London CANADA

DILLON CONSULTING

CITY OF LONDON

THAMES VALLEY PARKWAY

North Branch Connection

CATEGORY B: TRANSPORTATION

CANADIAN CONSULTING engineer

ASSOCIATION OF CONSULTING ENGINEERING COMPANIES | CANADA

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Meandering TVP North Branch Connection with park bench

Key Players

OWNER
City of London

PRIMARY CONSULTANT
Dillon Consulting Limited

GENERAL CONTRACTOR
J-AAR Excavating

PROJECT SUMMARY

The Thames Valley Corridor is one of London's most important natural, cultural, recreational, and aesthetic resources. Located along the Thames River, the corridor is a complex system of sensitive ecological habitats, intensive public recreation areas, and developed urban lands that are interconnected by a municipal pathway system called the Thames Valley Parkway (TVP). Comprising over 40 kilometres of multi-use pathway, the TVP extends along all three branches of the Thames River and converges in the downtown core. It links to over 150 kilometres of additional city trails.

The TVP - North Branch Connection project addresses a major gap in the Thames Valley Parkway between Richmond Street and Adelaide Street, connecting Ross Park to the North London Athletic Fields. The new pathway opens up the TVP to thousands of Londoners in the north east end of the City. The approximately 1.8 kilometre connection features two modified warren half-through pony truss bridges spanning the North Thames River and is fully accessible to all ages and abilities. A neighbourhood connection from North Branch Meadows to Tetherwood Boulevard provides access for maintenance and emergency vehicles to the new section of pathway north of the Thames River.

Opening up this section of the TVP has been a high priority for the City for many years, with property owner easement discussions starting over 10 years ago. Retained by the City of London, Dillon Consulting Limited (Dillon) completed an Environmental Assessment (EA) to develop an alignment that was sensitive to the natural surroundings. Dillon was later retained to complete the design, and contract administration for the preferred pathway alignment. Information gathered during the EA was used to guide the detailed design process with consideration for the natural environment sensitivities along the North Thames River. Construction of the pathway connection was completed by J-AAR Excavating which commenced in summer 2019 and was opened to the public in fall of 2020.

INNOVATIVE ENGINEERING SOLUTIONS

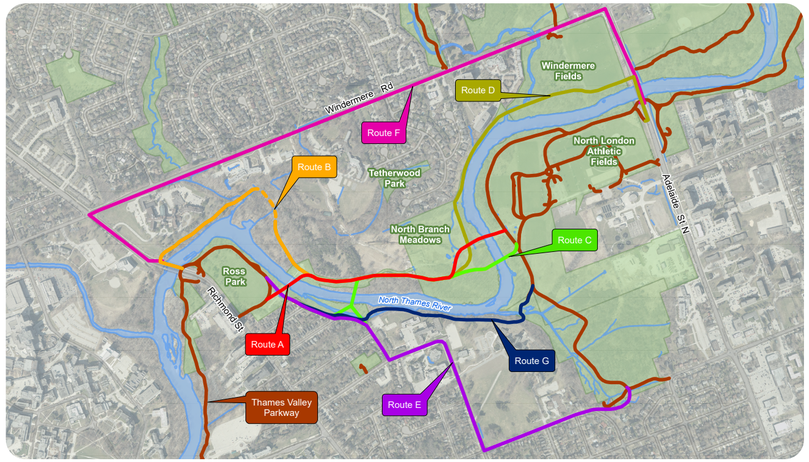
This TVP connection project addresses a major gap in the TVP between Richmond Street and Adelaide Street, connecting Ross Park to the North London Athletic Fields. The new pathway opens up access to the TVP to thousands of Londoners in the north east end of the City. The 1.8 km section of paved multi-use pathway features two 100m 3-span pony truss bridges spanning the North Thames River and is accessible to people of all ages and abilities.

Dillon completed a Schedule B Municipal Class Environmental Assessment (EA), detailed design, contract administration and post construction environmental monitoring. The EA phase included the development and evaluation of seven alternative solutions and multiple design options. Given the heavily constrained characteristics of the remaining gap in the TVP system, innovative and site specific options were developed. A rigorous evaluation of alternatives was required to demonstrate how extensive stakeholder, agency, and public input was considered in the project and how significant the constraints were balanced to select the preferred alignment and design.

A key concern raised by all stakeholders was impacts to the natural environment. To address this, the project team went beyond traditional mitigation practices and made protection of the natural environment a guiding principle for the project. The design of each aspect of the pathway connection was influenced by this principle. Consideration for the natural environment didn't stop after the design was complete, there was a concerted effort to incorporate environmental monitoring into the contract administration ensuring contractor accountability.

Innovative approaches or techniques used include:

- Stay in place sheet pile cofferdams were installed at most foundation locations to provide long-term scour protection, minimize the excavation footprint, and seal the excavations minimizing the dewatering required; and,
- During detailed design the team evaluated several methods to erect the bridges, specifically the main spans, to avoid in-water work. Methods considered were single crane lift, tandem crane lift, launching and crane assisted launch.



Alternative route alignments evaluated during the EA phase. Route A was identified as the preferred alignment

Flooding along the North Thames River

Three of the other unique and innovative design features that were considered included:

- Considering a tridge (a three approach water crossing bridge) for the westerly Thames River crossing;
- Investigating the use of a trail roundabout on the TVP at the easterly limits of the project; and,
- Using an elevated boardwalk system for some bridge approaches, rather than conventional fill approaches to address floodplain storage and conveyance.

Although these three design features weren't incorporated into the final design, their development illustrates the range of innovative design solutions considered for evaluation as part of the team's commitment to the project's principle approach of natural environment protection.

Pier foundation with stay-in-place sheet pile cofferdam adjacent to the North Thames River

Below: *Ross Park Bridge centre span being erected using two cranes in tandem*

COMPLEXITY

The extent of project complexities, challenges, and constraints is evidenced by the demand for the pathway system and logistical challenges associated with its construction. This was identified by the City as the most important gap to be constructed within the entire TVP system. Project success was a direct result of addressing these complexities in a comprehensive manner through the EA, design, and construction phases of the project.

Extensive investigation and assessment to inform the route selection process considered many constraints, including:

- Private land ownership was addressed with proactive stakeholder engagement;

View of the North Thames River looking upstream from near the North London Athletic Fields Bridge

Boulders encountered while driving sheet piles for the stay-in-place cofferdams

- Geotechnical and geomorphic constraints informed the route selection and bridge design;
- Sensitive habitat, species at risk, natural and cultural vegetation communities, flora, breeding birds, amphibians, wetland communities, significant woodlands, and archaeology features were all addressed with detailed inventories and meticulous route selection; and,
- Bridge design that accommodates the 250 year storm event with acceptable floodplain impacts, with no in-water work while also meeting scour protection requirements.

Both 3-span bridges include 60 m centre spans with field bolted connections to accommodate delivery logistics.

Construction challenges occurred when boulders were encountered as part of excavation and sheet pile driving adjacent to the Thames River. Impacts to schedule were mitigated by revising the approach to a mofidifed open cut excavation.

Ross Park Bridge

SOCIAL AND ECONOMIC BENEFITS

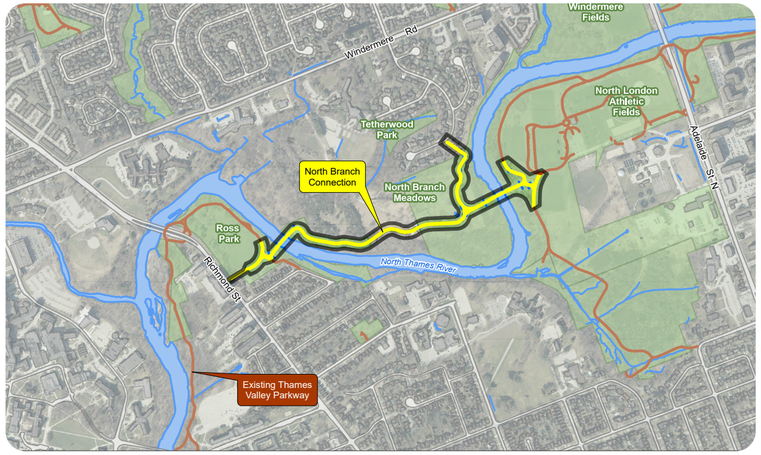
The Thames Valley Parkway (TVP) is described as "one of London's most valuable assets for generating our prosperity" and it is expected to play a "major role in helping London to attract a quality labour force and investment in our city". The completion of this project will link 50,000 Londoners to the existing TVP, Western University, and London's downtown core.

Public access to the 42 km TVP and its connections to over 120 km of secondary pathways within the City is an important societal benefit. This project addresses a gap that previously required the public to navigate on 2,500 m of nearby municipal roads or sidewalks, limiting access to many users. The connection provides improved safety and accessibility to more users in a form of mobility and active living which Londoners have consistently identified as a high priority.

Whether actively commuting to and from the north end of the City, exercising, or out for a leisurely stroll, trail users are able to observe the City's natural heritage and enjoy stunning views of the Thames River. Already well used, the meandering path with strategically placed seating areas and spacious bridge decks expands access to public open space and facilitates views of the Forest City which were previously unseen.

Right: Londoners using the North Branch Connection

Below: Thames Valley Parkway - North Branch Connection



Ross Park Bridge

ENVIRONMENTAL BENEFITS

This TVP connection resulted in significant environmental and sustainability benefits for the City through the completion of the highest priority gap in the City's active transportation network, as identified by the City of London's Bicycle Master Plan.

Through the EA, design, and construction phases, measures to consider and address environmental and sustainability issues were implemented, including:

- Use of a weighted multi-criteria decision making process, where each criteria was weighted based on stakeholder and project team input. Impacts to the natural environment received the highest weighting;
- Elimination of in-water work through innovative design and erection approaches;
- Provision of floodplain storage compensation area within adjacent City property;
- Detailed inventories of environmental features and meticulous development of the trail alignment to minimize impacts;
- Significant vegetation compensation and enhancement measures, including tree replacement with native species at 3:1 ratio for trees that were 30 cm in diameter or greater and 5:1 for trees greater than 50 cm;
- Design and construction of habitat compensation measures by the incorporation of log and brush pile habitats using the removed trees;
- Implementing 3-year ecological inventory (vegetation community assessments, breeding bird and nocturnal amphibian surveys, snakes and incidental wildlife surveys, aquatic resources, species at risk and critical wildlife habitat);
- Extensive on-site wildlife monitoring program prior to and during construction;
- Vegetative design measures to minimize anthropogenic disturbance adjacent to the new trail to protect sensitive wildlife, habitat and plants;
- Implementation of an Invasive Species Management Plan targeting aggressive flora;
- Extensive Sediment and Erosion Control and Monitoring Plan; and,
- Access design that eliminated the need for temporary crossings of the Thames River.

North Branch Meadows restoration

Brush pile habitat creation

MEETING CLIENT NEEDS

This project completes the highest priority gap in the TVP system and addresses the City's needs and objectives by fulfilling recommendations made in several Policy and Master Plan documents, including:

- The London Plan;
- London Bikes Cycling Master Plan;
- Smart Moves 2030 Transportation Master Plan;
- Age Friendly London Action Plan;
- Thames Valley Corridor Plan;
- London Strengthening Neighbourhoods Strategy; and,
- Parks and Recreation Strategic Master Plan.

Strava heat map depicting the high usage of the North Branch Connection.

Bridge aesthetic to compliment the natural setting

From project onset through to construction, input from the public has been overwhelmingly positive. Since the connection opened in the fall of 2020, there has been high usage of the TVP in this area.

The project was completed on schedule and within the construction and engineering budget and with all required approvals in place. In 2021 the project received the City of London Urban Design Award for Public Spaces and Landscapes.

In closing, The Thames Valley Corridor Plan Vision Statement notes:

"The Thames Valley Corridor is London's most important natural, cultural, recreational and aesthetic resource. The City and community partners will preserve and enhance the natural environment, Thames River health, vistas, beauty and cultural heritage while accommodating compatible infrastructure, accessibility and recreation."

This TVP connection project was successful in both meeting the City's project goals and respecting this vision statement.

Meandering TVP North Branch Connection

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