study Area; and Water and Waste Lidar.

Fig. 84: Site Topography and Predicted Drainage Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Manitoba Digital Topography Mapping; National Hydro Network - NHN - GeoBase Series; Selected Sites; Southwest Study Area; and Water and Waste Lidar.

Generated in CC Adobe Illustrator 2022. Bombback, Aaron. *Site Topography and Predicted Drainage Analysis*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 85: Southwest Network Potential Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; Major Redevelopment Sites; Manitoba Digital Topography Mapping; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; Selected Sites; Southwest Study Area.

Fig. 86: Site Network Potential Analysis

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Ecological Networking; Major Redevelopment Sites; Manitoba Digital Topography Mapping; National Hydro Network - NHN - GeoBase Series; Road Network; Survey Parcel; and Selected Sites.

Generated in CC Adobe Illustrator 2022. Bomback, Aaron. *Site Network Potential Analysis*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 87: Conceptual Sketches

Generated in CC Adobe Photoshop 2022. Bomback, Aaron. *Conceptual Sketches*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 88: Initial Design Explorations

Generated in CC Adobe Photoshop 2022. Bomback, Aaron. *Initial Design Explorations*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 89: Transformative Opportunities and Potential for Synergies

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprint; Manitoba Digital Topography Mapping; National Hydro Network - NHN - GeoBase Series; Selected Sites; and Southwest Study Area.

Generated in CC Adobe Photoshop 2022. Bomback, Aaron. *Transformative Opportunities and Potential for Synergies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 90: Southwest Winnipeg Neglected Landscapes

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Map of 2018 Orthographic Photography Tiles.

Generated in CC Adobe Illustrator 2022. Bomback, Aaron. *Southwest Winnipeg Neglected Landscapes*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 91: Infrastructure Strata

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Ecological Networking; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; Selected Sites.

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Fig. 92: Study of Infrastructure Types

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Ecological Networking; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; Selected Sites.

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Fig. 93: Southwest Hydro Corridors

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Ecological Networking; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; Selected Sites.

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Fig. 94: Manitoba Hydro Infrastructure

Generated in CC Adobe Illustrator 2022. Bomback, Aaron. *Manitoba Hydro Infrastructure*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 95: Hydro Corridor Constraints

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Fig. 96: Hydro Corridor Buffer Zones

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; Road Network, Hydro Corridor Buffer Zones.

Fig. 97: Southwest Rail Corridors

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Ecological Networking; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; Selected Sites.

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Fig. 98: Rail Infrastructure

Generated in CC Adobe Illustrator 2022. Bomback, Aaron. *Rail Infrastructure*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 99: Rail Corridor Constraints

Generated in CC Adobe Illustrator 2022. Bomback, Aaron. *Rail Corridor Constraints*. April 2023. Illustration. Winnipeg, Manitoba.

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Fig. 100: Rail Corridor Buffer Zones

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; Road Network, Rail Corridor Buffer Zones.

Fig. 101: Southwest Vehicle Corridors

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Building Footprints; Ecological Networking; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; Selected Sites.

Generated in CC Adobe Illustrator 2022. Bomback, Aaron. *Southwest Vehicle Corridors*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 102: Vehicle Infrastructure

Generated in CC Adobe Illustrator 2022. Bomback, Aaron. *Vehicle Infrastructure*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 103: Vehicle Corridor Constraints

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Vehicle Corridor Buffer Zones; Building Footprints; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; National Hydro Network - NHN - GeoBase Series, Road Network; and Selected Sites.

Fig. 104: Vehicle Corridor Buffer Zones

Compiled and mapped in ArcGIS Pro 3.1.0 with information from: Vehicle Corridor Buffer Zones; Building Footprints; Major Redevelopment Sites; Manitoba Digital Topographic Mapping; National Hydro Network - NHN - GeoBase Series, Road Network; and Selected Sites.

Fig. 105: Future Strategies for Selected Sites

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Future Strategies for Selected Sites*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 106: Abinojii Mikanah Existing Conditions

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Abinojii Mikanah Existing Conditions*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 107: Abinojii Mikanah Future Strategies

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Abinojii Mikanah Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 108: Abinojii Mikanah to the Red Site Plan

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Fig. 109: Abinojii Mikanah Strategy Zones

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Fig. 110: Sugar Beet Existing Conditions

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Sugar Beet Existing Conditions*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 111: Sugar Beet Future Strategies

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Sugar Beet Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 112: Sugar Beet Nature Verge Site Plan

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Sugar Beet Nature Verge Site Plan*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 113: Sugar Beet Nature Verge Strategy Zones

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Fig. 114: Sugar Beet Lands - Existing Conditions

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Sugar Beet Lands - Existing Conditions*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 115: Section Beet Lands - Future Strategies

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Sugar Beet Lands - Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 116: Hydro Corridors Existing Conditions

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Hydro Corridors Existing Conditions*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 117: Hydro Corridors Future Strategies

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Hydro Corridors Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 118: Biodiversity Corridors and Greenway Site Plan

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Biodiversity Corridors and Greenway Site Plan*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 119: Biodiversity Corridors Strategy Zones

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Biodiversity Corridors Strategy Zones*. May 2023. Illustration. Winnipeg, Manitoba.

Fig. 120: Hydro Corridor Existing Conditions

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Hydro Corridors Existing Conditions*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 121: Hydro Corridor Future Strategies

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Hydro Corridors - Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 122: Rail Corridors Existing Conditions

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Rail Corridors - Existing Conditions*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 123: Rail Corridors Future Strategies

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Rail Corridors - Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 124: Railway Corridor Existing Conditions

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Railway Corridor - Existing Conditions*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 125: Railway Corridor Future Strategies

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Railway Corridor - Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 126: Parker and Taylor Lands Existing Conditions

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Parker and Taylor Lands Existing Conditions*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 127: Parker and Taylor Lands Future Strategies

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Parker and Taylor Lands Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 128: Parker and Taylor Hydro Farming Site Plan

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Park and Taylor Hydro Farming Site Plan*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 129: Parker and Taylor Hydro Farming Strategy Zones

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Park and Taylor Hydro Farming Strategy Zones*. May 2023. Illustration. Winnipeg, Manitoba.

Fig. 130: Fort Rouge Greenway Existing Conditions

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Fort Rouge Greenway Existing Conditions*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 131: Fort Rouge Greenway Future Strategies

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Fort Rouge Greenway Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 132: Re-imagining Infrastructure

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Re-imagining Infrastructure*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 133: Re-imagining Hydro Infrastructure

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Hydro Corridors - Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

Fig. 134: Re-imagining Uncultivated Agricultural Land

Generated in CC Adobe Illustrator and Photoshop 2022. Bomback, Aaron. *Sugar Beet Lands - Future Strategies*. April 2023. Illustration. Winnipeg, Manitoba.

TABLES
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Table 1: Indispensable Patterns

Forman, Richard T.T. "Chapter 13: Land Planning and Management." In *Land Mosaics: The Ecology of Landscapes and Regions*, 452. Cambridge, UK: Cambridge University Press, 1995.

Table 2: Key Locations within a Landscape

Forman, Richard T.T. "Chapter 13: Land Planning and Management." In *Land Mosaics: The Ecology of Landscapes and Regions*, 454. Cambridge, UK: Cambridge University Press, 1995.

Table 3: Roadside Effects - Distance from Road Edge (m)

Forman, Richard T.T. "Chapter 5: Corridor Attributes, Roads, and Powerlines." In *Land Mosaics: The Ecology of Landscapes and Regions*, 169. Cambridge, UK: Cambridge University Press, 1995.

Table 4: Landscape Matrix - Vehicle Corridors

Forman, Richard T.T. "Chapter 5: Corridor Attributes, Roads, and Powerlines." In *Land Mosaics: The Ecology of Landscapes and Regions*, 146-176. Cambridge, UK: Cambridge University Press, 1995.

Table 5: Landscape Matrix - Hydro Corridors

Forman, Richard T.T. "Chapter 5: Corridor Attributes, Roads, and Powerlines." In *Land Mosaics: The Ecology of Landscapes and Regions*, 146-176. Cambridge, UK: Cambridge University Press, 1995.

Table 6: Landscape Matrix - Railway Corridors

Forman, Richard T.T. "Chapter 5: Corridor Attributes, Roads, and Powerlines." In *Land Mosaics: The Ecology of Landscapes and Regions*, 146-176. Cambridge, UK: Cambridge University Press, 1995.

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Active Transportation Network

Originator: City of Winnipeg Open Data Catalogue

Title: Active Transportation Network

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/Transportation-Planning-Traffic-Management/Active-Transportation-Network/wm39-dswz>

Description: Geospatial Map of Winnipeg's Cycling Facilities Network. This includes both on road bicycle lanes and off road shared paths.

Arenas

Originator: City of Winnipeg Open Data Catalogue

Title: Arenas

Geospatial Data Presentation Form: Excel data Tables

Online Linkage: <https://data.winnipeg.ca/Recreation/Arena/t3cz-kh3n>

Description: Locations of ice arenas owned by the City of Winnipeg.

Vehicle Corridor Buffer Zones

Originator: Aaron Bomback

Title: Vehicle Corridor Buffer Zones

Geospatial Data Presentation Form: vector digital data

Description: This dataset contains buffer zones in 100m increments from the roadway edges or shoulders to delineate roadway effects.

Building Footprints

Originator: Aaron Bomback

Title: Building Footprints

Geospatial Data Presentation Form: vector digital data

Description: This dataset contains building figure grounds for the study area generated by heads-up digitizing from 2018 Aerial photography.

City Limit

Originator: City of Winnipeg Open Data Catalogue

Title: City Limit

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/City-Planning/City-Limit/jx93-sett>

Description: Legal boundary of the City of Winnipeg.

Community Centres

Originator: City of Winnipeg Open Data Catalogue

Title: Community Centres

Geospatial Data Presentation Form: Excel data Tables

Online Linkage: <https://data.winnipeg.ca/Recreation/Community-Centre/m6ra-xm9i>

Description: Locations of community centres.

Corridor Typologies

Originator: Aaron Bomback

Title: Corridor Typologies

Geospatial Data Presentation Form: vector digital data

Description: Infrastructure Corridors within Southwest Winnipeg.

Ecological Networking

Originator: Aaron Bomback

Title: Ecological Networking

Geospatial Data Presentation Form: vector digital data

Description: Patch-Corridor-Matrix Criteria using Richard Forman's principles of Urban Ecology and Land Mosaics.

Employment and Vacant Lands

Originator: City of Winnipeg

Title: Employment and Vacant Lands

Geospatial Data Presentation Form: vector digital data

Description: Employment and Vacant lands digitized from the City of Winnipeg Complete Communities 2.0: An OurWinnipeg Direction Strategy.

ESRI Aerial Imagery

Originator: ESRI Maxar (DigitalGlobe)

Title: Aerial Imagery

Geospatial Data Presentation Form: Raster Satellite Imagery

Description: Commercial earth imaging of high-resolution, electro-optical imagery with satellite and aerial data.

Fitness Leisure Centres

Originator: City of Winnipeg Open Data Catalogue

Title: Fitness Leisure Centres

Geospatial Data Presentation Form: Excel data Tables

Online Linkage: <https://data.winnipeg.ca/Recreation/Fitness-Leisure-Centre/6bfx-4qpd>

Description: Locations of fitness and leisure centres.

Hydro Corridor Buffer Zones

Originator: Aaron Bomback

Title: Hydro Corridor Buffer Zones

Geospatial Data Presentation Form: vector digital data

Description: Hydro corridor buffer zones for planting areas based on ground clearance requirements and Manitoba Hydro planting requirements.

Major Redevelopment Sites

Originator: Aaron Bomback

Title: Major Redevelopment Sites

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://www.winnipeg.ca/interhom/CityHall/OurWinnipeg/CompleteCommunities.stm>.

Description: Major redevelopment sites from City of Winnipeg. "Winnipeg Complete Communities 2.0: An OurWinnipeg Direction Strategy Draft." Complete Communities - OurWinnipeg - City of Winnipeg. Accessed December 8, 2021. <https://www.winnipeg.ca/interhom/CityHall/OurWinnipeg/CompleteCommunities.stm>. Winnipeg City Clerk's eGovernment.

Major Land Uses

Originator: Aaron Bomback

Title: Major Land Uses

Geospatial Data Presentation Form: vector digital data

Description: Major land uses generalized using parcel data and a review of City of Winnipeg Zoning.

Manitoba AgriMaps

Originator: Manitoba Land Initiative

Title: Manitoba AgriMaps

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://agrimaps.gov.mb.ca/agrimaps/>

Description: Detailed soil survey data and maps for soil class, drainage class, and irrigation suitability.

Manitoba Digital Topographic Mapping

Originator: Manitoba Land Initiative

Title: 1:20,000 Digital Topographic Mapping

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://mli2.gov.mb.ca/t20k/topo062h.html>

Description: Contains hydrography lines, road and railway lines, utility lines and symbols.

Map of 2018 Orthographic Photography Tiles

Originator: City of Winnipeg Open Data Catalogue

Title: Map of 2018 Orthographic Photography Tiles

Geospatial Data Presentation Form: raster digital data

Online Linkage: <https://data.winnipeg.ca/Organizational-Support-Services/Map-of-2018-Orthographic-Photography-Tiles/7fv2-u4db>

Description: Map of orthographic photography tiles for the City of Winnipeg for 2018. The tiles link to the specific .ecw file for that area, with each file being on average 70MB in size. Copy and paste the 'download' link to get the ECW tile file.

Map of Assessment Parcels

Originator: City of Winnipeg Open Data Catalogue

Title: Map of Assessment Parcels

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/Assessment-Taxation-Corporate/Map-of-Assessment-Parcels/rt7t-3m4m>

Description: Map of all Assessment Parcels from the Assessment and Taxation Department.

Map of Parks and Open Spaces

Originator: City of Winnipeg Open Data Catalogue

Title: Map of Parks and Open Spaces

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/Parks/Map-of-Parks-And-Open-Space/tug6-p73s>

Description: Data representing parks and open space in Winnipeg, including the spatial boundaries, names, area, and addresses.

Map of PPD City Owned Parcels

Originator: City of Winnipeg Open Data Catalogue

Title: Map of PPD City Owned Parcels

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/Development-Approvals-Building-Permits-Inspections/Map-of-PPD-City-Owned-Parcels/9xvz-3uyg>

Description: City Owned Parcel that fall under the jurisdiction of the Property, Planning and Development (PPD) Department. This data is frequently updated based on land acquisitions and sales for the PPD Department.

National Hydro Network - NHN - GeoBase Series

Originator: Government of Canada - Natural Resources Canada

Title: National Hydro Network – NHN- GeoBase Series

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://open.canada.ca/data/en/dataset/a4b190fe-e090-4e6d-881e-b87956c07977>

Description: The National Hydro Network (NHN) focuses on providing a quality geometric description and a set of basic attributes describing Canada's inland surface waters.

Neighbourhood Boundaries

Originator: City of Winnipeg Open Data Catalogue

Title: Neighbourhood Boundaries

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/City-Planning/Neighbourhood/fen6-iygi>

Description: Boundaries of neighbourhood characterization areas (aka NCA) as polygons. Neighbourhood characterization areas are used to delineate neighbourhoods for city planning purposes.

Park Asset Inventory

Originator: City of Winnipeg Open Data Catalogue

Title: Map of Park Asset Inventory

Geospatial Data Presentation Form: vector point digital data

Online Linkage: <https://data.winnipeg.ca/Parks/Map-of-Park-Asset-Inventory/9qbp-pngj>

Description: A comprehensive database of assets managed by the Parks and Open Space division. The asset inventory includes everything from Parks down to fixtures in the park (such as benches and play structures). Includes asset ID, asset class, asset type, geometry, asset size, and whether it's the primary asset in that location. For example, in the case of athletic fields, asset size indicates whether the field is full or a reduced size. The Primary Field indicates whether that asset is the primary entity for that location.

Rail Corridor Buffer Zones

Originator: Aaron Bomback

Title: Rail Corridor Buffer Zones

Geospatial Data Presentation Form: vector digital data

Description: Building setbacks requirements and noise influence area setbacks.

Road Network

Originator: City of Winnipeg Open Data Catalogue

Title: Road Network

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/City-Planning/Road-Network/2eba-wm4h>

Description: Single Lane road network of the City of Winnipeg. Data includes bridges and address ranges.

Selected Sites

Originator: Aaron Bomback

Title: Selected Sites

Geospatial Data Presentation Form: vector digital data

Description: Outline boundary of the Southwest selected sites.

Southwest Study Area

Originator: City of Winnipeg Open Data Catalogue

Title: Southwest Study Area

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/City-Planning/City-Limit/jx93-sett>

Description: Outline boundary of the Southwest of Winnipeg.

Survey Parcel

Originator: City of Winnipeg Open Data Catalogue

Title: Survey Parcel

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/City-Planning/Survey-Parcel/emk4-cdaw>

Description: This dataset contains the legal survey parcels as polygons along with registered plan information in a Lot, Block, Plan format. This dataset is for information only, any coordinates derived from this information are not accurate. The City recommends that you contact a land survey firm (a Manitoba Land Surveyor) prior to construction on your property to ensure you are building within your property limits. The Association of Manitoba Land Surveyors maintains a website that contains contact information for all Manitoba Land Surveyors, <https://amls.ca/>.

Suitability Analysis Clusters

Originator: Aaron Bomback

Title: Suitability Analysis Clusters

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/City-Planning/City-Limit/jx93-sett>

Description: Geospatial analysis for transformative opportunities suitability by clustering of high and low values.

Suitability Analysis Transformative Opportunities

Originator: Aaron Bomback

Title: Suitability Analysis Transformative Opportunities

Geospatial Data Presentation Form: vector digital data

Online Linkage: <https://data.winnipeg.ca/City-Planning/City-Limit/jx93-sett>

Description: Geospatial analysis for transformative opportunities in Winnipeg.

Tree Inventory Map

Originator: City of Winnipeg Open Data Catalogue

Title: Map of Tree Inventory

Geospatial Data Presentation Form: vector point digital data

Online Linkage: <https://data.winnipeg.ca/Parks/Tree-Inventory-Map/xyma-gm38>

Description: Detailed list and map of all public trees located in the City of Winnipeg, including botanical name, common name and precise location.

Water and Waste Lidar

Originator: City of Winnipeg Open Data Catalogue

Title: Water and Waste Lidar

Geospatial Data Presentation Form: vector point digital data

Online Linkage: <https://data.winnipeg.ca/Water-and-Waste/Water-and-Waste-LiDAR/g634-qskh>

Description: This dataset is an index for City of Winnipeg LiDAR files created by the Water and Waste department. Each file contains a point cloud detailing the location, elevation and surface type at each location point. Rows with a file type of "Tile" link to a file containing a 1km x 1km section of the City, while rows with a file type of "Full" link to a zipped collection of every tile available for the year.

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Department of Landscape Architecture
University of Manitoba
Winnipeg

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