Expressway could be a washout; Red Hill Creek flooding problems are another reason not to build a road there

Hamilton Spectator, The (Ontario, Canada) - Wednesday, February 16, 2000
Author: *Glenn Rivers , The Spectator*

The proposed Red Hill Creek Expressway has been a source of argument in the Hamilton area for many years. I believe the expressway's detrimental effects on the environment are self-evident, and have been the key arguments of its opponents. However, the technical difficulties and potential dangers of building the expressway in a valley also occupied by a creek prone to flash flooding and erosion have not received as much attention.

A number of factors conspire to make Red Hill Creek a dangerous stream that can swell and flood quite rapidly. These factors include the shape of its watershed, the clay soils that efficiently produce surface run-off once they are waterlogged and the steep slope of parts of the stream channel, especially below the escarpment.

Man-made factors also come into play: A large portion of the watershed has been paved over, effectively rendering it impervious. Large volumes of storm water from the paved areas are channeled rapidly through sewer systems that discharge into the creek. The creek drains most of the city above the escarpment, from the crest to well south of Highway 53. Most land east of Wellington Street is drained by Red Hill Creek, and at one point the western boundary of the watershed extends as far as Garth Street.

Experience and research into flooding indicates that small to medium streams are responsible for a large share of fatalities caused by flooding. This is because, unlike large rivers upon which floods can often be forecast days or even weeks in advance, smaller streams can develop floods quite rapidly, often in a few hours or less. Compounding the danger on smaller streams are the often high velocities of the flood water caused by the typically steeper slopes of smaller stream channels. A large number of fatalities in flash floods occur in motor vehicles. Drivers often do not realize how easily their vehicles can be swept away by relatively shallow water when it is flowing very fast.

The building of the Red Hill Creek Expressway would require the construction of about seven kilometres of artificial channel to protect the expressway from flooding and erosion caused by the creek, as well as eight bridges. These "creek works" are expected to be very expensive (about $30 million) and even then, protection would only be provided against relatively small floods.

Each year, there would be about a 2 per cent probability that there would be a flood larger than the one that the expressway was designed to withstand, if the calculations of the expressway engineers are correct. However, those calculations are based on historical weather data, and do not allow for global warming. Many climate researchers fear global warming could lead to more frequent severe rainstorms and flooding.

So far, most attempts to alter the natural channel of Red Hill Creek have failed. The placement of cages filled with stones (known as gabian baskets), piles of boulders, or large concrete blocks in order to prevent erosion or to realign sections of the creek has been attempted at several locations, and in most cases, the creek has eventually undermined or destroyed these efforts. The Ontario Ministry of Natural Resources has formally expressed doubts that the "creek works" needed for the expressway will be successful. A recent report prepared by a consultant for Hamilton-Wentworth region admits that most creek alterations done to date have actually made erosion problems worse.

Here's a case in point to illustrate the difficulties of engineering in a hostile environment such as the

flood-prone creek. The concrete channel underneath the Queenston Road bridge spanning the Red Hill Valley was built in 1991. When it was discovered that the design of this channel was blocking fish migration, the federal Department of Fisheries and Oceans ordered that this problem be fixed. The solution arrived at was to place three V-shaped arrangements of concrete "baffle blocks" across the floor of the channel to break the flow and provide resting places for migrating fish.

Soon after the blocks were in place, floods swept them away. When the blocks were replaced and anchored by iron reinforcing rods, floods twisted some of the iron reinforcing rods like spaghetti and resumed washing the concrete blocks away. Today, only five of the 15 blocks remain in place.

Almost nine years have passed, yet the problem persists. And as if this wasn't enough, the recent consultants' report mentioned earlier suggests that this channel is aggravating erosion problems downstream.

Many engineers who work with creeks claim that they have learned from the mistakes of the past. They point to the artificial channel and the wetlands at the Dartnall Road interchange of the Lincoln M. Alexander Parkway as a prime example of their new methods. However, a cursory examination of this site already reveals sedimentation and erosion problems, even though this project is very new and has yet to experience a truly large flood.

If the Red Hill Creek Expressway is built as planned, we will end up with a project that has cost hundreds of millions of tax dollars, will do great damage to the environment, and will be prone to damage from flooding, erosion, and possibly other natural hazards such as rockfalls and landslides. Even worse, there will also be the possibility of loss of life if a large flash flood develops before the expressway can be closed, and motorists are trapped by rampaging floodwaters.

There are already many contraindications to building the Red Hill Creek Expressway, and when the technical problems of building the expressway in a naturally hazardous environment is added in, it leaves wisdom of building the expressway open to question.

Glenn Rivers is a geology student at McMaster University with a strong interest in environmental issues and natural hazards.
Caption: Photo: Spectator file photo The Red Hill Creek in mid-fall flow: Its watershed includes most of the city above the escarpment.
Edition: *FINAL*
Section: *Forum*
Page: *A13*
Record Number: *20000216HS181722*

Flood theories don't hold water

Hamilton Spectator, The (Ontario, Canada) - Saturday, February 19, 2000
Author: *The Spectator*
RED HILL CREEK EXPRESSWAY

RE: 'Expressway could be a washout' (Feb. 16).

I have followed The Spectator's coverage of the **Red Hill** Creek Expressway debate for quite some time, agreeing and disagreeing with the observations printed with equal measure.

However, the opinion piece by McMaster University student Glenn Rivers deserves response.

Rivers writes, and I paraphrase, "the dangers of flooding in the **Red Hill** Creek are high, so do not build the expressway and endanger motorists."

No doubt his essay has a foothold in theory but the "real world" of the expressway project is not as he sees it.

Rather than fill a space larger than the original article, I have provided several points to ponder:

* The statement that the expressway would have an annual 2 per cent probability of flooding, which exceeds the design specification, is incorrect. There are provincial standards for designing roads with respect to the danger of flooding. These have been meet and exceeded. The expressway is designed to withstand a 100-year storm standard. This exceeds the standards for municipal roads and most 400-series highways, which are to a 50-100 year storm standard.

* Construction of artificial channels is not being considered. Perhaps Rivers is thinking of plans 10 years ago where the creek would have been placed almost entirely in concrete. The current proposal calls for a natural channel and floodplain, designs formed by soil, rock and plant material which reduce overall water velocities. The cost is approximately $10 million, not $30 million as stated.

* Natural-channel-design techniques are favoured by both the federal Department of Fisheries and Oceans (DFO) and the Ontario Ministry of Natural Resources (MNR) as they provide for a stable stream and increased fish habitat. Natural channel design bears little resemblance to the work previously carried out in the creek. The consultant who produced this current design provides expert advice to DFO on other such design projects.

* Risk of flooding is further reduced by incorporation into the design of a large stormwater detention area. This is where water would be temporarily stored during high-water-flow events. The oversized culverts and bridges proposed for the expressway exceed the provincial standards.

The proposed expressway has been designed considering a wide range of scenarios, including events with the magnitude of Hurricane Hazel.

Gary Moore, P. Eng.

Manager of Engineering,

Special Projects Office,

Regional Municipality

of Hamilton-Wentworth.
Edition: *FINAL*
Section: *Forum*
Page: *D15*
Record Number: *20000219HS183748*

Latest arguments fail to inspire confidence; RED HILL CREEK EXPRESSWAY

Hamilton Spectator, The (Ontario, Canada) - Thursday, February 24, 2000
Author: *The Spectator*
RE: ' **Flood** theories do not hold water' (Feb.19).

The "special projects office manager of engineering" dismisses the concerns of a private citizen regarding the high costs and problematic nature of building the **Red Hill** Creek Expressway in the bottom of a narrow valley prone to flooding.

The problem with the manager's claims, like many of those made by the region, is that they are not subject to verification.

One reason is because the region refuses to release the supporting documentation, claiming it is either "internal" or protected by "lawyer-client privilege." Another reason is that the region is currently spending more than a million local tax dollars to prevent an independent assessment of the claims.

The manager claims the cost of constructing in a creek valley is $11 million. This figure contrasts markedly with the May 1999 report that says creek realignment and stormwater ponds will cost $26 million, excluding eight bridges/culverts.

This argument hardly inspires confidence in what the region is doing.

Joe Minor, Hamilton,

Chair, Friends of **Red Hill** Valley.
Edition: *FINAL*
Section: *Editorial/Opinion*
Page: *A12*
Record Number: *20000224HS186035*