2.0 Project Description

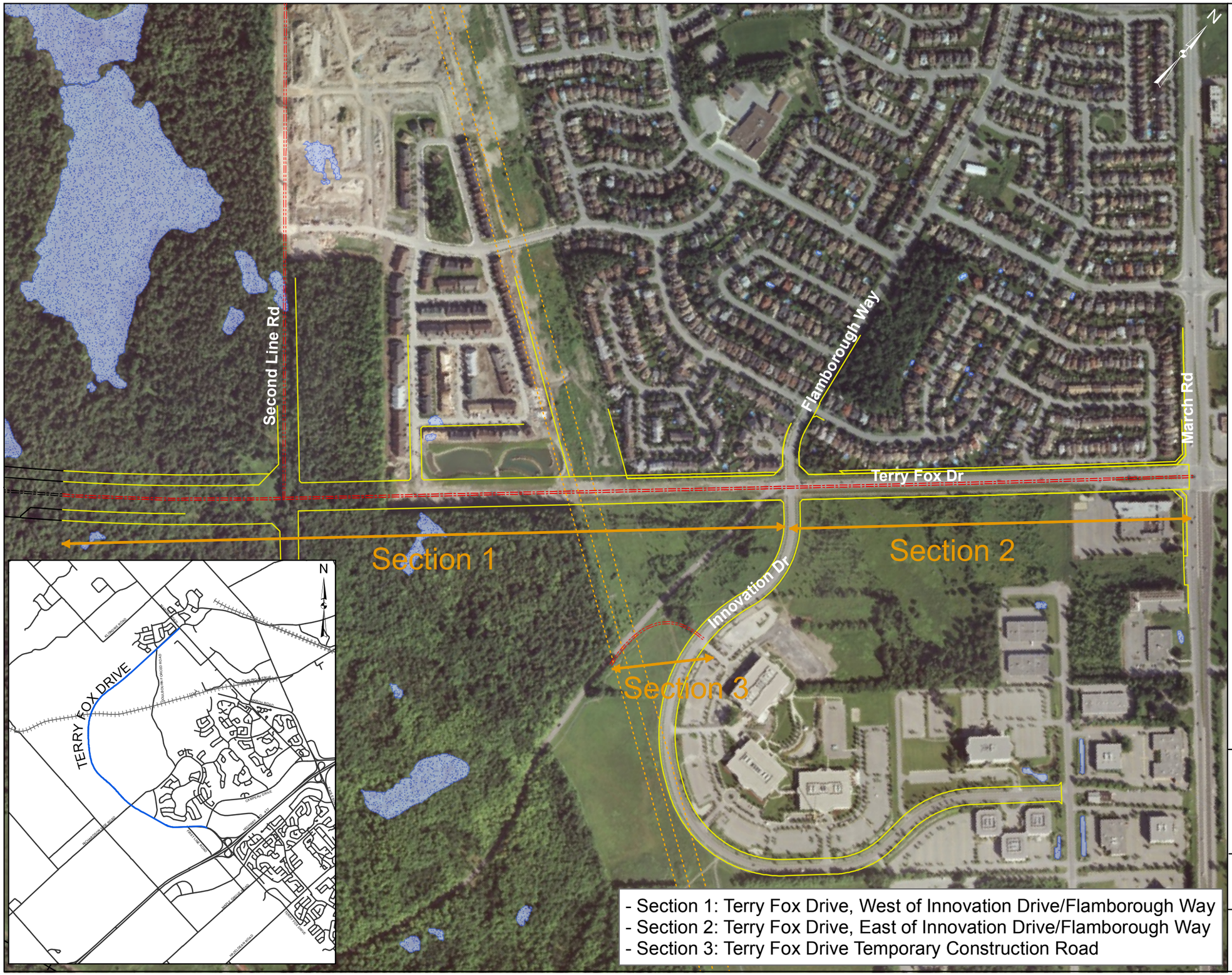
2.1 Part A Project Sections

Three main sections of physical works will be undertaken for the Part A TFD project as listed below. ***Figure 2*** illustrates the project location in plan view, and ***Figure 3*** provides the typical road cross-section for the proposed works.

Section 1: New Terry Fox Drive (west of Innovation Drive/Flamborough Way) – Construction consists of 1,100 metres of new two-lane roadway (undivided arterial) plus auxiliary lanes median wide roadbed within a 45 m right-of-way which is either owned or being acquired by the City of Ottawa. The roadway will be ultimately expanded to a four lane divided arterial roadway when future traffic volumes warrant, within the 45 m right-of-way. This section includes 300 metres southwest of the Second Line Road Intersection which will be constructed to provide a working area for construction staging.

Section 2: Existing Terry Fox Drive Upgrade (east of Innovation Drive/Flamborough Way) - This existing section of Terry Fox Drive between March Road and Innovation Drive/Flamborough Way (over 600 m) will be upgraded to arterial roadway standard. This will include the addition of auxiliary lanes and drainage improvements.

Section 3: Terry Fox Drive Temporary Construction Road – A temporary connection between Goulbourn Forced Road and Innovation Drive will consist of a two-lane roadway. This road is required to allow traffic movements to and from Goulbourn Forced Road until it is ultimately realigned into Terry Fox Drive, west of Second Line Road. When no longer required the temporary road will be removed and the site restored.



LEGEND:

- Preferred Alignment
- Right Of Way
- Existing Road
- Railway
- Hydro Lines
- Pond
- Marsh

- Section 1: Terry Fox Drive, West of Innovation Drive/Flamborough Way
- Section 2: Terry Fox Drive, East of Innovation Drive/Flamborough Way
- Section 3: Terry Fox Drive Temporary Construction Road

PART A
TERRY FOX DRIVE

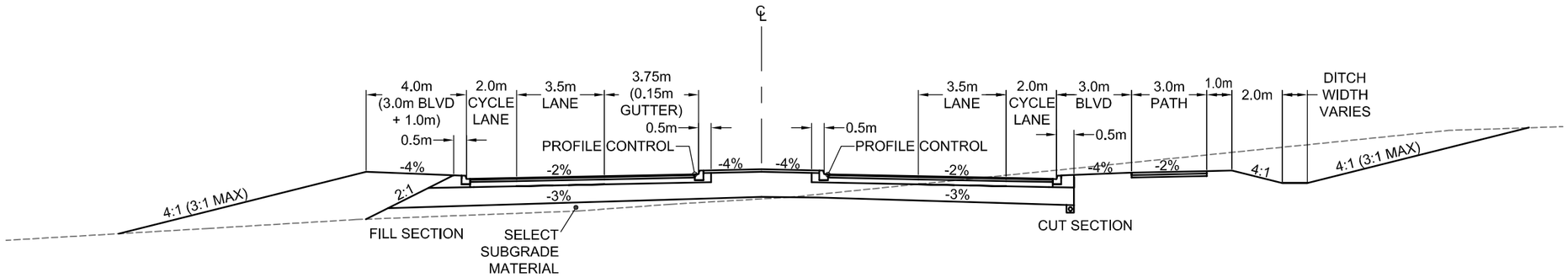
SECOND LINE ROAD
TO MARCH ROAD

Figure 2: Study Area

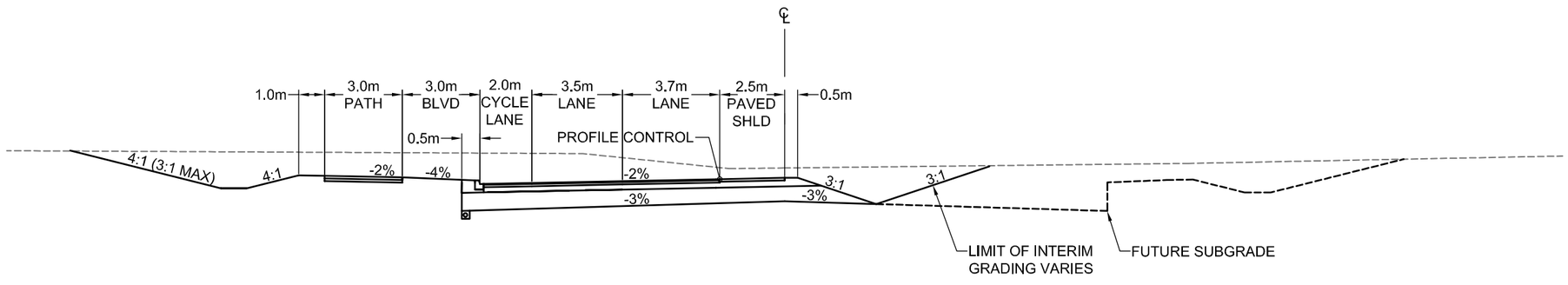
DILLON CONSULTING

DATE: SEPTEMBER 2009

SCALE: 1:6,000



ULTIMATE TERRY FOX DRIVE
TYPICAL 4-LANE NORMAL CROWN SECTION



TERRY FOX DRIVE
TYPICAL INTERIM 2-LANE NORMAL CROWN SECTION
FROM SECOND LINE ROAD TO MARCH ROAD

LEGEND:

- FUTURE SUBGRADE
- LIMIT OF CUT/FILL
- ORIGINAL GROUND

PART A
TERRY FOX DRIVE

SECOND LINE ROAD
TO MARCH ROAD

FIGURE 3
Typical Interim and
Final Cross-Sections

DILLON CONSULTING

DATE: AUGUST 2009

SCALE: 1:200

09-1518

For the proposed TFD project (both Part A and Part B), the ultimate roadway will be four lanes. However, current traffic volume for the new construction area only requires two main paved lanes be built at this time, along with the necessary median turning lanes, cycling lanes, and recreational pathways and sidewalks. The coarse road base and shot-rock roadbed for the ultimate section will however be built initially, so that in the future, when the additional lanes are required, the additional work will be to provide the final granular road base, pavement, curb and gutters and adjustments to the pavement markings. The scope of project includes the ultimate 4-lane cross section design throughout its entire length. Specifically, this means that the rock cuts made now will provide an adequate opening for the ultimate four lane section. Full length culverts will be constructed; the storm drains are sized to the ultimate area of imperviousness and all necessary fill through low lying areas will be placed now so they will be ready for the future four-lanes when they are needed.

Other project activities include the construction of cycling lanes adjacent to the roadway, stormwater management and drainage measures, traffic signals, street lighting, landscaping and in some locations a 3 m wide recreational pathway/sidewalk.

Table 2 identifies the various project components and their applicability to the road sections.

Stormwater will be handled using a combination of storm sewers, culverts and ditches. The drainage system will consist of precast catch-basins, manholes and roadside ditches. Sediment and erosion control in the ditches will be provided using flow checks, and permanent erosion control will be provided using riprap ditch linings where warranted, based on velocities. Urban sections will be fitted with curb and gutter systems with catch-basins that lead to a buried storm sewer. For Terry Fox Drive Part A, all stormwater will shed towards the east and be drained into two existing stormwater management ponds, built as part of the adjacent subdivisions. Following negotiations with the land owner / developers, both ponds were sized during Site Plan development to accept the additional water from the TFD roadway. The stormwater ponds will operate under Provincial Certificates of Approval and be maintained by the City of Ottawa upon assumption from the developer. A stormwater drainage report for both Part A & Part B TFD is available in a separate document.

Table 2 - Components

Project Activities	Construction & Implementation Activities	Section 1 New Terry Fox Drive	Section 2 Existing Terry Fox Drive	Section 3 Temporary Road
Road Improvements/ New Road Construction	• Ultimately a four lane urban divided arterial; in the interim a two lane semi-urban section; • Construct roadbed for 4 future lanes, pave two lanes now; and • Cycling lanes both directions.	✔ ✔ ✔	✔ ✔	
	• Two lane rural road with paved shoulders, traffic control, ditching and culvert			✔
Stormwater Management Features	• Storm sewers, catchbasins, culvert and ditching construction / improvements; • Curb and gutter system with storm drains on urban side of the roadway; rural ditch section on outer rural side; • Ditch storage required in some locations for stormwater quantity management; • Culvert to direct sheet drainage; • Outlets provided in existing stormwater management facilities in adjacent development lands to provide water quality treatment; • Temporary culverts installed; and • Implement sediment and erosion control plans adjacent to all creeks/drainage and wetlands.	✔ ✔ ✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Structures/ Road Infrastructure	• Traffic control signals will be installed at Innovation Drive / Flamborough Way and Second Line Road intersections; • A 3.0 metre wide recreational pathway / sidewalk along the urban sections; and • Road widening at intersections and ditch drainage improvements	✔ ✔ ✔	✔	

Project Activities	Construction & Implementation Activities	Section 1 New Terry Fox Drive	Section 2 Existing Terry Fox Drive	Section 3 Temporary Road
Road Safety	• Traffic signals installed at Innovation Drive / Flamborough Way and Second Line Road intersections;	✔	✔	
	• Street lighting;	✔	✔	
	• Pedestrian crossing for the planned sidewalk/recreational trail will occur at signalized intersections;	✔	✔	
	• Dedicated cycling lanes;	✔	✔	
	• 60-80 km / hr posted speed limit – design speed 90 km/hr; and	✔	✔	
	• 4:1 side slopes – guide rail will be provided where warranted based on roadside safety issues.	✔	✔	
Public Amenities	• Terry Fox Drive will be integrated with City-wide bicycle trails, a parallel recreational trail and local walking trails following the City of Ottawa, Cycle Plan.	✔	✔	

The project scope also includes the operational phase of the roadway, while it is in use by local residents and the connections to intersections made by adjacent landowners. All known intersections of collector and arterial roads have been allowed for in the design and impact analysis. The operational phase of the project includes the use of the roadway by the public, which includes electrical signals at intersections, snow clearing and de-icing, regular repairs of the road surface and maintenance of the roadway appurtenances.

The sections below provide a complete description of each component of the project, and the associated physical works and activities.

2.2 Construction Activities

Physical works and activities associated with the construction phase are discussed in the following sections.

2.2.1 Site Preparation

This activity includes tree clearing, topsoil stripping and earth / rock grading. A layout will be completed by a certified Ontario Land Surveyor (OLS) including lay-down areas, turnarounds and access roads. Since blasting is required, a dedicated explosives storage and preparation area will be established in a safe location by the contractor.

2.2.1.1 Vegetation and Topsoil Removal

For new road construction/widening, trees and all vegetation will be removed and topsoil and organic materials removed, within the roadway footprint and reused in landscaping once grading of slopes is completed. Trees valuable as lumber will be removed for their commercial value, while all other woody materials will be shredded for mulch to be used during the on-site landscaping. It is noted that while this activity will be done where possible, the project study area is within the area designated under the *Emerald Ash Borer Infested Place Order for the City of Gatineau, in the Province of Quebec and the City of Ottawa, in the Province of Ontario*, issued by the Minister of Agriculture and Agri-Food under subsection 15(3) of the *Plant Protection Act*. This Order prohibits the movement of ash tree materials (whole or part) or firewood from the designated area. A limited amount of woody material will be used in the landscaping. Additional, excess wood mulch (non ash) will be transported to the Municipal composting facility, where it will be finely ground or shredded and incorporated in the compost piles as a source of Carbon where needed to offset the Nitrogen-rich grass clippings collected by the City. This material will be recycled by the City and provided to residents as a source of compost and will be used in municipal flower bed and planting areas.

Approximately 14 trees will be removed. Topsoil will be stripped over the 80 metre long alignment. Topsoil will be reserved for use on the rest of the project. The remaining vegetation comprised of herbartious plants will be stripped and blended into the topsoil.

2.2.1.2 Earth Grading and Rock Excavation and Blasting

Earth grading will be completed to accommodate the road base platform as well as new ditching.

Within section 3 for the temporary road, earth grading will completed to subgrade in preparation for placing granulars. No blasting or rock excavation is required.

In areas where the planned profile is below the existing ground elevation, bedrock will need to be removed in certain cut areas using drilling machines, explosives and heavy construction machinery. Explosives will be used as part of the blasting operations, in areas where the rock cannot be excavated with a backhoe to establish the rough grade and elevations of the road base. Where the profile occurs above the existing ground, the broken rock will be used as the bottom areas of fill to establish a solid road base from which to build the road bed above. Based on the profile, only a few short sections of Part A TFD west of Statewood Avenue, will require blasting and as such, most will be a distance away from residential areas.

A total of 10,000 m^3 of rock is estimated to be required as roadbed fill from Stn. 15+700 to 16+865 in the vicinity of Second Line Road.

The use of blasting for rock excavation is dependent upon the competency of the rock. The contractor will determine whether or not blasting will be required for the construction of the various portions of the proposed alignment. Blasts must be designed to limit ground vibration and air concussion below provincial guidelines, which are set to prevent damage to wells and structures. Blasting will be monitored for ground vibration and air concussion, both close to the blast site, at the closest structures and near residential homes on Statewood Avenue.

2.2.2 Roadway Construction

Crushed shot rock and suitable recycled materials from local operations will be used for the embankment fill to meet the roadbed pre-grade elevations. Granular materials from local aggregate pits will then be used to prepare the road-base, prior to placing hot mix asphalt. Granular fill quantities will be supplemented with approved recycled materials used to replace materials brought from borrow pits or quarries. The volumes of recycled materials will not likely be known until the various contracting bids are received, but would be expected to range between 15-30% of the granular fill volume.

Once the roadbed is completed to grade, Granular A and Granular B will be used to build up to the required elevations of the compacted road base. Volumes will be refined as the detailed design progresses.

Concrete will be used for structural elements, hydraulic culverts, curbs and gutters. A temporary concrete mixing plant may be brought in and used by the Contractor at their discretion. Clean potable water will be needed to mix batches of concrete and there is none available on site, nor is

the limited amounts of surface water that is available of adequate quality. Water will be trucked in as needed; therefore no water from on-site resources will be required.

The main road lanes will be surfaced with asphalt. Paving will consist of 130 mm of hot mixed asphalt. For the relatively small areas of pavement required for TFD Part A, existing asphalt plants in the Kanata area will be used. It is not expected that a temporary asphalt plant will be required on site. The period of paving will be relatively short, a matter of a few days, however during that period, there will be an increase in local noise levels due to the additional trucking, the paving machine and proof rollers. This will be one of the last operations that the contractors do before pavement marking and final commissioning of the road surfaces and intersection signalling.

Hydroseeding of topsoiled surfaces and landscaping will be completed as soon as possible after completion of surface preparation, subject to timing restrictions related to climate and temperature.

2.2.3 Construction of New Pedestrian Pathway/Sidewalks

New sidewalks and trails will be routed along the urban sections of Terry Fox Drive. The existing gravel pathway along Goulbourn Forced Road will be incorporated into the existing sidewalk system on Innovation Drive. In the ultimate 4-lane configuration, sidewalks would be built along both sides of the roadway. The excavation and subgrade for the new pedestrian pathways and sidewalks will be undertaken as part of the overall road construction activity noted above, for those pieces indicated as urban section (i.e. with curb and gutters, no ditches). Redi-mix concrete will be used for all curbs, gutters and minor structures as noted above. The recreational trail will be surfaced with asphalt.

2.2.4 Installation of Traffic Control Signals, Road Signs and Street lighting

Traffic control signals, road signs, street lighting and the necessary electrical servicing will be installed in conjunction with the roadway construction.

2.2.5 Temporary Construction Laydown Areas

Temporary lay down areas will be required for use by the contractors, to stockpile materials, erect construction management trailers and park equipment. These will be on an as-needed basis

within the right-of-way on lands owned by the City or on private property with the permission of the land owners.

2.2.6 Disposal of Waste Materials

Disposal of waste materials includes surplus or unsuitable excavated materials, solid non-hazardous construction waste, wastewater and waste debris from clearing activities.

At this time, there are no known toxic or hazardous materials to be used in the construction of the Project. No toxic or hazardous waste sources (including former or currently operating landfill or hazardous waste sites) have been identified through the environmental screening assessment. However, during a Phase I Environmental Site Assessment completed by Golder Associates (Dillon Consulting, 2000), a site with surface waste (tires, automotive scraps, empty paint and oil cans etc.) was identified at Stn 16+100 near the intersection with Second Line Road. Waste in this area will be removed prior to road construction and waste material disposed of in a licensed waste disposal facility following Ontario Regulation 347 procedures.

2.2.6.1 Waste from Clearing Activities

Organics stripped from the roadbed will be recycled for use as finishing topsoil. Trees will be cleared and harvested for lumber of commercial value (subject to the *Emerald Borer Infested Place Order*). Excess wood debris will be shredded and used for mulch in the project landscaping or diverted to the municipal recycling program. No excess rock is expected to be generated. Excess native clay generated will be air-dried and used to line the bottom of the stormwater drainage ditches, to inhibit contamination of the groundwater table, or as clay plugs along buried storm drain bedding.

2.2.6.2 Excavated Materials

Although an objective of the design will be to minimize rock cut and provide an equal cut: fill balance, the necessary timing may require the excess materials be removed offsite for use elsewhere in the City.

2.2.6.3 Solid Non-Hazardous Construction Waste

Solid waste will be collected on site and either recycled where possible, or disposed of in a waste facility licensed by the Ontario Ministry of the Environment.

2.2.6.4 Dewatering Activities

Some temporary surface water dewatering of excavations may be required. Where needed, the discharge water will be treated or clarified in temporary sediment control ponds, clarifying tanks or through suitable filtration technologies before release. These requirements will be identified in the sediment and erosion control plans that will be prepared as part of the detailed design drawings and in the Sediment & Erosion Control plan submitted by the Contractor.

2.2.7 Site Restoration

The areas impacted by the proposed works will be restored with topsoil, seed, mulch or sod. Only native plants will be used in seed mixes and planting plans. Wherever practical, the seed mix specified will be drawn from plant species found along the right of way (ROW) during the Spring and Summer 2009 field work. Appropriate sediment and erosion control measures, such as covering the seed with erosion control blankets, will be done as part of the site restorations.

When the temporary connection Goulbourn Forced Road is no longer required, it will be removed and the site restored. Removal will consist of returning the site to pre-existing ground level, removal of storm drainage culvert and stabilization of the site as above. Appropriate provincial permit requirements will be met for construction and restoration activities including roadbed material disposal.

2.2.8 Use and Storage of Construction Vehicles and Equipment

Heavy construction equipment will be used in all sections. Drilling and blasting equipment may be required in some areas of new alignment.

Vehicles used in subgrade construction typically include excavators, bulldozers, rollers, trucks, and graders. Most of these vehicles operate on diesel fuel and require some form of daily maintenance. The vehicles typically operate continuously for 12-hour shifts. Truck traffic during subgrade construction will primarily be confined to on-site operations and to transportation of material for cut and fill operations. Some truck traffic will occur off-site to travel to borrow and/or disposal sites.

Vehicles typically used in base and pavement construction include pneumatic tire and steel drum rollers, graders, trucks, and asphalt concrete pavers.

2.2.9 Transportation and Storage of Construction Materials

Construction materials will be transported to the site by vehicles as noted above. Any storage of construction materials will be within the ROW or temporary laydown area at the south-western end of the project site. Any materials with potential for sedimentation will be stored following the S & EC specifications for the project.

2.3 Operational Activities

Operational phase activities are discussed below including repairs, debris removal, snow and ice removal, infrastructure maintenance and modifications to sidewalks, curbs and intersections to improve traffic flow.

2.3.1 Decommissioning Temporary Construction Road

Upon completion of Terry Fox drive, mid 2011, the temporary construction road will be removed and decommissioned. This will involve stripping and recycling the asphalt pavement, removing and recycling the granular road base and re application of stored topsoil. The restored roadbed will be seeded using the City standard restoration mix. The culvert will be recycled for later use.

2.3.2 Minor Repairs

Minor repairs to pavement (such as crack filling, line painting, pot hole repair, re-surfacing, re-gravelling shoulders) and structures, or to lighting or signage, occurs on an intermittent and as necessary basis following scheduled maintenance review.

2.3.3 Sediment, Debris and Snow Removal

Sediment and debris removal occurs on an occasional basis as needed related to specific events.

Winter maintenance is primarily snow removal and ice control to ensure the required level of service and the safety of road use. This combines plowing with the application of sand or road salt (sodium chloride) or other compounds to melt ice. The rate of salt application varies with the number of storms during the winter, the frequency and duration of frost conditions, and the personal judgement of the drivers of salt trucks. Compounds to melt ice are being considered in an effort to reduce the amount of salt used. Due to the very cold winters experienced in Ottawa, sand is often the application of choice.

Since a federal environmental assessment on road salt concluded that road salts are "toxic" to the environment, as defined under the *Canadian Environmental Protection Act* (CEPA), federal and provincial governments are currently developing management instruments to reduce the impacts of road salts on the environment. One of the federal government initiatives was the development of the Code of Practice for the Environmental Management of Road Salts. Snow removal for this project follows the City of Ottawa initiatives including Salt Management/Snow Disposal Plan.

2.3.4 General Cleaning and Maintenance Activities

General maintenance activities include the upkeep of ditches through weed control and re-ditching; and, mowing of shoulders and brush cutting of back slopes. Control of vegetation along roads is required to prevent the encroachment of trees and shrubs into the roadway and to maintain sight distances. In addition, control of noxious weeds is required where there is potential for spread from the ROW to cultivated or pasture land.

2.3.5 Modifications

No modifications to the current design are anticipated.

2.4 Project Schedule

The proposed project schedule is outlined below.

- Clearing and Construction of Terry Fox Drive in the vicinity of Second Line Road;
- Commencing early 2010. Clearing must be completed by May 1, 2010 due to the migratory bird nesting season;
- Temporary Construction Road to be completed by May 1, 2010 prior to migratory bird nesting season ;
- Construction to be completed by August 2010;
- Construction of staging area along Terry Fox Drive 300 metres westward from Second Line – completion by August 2010; and
- Construction of road improvements and temporary intersection realignment – completion by August 2010.

Preparation of detailed design drawings is currently underway and preparation of technical specifications will follow prior to tendering. Phasing of the work has yet to be determined and

will be subject to the timing of approvals considering the compressed time schedule. All property owners have been informed of the project scope. Ongoing communication with stakeholders throughout the design and construction stages will be completed.