John Hirsch Place – Winnipeg's First Woonerf

As part of the City of Winnipeg's Northeast Exchange District Renewals project, WSP Canada Group Limited was contracted to redesign John Hirsch Place as a unique shared space roadway in Winnipeg. The project involved the reconstruction of John Hirsch Place in Winnipeg's historic exchange district and redesigning the right of way to a curbless shared street based on the Dutch 'Woonerf' (living street) model, which involves traffic yielding to pedestrian activity and significant landscaping to enhance the pedestrian environment. The curbless design was used to avoid defining areas and boundaries that restrict pedestrian movement but rather allow pedestrians to move freely within the site. Limited parking within the roadway is available, and vehicles are slowed by traffic calming measures such as bollards, narrow path of travel, and limited sight distance to discourage a large volume of vehicle traffic and enhance pedestrian safety and environment. The project is notable for its links to the district's cultural context, technical innovations, and quality of design.

To accommodate the significant landscaping along John Hirsch Place, a soil retention system was installed to provide uncompacted soil volume necessary for tree growth and provide opportunity to greatly increase plantings and trees in the public right of way, while not restricting the roadway for all road users. Strata Cells, capable of withstanding vehicular traffic and pavement loads, were placed beneath the roadway due to the proximity of existing trees to the roadway that required additional soil volume. Stormwater enters the systems along the roadway through a series of catch basins to reduce loading on a combined sewer while providing water for the tree roots. The sustainable drainage system provides financial benefit by reducing maintenance requirements and loading requirements for an aging sewer system in Winnipeg's downtown area. The system is the first of its kind in Winnipeg and was chosen because of the limited right of way available and the need for soil volume underneath the roadway.

Due to the broad and complex nature of the project, transportation engineers, land drainage engineers, and landscape architects collaborated to develop the Woonerf design and blend traditional roadway improvements with innovative drainage solutions

and significant streetscaping and landscaping to effectively create a unique shared space that will provide an example for the feasibility of shared streets in Winnipeg in an effort to aid in future reconfigurations of roadways to shared spaces.

This paper highlights the key components from this project with a focus on Winnipeg's first Woonerf roadway design and the Strata Cell soil retention system pilot project and the social and environmental benefits resulting from the project.

Woonerf Shared Space Roadway

The City of Winnipeg outlined key objectives in the Transportation Master Plan, released in 2011, that focus on creating roadways that integrate with land use, support healthy living, and are safe, equitable to all road users, and accessible. The Woonerf model accomplishes these goals as sharing pedestrian and vehicle roadway without any grade separation the streetscape creates a clear, safe, comfortable, and accessible pedestrian environment. Pedestrians are able to move freely in and out of the shared roadway from adjacent spaces and are able to rest at multiple seating locations regardless of any mobility impairments.

Previously, John Hirsch Place was a one way roadway with parking on one side of the road and sidewalks on either side of the road. The sidewalks featured minimal accessible accesses to the surrounding pedestrian network and parking lots and also terminated abruptly at several locations. The path of travel for pedestrians was obstructed or limited by garbage bins, fences, and trees at several locations. Additionally, there were no pedestrian amenities or site furnishings to enhance the pedestrian environment and draw pedestrians to the roadway.

The new roadway, which boasts a design without traditional curb, sidewalk, and boulevard, accommodates accessible pedestrian movement throughout the project area and to connecting roadways, pathways, parking lots, and buildings. The curbless roadway created design challenges due to numerous connections and accesses along the roadway including parking lots, sidewalks, walkways, entry ways, and ramps with varying elevations. Some curbing was included in the design on one side to provide guidance for vehicles, identify parking locations, protect trees and site furnishings where

bollards could not be placed, and also provide a planting area above road grade at parking locations. Bollards were installed along the roadway to provide guidance for vehicles while also providing protection for vulnerable road users within areas designated for pedestrians only.

Pedestrian areas feature benches, planters, and informational panels highlighting the historic significance of the area. These areas draw in pedestrians and are used as meeting locations and breaks for nearby workers and residents during the summer months. Community planters allow nearby residents and businesses to plant and maintain their own plants and take ownership of the landscaping in the area, creating a heightened sense of community involvement along the roadway and in the area.

The project also included the installation of significant pedestrian lighting along the roadway to address safety concerns and promote pedestrian activity during the evening. The roadway is frequently used in the evening because of events at the surrounding theatres and concert hall as well as many nearby restaurants. Additionally, flood lights were installed to illuminate trees and artistic lighting was encorporated on buildings to enhance the aesthetics of the area, while maintaing the historic character of the area.

Vehicle access is maintained along the roadway, as well as a limited amount of parking spaces. The intent of a shared roadway is to decrease driver comfort as a traffic calming measure while maintaining access and parking. While vehicles are restricted in how they move throughout the area, pedestrians are encouraged to move freely from connected pathways, parking lots, and building accesses and utilize the entire roadway.

Another typical feature of a Woonerf is significant landscaping, which along John Hirsch Place consists of raised community gardens for annuals to be planted, new and existing trees along the north and south side of the roadway, climbing ivys placed on fences and screens, and perennials placed in planting areas along both sides of the roadway to fill in the space around trees and separate buildings from the roadway. The increased landscaping, combined with other pedestrian environment elements such as benches, artwork, and other furnishings enforce the pedestrian first design of the shared roadway. This provides a social benefit to those who live, work, or travel through the area to enjoy the space while enhancing the pedestrian network in the area.

Strata Cell Soil Retention

To accommodate the significant landscape and limited right-of-way within John Hirsch Place, a key component of the design was the incorporation of the Strata Cell soil retention system beneath the roadway. The successful application of the soil retention system allows for the trees and shrubs to have sufficient soil volume to facilitate grow and development, while maximizing the available right-of-way for all road users.

The system provides additional benefit by significantly reducing stormwater loading into the combined sewer system to create a more sustainable drainage for stormwater by supplying the tree roots. Stormwater enters the Strata Cell system and is absorbed and filtered by the soil. Once the soil becomes saturated, remaining stormwater then flows into the sewer from the sub drain located beneath the system. The City of Winnipeg is exploring options to reduce flow and loading within its aging combined sewer network. Stormwater relief through a soil retention system such as the Strata Cell system allows for heavy loading from stormwater to be significantly reduced.

Trees require an abundance of soil for roots to obtain nutrients, oxygen, and water. Conventional methods of providing uncompacted soil require space within the sidewalk either through alternative soil retention systems or traditional sodded boulevards. Where boulevard or sidewalk space for uncompacted soil is unavailable, the Strata Cell system can be used to utilize space underneath a roadway to provide additional soil volume for trees to obtain nutrients, air, and water, while still providing the structural strength as a subbase for the roadway. During excavation of the roadway, it was found that tree roots did not grow into the road due to the base and pavement, limiting the growth of the trees. The Strata Cells are placed as close to trees as possible to allow for roots to easily enter the system. The existing trees' roots were pruned where possible to allow for the cells to be placed closer to the tree and maximize the effectiveness of the system. Cell location was not finalized until during construction due to the unknown extent of the root system for each tree. For new tree locations, cells were placed all around the base of the tree with an opening located where the root ball was to be placed.

The system allows for trees in developed urban areas to grow by providing water and air to the system. Perforated drainage pipe runs throughout the Strata Cell matrix so that water can enter the system through a series of catch basins and saturate the soil beneath the road. Air circulates into the system through a series of air vents that are spread out through the matrix with vent covers at the surface. The system is protected by geotextile fabric to prevent soil from escaping or from surrounding material from entering the system. Drainable material is used as a base for the Strata Cells to be placed on to allow for water to enter the subdrain if necessary. The cells interlock with one another to provide the strength needed to support the pavement structure and vehicular loading and can be stacked atop one another to increase soil volume.

The Strata Cell system was placed beneath 20% of the roadway pavement and the total area of the Strata Cell system, combined with the planting areas made up approximately 45% of the public right of way within the construction limits. The planting areas and Strata Cells allowed space and soil volume for approximately 600 perennials, as well as 20 new and existing trees and several planters. The landscaping area is protected from drivers through the placement of bollards as well as the construction of raised planters using reclaimed timber as well as concrete curbs.

John Hirsch Place was chosen as a pilot location due to the presence of mature trees along the roadway that could not get sufficient soil volume from planting areas alone. Another benefit for the Strata Cells is stormwater management. Downtown Winnipeg is comprised of old combined sewers requiring maintenance, repair, or replacement. To reduce the loading on the combined sewer system, stormwater is sent through the Strata Cell system. Once the system is saturated, water enters a subdrain beneath the system that then connects to the sewer.

Conclusion

Overall the implementation of Winnipeg's first Woonerf created a shared space that promotes pedestrian activity within the right of way with enhanced pedestrian facilities and safety while maintaining limited vehicle access and parking. The roadway was designed for pedestrians first to encourage pedestrian traffic in the area and create a destination through pedestrian areas with benches and site furnishings, improved

lighting, accessibility within the project area as well as connectivity to the existing pedestrian network. Safety was improved through traffic calming measures and fixtures such as bollards to prevent vehicles from entering pedestrian spaces and provide guidance through the area.

Winnipeg's first street to incorporate Strata Cells allowed for the necessary soil volume to be available for the significant landscaping in the area while also not limiting the right of way for road users, which was a key goal of the project due to the space constraints in the urban environment. Overall, the soil retention system and planting areas make up approximately 45% of the public right of way and provide the soil volume necessary for the growth of approximately 600 perennials and 20 new and mature trees. The soil retention system provides additional benefit in stormwater relief for an old combined sewer system, where reducing loading was another key goal of the project in order to reduce costly sewer maintenance work. Stormwater enters into the soil retention system and only enters the combined sewer if the soil becomes saturated and the additional water enters the subdrain, connected to the combined sewer.

The project utilized new innovative roadway design concepts and tools to improve the pedestrian environment while maintaining vehicle requirements; innovative drainage to reduce sewer stormwater loads and facilitate tree growth; and significant streetscaping and landscaping to create a complex shared space that benefits all road users. The project shows the success of a multidisciplinary team working together and expanding their expertise through innovation and collaboration to meet client needs for a broad and unique project and encourage the future construction of shared streets in Winnipeg.

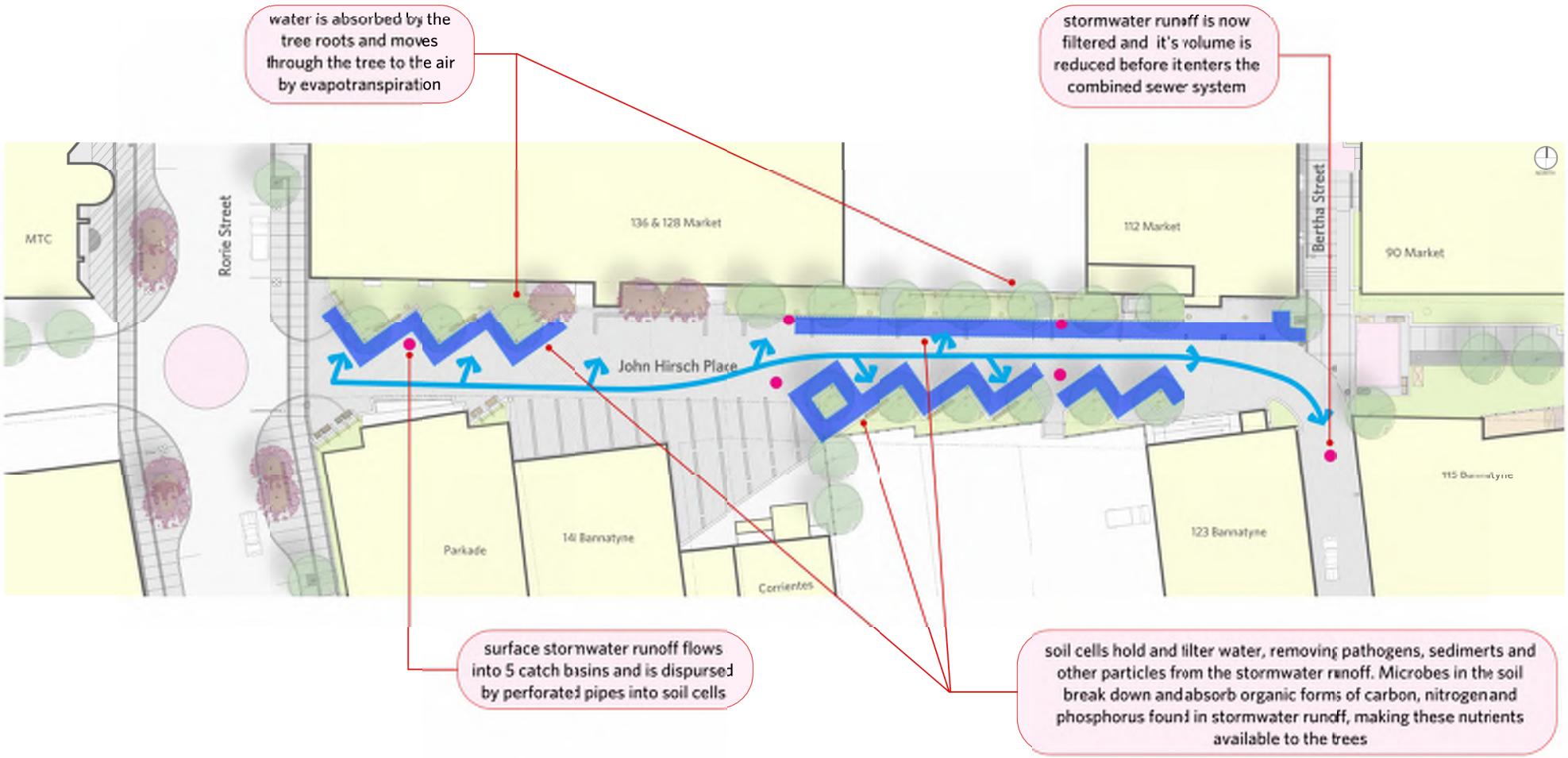

Figure 1 - John Hirsch Place Sustainable Drainage Plan

Figure 2 - John Hirsch Place Pedestrian Walkway Connections

Figure 3 - John Hirsch Place Pedestrian Environment

Figure 4 - John Hirsch Place Roadway Lighting

Figure 5 - John Hirsch Place Strata Cell Placement