WELCOME TO THE MCINTYRE RIVER MULTI-USE BRIDGE OPEN HOUSE!

Thank you for coming to this special event. This is your chance to learn all about the project, talk to the people involved in the planning and design, and tell us what you think.

Take a look at the poster boards. Ask questions!

VOTE WITH YOUR STICKERS!

- We are doing a 'dot-mocracy' at this event.
- We are looking for your thoughts on some of the boards.
- You can tell us by putting a sticker on your favourite option.

How it works: You'll get three stickers for each board. Put stickers on your favourite choice. You can either put all your stickers on one choice, if it's your absolute favourite, or put stickers on a couple of your choices if you like them equally. We'll count up the stickers at the end to see which options people liked best!

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MCINTYRE RIVER MULTI-USE BRIDGE

BACKGROUND

The City of Thunder Bay is looking to build a new multi-use bridge over the McIntyre River near the existing Nakina Drive Bridge.

HISTORY

- The Nakina Drive Bridge (owned by Confederation College) has two-1.5 metre-wide sidewalks are used by both pedestrians and cyclists
- The existing bridge sidewalk does not meet the current multi-use trail standard width of 3.0m
- This is a major river crossing for north-south travel. It is used by College students and the general public as they pass through the College campus
- To help with safety and comfort, the City wants a separate crossing for pedestrians and cyclists
- The City was awarded $325,000 from the Ministry of Transportation's Ontario Municipal Cycling Infrastructure Fund (OMCIP) for this project

BENEFITS

- Make it safer for people walking and biking by having a separated bridge away from car and bus traffic
- A chance to improve the flow of the trails with a new crossing
- A dedicated bridge would mean fewer cyclists on the roadway at busy times

Separate from this project, Confederation College plans on repairing the Nakina Drive Bridge in the near future:

- They plan on removing the west sidewalk and widening the east sidewalk to 3.0 metres
- Make the current crossing safer for pedestrians, cyclists, and vehicles going to Confederation College

ENVIRONMENTAL ASSESSMENT

A project like this must go through a process called a 'Municipal Class Environmental Assessment' (MCEA). There are different classes of assessments. The proposed pedestrian bridge falls under a **Schedule B MCEA**. As part of this process, the City must present the project to the public and to relevant agencies. The purpose is to review concerns and gather feedback. These are the steps of the Schedule B MCEA:

1. Identify problem or opportunity
2. Identify alternative solutions
3. Identify impacts; evaluate alternative solutions
4. Consult review agencies and public consultation
5. Select the best solution
6. Notice of completion public and agencies
7. Part II order opportunity
8. Complete design and construction

We are at Step 4: Consultation

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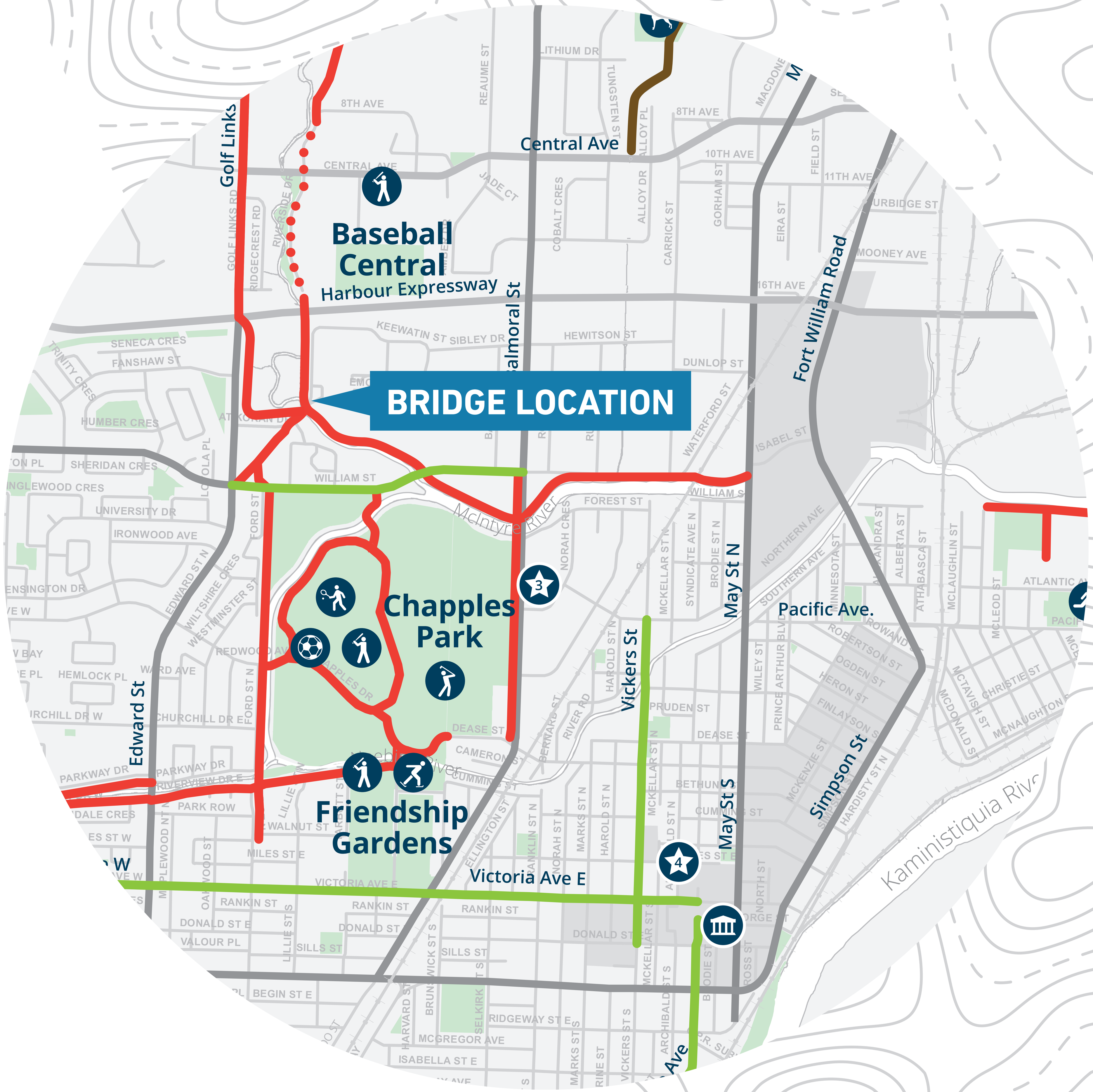
CONNECTIVITY

The City's multi-use trail system is a 55-kilometre network of trails that helps to connect citizens to destinations using an off-road network. The City is trying to develop a safe, connected, and comfortable network.

This trail connection is important because it creates a safer connection across the McIntyre River. This is one of the main north-south trails in Thunder Bay and is used by students and every day people, for exercise, commuting, and exploring.



LOCATION A

Location 'A' will weave into a green space but will need more trail to be built. It will also be dark at night and in winter, if not lit.

LOCATION B

Location 'B' aligns perfectly with the existing trails. This saves money. The trail is well-lit from nearby lighting.

LOCATION C

Location 'C' is on the opposite side of where the current main multi-use trail is. It would need lots of new trail and a better crossing of Nakina Dr. to access the bridge.

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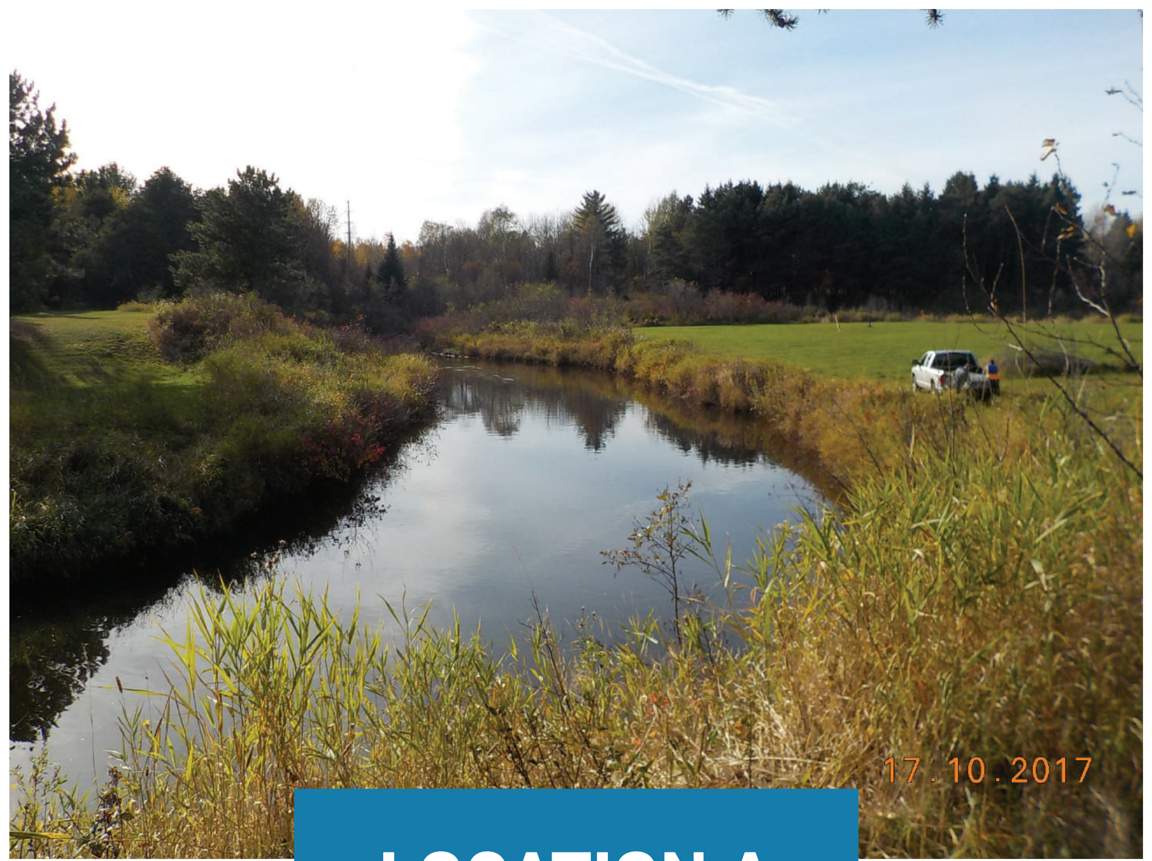
THREE LOCATION OPTIONS

Three locations are being considered for the new multi-use bridge over the McIntyre River.



LOCATION A

Location 'A' is about 50 metres up the river from Nakina Drive Bridge.

This spot has views of the natural, winding river upstream of the crossing.

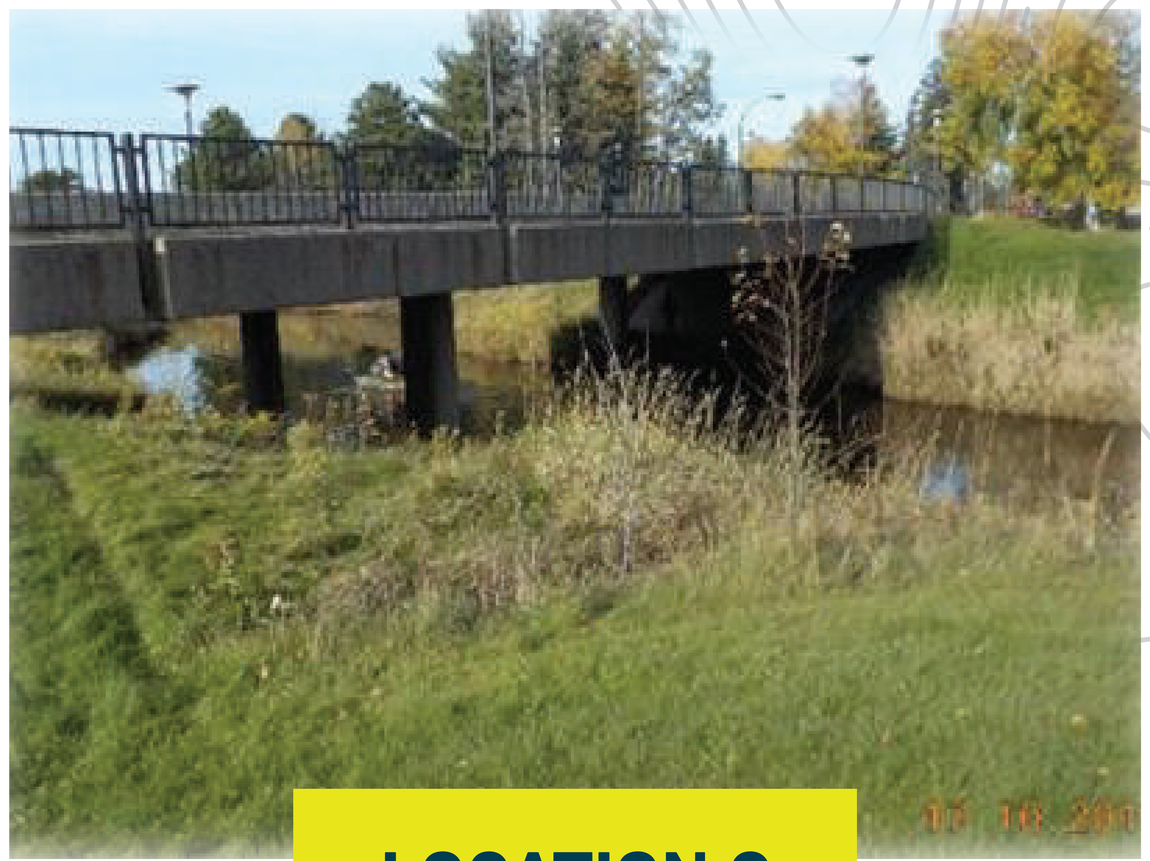
If this bridge were built, when you looked down the river, you would see the Nakina Drive Bridge.

LOCATION B

Location 'B' is very close to the Nakina Drive Bridge.

Looking north-west, up the river, you will see the winding river.

If you want to look down river, south-east, you'll mostly see the Nakina Drive Bridge.



LOCATION C

Location 'C' is about 50 metres down the river from the Nakina Drive Bridge.

At this location, when looking down the river, you'll see the winding river headed south-east.

When you look up the river, the Nakina Drive Bridge is most of what you'll see.

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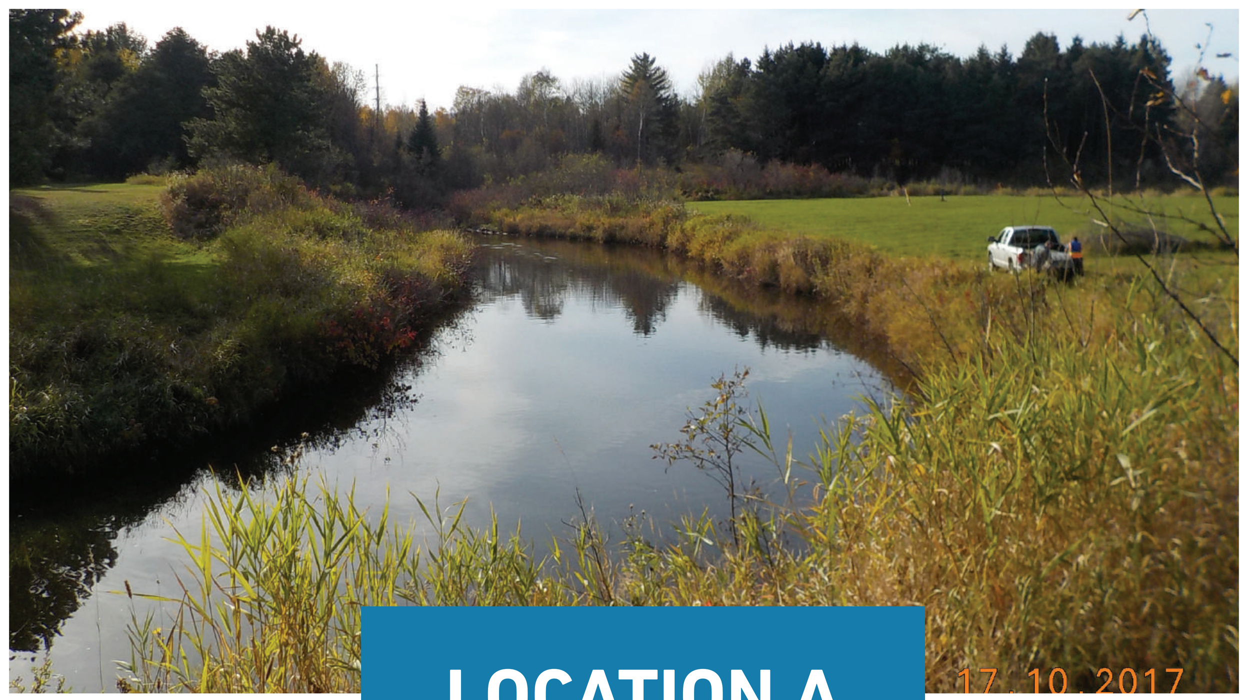
WHICH LOCATION IS BEST?



LOCATION A

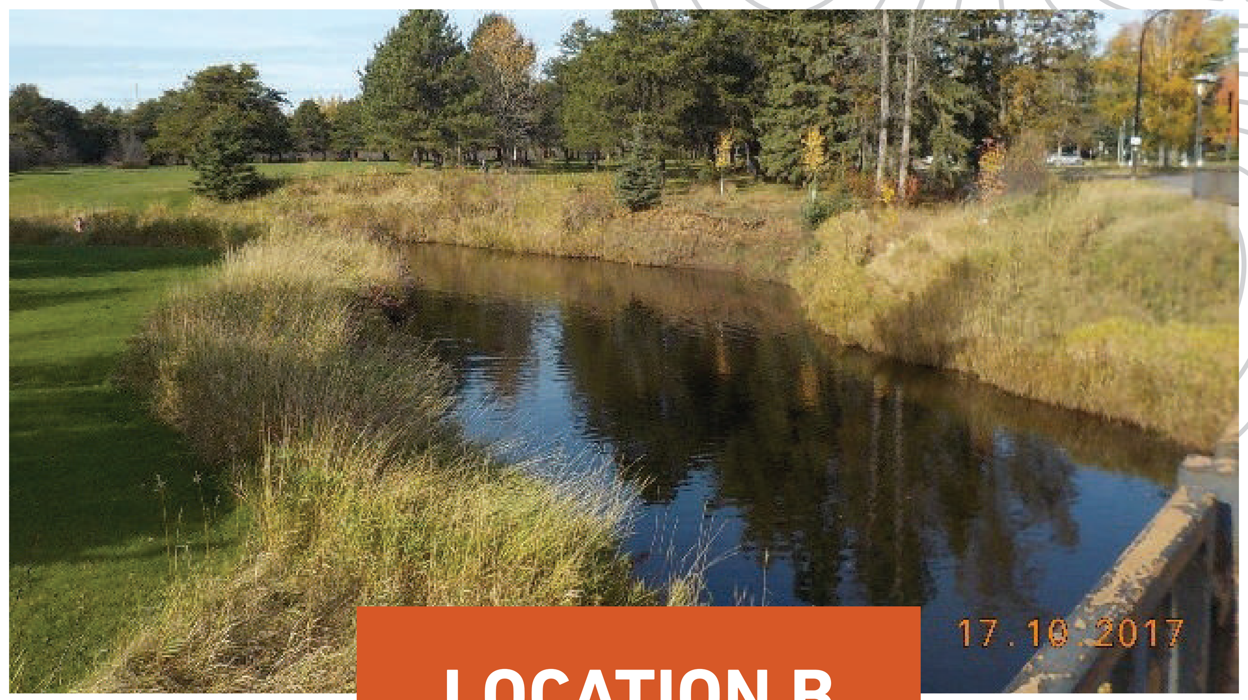
⬇ VOTE ⬇

Advantages

- Bridge would be a good connection to existing multi-use trails
- Bridge would be easily seen from Nakina Drive bridge
- Shortest bridge structure needed: 25 meters
- Almost no disturbance to pedestrian, cyclist, or car traffic during construction

Disadvantages

- Most work needed to balance Regional Floodwater surface elevation, i.e. culverts, overflows, removing and adding fill, matching grades, and more.
- Longest connecting trail needed: 60 meters within the Regional Floodplain.
- Most expensive abutments: lots of work needed to stabilize the north shore and embankments, such as Retained Soil Systems (RSS) or Mechanically Stabilized Earth (MSE) walls
- Most negative environmental impact of the three locations
- Highest construction costs because of environmental protection work



LOCATION B

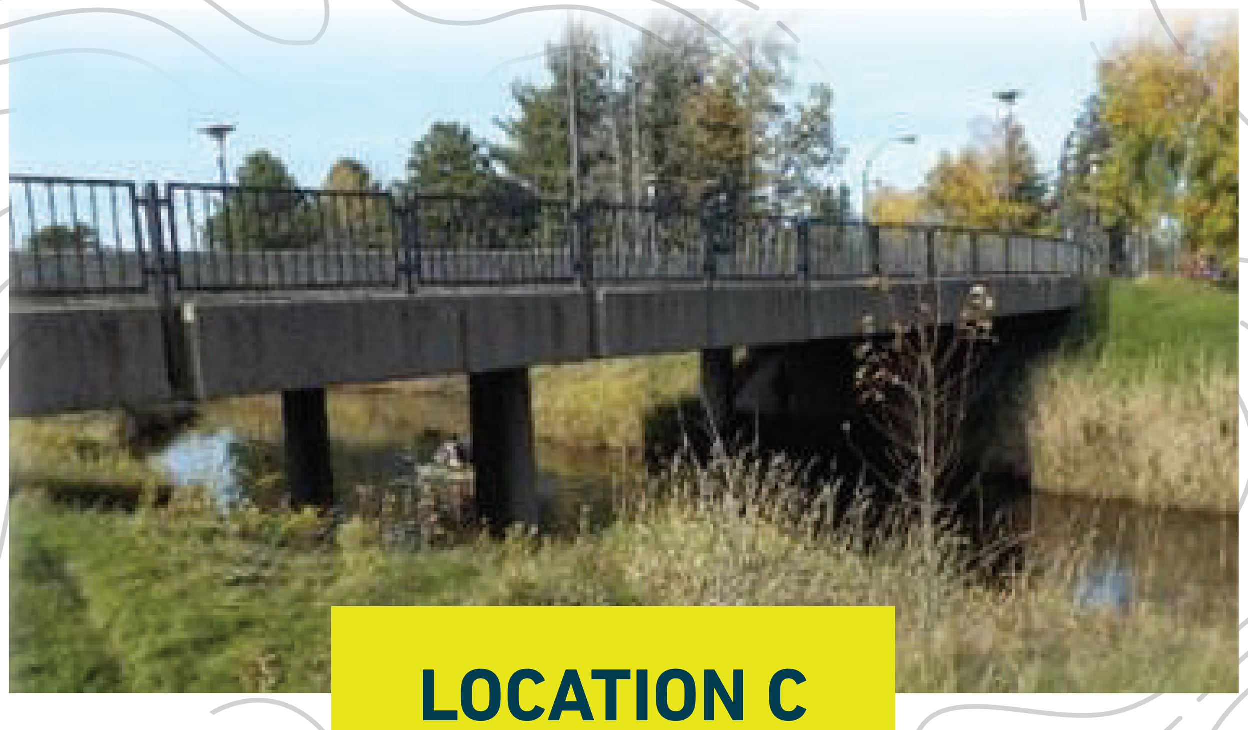
⬇ VOTE ⬇

Advantages

- Bridge would connect perfectly with existing trail system
- Almost no new trails need to be built
- Very little impact to the environment and embankments
- The bridge would be high enough to pass the Regional Flood
- Second-cheapest abutment construction
- Second-cheapest total construction costs

Disadvantages

- Longest bridge structure needed: 40 meters
- Aesthetics: it may look odd to have a straight bridge beside the curved Nakina Drive bridge; it will be hard to get a nice view of the new bridge from the Nakina Bridge
- During construction, the west sidewalk will have to be closed. Pedestrians will have to walk on the east sidewalk
- Some shore stabilization required



LOCATION C

⬇ VOTE ⬇

Advantages

- Good view of the new multi-use bridge from the Nakina Drive Bridge
- The bridge would be high enough to pass the Regional Flood
- Cheapest abutment construction
- Least impact to the environment and embankments
- Least embankment fill required out of all options.
- Cheapest total construction costs of the three options

Disadvantages

- Longest bridge structure needed: 40 meters
- This bridge would not line up with the existing trail system. A new road crossing would be needed.
- This bridge doesn't fit with the City's planned and current trail system
- 90 metre trail needs to be built within the Regional Floodplain
- During construction, pedestrian traffic on the sidewalks west of the Nakina Drive bridge should be rerouted
- Doesn't fit with Confederation College's plan for the reconstruction of the Nakina Drive Bridge; bridge would be on the same side as the new sidewalk
- Some shore stabilization required

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OVERVIEW

	LOCATION A	LOCATION B (PREFERRED)	LOCATION C
Total Cost	Highest	Medium	Lowest
Environmental Impact	Highest	Medium	Lowest
Connectivity	Good	Best	Poor
Aesthetics	Good	Fair	Good

PRE-ENGINEERED SUPERSTRUCTURES



	TIMBER	ALUMINIUM	STEEL (PREFERRED)
Cost of Structure 25m Bridge	**Medium** $115,000 to $140,000	**High** $200,000	**Low – Medium** $95,000 to $140,000
Cost of Structure 40m Bridge	$210,000 to $290,000	$320,000	$175,000 to $255,000
Design Life	**75 Years**	**75 Years**	**75 Years**
Aesthetics New	**Very Good**	**Good**	**ACR:** Fair **Galvanized:** Good **Paint:** Good
Aesthetics Aged	**Poor** Checked/split timbers and discolouration	**Poor – Fair** Tarnished or dull appearance, some corrosion	**ACR:** Fair **Galvanized:** Corrosion is visible **Paint:** Corrosion is visible
Maintenance	Clean and seal timbers every 25 years Replace deck timbers every 10-15 years	Clean and paint corroded areas every 30-40 years	**ACR:** None **Galvanized:** Clean and paint every 30 years **Paint:** Clean and recoat every 20 years
Life-Cycle Cost	**Medium – High**	**Low**	**Low – Medium**

TIMBER BRIDGE OPTIONS

Timber bridges have been successfully installed at locations such as golf courses, recreational trails, and municipal parks.

Timber bridges are wood-based bridges. They can look great and be made in a variety of designs. Timber is a natural and sustainable bridge option with a lifespan of about 75-years. Timber bridges are lightweight and blend well in a natural environment.

Timber bridges can be made from Red Pine, Spruce, to Douglas Fir, and other trees. The wood is typically constructed using glued-laminated timbers, sawn timbers, or a combination of both. To help the timber last longer, it is typically treated using copper-chromium arsenate (CCA), pentachlorophenol (PCP), or alkaline copper quaternary (ACQ). Timber bridges may include steel parts such as steel angles or steel rods. The guards and handrails can be constructed with either timber or steel.

WORKS FOR LOCATION

DOES NOT WORK FOR LOCATION

VOTE

GIRDER BRIDGE

A B C

PONY TRUSS BRIDGE

A B C

ARCH BRIDGE

A B C

BOWSTRING TRUSS BRIDGE

A B C

CAMELBACK TRUSS BRIDGE

A B C

STEEL BRIDGE OPTIONS

Steel pedestrian bridges are the most common type.

Steel requires little maintenance and may arrive at the site fully assembled. Pre-engineered steel pedestrian bridges are typically truss-type bridges. The trusses are hollow and welded together. Truss-type bridges include Bowstring Truss Bridge, Pratt Truss Bridge, and Warren Truss Bridge.

ALUMINUM BRIDGE OPTIONS

Aluminum pedestrian bridges are typically truss-type bridges.

The trusses are hollow and welded together. Aluminum pedestrian bridges are lightweight and offer service of approximately 75 years. Aluminum bridges requires little maintenance and would arrive at the site fully assembled.

WORKS FOR LOCATION

DOES NOT WORK FOR LOCATION

↓ VOTE ↓


EXAMPLE OF PAINTED STEEL BOWSTRING TRUSS

BOWSTRING TRUSS BRIDGE

A B C


EXAMPLE OF GALVANIZED STEEL PRATT TRUSS

PRATT TRUSS BRIDGE

A B C


EXAMPLE OF WEATHERED STEEL WARREN TRUSS

WARREN TRUSS BRIDGE

A B C


EXAMPLE OF NATURAL ALUMINUM WARREN TRUSS

ALUMINUM BRIDGE
FINISH: BARE ALUMINUM

A B C

STEEL BRIDGE FINISHING OPTIONS

Steel bridges can come with one of three different finishes:

Weathering Steel (ACR)

- Surface coat of rust and appears rusty for its entire service life
- Prevents more severe corrosion from occurring

Paint

- Protects steel from the elements
- Provides colour and/or gloss
- Areas of corrosion appear and requires costly recoating approximately every 20 years

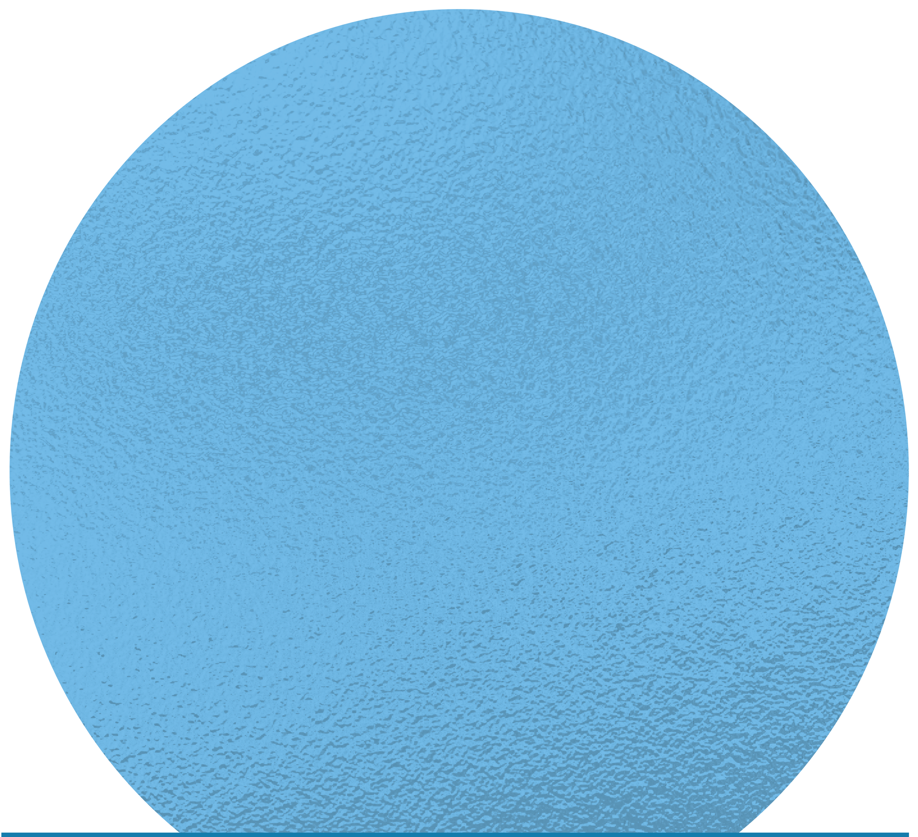
Hot-dipped galvanized

- Steel is coated with zinc, which prevents corrosion
- Areas of corrosion appear and requires costly recoating approximately every 30 years

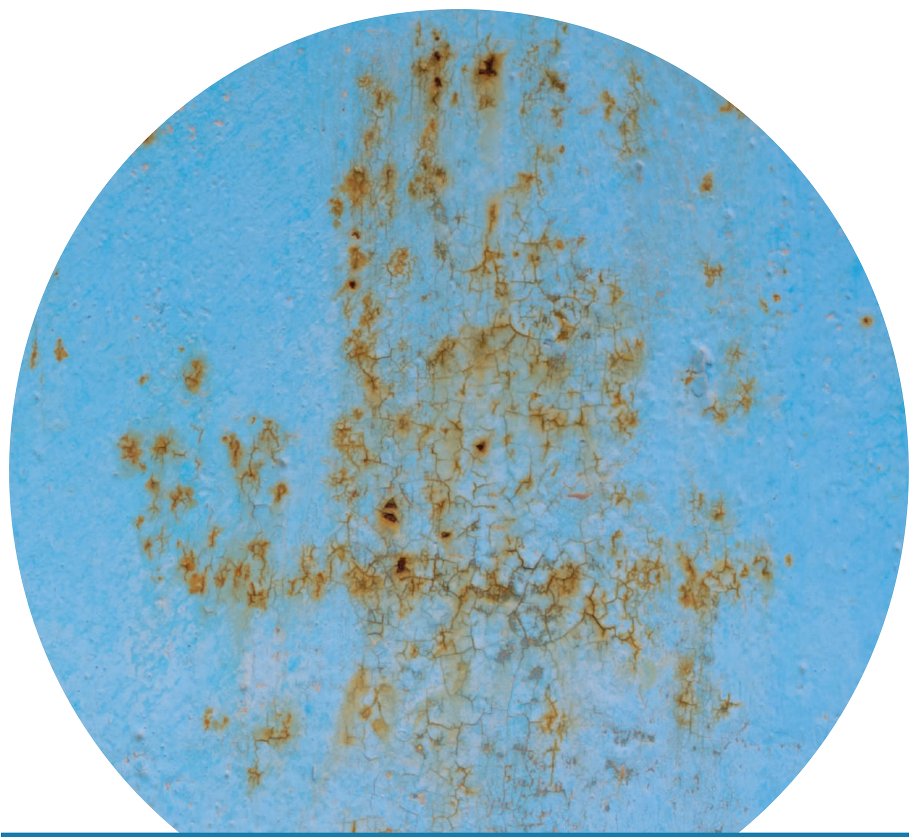
VOTE

WEATHERING STEEL
NEW

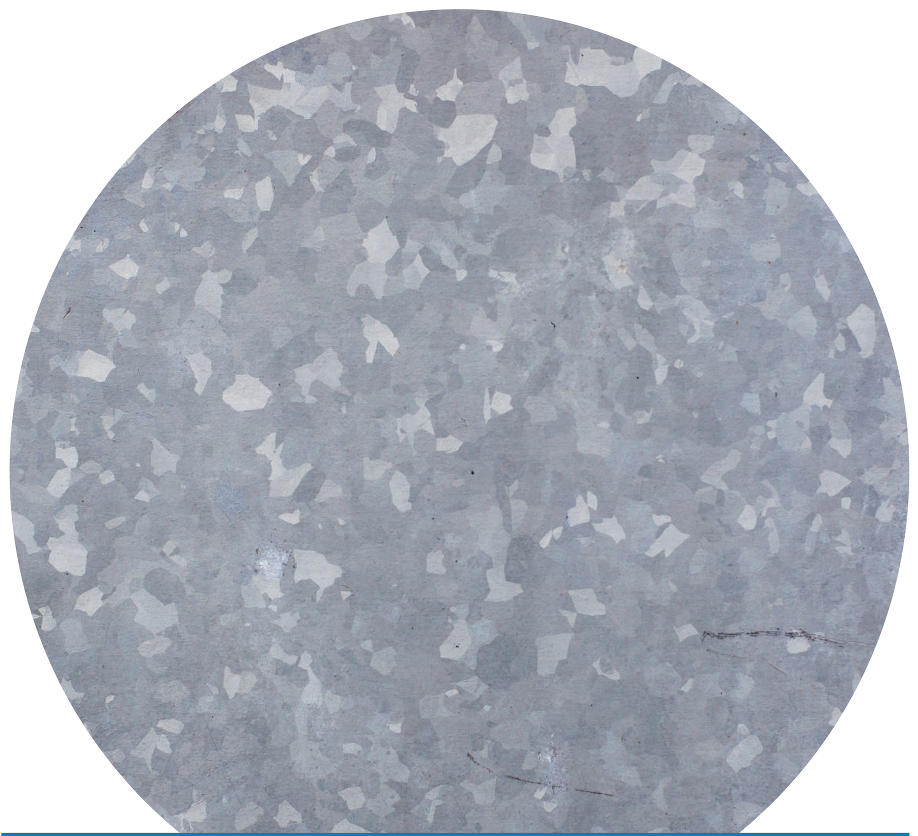
WEATHERING STEEL
AGED



PAINT
NEW



PAINT
AGED



HOT-DIPPED GALVANIZED
NEW

HOT-DIPPED GALVANIZED
AGED

ABUTMENTS

An 'abutment' is a structure at the ends of a bridge that is designed to carry the weight of the bridge, connect it to the ground, and protect the banks from erosion.

At each proposed bridge location, a foundation built deep in the ground will be needed to carry the weight of the bridge; this is called a 'deep foundation'.

After talking with local geotechnical firms, building the deep foundation will probably involve hammering steel piles into the ground, until they hit bedrock. This is based on what we know about the soils at this site. Once a preferred bridge location has been chosen, a geotechnical investigation would be done.

In the past, cast-in-place concrete abutments were used along with pile foundations. More recently, steel or concrete pile caps in combination with Retained Soil System (RSS) or Mechanically Stabilized Earth (MSE) walls have been used along with pile foundations. These wall systems are durable and can be constructed to look good in an urban or park setting. Concrete is very durable and can be made to look good using stamped patterns and adding colour.

STAMPED CONCRETE ABUTMENT
TROWBRIDGE FALLS, THUNDER BAY

RSS WALL WITH
CONCRETE ABUTMENT

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RECOMMENDATION

The project team recommends location ‘B’ for the site of the new multi-use bridge.

LOCATION B:

- There seems to be more benefits of constructing a new bridge at Location B when compared to locations ‘A’ and ‘C’
- Least environmental disturbance
- Fits best with existing trails
- Cost is within budget
- Affordability is a key decision-factor

WEATHERING STEEL, PRE-ENGINEERED SUPERSTRUCTURE:

- Durable
- Cost-Effective
- Minimal maintenance
- Mid-range initial and life-cycle cost

RSS WALLS:

- Durable
- Cost-Effective
- Cheaper than concrete
- Faster to construct than concrete

THE ESTIMATED CONSTRUCTION COST FOR THIS SOLUTION IS $740,000.00^{+HST}

OTHER BRIDGE OPTIONS

CONCRETE BRIDGE OPTIONS

Concrete pedestrian bridges are the most durable type of bridge. Concrete parts generally need the least maintenance and last the longest. A precast concrete pedestrian bridge arrives in sections that are then attached together, on-site.

Concrete pedestrian bridges are usually 'girder-type' bridges. The girders include: box-girders, T-shapes, and I-shapes. Concrete curbs can be included. Steel guards can be installed on concrete pedestrian bridges. Concrete posts can be incorporated into the design of the guard system.

ENGINEERED SUPERSTRUCTURE

A pre-engineered bridge is usually more feasible than designing a new bridge from scratch and building it on-site. The advantage of an engineered superstructure is that it can be designed to look exactly as you'd like it to, using any kind of material, for any width, length, and load. An engineered superstructure would be needed to build a bridge that matches the curve of the Nakina Drive Bridge.

For this site, an engineered superstructure would include a steel girder bridge with a concrete deck. This is similar to the bridge was recently built on Junot Avenue over the McIntyre River.

WIDENING THE NAKINA DRIVE BRIDGE

Options for widening the existing Nakina Drive Bridge were looked into. A detailed analysis was done the previous year, with Confederation College and the City of Thunder Bay. The result was that it would cost significantly more to repair and widen the existing bridge than to build a smaller, separate multi-use bridge.

THESE OPTIONS WERE ELIMINATED BECAUSE THE COST OF DOING THEM WAS BEYOND THE AVAILABLE BUDGET.