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Executive Summary

Project objective:

The objective of this study was to plan for reconstruction of Henderson Highway between Gilmore Avenue and the City limit at Glenway Avenue, including replacement of the Bunn's Creek crossing structure to achieve the following:

- Renewing the asset condition of the pavement structure and right-of-way infrastructure
- Renewing the asset condition of the Bunn's Creek crossing structure
- Accommodating and integrating the safe, efficient and accessible movement of people and goods in a variety of modes throughout the study area, in particular pedestrians, cyclists, Transit, passenger vehicles, and truck traffic
- Improving the safety and efficiency for all users by introducing a median, performing intersection improvements, and implementing appropriate right-of-way access management

Project background:

The project limits for this study are Henderson Highway from the intersection with Gilmore Avenue north to the City limit and transition to PR 204 at Glenway Avenue.

Henderson Highway is a regional street and has an annual average daily traffic count (as of 2018) of 22,300 near the north end, and 30,000 near the south end of the study area. The roadway is undivided between Fortier Avenue and Glenway Avenue. The Henderson Highway right-of-way (ROW) in this area was historically 30.18 m, however with ongoing development on the west side of Henderson Highway, the City has secured a right-of-way width of up to approximately 36.58 m in some areas. The ROW is currently served by two land drainage trunk sewers, one north and one south of Bunn's Creek, both with outfalls into Bunn's Creek immediately upstream of the existing crossing structure. Shallow ditches are also present on both sides of Henderson Highway. The pavement is nearing the end of its useful life, and reconstruction of the pavement provides an opportunity to improve safety and efficiency of the corridor for all modes.

The existing crossing structure at Henderson Highway over Bunn's Creek was constructed in the 1930s and consists of a four-cell bi-level (2 x 2 cell configuration) concrete box culvert located approximately 150 m upstream of the confluence of Bunn's Creek and the Red River. The culvert has timber extensions at both ends and slope stabilization works of the southeast embankment were completed in 2000. Rockfill columns were used in the southeast slope area to stabilize the slope. The existing structure is in poor condition and requires replacement as part of the project.

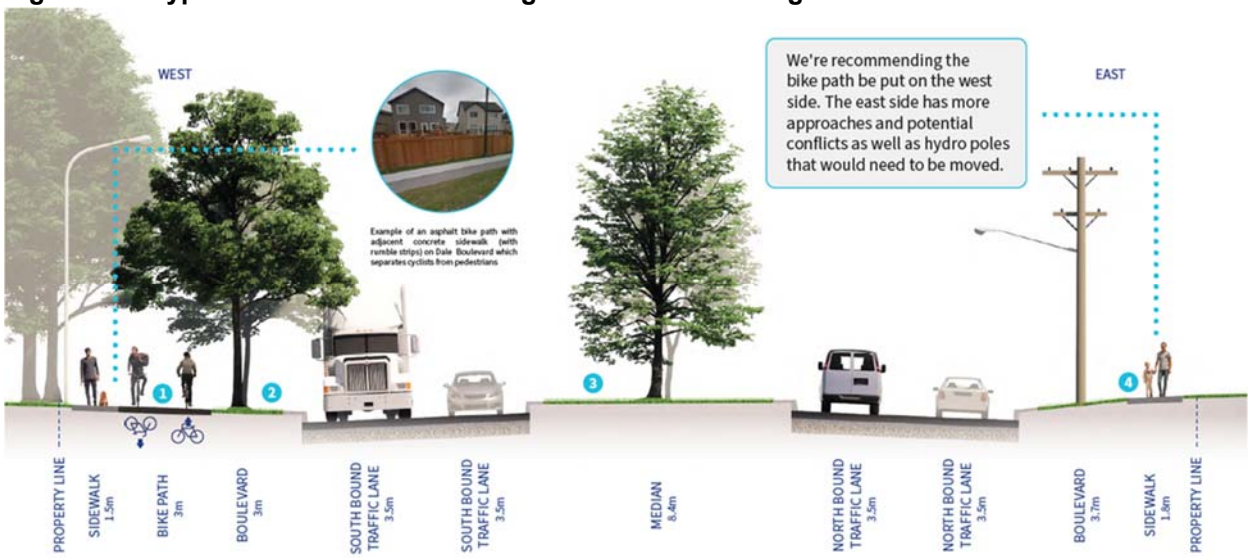
Recommended design:

The recommended design prioritizes safety and traffic flow by incorporating a centre median and strategic placement of median openings, as well as allowing U-turns at key intersections. While median openings are integrated at intersections with local streets for local access, it is not feasible or safe to include a median opening at every private commercial and residential approach in the study area. The proposed median openings were carefully selected by considering traffic patterns, property features, and safety principles. While introducing a median enhances safety and traffic flow, it does impact some motorists who prefer direct left-in and left-out access to properties. To address this, the design includes median openings tailored for U-turns, accommodating most passenger vehicles.

The design also prioritizes active transportation. A new two-way bike path on the west side creates a continuous route from Chief Peguis Greenway in the south to Glenway Avenue in the north, connecting with the RM of East St. Paul trail system. The north-south bike path links with east-west routes including Bunn's Creek Trail. Signalized intersections and half-signals ensure safe pedestrian and cyclist crossings of Henderson Highway, with transit stops conveniently located for seamless connections.

On the east side, existing overhead utility poles support a Manitoba Hydro electrical distribution line. Through collaboration with Manitoba Hydro, we explored burying the line, but the substantial cost increase to the project budget (around 30 percent) made it impractical. By strategically relocating individual poles to avoid conflicts with redesigned approaches and the new Bunn's Creek crossing, traffic safety and property access are maintained at a much lower cost. Refer to Figure E1 showing a typical cross section of the recommended design along Henderson Highway.

Figure E1 - Typical cross section showing recommended design.



The recommended design extends to the City limit at Glenway Avenue, where Henderson Highway transitions into Provincial Road (PR) 204. To ensure a smooth transition, some construction work beyond the City's limits on PR 204 is necessary. Manitoba Transportation and Infrastructure and the RM of East St. Paul were consulted in developing this design.

For the structure crossing at Bunn's Creek, it was determined that the preferred replacement structure is a two-cell cast-in-place concrete box culvert with cells measuring 4.5 m wide by 4.0 m high. This is shown below in Figure E2 Bunn's Creek Culvert East Elevation. The structure would be constructed in two stages, maintaining a single lane of traffic in both directions during the work.

Figure E2 – Bunn's Creek Culvert East Elevation.

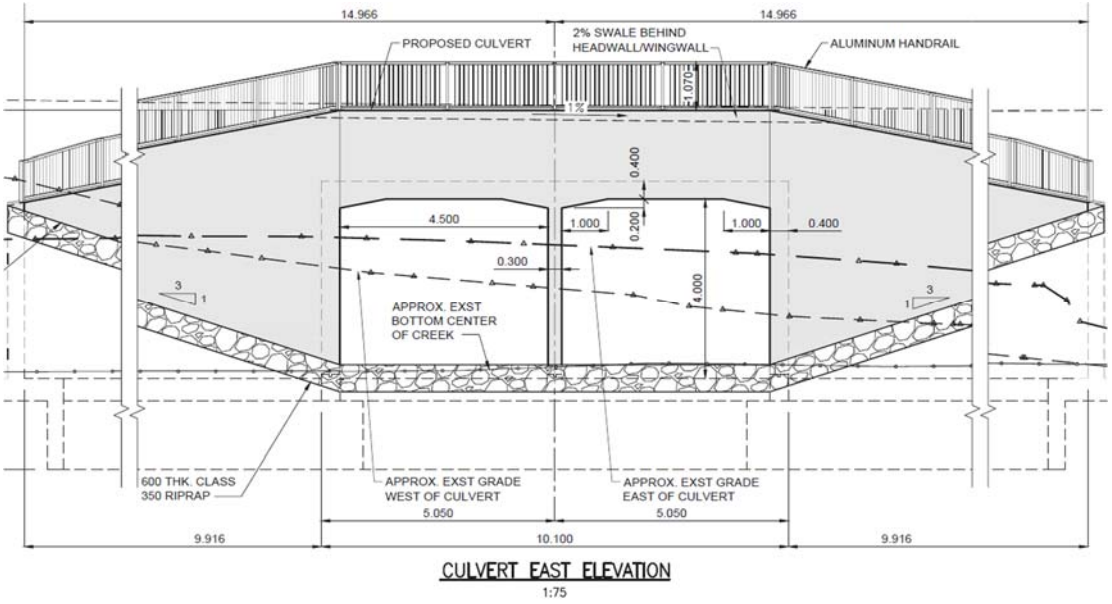


Table E1 - Key improvements and benefits of the proposed design

Improvement	Benefit
New centre median	• Separates northbound and southbound traffic to improve safety. • Provides refuge area for pedestrians and cyclists crossing Henderson Highway. • Allows for more intentional access management and reduced conflicts between vehicles and pedestrians & cyclists. • Allows for left turn storage lanes at intersections and major median openings, improving traffic flow. • Is wide enough to allow U-turns for most vehicles.
New bi-directional bike path on west side	• Provides dedicated bike infrastructure separate from vehicular traffic. • Maintains a designated sidewalk area for pedestrians. • Provides a contiguous north-south active transportation route through the study area, which connects to east-west walking and biking routes throughout the community, and connects to the Chief Peguis Greenway Trail to the south, and the RM of East St. Paul's trail system to the north.
Urbanization of the cross section	• Eliminates shallow ditches prone to drainage issues. • New curbside boulevards will provide improved Transit stops and accessible service. • Presents opportunity for streetscaping and improved corridor aesthetics.
New crossing structure at Bunn's Creek	• Replaces an aging structure that has reached the end of its useful life. • Supports the improvements to Henderson Highway above (new median, pedestrian and bike facilities). • Improves the hydraulic capacity of Bunn's Creek. • Satisfies modern regulatory requirements for navigability and protection of the environment.

Risk:

The preliminary design study included development of a risk management plan. Project risks were identified and evaluated based on their potential impact to cost, time, reputation, and goals of the project. These risks were addressed throughout the preliminary design and are to be addressed continuously throughout the detailed design phase and into construction. The risk management plan identifies risks in key areas such as property, environmental and regulatory, utilities and third party assets, design and construction, and internal and external stakeholder needs.

Schedule:

It is assumed that this work will be tendered under two or more separate construction contracts using the design bid build model – one for the culvert crossing including slope stabilization and creek realignment, and additional contract(s) for roadworks and land drainage construction.

The Project is anticipated to start in 2027 with detailed design and property acquisition. Construction is a four-year timeframe tentatively starting in 2027 (pre-work) and finishing in 2030.

Class 3 cost estimate:

The estimated cost for the project is $50.03M. This Class 3 cost estimate has an expected accuracy of -20% to +30% and was prepared according to the recommended design options and crossing structure selection. estimate.