

Table E.1: Bridge Condition & Function

Criteria	Measures	Retain Keep the existing bridge (conduct maintenance repairs)	Rehabilitate Repair the existing bridge (widening not feasible) (adding a sidewalk not feasible)	Replace Construct a new bridge at the same location (remove existing bridge)
Bridge Condition	Deterioration, structural risk	The existing bridge is currently in fair to poor condition, and would be repaired to address significant deficiencies.	The existing bridge is currently in fair to poor condition, and would be repaired to address significant deficiencies.	The construction of new bridge would meet current standards and include the removal or relocation of the existing bridge.
		Neutral	Neutral	Most Preferred
Bridge Life & Maintenance	Years to next assessment, frequency, reliability, disruption	The existing structure is nearing the end of its service life. Following repairs, a monitoring and maintenance program would be required to extend the service life until rehabilitation or replacement.	The existing structure is nearing the end of its service life. Following repairs, a monitoring and maintenance program would be required to extend the service life until rehabilitation or replacement.	The design life for a replacement bridge is 75 years. The structure will likely require minimal maintenance for the first 20 years.
		Least Preferred	Least Preferred	Most Preferred
Vehicle types crossing the bridge	Fire trucks (30 t) Ambulance (9 t) Service vehicles, Snow Removal, Buses (if required)	The current load posting of the bridge is 3 tonnes, which is an extremely low value. Trucks and other heavy emergency vehicles would continue to not be permitted.	Rehabilitation would likely involve extensive strengthening to improve the load posting, but would not be sufficient to allow trucks to use the bridge.	The construction of a replacement bridge would meet current standards and would allow trucks and emergency vehicles to use the bridge. No posted load limit signage required.
		Neutral	Neutral	Most Preferred
Bridge Safety & Function	Width, collision risk, on-road cyclists and pedestrians, deck surface	Bridge would remain one lane wide. Signage requiring vehicles to yield to oncoming traffic would remain, with associated collision risk. Cyclists would share the lane, single-file. The metal open-grating deck type would remain; traction concern for some users. Continued risk of collision with bridge.	Bridge would remain one lane wide. Signage requiring vehicles to yield to oncoming traffic would remain, with associated collision risk. Cyclists would share the lane, single-file. The metal open-grating deck type would remain; traction concern for some users. Continued risk of collision with bridge.	Two lane bridge with shoulders. Separate lane for each direction of travel, reduces collision risk. Cyclists would be in separate lanes. Concrete deck with asphalt. Reduced risk of collision with bridge, due to shoulder width and addition of barriers.
		Least Preferred	Least Preferred	Most Preferred
Bridge Condition & Function Evaluation Summary		Least Preferred	Least Preferred	Most Preferred

Table E.2: Transportation

Criteria	Measures	Retain Keep the existing bridge (conduct maintenance repairs)	Rehabilitate Repair the existing bridge (widening not feasible) (adding a sidewalk not feasible)	Replace Construct a new bridge at the same location (remove existing bridge)
Roadway Design	Design criteria, geometry, speed reduction, cross-section, approach sight lines	Narrow, alternating one-way traffic with no shoulder is a mismatch to roadway width and operating speeds. Posted speed reduction at bridge. Roadway profile unchanged. Roadway horizontal alignment unchanged.	Narrow, alternating one-way traffic with no shoulder is a mismatch to roadway width and operating speeds. Posted speed reduction at bridge. Roadway profile unchanged. Roadway horizontal alignment unchanged.	Two lane bridge matches roadway width and operating speeds. No posted speed reduction required. Potential to reduce roadway sag curve. Roadway horizontal alignment unchanged.
		Neutral	Neutral	Most Preferred
Traffic Operations	Travel delays due to bridge configuration	The bridge would remain one lane wide, and yield-controlled to accommodate alternating traffic directions. This is narrower than the roadway, forming a minor constraint.	The bridge would remain one lane wide, and yield-controlled to accommodate alternating traffic directions. This is narrower than the roadway, forming a minor constraint.	The bridge would be two-lanes wide, matching the roadway, and no longer a constraint on traffic flow.
		Neutral	Neutral	Most Preferred
Network Connectivity & Access	Alternative routes, Fire & Emergency access  Twyn Rivers Drive evacuation route  (Stotts’ & Maxwell bridges to be considered together.)	Trucks and emergency vehicles would continue to use an alternative route.  Twyn Rivers Drive evacuation route would continue “no trucks” restriction.	Trucks and emergency vehicles would continue to use an alternative route.  Twyn Rivers Drive evacuation route would continue “no trucks” restriction.	Trucks and emergency vehicles could cross the bridge, improving emergency access to the area between the Rouge River and the Little Rouge River on Twyn Rivers Drive, from the west, regardless of changes at the Maxwell Bridge. (This area is currently not accessible to trucks from either direction.)  Twyn Rivers Drive evacuation route would allow trucks if both bridges are improved.
		Neutral	Neutral	Most Preferred
Active transportation	On-road cyclists & On-road pedestrians  (Off-road recreational trail usage not included.)	Twyn Rivers Drive is not a designated cycling route. Cyclists would continue to share the lanes with vehicles, due to narrow/soft shoulders, and share the lanes on the bridge, single file. Cyclists are currently advised to dismount prior to crossing the bridge for safety reasons associated with the open grate decking.  Currently, there are no sidewalks along the roadway. Pedestrians would continue to walk along the shoulder of the road and on the edge of the driving lanes on the bridge.	Twyn Rivers Drive is not a designated cycling route. Cyclists would continue to share the lanes with vehicles, due to narrow/soft shoulders, and share the lanes on the bridge, single file. Cyclists are currently advised to dismount prior to crossing the bridge for safety reasons associated with the open grate decking.  Currently, there are no sidewalks along the roadway. Pedestrians would continue to walk along the shoulder of the road and on the edge of the driving lanes on the bridge.	Twyn Rivers Drive is not a designated cycling route. A replacement bridge would be wider and could accommodate cyclists, which would provide accommodation if the designation is changed in the future.  Currently, there are no sidewalks along the roadway. A sidewalk is considered optional and not included in this alternative. A separate pedestrian bridge could be constructed if needed in the future.
		Neutral	Neutral	Most Preferred

Criteria	Measures	Retain Keep the existing bridge (conduct maintenance repairs)	Rehabilitate Repair the existing bridge (widening not feasible) (adding a sidewalk not feasible)	Replace Construct a new bridge at the same location (remove existing bridge)
Recreational Access	Maintains or improves recreational access to RNUP and Zoo	Maintains existing recreational access.	Maintains existing recreational access.	Improves recreational access.
		Neutral	Neutral	Most Preferred
Transportation Evaluation Summary		Neutral	Neutral	Most Preferred

Table E.3: Heritage & Archaeology

Criteria	Measures	Retain Keep the existing bridge (conduct maintenance repairs)	Rehabilitate Repair the existing bridge (widening not feasible) (adding a sidewalk not feasible)	Replace Construct a new bridge at the same location (remove existing bridge)
Cultural Heritage	Role in community, namesake and history	The structure was constructed in 1915 to replace an earlier wooden structure and bears the name of William Stotts, who owned the property nearby. The bridge is currently used as a crossing.	Rehabilitation has the potential to impact its cultural heritage.	A replacement bridge would not have a pre-existing role in the community. Consideration could be given to designing a bridge of a similar configuration, or erection of a memorial monument to recognize and document the history of the original bridge.
		Most Preferred	Neutral	Least Preferred
Built Heritage	Uniqueness of bridge	The existing bridge is designated as being of historical and architectural value or interest under Part IV of the Ontario Heritage Act, By-law No. 25154.	The work to rehabilitate the bridge may detract from some of the heritage characteristics.	The new bridge may conserve little or no heritage characteristics.
		Most Preferred	Neutral	Least Preferred
Archaeological Potential	Area of disturbance	The work to retain the bridge are anticipated to remain within previously disturbed lands or areas of no potential within the existing right-of-way.	The work to rehabilitate the bridge is anticipated to remain in previously disturbed lands and areas of no potential within the existing right-of-way. A detour bridge is not anticipated. There is limited potential to impact areas of archaeological potential.	A replacement bridge is anticipated to remain on the existing alignment and within the existing right-of-way. A detour bridge is not anticipated. There is potential to impact areas of archaeological potential with temporary works outside of the existing right-of-way.
		Most Preferred	Neutral	Neutral
Heritage & Archaeology Evaluation Summary		Most Preferred	Neutral	Least Preferred

Table E.4: Natural Environment & Hydraulics

Criteria	Measures	Retain Keep the existing bridge (conduct maintenance repairs)	Rehabilitate Repair the existing bridge (widening not feasible) (adding a sidewalk not feasible)	Replace Construct a new bridge at the same location (remove existing bridge)
Terrestrial Habitat	Potential for impacts to Species at Risk and Significant Wildlife Habitat (temporary and permanent)	No impacts to SAR if no construction is proposed.	Potential temporary impacts related anthropogenic disturbances (i.e. noise, lights) to adjacent potential SAR bird and SAR bat habitat (i.e. forests and bluffs) during construction.  Minimal permanent impacts to potential SAR bird and SAR bat habitat (i.e. forests and bluffs) if construction limits remain within ROW.	Potential temporary impacts related anthropogenic disturbances (i.e. noise, lights) to adjacent potential SAR bird and SAR bat habitat (i.e. forests and bluffs) during construction.  Minimal permanent impacts to potential SAR bird and SAR bat habitat (i.e. forests and bluffs) if construction limits remain within ROW.
		No impacts to SWH if no construction is proposed.	Potential temporary impacts related anthropogenic disturbances (i.e. noise, lights) to adjacent potential SWH habitat for birds and bats (i.e. forests, swamps and bluffs) during construction.  Minimal permanent impacts to potential SWH for birds and bats if construction limits remain within ROW.  Removal of potential snake hibernacula habitat if bridge abutments are proposed to be disturbed.	Potential temporary impacts related anthropogenic disturbances (i.e. noise, lights) to adjacent potential SWH habitat for birds and bats (i.e. forests, swamps and bluffs) during construction.  Minimal permanent impacts to potential SWH for birds and bats if construction limits remain within ROW.  Removal of potential snake hibernacula habitat if bridge abutments are proposed to be replaced.
		Most Preferred	Neutral	Neutral
Aquatic Habitat	Potential for impacts to Species at Risk and aquatic habitat (temporary and permanent)	No anticipated impacts to aquatic SAR since none have been identified within the vicinity of the crossing.	No anticipated impacts to aquatic SAR since none have been identified within the vicinity of the crossing.	No anticipated impacts to aquatic SAR since none have been identified within the vicinity of the crossing.
		No impacts to aquatic habitat if no in- water work is proposed.	Permanent loss of aquatic habitat if proposed widening work extends below the high water mark.  Temporary loss of aquatic habitat to accommodate construction footprint if in-water work is proposed.	Permanent loss of aquatic habitat if proposed widening work extends below the high water mark.  Temporary loss of aquatic habitat to accommodate construction footprint if in-water work is proposed.
		Most Preferred	Least Preferred	Least Preferred
River Conveyance	Clearance, span, bank scour, climate change resilience (potential damage to structure)	No improvement to river conveyance, continued risk of substandard clearances.	No improvement to river conveyance, continued risk.	A replacement bridge would be designed to meet current standards, involving raising the roadway profile and bridge soffit, potentially combined with lengthening the span to provide adequate clearance, In addition, fluvial geomorphology over the life of the bridge and protection of adjacent river banks against scour would be considered.
		Neutral	Neutral	Most Preferred
Natural Environment & Hydraulics Evaluation Summary		Most Preferred	Neutral	Neutral

Table E.5: Public Uses in RNUP

Criteria	Measures	Retain Keep the existing bridge (conduct maintenance repairs)	Rehabilitate Repair the existing bridge (widening not feasible ) (adding a sidewalk not feasible)	Replace Construct a new bridge at the same location (remove existing bridge)
Rouge National Urban Park (RNUP)	Public and worker access to amenities (visitor centre, trailheads, etc.)	Maintains existing public and worker access.	Maintains existing public and worker access.	Minor improvement to public and worker access as a result of widening the bridge.
		Neutral	Neutral	Neutral
Toronto Zoo	Public and worker access to zoo	Maintains existing public and worker access.	Maintains existing public and worker access.	Minor improvement to public and worker access as a result of widening the bridge.
		Neutral	Neutral	Neutral
Public Uses in RNUP Evaluation Summary		Neutral	Neutral	Neutral

Table E.6: Implementation

Criteria	Measures	Retain Keep the existing bridge (conduct maintenance repairs)	Rehabilitate Repair the existing bridge (widening not feasible) (adding a sidewalk not feasible)	Replace Construct a new bridge at the same location (remove existing bridge)
Complexity & Constructability	Construction access, staging, methods, duration, and other factors	Complexity is high due to old grades of metal being less compatible for welding and weaker as well. Risk of fatigue cracking on existing bridge may lead to more replacement members. Old pony truss bridges like this seldom meet modern code requirements requiring extensive strengthening, with diminishing benefits.	Complexity is high due to old grades of metal being less compatible for welding and weaker as well. Risk of fatigue cracking on existing bridge may lead to more replacement members. Old pony truss bridges like this seldom meet modern code requirements requiring extensive strengthening, with diminishing benefits.  Widening not feasible, and would trigger full bridge replacement.	Replacement options would include low complexity slab-on-girder type of bridge, or moderate complexity pony truss bridge.  If slab-on-girder bridge is selected, consideration should be given to rehabilitation (and potential narrowing) of the existing bridge for re-use as a pedestrian bridge at another site, instead of demolition.
		Least Preferred	Least Preferred	Most Preferred
Cost Considerations	Design & Construction, Lifecycle, Maintenance and Future replacement	Low initial cost, high maintenance cost.	Moderate initial cost, high maintenance cost.	Normal initial cost, lower maintenance cost.
		Neutral	Neutral	Neutral
Implementation Evaluation Summary		Least Preferred	Least Preferred	Most Preferred

Table D.7: Overall Preferred Alternative

<b>Retain</b> Keep the existing bridge (conduct maintenance repairs) (optionally realign south approach road)	<b>Rehabilitate</b> Strengthen the existing bridge (widening not feasible) (adding a sidewalk not feasible)	<b>Replace</b> Construct a new bridge at the same location (remove existing bridge)
<b>Least Preferred</b>	<b>Least Preferred</b>	<b>Most Preferred</b>