Transportation Association of Canada Environmental Achievement Award
Nomination Submission:

Highway 26 New Wildlife Passage and Enhancements

Ontario Ministry of Transportation, Central Region

Nominees:

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Simple design changes opened up unique opportunities to enhance the environment on Highway 26 New, for wildlife and the aquatic ecosystem.

The Individual Environmental Assessment for Highway 26 New, located between Collingwood and Wasaga Beach, Ontario, was filed by the Ontario Ministry of Transportation (MTO) in 1992. Subsequent to that time numerous updates were made to the planned new alignment, incorporating environmental features and mitigation measures. Highway 26 New is a 4-lane, access-controlled facility extending 8.3 km between Collingwood and Wasaga Beach. The Highway opened to traffic in late 2012.

A major challenge of this project was accommodating the large population of deer. Their pathway to abandoned apple orchards (a major food source) from their forest cover was being severed by the original highway design. This would have posed a problem for deer and other wildlife, and would have also posed a significant safety hazard for the travelling public.

On a site visit prior to the initiation of the detail design of the highway, MTO Planning and Environmental staff identified the opportunity to relocate the Nottawa Side Road cul-de-sac at Highway (Hwy) 26 New, by simply pulling it a short distance back from the new highway. This small, but creative, change in the location of the side road provided space for the design and implementation of a naturalized valley from the orchards between the cul-de-sac and the new highway. This section of side road had contained a small old steel pipe culvert, propped up by a few boards that conveyed intermittent water flows from the orchard, upstream. It also blocked fish movement under Nottawa Road. To facilitate both deer and fish passage, it was decided to remove the collapsed culvert and replace it with a 50 m long, open landscaped valley, incorporating natural channel design for the watercourse. (Figure 1).

The next step was to redesign the originally planned culverts under Hwy 26 New to provide deer and other wildlife passage from the orchards to the woods on the other side of Highway 26 New.

These small culverts were redesigned to become a wildlife crossing consisting of two large open structures underneath Highway 26 New, which was raised to accommodate them. The entrances to the structures are 8.5m wide and over 3.25 m high. The openness of the structures makes the passage attractive to deer as they can see the other side and any predators that might be in the crossing. The crossing was left open, but fenced, through the 16 m highway median to convey more light into this passage system.
Inside the deer and wildlife passage structures, the base is covered with grassed earth which is a suitable substrate for the deer as well as other smaller wildlife. Part of the passage is also lined in riverstone (rounded stones) mixed with sand and gravel to create a natural channel for the intermittent watercourse flows. There is a 1m section of grassed earth on the other side of the passage as well. Contract drawings, Reach 1 and Reach 2, in the appendix, illustrates the cross-section of the opening. Refer to figures 2 to 8.

These measures not only restore and maintain the pre-existing wildlife natural corridor, allowing deer to easily and safely pass from their sheltered woods to food locations on the other side of the highway, but also contribute greatly to the safety of the traveling public by helping to avoid vehicle-wildlife collisions.

The ecosystems of this and another small watercourses benefitted from natural channel design, with placement of larger rocks, riverstone, gravel and plantings, live stakes and brush layer treatment. Native species were utilized in plantings on the right of way around stormwater ponds, the wildlife passage and in streambanks, to blend with existing natural vegetation. Obstructions to fish passage were removed and improved upstream fish migration has been documented. The removal of the old perched steel culvert,( figure 2 to 4) eliminated a barrier to movement for both aquatic and terrestrial species. This watercourse was previously classified as a warm water intermittent stream, home to warm water bait fish such as minnows, sticklebacks and pumpkinseeds. Now, coldwater species such as rainbow trout have been documented in this enhanced watercourse. (Figure 6 and 10 and Contract drawing – Vegetation Restoration Plan).

The replacement of the small steel culvert upstream of the wildlife crossing with an open channel and valley has restored a passage that had been blocked for many years. The natural channel design utilized in two small watercourses on this project provides improved fisheries and aquatic habitat, with improved streambed substrate, meanders, pools and riffles. The newly stabilized stream banks protect the quality of the aquatic environment, with plantings, live stakes, brush bundles and the use of compost, injected with seed throughout to promote fast, dense growth of grasses, maintain moisture and prevent erosion. The watercourse at the wildlife passage has been restored such that large rainbow trout have been documented in what had formerly been warm water baitfish habitat for minnows and other small warm water fish. In addition, eight stormwater management ponds with significant landscaping were incorporated into the project to treat stormwater runoff for quality and quantity. (Figure 10)

Other wildlife measures on this project include 3 m high deer fencing, deer escape ramps as well as fencing to prevent deer from jumping off of a structure onto the highway below. (Figure 11)
Wildlife and man are often in conflict and the use of deer fencing with deer escape ramps, allows deer that wander onto the highway an opportunity to escape to safety away from traffic. These ramps were installed early during the construction phase and the deer were very curious, traversing the ramps prior to the installation of the fencing, allowing them the opportunity to get used to the ramps, before the highway was open to traffic.

Additional wildlife passage was provided through a second span under the bridge at the Batteaux River. In all but high flood conditions, the dry second span provides wildlife passage.

Some of the construction challenges included the deer population eating all of the new grass. Additional environmental measures, such as soil tackifiers and composted topsoil with grass seed for erosion control, totalling over $0.5 million were added to the project during construction as a result of environmental monitoring. (Figure 9) Environmental monitoring requirements included a comprehensive, weekly inspection. When storm events were predicted, a warning was issued to the contractor to ensure that appropriate measures were taken with additional post-storm environmental inspection and remedial measures.

Specific, on going maintenance requirements have been developed for the wildlife passage system and associated environmental features on this project.

Although wildlife issues were apparent to Ministry Planning and Environmental staff at the initiation of the design stage of Highway 26 New, local input and expertise was encouraged and was offered by residents on wildlife, their movements and food sources in the area. Ministry staff and biology consultants consulted further with these residents and this input helped to define the parameters of the deer study as well as the mitigation measures for deer passage. One resident accompanied biologists to share his local knowledge.

This project is an excellent example of how a simple refinement of a design (the cul-de-sac- relocation) can foster a complete wildlife passage system that since its construction has been very well utilized, as evidenced by the multitude of hoof prints through the new valley and under hwy 26 New (figure 8).
Enhanced Environmental Features Costs:

The construction cost (tender value) of Highway 26 New was $32.6 M. The cost of the environmental features of this project, itemized below, totalled $4.6M or 14% of the project cost.

- Wildlife/Deer Structure - $1.8 M
- Deer ramps - $0.3 M
- Deer Fence - > $0.5 M
- Deer escape ramps - $0.3 M
- Landscape plantings - > $0.2 M
- Stormwater management ponds - > $1 M
- Additional environmental mitigation during construction - > $0.5 M

Examples of Environmental Measures in Contract Documentation:

Contract Drawing of the Deer/wildlife Passage Structure at Nottawa Side Road:
(Cross Sections of Reach 1 and Reach 2, Refer to Appendix)

This drawing shows the horizontal cross sections of the structures under Highway 26 New and associated open valley with natural channel design of the watercourse. This was accomplished by removing the old steel culvert and moving back the cul de sac on Nottawa Side Road.

Contract Drawing of the Nottawa Side Road Water Course Restoration Plan:
(Vegetation Restoration Plan, Refer to Appendix)

This drawing shows the details and quantities of plantings, the natural channel design features such as meanders, rock substrate and placement and detailed instruction for planting.
APPENDIX

Figure 1  Highway 26 Wildlife Passage System

1. Shortened Nottawasaga Sideroad Cul-de-Sac
2. Apple Orchard
3. Steel Culvert Removed
4. Valley/Watercourse Constructed
5. Wildlife Passage Structures
6. Deer Habitat/Wintering Area
7. Stormwater Management Pond (SWM)
8. Watercourse with Natural Channel Design
   (Features now utilized by Rainbow Trout)
Figure 2: Old Steel Culvert Under Nottawa Side Road:
This culvert was removed and the side road cull de sac pulled back to provide room to create a naturalized valley and watercourse with natural channel design features. This is located at the easterly side of the new highway.

Figure 3: Nottawa Side Road with Watercourse Channel Installed:
The watercourse features and side slopes were installed and let stabilize prior to culvert removal.

Figure 4: Nottawa Side Road Valley and Water Course Completed “In the Dry”:
The old steel culvert has been removed, the channel substrate installed and the new valley opened to the abandoned orchards.

Figure 5: Construction of the Deer/Wildlife Crossing Structure:
These two structures allow wildlife to pass under the new highway. The rectangles of river stone and the larger boulders are the initial stages of the installation of the naturalized channel for the small watercourse at Nottawa side Road.

Figure 6: View of Nottawa Side Road Watercourse with Completed Channel:
Water now flows freely from the abandoned orchards, downstream through the deer/wildlife crossing. This watercourse is now utilized by rainbow trout. It was formerly home to only small baitfish such as minnows. Deer and other wildlife use the grassy areas to cross.

Figure 7: Open Area Between Wildlife Structures Allows Deer Good Visibility to Identify Predators and Safely Use the Passage
Figure 8 Deer Tracks in the Earth at the Wildlife Structure (deer fencing to the left)

Figure 10 One of the Eight Stormwater Management Ponds:
This stormwater management pond is adjacent to the naturalized watercourse at the downstream side of the deer/wildlife structure passage at Nottawa Side Road.

Figure 9 Construction Challenges:
Keeping up with the deer consuming all of the tasty fresh grass was a constant challenge. The deer removed all of the grass growth in this area in a couple of days.

Figure 11 Deer Escape Ramp:
Grassed earthen deer escape ramps allow deer accidently trapped inside the highway an opportunity to run up the ramp and jump down to the soft sandy pad below in the other side of the 3m high deer fence. The straight rock wall at the fence line prevents the deer from jumping back onto the highway side.