CASE-IN-POINT | 2025

PROTECTING THE CITY INFRASTRUCTURE

Lessons learned from the Wellington Crescent Riverbank, Path, and Roadway Project

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1.0 Introduction

City infrastructure is essential for maintaining the quality of life in cities (Raea et al., 2020). Protecting this infrastructure is important, especially in the face of environmental challenges and growth expansion. The Wellington Crescent Riverbank, Path, and Roadway Project in Winnipeg serves as an exemplary case study of how the City protected its infrastructure. This case-in-point report examines the City of Winnipeg's effort to prevent further erosion along the south bank of the Assiniboine River, between Assiniboine Park and Doncaster Street. To tackle these challenges, city planners worked closely with engineers and environmental experts to develop effective solutions to stabilize the area and prevent further damages.

Figure 2: Riverbank view t

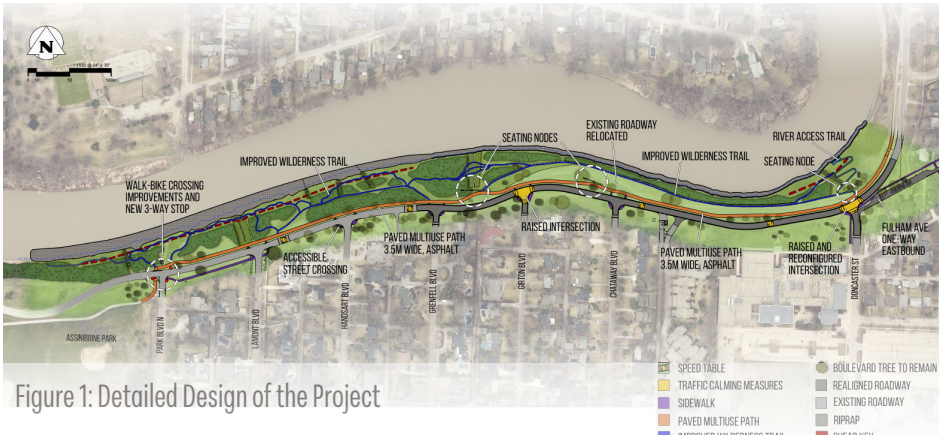

Figure 1: Detailed Design of the Project

2.0 BACKGROUND & CONTEXT

As cities continue to grow the pressure on existing infrastructure systems intensifies. By 2050, approximately 70% of the global population is expected to reside in city areas, presenting unprecedented challenges for city planners and policymakers (United Nations, 2018). This demographic shift could place a significant strain on the infrastructure, necessitating resilient and sustainable solutions to support growing populations and adapt to evolving economic landscapes. Additionally, climate change increases these challenges by introducing new risks, such as extreme weather events, rising temperatures, and flooding, which cities infrastructure must be protected (Salimi & Al-Ghamdi, 2020).

> **"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody."**
>
> **Jane Jacobs**

The role of infrastructure in cities settings cannot be overstated, as it supports economic activities, facilitates mobility and ensures the well-being of city residents. Despite the numerous benefits that city infrastructure provides, many cities continue

to experience infrastructure deficit, facing challenges in developing and implementing innovative strategies to protect and maintain their existing infrastructure effectively (Macneil, 2024). According to Swanson et al. (2021), Canada infrastructure deficit ranges from $150 trillion $ 1trillion. This gap poses a substantial challenge for cities, threatening their ability to sustain growth, manage environmental risks, and maintain global competitiveness.

Winnipeg exemplifies these infrastructure challenges faced by many cities, particularly those experiencing rapid expansion and extreme climatic conditions. Harsh winters, fluctuating temperatures, and urban sprawl place significant strain on the City infrastructure, increasing maintenance costs and the risk of system failures (City of Winnipeg, 2018). The City of Winnipeg's 2018 State of the Infrastructure Report identified a $6.9 billion infrastructure deficit over a 10-year period (2018-2027), spanning across all civic services, including roads, water systems, bridges, and public transit (City of Winnipeg, 2018). Given this substantial infrastructure gap, protecting and maintaining existing infrastructure has become a priority to prevent further financial strain and service disruptions.

Figure 4: Cracks of the Road

One pressing issue that the City took attention was the riverbank erosion along Wellington Crescent, a key transportation and recreational corridor adjacent to the south bank of the Assiniboine River. Recognizing the critical need to protect its infrastructure, the City launched a detailed investigation in September 2018 to identify the most effective solutions for stabilizing the riverbank and preventing further

Figure 3: Cracks of the Road

damage to roads, utilities, and public spaces (City of Winnipeg, 2021). Various strategies were evaluated to determine the best approach for mitigating riverbank-related risks while ensuring long-term resilience.

3.0
FACTS OF THE CASE

The Wellington Project emerged as a direct response to infrastructure threats caused by riverbank erosion along the Assiniboine River. The situation became critical in the summer of 2016 when severe cracking appeared on the bike path near Lamont Boulevard due to riverbank movement (City of Winnipeg,

Figure 5: Construction view of the land

2021). By July 2017, the conditions had worsened, leading to a significant riverbank failure that forced the closure of the pathway and necessitated the creation of a temporary detour (City of Winnipeg, 2021). Recognizing the urgency of the issue, the city launched a detailed investigative and planning phase in September 2018 to develop a comprehensive solution aimed at safeguarding essential infrastructure (City of Winnipeg, 2021).

The primary objectives of the Wellington Project were threefold (City of Winnipeg, 2021). First, it sought to stabilize the riverbank or relocate infrastructure to protect roads, pathways, and utility networks from further erosion. Given the increasing instability of the riverbank, taking preventive action was crucial in preventing future structural failures. Second, the project aimed to enhance erosion protection along the south bank of the Assiniboine River to ensure long-term stability. This measure was intended not only to secure existing infrastructure but also to minimize the environmental impact of erosion over time. Lastly, the project focused on repairing or

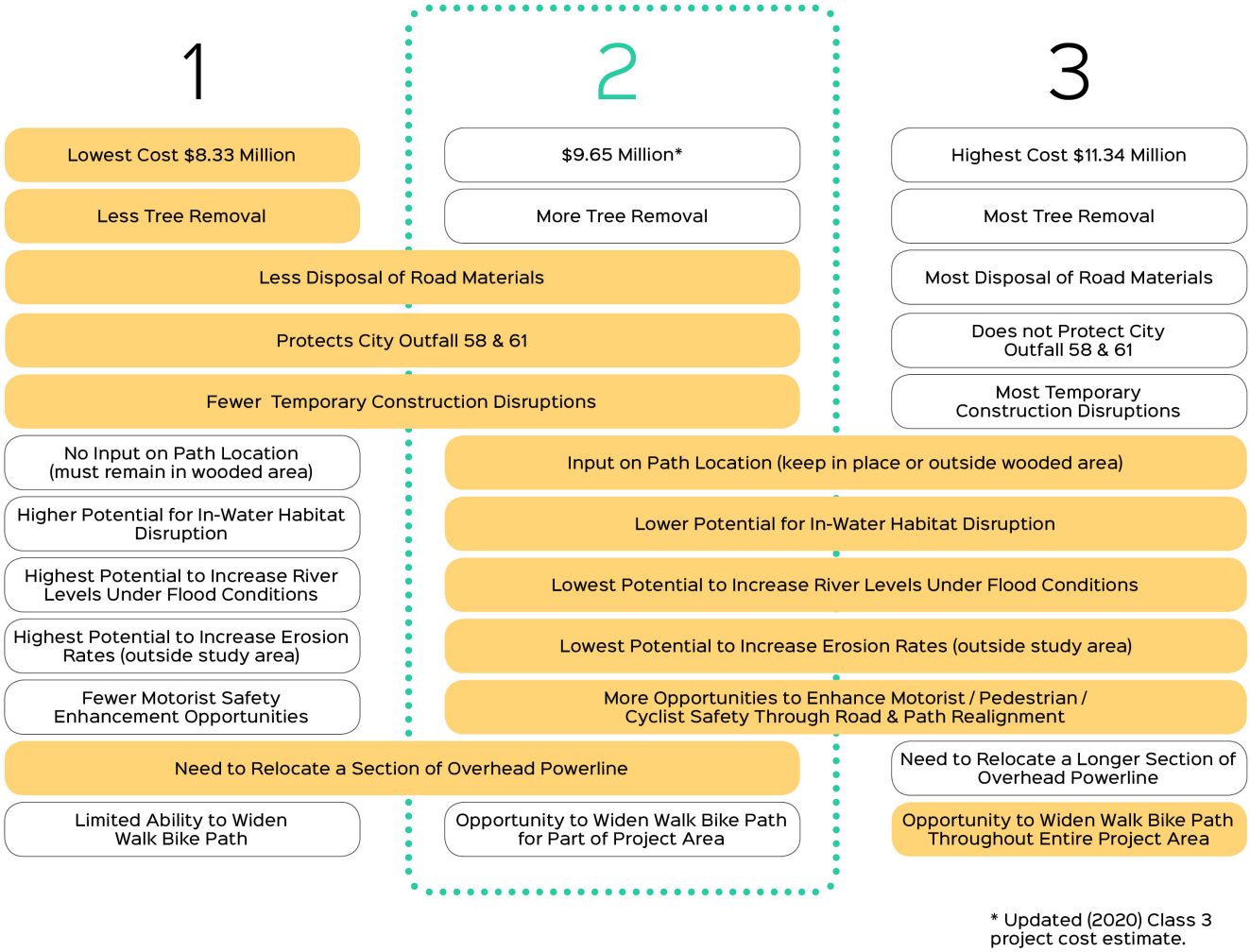

Figure 6: Stategy Evaluation

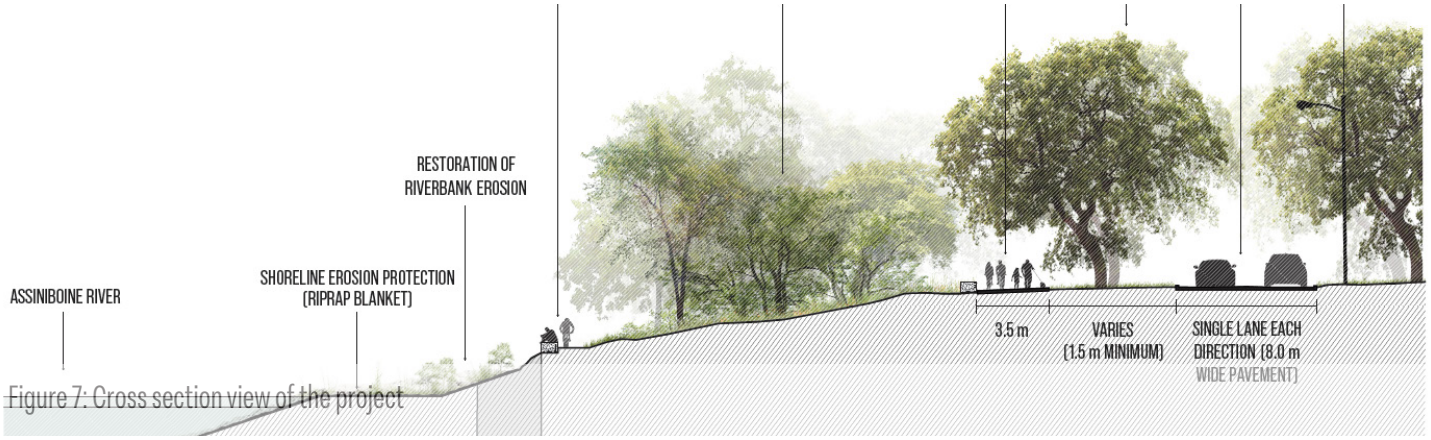

Figure 7: Cross section view of the project

reconstructing the pedestrian and bicycle pathway along Wellington Crescent, ensuring that the route remained both safe and accessible for all users. The closure of the original pathway had disrupted the daily routines of pedestrians and cyclists, reinforcing the need for a sustainable and long-term solution.

During the Functional Design and Options Assessment phase in the winter of 2018-2019, the city explored multiple stabilization strategies (City of Winnipeg, 2021). After thorough evaluation, Strategy 2 was selected as the most balanced approach, considering its effectiveness, cost efficiency, and minimal environmental impact. In addition to conventional stabilization methods, the city examined innovative alternatives such as partial road closures, which would allow for increased recreational space while simultaneously reducing the need for large-scale structural interventions. This forward-thinking approach demonstrated the city's commitment to developing solutions that balanced functionality with environmental and community considerations.

The implementation of the Wellington Project included several key engineering interventions designed to reinforce the stability of the riverbank and enhance the usability of the area (City of Winnipeg, 2021). One of the most critical aspects of the project was the installation of riprap and the construction of shear keys at strategic locations to prevent further erosion. These measures played a fundamental role in stabilizing the riverbank and ensuring its resilience against natural forces. Additionally, the project involved relocating a section of Wellington Crescent further away from the river, reducing its vulnerability to future erosive forces. This shift was a significant undertaking, reflecting the city's proactive approach to long-term infrastructure planning. Furthermore, a 3.5-meter-wide asphalt pathway was constructed to improve accessibility for pedestrians and cyclists, aligning with modern urban design principles that prioritize sustainable transportation options.

Beyond addressing structural concerns, the Wellington Project also incorporated traffic calming features in response to community feedback regarding road safety (City of Winnipeg, 2021). These enhancements included the installation of speed tables and raised intersections, which were designed to slow down vehicle traffic and create a safer environment for pedestrians and cyclists. Additionally, the introduction of a three-way stop at the park's entrance significantly improved the safety of the intersection, demonstrating the project's emphasis on community well-being.

4.0
LESSONS LEARNED

Planning is a dynamic field that requires foresight, adaptability, and a deep understanding of environmental and social contexts. The Wellington Project, a response to riverbank erosion along the Assiniboine River, offers invaluable lessons that can inform future planning efforts.

The importance of proactive planning

The most immediate lesson from the Wellington Project is that waiting until a crisis reaches a breaking point often leads to more complicated, costly, and disruptive solutions. Early warning signs of riverbank instability were evident in 2016 when significant cracking appeared on the bike path near Lamont Boulevard. By 2017, these signs had escalated into a full-scale failure, requiring immediate intervention. The damage forced pathway closures and emergency detours, inconveniencing pedestrians and cyclists who relied on the route for daily travel.

Had pre-emptive action been taken earlier, the city could have mitigated the severity of the failure and avoided both the financial and logistical burdens of a reactive response. Instead of scrambling to address an emergency, a well-planned, proactive strategy could have allowed for gradual stabilization, minimizing disruption to public spaces. This is a lesson that applies to all forms of urban planning: infrastructure must be monitored, assessed, and reinforced before damage becomes catastrophic. The tendency to delay action due to cost considerations often results in even greater expenses in the long run.

Adaptability as a strength, not a weakness in planning

Planning is an iterative process, and rigid, unyielding strategies often lead to inefficiencies and unforeseen complications. The Wellington Project also illustrates that flexibility in decision-making is not an admission of uncertainty but rather a strategic advantage. From the outset, the project team recognized that a one-size-fits-all approach would not be effective. Instead of rigidly committing to a single stabilization method, the team explored various approaches and adjusted its strategy as new information emerged.

One particularly insightful consideration was the potential for partial road closures. This option, while ultimately not selected, demonstrated a willingness to think beyond conventional engineering solutions. By evaluating creative alternatives, the project reflected an evolving mindset in urban planning, one that prioritizes a balance between function, cost-efficiency, and environmental sustainability.

The power of community engagement in project success

Infrastructure does not exist in isolation; it serves the people who use it daily. An important takeaway from the Wellington Project is the impact of community engagement on project success. Public feedback played a significant role in shaping aspects of the design, particularly regarding safety and accessibility. Concerns raised by residents led to the inclusion

Figure 8: Final outlook of the road

of traffic-calming measures, such as speed tables, raised intersections, and a new three-way stop at the park entrance.

Had these elements been overlooked, the project might have met its engineering objectives but failed to address the everyday experiences of those who interact with the space. The Wellington Project shows the fact that planning is not merely about structures and landscapes, it is about people. Engaging the public early in the process ensures that the project is not just efficient but also intuitive, safe, and aligned with community needs.

This lesson extends beyond any single project. Across urban environments, public spaces are often designed with technical efficiency in mind but without considering the human experience. True success in planning is measured not just by structural integrity but by how well a space integrates into the daily lives of those it serves. Planners can take from the Wellington project that a truly collaborative approach to community engagement can transform potential obstacles into opportunities for enhancing project design and increasing public approval.

Multidisciplinary collaboration strengthens project outcomes

The complexity of the Wellington Project required expertise from multiple disciplines, highlighting the importance of interdisciplinary collaboration in infrastructure development. Engineers, environmental scientists, urban planners, and community stakeholders worked together to develop a solution that balanced technical feasibility, environmental impact, and public accessibility.

Riverbank stabilization is not merely an engineering problem it is also an ecological and urban planning challenge. The project required careful coordination between geotechnical experts who assessed erosion risks, environmental specialists who evaluated ecological impacts, and urban designers who ensured that the new infrastructure met the needs of the community. This collaboration resulted in a more comprehensive and sustainable solution, reinforcing the idea that complex urban challenges cannot be solved in isolation.

By integrating expertise from multiple fields, the project was able to move beyond short-term stabilization efforts and toward a holistic strategy that considered long-term resilience, environmental preservation, and community well-being. Future projects should embrace this collaborative model, ensuring that planning efforts draw from a diverse range of professional perspectives.

5.0
FINAL THOUGHTS

City infrastructure is more than just roads, bridges, and pathways, it reflects how cities prioritize resilience, inclusivity, and sustainability. The Wellington Project illustrates that the most successful planning initiatives are those that anticipate future challenges, incorporate diverse perspectives, and actively engage the communities they serve. By applying these principles to future projects, cities can develop infrastructure that is not only structurally sound but also adaptable, environmentally responsible, and deeply connected to the people who rely on it.

Ultimately, the Wellington Project is a testament to the power of integrated, forward-thinking planning. It serves as a reminder that the best infrastructure solutions do not merely address immediate concerns but create a foundation for long-term resilience and community well-being. The Wellington Project provides an instructive example of how thoughtful urban planning can balance infrastructure stability, environmental sustainability, and community engagement.

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FIGURES

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