

**Terry Fox Drive CEAA
Screening - Part B
Richardson Side Road to
Second Line Road
Final Report**

April 2010

(Appendices under Separate Cover)



Submitted to

***Infrastructure Canada and
Department of Fisheries and
Oceans Canada***

Submitted by

City of Ottawa

Project No. 09-1518

Prepared by

Dillon Consulting Limited

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1.0	INTRODUCTION	1
1.1	Project Location	1
1.2	Need for Road Widening/Extension	1
1.3	Project Background.....	3
1.3.1	Ontario Municipal Board Decision (1983).....	3
1.3.2	Municipal Class EA (2000).....	3
1.3.3	Terry Fox Drive EA Addendum (2004)	4
1.3.4	City of Ottawa Official Plan Amendment (2007).....	4
1.3.5	Class EA Addendum (2007).....	5
1.3.6	Current Study – 2007 – Present.....	5
1.4	CEAA Triggers	5
1.5	Notification of Other Jurisdictions.....	6
1.6	Legislation Considered	6
1.6.1	Permit Requirements.....	7
2.0	PROJECT DESCRIPTION & SCOPE OF PROJECT	9
2.1	Part B Project Components	9
2.2	Scope of Project.....	12
2.3	Construction Activities	13
2.3.1	Site Preparation	13
2.3.1.1	Vegetation and Topsoil Removal	13
2.3.1.2	Earth Grading, Rock Excavation and Blasting.....	13
2.3.1.3	14	
2.3.2	Roadway Construction	14
2.3.3	Construction of New Pedestrian Pathway/Sidewalks	14
2.3.4	Stormwater and Drainage.....	15
2.3.5	Wetland Crossings	15
2.3.6	Shirley’s Brook Realignment.....	15
2.3.7	Installation of Traffic Control Signals, Road Signs and Street Lighting.....	16
2.3.8	Temporary Construction Laydown Areas.....	16
2.3.9	Disposal of Waste Materials.....	16
2.3.9.1	Waste from Clearing Activities	16
2.3.9.2	Excavated Materials	16
2.3.9.3	Solid Non-Hazardous Construction Waste	16
2.3.10	Dewatering Activities.....	16
2.3.11	Site Restoration	17
2.3.12	Use and Storage of Construction Vehicles and Equipment	17
2.3.13	Transportation and Storage of Construction Materials.....	17
2.3.14	Dust Control	17
2.3.15	Erosion and Sediment Control	17

2.4	Operational Activities	18
2.4.1	Minor Repairs	18
2.4.2	Sediment, Debris and Snow Removal	18
2.4.3	Monitoring of Mitigation Measures	18
2.4.4	General Cleaning and Maintenance Activities	19
2.4.5	Modifications	19
2.5	Project Construction Schedule	19
3.0	SCOPE OF ASSESSMENT	20
3.1	Environmental Assessment Method	21
3.2	Valued Environmental Components	22
3.3	Project Interactions	25
3.4	Evaluating Significance	27
3.5	Boundaries for Environmental Effects Assessment	27
3.5.1	Spatial Boundaries	27
3.5.2	Temporal Boundaries	28
4.0	PUBLIC AND AGENCY CONSULTATION	29
4.1	Agency and Public Stakeholder Contact	29
4.2	Commitment to Stakeholder Consultation	32
4.3	Aboriginal Consultation	32
5.0	SOCIAL AND CULTURAL ENVIRONMENT – BASELINE CONDITIONS DESCRIPTION, IMPACT ASSESSMENT AND MITIGATION	35
5.1	Land Use and Land Use Designations	35
5.1.1	Current Baseline Conditions	35
	5.1.1.1 Floodplain Considerations in Land-Use Designation	38
5.1.2	Effects Assessment: Land Use Designations	38
	5.1.2.1 Potentially Contaminated Sites	39
5.1.3	Assessment of Significance	40
5.2	Land Use - Agriculture	41
5.2.1	Current Baseline Conditions	41
5.2.2	Effects Assessment	42
5.2.3	Assessment of Significance	43
5.3	Land Use – Historical	44
5.3.1	Current Baseline Conditions	44
5.3.2	Effects Assessment	44
5.3.3	Assessment of Significance	46
5.4	Land and Resource Use by Aboriginal People	48
5.4.1	Current Baseline Conditions	48
5.4.2	Effects Assessment	48
5.4.3	Assessment of Significance	48
6.0	NATURAL ENVIRONMENT – BASELINE CONDITION DESCRIPTION, IMPACT ASSESSMENT AND MITIGATION	50
6.1	Bedrock Geology, Surficial Geology and Soils	50

6.1.1	Current Baseline Conditions	50
	6.1.1.1 <i>Bedrock Geology</i>	50
	6.1.1.2 <i>Physiography and Surficial Geology</i>	51
	6.1.1.3 <i>Soils</i>	51
6.1.2	Effects Assessment	52
6.1.3	Assessment of Significance	53
6.2	Groundwater Quality and Quantity	55
6.2.1	Current Baseline Conditions	55
6.2.2	Effects Assessment	57
6.2.3	Assessment of Significance	57
6.3	Air Quality & Dust	59
6.3.1	Current Baseline Conditions	59
6.3.2	Effects Assessment	59
6.3.3	Assessment of Significance	60
6.4	Noise	62
6.4.1	Current Baseline Conditions	62
6.4.2	Effects Assessment	62
6.4.3	Assessment of Significance	62
6.5	Designated Natural Features	63
6.5.1	Current Baseline Conditions	64
	6.5.1.1 <i>Baseline Conditions: Primary and Secondary Lands</i>	64
	6.5.1.2 <i>Baseline Conditions: South March Highlands Candidate Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI)</i>	66
	6.5.1.3 <i>Baseline Conditions: South March Highlands Provincially Significant Wetlands Complex</i>	70
	6.5.1.4 <i>Baseline Conditions: South Kizel Drain Wetland Complex</i>	71
	6.5.1.5 <i>Baseline Conditions: Deer Wintering Areas</i>	71
6.5.2	Effects Assessment	72
	6.5.2.1 <i>Effects Assessment: Primary and Secondary Lands</i>	74
	6.5.2.2 <i>Effects Assessment: South March Highlands Candidate Provincially Significant Life Science Area of Natural and Scientific Interest</i>	75
	6.5.2.3 <i>Effects Assessment: South March Highlands Provincially Significant Wetlands Complex</i>	76
	6.5.2.4 <i>Effects Assessment: South Kizel Drain and Other Wetlands</i>	84
	6.5.2.5 <i>Effects Assessment: Deer Wintering Yards</i>	86
6.5.3	Assessment of Significance: Designated Natural Features	86
6.6	Vegetation	89
6.6.1	Methods: Ecological Land Classification	89
6.6.2	Methods: Botanical Surveys	89
6.6.3	Current Baseline Conditions	91
	6.6.3.1 <i>Results of Ecological Land Classification</i>	91
	6.6.3.2 <i>Botanical Survey Results</i>	93

6.6.4	Effects Assessment: Vegetation	94
	6.6.4.1 <i>Impacts to Plants and Plant Communities</i>	94
	6.6.4.2 <i>Botanical</i>	95
6.6.5	Assessment of Significance: Vegetation	95
6.7	Wildlife	96
6.7.1	Survey Methods	96
	6.7.1.1 <i>Nocturnal Amphibian Surveys</i>	97
	6.7.1.2 <i>Salamander Surveys</i>	99
	6.7.1.3 <i>Breeding Bird Survey</i>	100
	6.7.1.4 <i>Pre-Clearance Nest Survey for Geotechnical Testing</i>	100
6.7.2	Current Baseline Conditions - Wildlife	100
	6.7.2.1 <i>Mammals</i>	100
	6.7.2.2 <i>Herptofauna</i>	101
	6.7.2.3 <i>Herptofauna Habitat in the TFD Study Area</i>	107
	6.7.2.4 <i>Other Herptofauna Habitat (Vernal Pools)</i>	108
6.7.3	Effects Assessment and Specific Mitigation: Wildlife	109
	6.7.3.1 <i>Mitigation Measures: Wildlife</i>	110
	6.7.3.2 <i>Wildlife Migration Corridor Mitigation</i>	111
	6.7.3.3 <i>Wildlife Barrier Mitigation</i>	117
6.7.4	Effects Assessment and Specific Mitigation: Herptofauna	119
6.7.5	Migratory Nesting Birds Effects Assessment	121
	6.7.5.1 <i>Current Baseline: Breeding Bird Surveys</i>	121
	6.7.5.2 <i>Effects Assessment and Specific Mitigation: Migratory Nesting Birds</i>	122
	6.7.5.3 <i>Mitigation: Nesting Migratory Birds</i>	123
6.7.6	Assessment of Significance: All Wildlife Species	124
7.0	SURFACE WATER QUALITY AND QUANTITY	127
7.1	Background: Surface Water	127
7.2	Current Baseline Conditions: Surface Water	127
	7.2.1 <i>Shirley’s Brook Watershed</i>	127
	7.2.2 <i>Kizel Drain/ Watts Creek Watershed</i>	128
	7.2.3 <i>Carp River Watershed</i>	128
	7.2.4 <i>Roadway Proximity to Water Bodies</i>	129
7.3	Effects Assessment: Surface Water	130
	7.3.1 Potential Water Quantity Impacts	130
	7.3.2 Potential Water Quality Impacts	130
	7.3.3 Geophysical Considerations	131
	7.3.4 Natural Environment Considerations	131
	7.3.5 Urban Development Considerations	131
	7.3.6 Carp River Watershed Drainage/SWM Design Considerations	132
	7.3.7 Shirley’s Brook Watershed Drainage/SWM Constraints	132
7.4	Mitigation Strategy: Surface Water Quantity	133
	7.4.1 Drainage Area Details and Road Crossing Culverts	133

7.4.2	Carp River Floodplain Water Quantity	134
	7.4.2.1 <i>Background - Floodplain Displacement and Compensation Options.....</i>	<i>134</i>
	7.4.2.2 <i>Floodplain Displacement Compensation Options.....</i>	<i>137</i>
	7.4.2.3 <i>Evaluation of Proposed Compensation Options.....</i>	<i>140</i>
	7.4.2.4 <i>Final Area and Volumetric Compensation Design Criteria.....</i>	<i>140</i>
	7.4.2.5 <i>Floodplain Cut Area Restoration</i>	<i>142</i>
7.5	Mitigation Strategy: Surface Water Quality	146
7.6	Assessment of Significance: Surface Water.....	147
8.0	FISH AND FISH HABITATS.....	150
8.1	Current Baseline Conditions: Fish and Fish Habitats.....	150
8.1.1	Current Fish Communities	150
8.1.2	Existing Watercourses	153
8.1.3	Current Baseline: Fish Habitat Resources	157
	8.1.3.1 <i>Direct Habitat Resources.....</i>	<i>158</i>
	8.1.3.2 <i>Indirect Habitat Resources.....</i>	<i>161</i>
8.1.4	Current Baseline: Geomorphology Assessment of East Shirley’s Brook.....	162
8.2	Effects Assessment: Fish and Fish Habitats	166
8.2.1	Evaluation under the Risk Management Framework.....	166
8.2.2	Effects Assessment: Application of RMF to Categorize the Risk to Fish and Fish Habitats.....	168
8.2.3	Effects Assessment: East Shirley’s Brook Creek Realignment	171
8.2.4	Effects Assessment: Barriers to Fish Passage	172
8.3	Mitigation Measures: Fish and Fish Habitats	172
8.3.1	Culvert Installations	172
8.3.2	Watercourse Realignment.....	174
8.4	Assessment of Significance: Fish and Fish Habitats.....	178
9.0	SPECIES AT RISK – IDENTIFICATION OF EFFECTS AND MITIGATION.....	180
9.1	Species at Risk Legislation	180
9.1.1	Overview of Species at Risk in the Terry Fox Drive Study Area	181
9.2	Descriptions of Species at Risk Found Within the Alignment	184
9.2.1	Current Baseline: Schedule 1 Federally Endangered Species	184
	9.2.1.1 <i>Butternut; Tree - Juglans cinerea.....</i>	<i>184</i>
	9.2.1.2 <i>Butternut Tree Health Assessment.....</i>	<i>185</i>
	9.2.1.3 <i>American Ginseng; Herbaceous Plant - Panax quinquefolius</i>	<i>186</i>
	9.2.1.4 <i>Loggerhead Shrike; Bird – Lanius ludovicianus</i>	<i>187</i>
9.2.2	Schedule 1 Federally Threatened Species.....	187
	9.2.2.1 <i>Blanding’s Turtle; Reptile- Emydoidea blandingi.....</i>	<i>187</i>
	9.2.2.2 <i>Eastern Musk Turtle (Stinkpot); Reptile - Sternotherus odoratus</i>	<i>188</i>
	9.2.2.3 <i>Golden-Winged Warbler; Bird - Vermivora chrysoptera.....</i>	<i>189</i>
	9.2.2.4 <i>Western Chorus Frog – Pseudacris triseriata</i>	<i>190</i>

9.2.3	Schedule 1 Federally Special Concern Species.....	190
9.2.3.1	Eastern Milk Snake; Reptile – <i>Lampropeltis triangulum</i>	190
9.2.4	Provincial Species at Risk	191
9.2.4.1	Whip-poor-will; Bird - <i>Caprimulgus vociferus</i>	191
9.2.4.2	Olive-sided Flycatcher; Bird - <i>Contopus cooperi</i>	192
9.2.4.3	Snapping Turtle; Reptile - <i>Chelydra serpentina</i>	193
9.2.4.4	Bald Eagle; Bird - <i>Haliaeetus leucocephalus</i>	193
9.2.4.5	Black Tern; Bird - <i>Chlidonias niger</i>	194
9.3	Effects Assessment: Species at Risk and Their Habitats.....	194
9.3.1	Effects Assessment: Butternut Tree.....	194
9.3.2	Effects Assessment: American Ginseng.....	202
9.3.3	Effects Assessment: Loggerhead Shrike	202
9.3.4	Effects Assessment: Blanding’s Turtle.....	202
9.3.5	Effects Assessment: Western Chorus Frog.....	202
9.3.6	Effects Assessment: Musk Turtle (Stinkpot).....	203
9.3.7	Effects Assessment: Golden-winged Warbler	203
9.3.8	Effects Assessment: Whip-poor-will	204
9.3.9	Effects Assessment: Olive-sided Flycatcher	204
9.3.10	Effects Assessment: Eastern Milk Snake.....	204
9.3.11	Effects Assessment: Snapping Turtle.....	204
9.3.12	Effects Assessment: Bald Eagle	204
9.3.13	Effects Assessment: Black Tern.....	204
9.3.14	Effects Assessment Summary: Species at Risk	204
9.4	Mitigation of Effects on Species at Risk.....	206
9.4.1	Butternut Tree Effects Mitigation/ Offsetting Compensation Plan	207
9.4.2	American Ginseng Effects Mitigation Plan	210
9.4.3	Blanding’s Turtle Effects Mitigation Plan.....	211
9.4.4	Western Chorus Frog Effects Mitigation Plan.....	212
9.5	Assessment of Significance: Species at Risk	213
10.0	ACCIDENTS, MALFUNCTIONS AND EFFECTS OF THE ENVIRONMENT ON THE PROJECT.....	219
10.1	Accidents and Malfunctions.....	219
10.2	Effects of Accidents and Malfunctions on Identified Species at Risk	220
10.3	Surface Water - Effects of the Environment on the Project	221
11.0	CUMULATIVE EFFECTS.....	223
11.1	Description of the Future Projects and Activities	223
11.2	Potential for Cumulative Effects with Other Projects and Activities	228
11.3	Valued Environmental Component Interactions.....	228
11.3.1	Land Use and Land Use Designations.....	228
11.3.2	Land Use - Agriculture.....	229
11.3.3	Land Use – Aboriginal.....	229
11.3.4	Archaeological Resources Land Use - Historic	229
11.3.5	Bedrock and Surficial and Geology.....	230

11.3.6	Groundwater Resources.....	230
11.3.7	Air Quality and Dust	230
11.3.8	Noise	231
11.3.9	Designated Natural Features	232
11.3.10	Vegetation.....	233
11.3.11	Wildlife.....	233
11.3.12	Wildlife: Migratory Birds	235
11.3.13	Surface Water Quality.....	236
11.3.14	Surface Water Quantity (Flooding)	237
11.3.15	Fish and Fish Habitats.....	237
11.3.16	Species at Risk.....	238
11.4	Cumulative Effects Summary	240
12.0	ENVIRONMENTAL INSPECTION AND MONITORING	244
12.1	Pre-construction Monitoring	244
12.2	Environmental Compliance Monitoring.....	244
12.3	Follow-up Programs	245
13.0	SUMMARY AND CONCLUSIONS	246
13.1	Mitigation and Management of Potential Adverse Environmental Effects.....	246
14.0	ENDORSEMENT OF CEAA SCREENING REPORT	248
14.1	Sign-off.....	248

LIST OF TABLES

Table 1-1 - Authorizations, Permits and Approvals.....	7
Table 2-1 – Project Components.....	12
Table 3-1 – Terry Fox Drive Part B:.....	23
Table 3-2 – Potential Project to Environmental Interaction Matrix.....	26
Table 4-1 – Meetings with the Major Land Owners and Agencies	31
Table 5-1 – Summary of Effects on Land Use and Land Use Designations.....	41
Table 5-2 – Summary of Effects on Land Use –Agricultural	43
Table 5-3 – Summary of Effects on Historical Land Uses - Historical,	47
Table 5-4 – Summary of Effects on Land Use by Aboriginal Peoples	49
Table 6-1 – Soils in the Project Study Area.....	51
Table 6-2 – Summary of Effects on Bedrock Geology, Surficial Geology and Soils.....	54
Table 6-3 – Observed Groundwater Elevations	56
Table 6-4 – Summary of Effects on Groundwater Quality and Quantity	58
Table 6-5 – Summary of Effects on Air Quality and Dust	60
Table 6-6 – Summary of Effects on Noise Levels	63
Table 6-7 – Summary of Effects on Designated Natural Features against Current Baseline Conditions ...	87
Table 6-8 – Description of ELC Communities Documented in the Terry Fox Drive Study Area.....	91
Table 6-9 – Summary of Effects on Vegetation	96
Table 6-10 – Breeding Frog Survey Results.....	103
Table 6-11 – Summary of Effects on Wildlife on the Current Baseline Conditions	125
Table 7-1 - Summary of Displacement Volumes.....	140
Table 7-2 - Summary of Displacement Volumes between Cross-Sections	141
Table 7-3 - Summary of Compensation Option Details.....	141
Table 7-4 - Summary of Effects on Surface Water Quality and Quantity	147
Table 8-1 - Fish Survey Results: Shirley’s Brook Watershed Tributaries at Terry Fox Drive.....	152
Table 8-2 - Fish Survey Results of the Carp River & Tributaries at Terry Fox Drive.....	153
Table 8-3 - Summary of Effects on Fish and Fish Habitats.....	178
Table 9-1 - Schedule 1 Federal Species at Risk.....	182
Table 9-2 - Provincial Species at Risk.....	184
Table 9-3 - Butternut Tree Groupings within 45 m of the Parts A & B Centreline	196
Table 9-4 - Summary of Effects on Species at Risk and Other Important Amphibians	205
Table 9-5 - Temporary Tree Protection Zones.....	208
Table 9-6 - Summary of Effects on Species at Risk and Unique Species.....	214
Table 11-1 – Expected Future Projects/Activities	225
Table 11-2 – Cumulative Effects Assessment Summary	241
Table 11-3 – Potential Project Effects	243

LIST OF FIGURES

Figure 1: Project Location	2
Figure 2: Typical Road Cross Sections.....	11
Figure 3: Future Land Development.....	37
Figure 4: Designated Natural Features.....	67
Figure 5: Designated Natural Areas Affected by Construction	73
Figure 6: Ecological Land Classification.....	90
Figure 7: Wildlife Survey Locations.....	98
Figure 8: Species at Risk.....	105
Figure 9: Watercourse Culverts and Wildlife Passages	116
Figure 10: Carp River Floodplain	136
Figure 11: Terry Fox Drive Typical Section within Floodplain Area (includes vertical exaggeration) ..	137
Figure 12: Floodplain Compensation Options	139
Figure 13: Floodplain Compensation Restoration and Preloading	143
Figure 14: Floodplain Compensation Restoration Preliminary Design	145
Figure 15: Fishery Assessment and Sample Location	151
Figure 16: Drainage Features of Shirley’s Brook	160
Figure 17: Shirley’s Brook Re-Alignment Location.....	163
Figure 18: Shirley’s Brook East Tributary Bed Profile:	164
Figure 19: Shirley’s Brook East Trib. Typical Cross Section at Rock Outcrop	165
Figure 20: Detail of Butternut Locations	197

LIST OF APPENDICES

Appendix A – Site Aerials
Appendix B – SWM Report
Appendix C – SAR Data Sheets
Appendix D – Archaeology
Appendix E – Public Notices – EA Addendum
Appendix F – Aboriginal Consultation Log
Appendix G – Detailed Design – Draft Geotechnical Report July 2009
Appendix H – Carp River Floodplain Draft Geotechnical Report September 2009
Appendix J – Plant List
Appendix K – Mammal and Herb Table
Appendix L – Bird List
Appendix M – Official Plan Amendments and OMB Decision
Appendix N – Fish Habitat Risk Management Framework

SUMMARY

Project Details													
Name of Project	Terry Fox Drive – Richardson Side Road to Second Line Road												
Project Location	City of Ottawa												
Proponent	Design and Construction - Municipal (West) Infrastructure Services Department 100 Constellation Cres., 6th Floor, City of Ottawa, ON K2G 6J8												
Contact(s)	Steven Stoddard, Senior Project Engineer												
EA Details													
Responsible Authority	Infrastructure Canada Fisheries and Oceans Canada												
Contact(s)	Tamara Skillen-Haynes Senior Advisor, Environmental Review and Approvals Tel : 613-948-9461 Fax: 613-960-6398 Tamara.Skillen.Haynes@infc.gc.ca												
CEAA Trigger	Financial – s. 5(1)(b) ; Fisheries Act Authorization s. 35(2)												
CEAR Reference	09-01-49614												
EA Type Required	Coordinated Screening												
EA Commencement	August 19, 2009												
Provincial EA Requirement	None												
CEAA Determination													
RA Decision under s. 20(1)	s. 20(1)(a) – Project is not likely to cause significant adverse environmental effects taking into account the implementation of mitigation measures												
Requirements associated with s. 20(1) decision	<table style="width: 100%; border: none;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 15%; text-align: center;">Yes</th> <th style="width: 15%; text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>Mitigation</td> <td style="text-align: center;">(✓)</td> <td style="text-align: center;">()</td> </tr> <tr> <td>Follow-up</td> <td style="text-align: center;">()</td> <td style="text-align: center;">(✓)</td> </tr> <tr> <td>Monitoring/reporting</td> <td style="text-align: center;">(✓)</td> <td style="text-align: center;">()</td> </tr> </tbody> </table>		Yes	No	Mitigation	(✓)	()	Follow-up	()	(✓)	Monitoring/reporting	(✓)	()
	Yes	No											
Mitigation	(✓)	()											
Follow-up	()	(✓)											
Monitoring/reporting	(✓)	()											

EXECUTIVE SUMMARY

TERRY FOX DRIVE EXTENSION – PART B CANADIAN ENVIRONMENTAL ASSESSMENT SCREENING REPORT

The Terry Fox Drive road extension provides the remaining linkage between previously constructed portions of road within north and south Kanata in the City of Ottawa. The 4.8 km road will be a major arterial, increasing mobility and improving safety for travelers moving between the two parts of the community and parts beyond. As decided through various planning procedures, beginning in the early 1980's at the former City of Kanata, Regional Municipality of Ottawa-Carleton, and updated in the Official Plan Amendments for the City of Ottawa, Terry Fox Drive defines the urban boundary of West Ottawa.

Currently, the project has moved into the final design stage prior to construction. The 1.2 km Part A portion of the project was designed through to final construction drawings and tender-ready in 2005. To allow this less complex, mostly cleared north end to proceed directly to construction, the Part A project was the subject of a separate environmental assessment.

Part B to the south, is 3.6 km long. As part of the review process to secure permits, federal authorizations and other regulatory approvals for Part B, this Canadian Environmental Assessment (CEAA) screening report is intended to review the expected environmental impacts of road construction, identify how some impacts were avoided, propose construction mitigation measures, specify any necessary interim measures and determine the cumulative, net effects of the planned road. The road impacts are assessed against the current baseline conditions, but when reviewing the cumulative effects have also taken into regard the long term mitigative context of the future land developments adjacent to the road.

The South March Highlands have been recognized as having a unique biological diversity, with the province proposing 895 ha of it as a Candidate Provincially Significant Life Sciences Area of Natural and Scientific Interest (ANSI). Within this designation there is a Provincially Significant Wetlands Complex, white-tailed deer wintering yards, significant woodlands, habitat for 12 potential species at risk where the complex topography creates wet depressions, which flow together and constitutes the headwaters of Shirley's Brook, draining east to the Ottawa River. Contrasting this, one third of the roadway lies in the Carp River floodplain, a flat clay plain currently farmed, yet a low lying area which floods seasonally as the Carp flows north to the Ottawa River. Through these two environments, the Municipal Class EA process determined a route that eliminated most impacts to the wetlands, had few water crossings, generally minimized the environmental impacts of the unique ecology within the area, yet allows for the necessary traffic connections within Kanata.

At this time, two-lanes of the proposed four-lane-ultimate cross section will be built to service the current traffic needs of North Kanata. The full width of the 4 lane road base however will be built now, as blasting will be required to grade the road to meet the vertical profile and horizontal alignment requirements. Throughout the 4.8 km of roadway (Part A & Part B), 13 full-length culverts will be built, four of which will be placed in particular locations to allow small wildlife species to migrate underneath the road between their preferred habitats. The remainder will convey water flows, and in most cases will allow fish and other aquatic organisms to migrate along the stream corridors. Storm sewers will be constructed at this time, with municipal water mains and sanitary sewers coming in the future depending on the pace and needs of the future growth. To reduce the impacts to the wetlands and watercourses, advanced-technology VortechsTM oil & grit separators and 'Enhanced Swale' outlets will be used to treat the road storm runoff.

Part of the proposed road footprint lies within the 100 year flood zone of the Carp River. To offset the storage volume losses, an area of equal volume will be excavated on the opposite bank, compensating for the losses on an elevation by elevation basis. The 18.2 ha piece of lowered land will be restored to 10 ha of farm land, with improved drainage, and 8.2 ha of swamp wetlands within the riparian zone of the River, to be restored as habitat for reptiles, amphibians, small mammals and birds. An additional 2 ha of afforestation along the Carp River will offset losses of forest land cleared along the roadway.

Some small areas of agricultural land within the Carp River floodplain will become bisected by the new road, half of which is planned to be developed, and the other half planned as Open Space. This provides a future opportunity to take these marginal lands out of production, plant trees on them to help restore the floodplain, reducing the effects of air pollution and climate change, provide a western buffer to the residential areas and reduce the incidence of drifting snow along the exposed clay flats.

As land is developed nearby, the internal forest conditions and vegetative communities along Terry Fox Drive through the South March Highlands will be converted to edge habitats, as a fringe along the outer edge of the urban environment. An edge management planting plan is being developed along the northern side of the road to buffer the cleared edge of trees and mitigate the effects of clearing on the trees and wildlife habitats and to mitigate the impact of the developing land on the wildlife.

A realignment of the East Shirley's Brook will be required to avoid direct road impacts to fish habitats. A short 250 m diversion will be built within the road right of way, to offset the enclosure of 190 m of the creek beneath the roadway. Straddling the rail line, two provincially significant wetlands exist, of which 0.99 ha will be removed as the road alignment passes through. The impacts on the wetlands have been reduced as much as possible through careful route planning and into the final design phases of the provincial and federal environmental assessments.

Species at risk are an important consideration in the routing, design and consideration of Terry Fox Drive.

Butternut is a federally endangered species of tree that is being fatally affected by a fungal disease in some parts of Canada. Within close proximity to the Terry Fox Drive alignment, 179 butternut trees were found by a OMNR approved specialist, many in three concentrated clumps within the Part A piece of the project. Although 109 are diseased and may be cleared, of the remainder that are less disease-affected and retainable, six are small enough to be transplanted, 23 will need to be cleared and 20 may be effected by the nearby road construction. A further 21 will remain where they are, unaffected. Overall, through a proposed agreement with the Ministry of Natural Resources and partnership with local gene conservation organizations, 602 seedlings will be planted to offset the losses, either along the road alignment or in the nearby Monaghan forest within City limits.

Three specimens of American ginseng, also a federally endangered plant were found along the alignment. This species is quite prone to poaching for the commercial trade so their locations are kept confidential. Unfortunately, they must be removed from their natural habitat, and will be transplanted to a similar habitat at another location outside of the planned urban area. Through a proposed agreement with MNR, seed and seedlings of American ginseng will be used to reproduce this species within its natural habitat to help re-establish the population, previously thought to have been extirpated.

Four specimens of Blanding's turtle, a third species at risk which is listed federally as threatened, have been found within the area of the proposed Terry Fox Drive since 1999. Although their habitat is not currently protected under the provincial Endangered Species Act, harming an individual is prohibited. Although the road alignment was routed to miss open water, which is the preferred over-wintering habitat for Blanding's turtles, there is a potential for an animal to be disturbed or killed during construction. To

protect the species at risk and other species of wildlife and flora, the City will provide contract staging, direction and training to reinforce the commitment to protect the species found in the unique habitats of the South March Highlands.

Indications of breeding activity of the Western Chorus frog have been confirmed in one unit of wetland that will be altered and one other piece of wetland that is in close proximity to the road. Although not currently listed as federally threatened, the Western Chorus Frog is expected to be listed in the near future so the project has taken a pro-active approach to protecting some amphibian habitats that will benefit several of these sensitive species that were found in the area.

Many species of wildlife, including the species at risk noted here, may be prone to the risk of road kill if they attempt to cross the road while traffic is busy. To minimize this risk to the wildlife of the South March Highlands, the entire roadway where it travels through forested sections will be secured with a specialized series of wildlife guide walls, terrestrial culvert passageways and wildlife guide fencing. This extensive system of barriers will be of benefit to both the turtles, small mammals, meso-mammals and amphibians, as well as create a barrier to the public to increase the safety factor of the road.

The improvements to mobility and safety will be significant. New intersections with signals are being built at Richardson's Side Road, Kanata Avenue, Second Line, Goulbourn Forced Road and at Innovation Drive. They will improve the safety and efficiency of the arterial road system for the former City of Kanata, linking commuters with Highway 417 to the south. As the residential developments come on line in the future, three new intersections have been allowed for to access the new communities. Depending on the pace of growth in the Ottawa region, it may be expected that the four-lane ultimate cross section will be constructed sometime around 2020. By then, community recreational pathways and city-wide bicycle trails will criss-cross the newly developed lands and Terry Fox Drive, stitching together the fabric of the community.

As the project is quite challenging and will benefit the larger community objectives of the Kanata area, federal and provincial stimulus money was sought to assist the City of Ottawa in funding the project. The request for financial assistance from Infrastructure Canada triggered a federal screening under the *Canadian Environmental Assessment Act*. The request to provide an authorization under the *Fisheries Act* for the relocation of the East Shirley's Brook watercourse also triggered a federal environmental assessment. Initiated on August 19, 2009, the project environmental assessment was posted to the Canadian Environmental Assessment Registry with a Notice of Commencement for the "Terry Fox Drive Extension Part B: Richardson Side Road to Second Line Road".

Route planning and deciding on the preliminary design elements for the 4.8 km Terry Fox Drive has been occurring for a long time, through the Provincial Class Environmental Assessment process for municipal undertakings. This environmental assessment is based on that past information, as well as newer studies.

This assessment found that the road construction would result in direct and indirect effects on forests, wetlands, fish habitats, floodplains and five listed species at risk. Through extensive consultation with the regulatory agencies and federal authorities, and identification of mitigative measures, including fencing the majority of the project to avoid impacting wildlife, the assessment concluded that the environmental effects on all valued environmental components could be mitigated through available technologies and the application of Best Management Practices, such that no significant adverse environmental effects are anticipated. When cumulative effects are considered in the context of the growing community which Terry Fox Drive will serve, the long term effects were deemed to be acceptable and not significant.

The following chapters introduce the project as well as document the study process and scope.

Chapter 1: Introduction
Chapter 2: Scope of the Project
Chapter 3: Study Process
Chapter 4: Public and Agency Consultation