7.0 PREFERRED DESIGN AND ASSESSMENT

7.1 Refinements To The Preliminary Preferred Design Concept

A preliminary preferred design concept, as described in the previous section, was identified for each of the South, Central, Riverside and Nicholas/Lees Sections of the Corridor. The preferred concept for each section was carried forward for further refinement as appropriate. The strategy for concept refinements benefited from a combination of further technical analysis and contributions from the TAC and PAC (Meetings #8 and #10 respectively). These refinements included:

- The width of the widened median areas in the South and Central Sections was decreased in order to increase the separation of vehicle lanes from existing residences. This is in response to the preference of communities that the alignment be centralized and located as far away from residences as possible. Where widened, the median width remains sufficient for landscaping and storm water management;
- The alignment in the area of the Hospital Woods was deflected to the south and west to minimize woodlot displacement and to locate vehicle lanes further away from residences;
- The alignment north of the Hospital Complex was located to the northern limit of the Corridor to provide sufficient vehicle storage capacity on the connecting link between the new facility and the Hospital Ring Road;
- The alignment between Alta Vista Dive and Riverside Drive was shifted north to protect for an approximate 15m wide rapid transit corridor through this area; and
- The alignment in the area of the woodlot along the Rideau River was deflected to the south and west to minimize woodlot displacement and to minimize site alteration of flood plain and former landfill areas.

7.1.1 Transit Priority at Intersections

The preferred at-grade intersection designs also respond to input from the Transit Services Branch (OC Transpo) of the City of Ottawa. At intersections where a bus stop is required, a bus priority design has been incorporated. This includes the development of a bus priority lane and bus shelter island on the near side of the identified intersections, adjacent to the HOV lane. This will allow buses to pickup passengers without blocking traffic, as well as a priority signal phase (white vertical bar), when the signal turns from red. Additional benefits include less chance of transit passengers being splashed by passing vehicles, and no right-turning vehicles turning in front of buses. At these locations, a right-turn lane for traffic exiting the arterial will be located to the right side of the island. The Transit Services Branch has estimated that over a 20-year horizon, peak hour bus volumes in the peak direction would grow/range from approximately 12 to 30 buses per hour.

It should be noted that this bus priority design adds significant width to the road facility. Another alternative that was considered was to combine the bus priority lane and the right turn lane. This would reduce the overall road width at these intersections by 10m, at each bus stop location, reducing pedestrian crossing distances, and giving lesser priority to buses. Additional characteristics include greater potential for waiting transit passengers being splashed by right-turning vehicles, potential bus delays due to right-turning vehicles, delays to right-turning vehicles due to stopped buses and safety concerns associated with right-turning vehicles passing in front of stopped buses. Either alternative would provide a suitable level of service and safety for all modes. This is considered to be a choice that can be determined at the subsequent detailed design stage.
7.1.2 Noise Attenuation Measures

The development of noise attenuation measures for the preliminary preferred design included the input of a professional engineer and certified noise consultant. Guidance was provided in relation to applicable provincial and municipal guidelines pertaining to facility noise and potential effects on adjacent sensitive receivers. The following assessment process was utilized:

- Various locations along the AVTC where project-related noise might be of concern were established as noise receptors;
- Existing noise levels at the receptors were forecast;
- Future noise levels at the receptors were forecast;
- Locations requiring mitigation were determined where the change in noise was forecast to exceed 5 dba and the future noise level was forecast to exceed 55 dba; and
- For the locations requiring mitigation, noise mitigation options were considered to include 2m to 4.5m high earth berms, or 2m to 2.5m high noise attenuation fences.

Resulting preliminary recommendations for noise attenuation, including proposed locations for berm and/or fence treatments were determined. These mitigation recommendations were influenced by various factors including the noise forecasts, grade differences between the noise source and receivers, land availability, relationship to intersections at roadways and pathways, proposed community garden location opportunities, effects on the Hospital Woods, and drainage requirements.

It is important to note that in some cases there is an opportunity to replace the noise attenuation fences with higher berms located either adjacent at the facility edge, or in some locations, adjacent to dwellings. However, to attain similar levels of noise reductions, such berms would need to be of heights ranging from 3.0m to 4.5m (as opposed to 2.0m), depending on location along the Corridor. When designed with acceptable 3:1 side slopes, such high berms would consume a wider open space swath and might be more visually obtrusive to the overall neighbourhood. However, these disbenefits might be counter-weighted by benefits to adjacent residents who may prefer a high berm to mitigate noise and visual impacts rather than a noise attenuation fence located on/near their lot line. A public desire was also expressed to have the berms extended as visual barriers into areas where they would otherwise not be warranted for noise attenuation purposes. The subsequent detailed design process for noise attenuation measures should include involvement of adjacent residents for reasons such as this.

7.1.3 Landscape Concept

One of the key common design objectives for the facility is for it to be developed as a Scenic Route located within a Major Open Space corridor yet adjacent to residential uses. Key characteristics of the plan pertaining to landscaping include:

- Integration of noise attenuation berms as a visually interesting landscape feature;
- Pursuit of a rhythm of berms, planting groupings, open spaces, and intersections;
- Occasional visual openings and landscape connections to adjacent open space areas where berms are not required or not possible or where breaks are necessary (such as at intersections and pathway crossings);
- Mitigation of the visual effects of noise attenuation fences, where utilized, by including planting adjacent to them;
- Mitigation of visual effects of the facility on adjacent users, through the location and design of planting and berms;
- Mitigation of potential headlight glare in the vicinity of curves and intersections by the strategic location and design of planting and berms;
• Dual use of wide median areas for a combination of planting and stormwater management where required;
• Locating tree plantings on the windward (outside) sides of berms, and offset from the road edge in other locations, in an attempt to mitigate potential for snow drifting;
• Locating features in a manner that leaves opportunities for open space uses requiring large areas unobstructed by berms or planting; and
• Planting adjacent to natural areas that is non-invasive and that will emulate natural characteristics.

7.1.4 Stormwater Management

One of the considerations in the evaluation of alternative designs was the incorporation of stormwater management facilities (SWMF) into the roadway. A detailed Stormwater Management Study is required to address benefits and optimization of proposed SWMF. This study would look at specific areas and details including the Norway Crescent drainage basin and Smyth Road westerly in the AVTC storm sewer outlet, to again increase level of service in the sewer system to the east. While the detailed Stormwater Management Study will address the design specifics of the SWMF, the following is an overview of the required facilities:

• Dry pond(s) will be required for the AVTC in any event to control flows to existing outlets;
• Direct flows from 200m south of Pleasant Park to the bend north of Smyth, which naturally drains easterly to the Rideau River. This has been suggested in past reports as an alternative to taking the controlled flows easterly, which generally help to reduce flooding and relieve other issues;
• North of Smyth for example, an existing SWMF in the Ottawa Life Sciences Technology Park would need to be expanded, if there is sufficient room. Quality treatment would be considered at several locations as opposed to one location at the Rideau River;
• Specific surface icing/flooding maintenance issues can be addressed at 2 locations on the east side of the corridor, north and south of Pleasant Park Road, which provides benefits beyond the requirements of the roadway;
• Larger areas than needed for the roadway are included as they drain towards the Corridor from Lynda Lane and other lands to the west, and to minimize areas draining to the east;
• A larger pond will reduce the downstream flow and hence the piping costs all the way to the Rideau River; and
• Pleasant Park Road drainage across the AVTC has been included, again to increase the level of service downstream easterly.

7.2 Overview of Preferred Design

The Preferred Design for the entire AVTC is illustrated on the following Figures 7-1 to 7-4. These plans show the basic functional geometric design of the proposed facility for each of the Corridor’s four sections. The four section plans also show a demonstration of landscaping and noise mitigation measures that are considered built-into the Preferred Design. It is important to note that the landscaping and noise mitigation measures are shown as a conceptual demonstration, and would be subject to refinements at the detailed design stage. Participation of adjacent residents into the design of the landscaping and noise mitigation measures will be an important aspect during the detailed design phase.
Figure 7-1: South Section
Preferred Design (Berm Option)
7.2.1 South and Central Sections

- The design includes a slightly meandering at-grade alignment that is somewhat centrally located within the City-owned Corridor;
- With the exception of two lots located on the southwest corner of Urbandale Drive, the minimum distance that the road is off-set from the property line of adjacent homes is fairly consistent (at approximately 65m) along the length of this section. Backyard depths can be another 10m to 15m. Due to the alignment of existing Conroy Road at its Walkley Road intersection, the proposed road is somewhat closer to these two Urbandale Drive lots, with the road being offset approximately 37m to the property line and 53m to the back-of-house;
- The design includes relatively wide medians (37m to 56m) located in the wider sections of the Corridor which have the potential to accommodate scenic landscaping and storm water management features;
- The major recreational pathway runs parallel to and integrated with the west side of the facility, and a sidewalk runs along the east side;
- Two existing pathways in the South Section that cross the proposed facility at mid-block locations between Walkley and Kilborn, and between Pleasant Park and Smyth, will be provided with a pedestrian-activated signal crossing;
- In the Hospital Woods area, the alignment runs to the south and west of the wooded area as much as possible to minimize woodlot displacement;
- One road connection is provided to each of the NDMC Lands, the Hospital Complex and the Ottawa Life Sciences Technology Park;
- The short road connection to the Hospital Ring Road opposite the new access road to the Ottawa Life Sciences Technology Park is a westbound transit-only link. This connection does not have enough length to accommodate two-way mixed traffic, but it is sufficient to accommodate efficient bus routing through the Ottawa Hospital Complex as it will bring buses closer to the campus building thereby reducing walking distance. The northbound left-turn lane on the new facility will be a bus-only lane receiving priority at the signal;
- The potential future opportunity to locate a future east-west rapid transit facility serving the Ottawa Hospital Complex and extending east to the Browning Avenue Corridor is maintained;
- The two pathways that currently cross the hydro corridor south of the Riverview Park Community will be aligned to connect to the signalized intersections to the NDMC Lands and to the Ottawa Hospital Complex. At this location, they will tie into both the sidewalk and recreational pathway adjacent to the facility;
- Intersections at Conroy Road, Kilborn Avenue, Pleasant Park Road, Smyth Road, and Alta Vista Drive, as well as the OHSC connections, are provided as traditional at-grade, signalized, intersections. There is the potential to prohibit certain turn movements at the Alta Vista Drive intersection, if deemed appropriate as a means to reduce the use of Alta Vista Drive north of the AVTC;
- Due to the proposed locations of the intersections with Smyth Road and Alta Vista Drive, three of the existing adjacent intersections will need to be restricted to right-in/right-out because of their close proximity to the new intersections. Each of the Roger Guindon/Smyth, NDMB/Alta Vista and Catholic Church/Alta Vista (north driveway) will need to be restricted to right-in/right-out only; and
- Significant land areas adjacent to the road remain available for use in accordance with their Major Open Space designation in the Official Plan. This may include the development of community gardening plots in the section between Kilborn and Pleasant Park.
7.2.2 Riverside Section

- Immediately west of Alta Vista Drive, the road profile drops at a grade of approximately 6% to go under the rail tracks and then up and over the Transitway (7% grade) and a realigned Riverside Drive;
- The design includes a narrow median where appropriate, in response to a more-constrained Corridor;
- The proposed facility passes under the CN rail line, over the Southeast Transitway, and requires the termination of Old Riverside Drive on either side with cul-de-sacs. These are necessary as the road cannot rise up quickly enough to provide the necessary clearance over top Old Riverside Drive. Furthermore, an emergency-only link has been provided to Old Riverside Drive from the westbound bus ramp to provide alternative access to residences and the School along the north section of Old Riverside Drive. Use of this connection would be restricted to emergency and other authorized vehicles. Grades do not allow a similar access to the south section of Old Riverside Drive;
- Bus ramps are provided to the Transitway to accommodate bus routing to/from the Hospital Complex and beyond. The eastbound ramp leaves the Transitway and merges onto the facility, and then shortly thereafter a bus priority lane and bus stop are provided at the Alta Vista Drive intersection. This lane gives buses priority to proceed through the intersection in advance of other vehicles when the signal turns from red. West of Alta Vista Drive, a westbound bus-only lane is provided adjacent to the westbound HOV lane. This lane accommodates a bus stop just west of Alta Vista Drive and then connects directly to the ramp onto the Transitway without westbound buses having to merge with traffic in the HOV lane;
- The design involves a realignment of Riverside Drive to allow the proposed facility to pass over it, and to enable the rail and Transitway grade-separations while maintaining minimum acceptable facility grades;
- A combination of ramp connections are provided between the facility and the realigned Riverside Drive for the primary movements between facilities;
- A connection of the proposed recreational pathway is provided to the existing pathway system along the Rideau River;
- Sidewalk connections are provided from the road to Old Riverside Drive;
- The road proceeds westerly and northerly along lands owned by the NCC, and is aligned between the western edge of the former landfill mounds and the eastern edge of a wooded area along the Rideau River;
- The design can accommodate an at-grade signalized intersection to adjacent (to the east) NCC lands, if required;
- On the south side of the Rideau River, the bridge will be designed to accommodate an underpass of the existing recreational pathway, which may be accommodated through some realignment of the existing pathway; and
- The design provides for a bridge crossing over the Rideau River in a location that lines up with a connection to Nicholas Street at the Hwy 417 interchange.

7.2.3 Nicholas/Lees Section

- The design aligns with Nicholas Street at the Hwy 417 interchange;
- The alignment is by and large centrally located in the AVTC Corridor;
- The design includes narrow median in response to a more-constrained Corridor;
- The profile of the proposed facility rises up as it approaches Lees Avenue to enable it to pass over existing Lees Avenue while providing opportunities for ramp connections to Lees Avenue;
- The Lees Avenue ramps will have to accommodate sidewalks and bicycle lanes, as these facilities will have to terminate/start at Lees Avenue. This is necessary as there is no current
accommodation of pedestrians or cyclists through the existing Highway 417/Nicholas interchange. Lees Avenue in this immediate area will have to be repainted to provide a westbound to southbound left-turn lane. There is sufficient pavement width for three delineated lanes, however, to accommodate this, on-street parking would have to be prohibited in the ramp terminal area.

- Modifications to the Hwy 417 interchange at Nicholas to accommodate the required vehicle movements including:
  - signalization of the eastbound off-ramp and the westbound on-ramp with the Nicholas overpass;
  - provision of double eastbound to northbound lanes and double eastbound to southbound lanes at the new southerly signalized intersection;
  - realignment of the two westbound on-ramps (from Nicholas and from Greenfield) to accommodate the new northbound to westbound connection from the AVTC, while maintaining lane balance and existing weaving distances between the Nicholas and Metcalfe interchanges (note that capacity limitations of this connection may need to be addressed over the long term through subsequent Transportation Master Plan initiatives); and
  - provision of a southbound right-turn lane and a northbound left-turn lane at the new northerly signalized intersection.

- For traffic to/from the east on Hwy 417, there is no direct connection to the AVTC facility. This role is filled by the adjacent Highway 417/Riverside interchange for traffic to/from the south.

### 7.3 Project Activities

In order to assess the potential environmental effects of the Preferred Design, it is necessary to understand the associated project activities. These activities will occur during three distinct project phases: pre-construction; construction; and operation. The activities associated with each of these phases is presented below, as well as the “built-in mitigation” measures. In this assessment, “built-in mitigation” is defined as actions and design features incorporated on the pre-construction, construction, and operational phases, that have the specific objective of lessening the significance or severity of environmental effects which may be caused by the proposed project. These mitigation measures will be applied and refined during each phase of the project.

Overall, the AVTC project will be designed and implemented with benefit of planning, road design engineering, landscaping design, and environmental best management practices (BMPs). BMPs that could be employed for the AVTC include those outlined in:

- Environmental Protection Requirements for Transportation and Highway Design, Construction, Operation and Maintenance (MTO, 2004);
  - Fish & Wildlife Habitat Management
  - Stormwater Management
  - Water Management
- MOE Stormwater Management Manual

Regard shall be given to the legislation, policies, regulations, guidelines, and best management practices of the day. Where needed, mitigation measures will be further prescribed in the construction contracts and specifications.
7.3.1 Pre-construction Phase

This phase includes completion of preliminary and detailed engineering and landscape designs and preparation of contract drawings and specifications. This phase also involves obtaining all necessary permits, as well as approvals from regulatory agencies. Design issues to be addressed and refined during the detailed design phase include:

- Noise attenuation measures (refinement to specific locations and design);
- Landscaping materials and design;
- Exact location of sidewalks and major recreational pathways and connections;
- Corridor lighting design, spacing and location;
- Utility relocations (including hydro towers)
- Stormwater management;
- Sewer and watermain design;
- All Structures;
- Highway 417 interchange; and
- Construction staging and phasing.

Other pre-construction activities include:

- Site surveying as required;
- Obtaining approvals for construction access and working or staging areas;
- Geotechnical and environmental investigations including drilling of boreholes and/or test pits to determine area-specific soil and groundwater conditions and required mitigation plans;
- Archaeological investigations where deep excavations may encounter buried resources;
- Identification of all existing utilities in the area and coordinating plans for burying/relocation;
- Property acquisition and/or easement negotiations;
- Coordination with other planned projects in the vicinity of the Corridor, including MTO’s Highway 417 widening/modification plans; and
- Obtain required MTO approvals.

7.3.1.1 Pre-Construction Mitigation

**Lighting Treatment Plan**

A Lighting Treatment Plan will be prepared during the pre-construction phase. The plan will include details on lighting fixtures and illumination along the various sections of the Corridor.

**Landscape Plan**

The Landscape Plan will be prepared during the pre-construction phase and implemented during the construction phase. The plan will be prepared to the satisfaction of the City of Ottawa and NCC, where appropriate. The landscape plan will guide the species selection, location, and planting details for all proposed plants and other elements within the Corridor, including berms and relocated garden plots.

**Archaeological Assessment**

Within the study area corridor there is both prehistoric site potential and historic site potential. It is recommended that a Stage 2 Archaeological Assessment be conducted by a licensed archaeologist, prior to construction, to ensure that no areas of archaeological and historic importance are disturbed or destroyed.
Phase II Environmental Site Assessment
A Phase II ESA will be required to assess the extent of potential contamination for the Hurdman Landfill and Lees Avenue Areas. The ESA will identify the limits and degree of soils and groundwater contamination and make recommendations for management, remediation and disposal of the contaminated materials including a Landfill Management Plan.

Detailed Geotechnical and Groundwater Investigation
A Detailed Geotechnical Investigation will be conducted by a qualified firm. The investigation should confirm groundwater and subsurface conditions and potential impacts and construction management requirements that will need to be considered during the detailed design of the project. The detailed geotechnical investigation should be coordinated where appropriate with the Archaeological Assessment and Site Investigations associated with the presence of contamination.

Stormwater Management Plan
A Stormwater Management Plan will be prepared during the preliminary and detailed design phase to identify the rate and volume of anticipated stormwater runoff, the appropriate means to accommodate the runoff, and the measures of achieving Ministry of the Environment guidelines for water quality of stormwater runoff.

Public Communication Plan
The requirement for a Public Communication Plan stems from the need to keep the public informed about the work in progress and provide opportunities for input into the design, and the end result of construction activity. For example, during the pre-construction phase, property owners along the corridor will be contacted on matters related to landscaping, noise attenuation and berming. Overall, the Plan should detail how to communicate the information to the public, what information should be disseminated, and at what project phases the communication should take place.

Highway 417 Traffic Analysis
MTO has requested that additional review and traffic analysis be undertaken for the Highway 417/AVTC interchange close to the time of implementation. Consideration needs to be given to the ability to meter the north-bound and west-bound movements by signal timing to ensure safe weaving at the Metcalfe westbound off-ramp, the opportunity in the future to make Greenfield Ave less attractive (or remove the connection altogether), the benefits derived elsewhere on the Highway 417 corridor, and the uncertainties regarding prediction of future traffic patterns at an operational level of detail.

7.3.2 Construction Phase
This phase involves all activities related to construction such as: clearing, grading, excavation, filling, construction, planting, and remediation, for the entire construction period. Physical construction activities may include:

- Installation of construction mitigation measures such as silt fences, tree protection fences, and directional/safety signage;
- Clearing and grubbing of trees and vegetation within delineated grading limits for construction of the project;
- Stripping of topsoil within the grading limits;
- Trenching and installing new below-grade infrastructure as required;
- Removing existing asphalt and associated infrastructure (related to realignment of Riverside Drive) and disposing at approved facility;
- Constructing the foundations for structures including potentially driving of H-piles and/or installation of deep caissons;
• Installation and use of dewatering pumps in the deeper cuts (under CN Rail line) is required;
• Preparing road bed including cutting and filling and laying of granulars;
• Potentially salvaging existing granulars for reuse;
• Pouring concrete for curb and sidewalks;
• Laying granular and application of hot mix asphalt;
• Installing lighting and traffic signals;
• Construction of earth berms and noise attenuation fences as required;
• Final grading and topsoil application;
• Asphalt line painting; and
• Installing landscaping features such as sod, shrubs, and trees.

Throughout the construction stage, various associated activities which can have potentially adverse environmental effects will need to be mitigated. These activities are to be performed in compliance with the requirements of legislation, regulations and/or approval plans.

7.3.2.1 Construction Mitigation

Erosion and Sediment Control Plan
This Plan will be prepared to manage the flow of sediment into storm sewers and surface water. This plan will be based on best control management practices including the Guideline on Erosion and Sediment Control and Urban Construction Sites. The design elements associated with the plan will be identified in the detailed design process and construction specifications. To mitigate any unforeseen areas predisposed to erosion or sedimentation, the contractor will be required to prepare an erosion and sedimentation control plan prior to commencing work on the site. The plan will be prepared to the satisfaction of the City of Ottawa and the NCC, where appropriate.

Archaeological Monitoring
Archaeological monitoring requirements will be identified in the Stage 2 Archaeological Assessment and should be carried out accordingly. If a discovery is made during the construction phase, appropriate agencies will be notified and work will be temporarily stopped.

Construction Waste Management Plan
General management and disposal of construction waste and debris by the contractor will be similar to the guidelines and practices of the Ontario Provincial Standard Specification (OPSS) 180, and shall conform to Ontario’s Environmental Protection Act and associated regulations (notably Regulation 347), and, if applicable, to the Ontario Dangerous Goods Transportation Act and the Canadian Transportation of Dangerous Goods Act.

Environmental Protection Plan
It will be the responsibility of the contractor to ensure that no contamination, waste or other substances, which may be detrimental to the environment, will enter the environment as either a direct or indirect result of construction. In this regard, any floating debris resulting from construction which accumulates on the Rideau River or on its banks is to be immediately cleaned up and disposed of. Any spills or contamination, waste or other substances which may be detrimental to aquatic life or water quality will also be immediately cleaned up.

Any work which will cause or be the cause of discharge to watercourses is to be prohibited. At all times, netting or some other suitable material should be used to prevent entry of deleterious materials to watercourses. In particular, construction material, excess material, construction debris and empty containers are to be stored away from the Rideau River and its banks. It should be noted that refuelling is
not to occur within 30m of the River or other water body. Designated areas will be required for maintenance of equipment and refuelling.

**Emergency Response Plan**

The preparation of an Emergency Response Plan by the contractor shall allow for full emergency services access during the construction period, such that anytime there is a method to access all residential, institutional and other land uses in the event of an emergency. Additionally, the emergency response plan should include provisions for providing temporary services to end users in the event of a construction-related service outage or other service disruption. A Spills Response and Reporting Plan will be prepared and adhered to by the contractor.

**Management of Contaminated Materials**

The MOE and Construction Manager should be notified immediately upon discovery of any contaminated material encountered within the construction area. If contaminated materials or contaminated groundwater are encountered within the construction limits, these are to be removed and disposed of in accordance with all applicable Acts and Regulations. Management of contaminated materials with appropriate agencies/authorities is to be coordinated through the City of Ottawa and NCC’s Environmental Services where appropriate. The results from the Phase II ESA will be incorporated into the Management of Contaminated Materials Plan. Recommendations regarding material, handling, storage, remediation/disposal will be incorporated and monitored during construction.

**Construction and Traffic Management Plan**

A construction and traffic management plan would be developed during the planning/pre-construction phase and implemented during the construction phase. The plan should identify clear marking routes, maintenance of as many traffic lanes as possible, and measures to minimize potential disruptions to the CN Rail line and transitway.

**Occupational Health and Safety Plan**

The contractor will prepare an occupational health and safety plan under the requirements of the *Occupational Health and Safety Act and Regulations for Construction Projects*. This plan should include information regarding protective clothing, equipment and devices that workers shall wear during construction, and a fall arrest system. This plan will be reviewed by the Ministry of Labour.

7.3.3 **Operation Phase**

This phase begins with the first day of facility operation, and covers the general operational activities such as monitoring and maintenance, on an as required basis. Once construction is complete, monitoring of the resulting facility will be initiated. This will include monitoring of:

- Traffic and parking enforcement matters;
- Occasional monitoring of traffic volumes to determine the potential for future road and/or intersection modifications;
- Accidents to analyze safety conditions;
- Traffic signals timing; and
- Landscape health, typically as part of a one-year warranty inspection.

Routine maintenance activities include:

- Spring sweeping of road, sidewalks, and boulevards;
- Snow and ice removal in the winter;
- Traffic signal and road lighting maintenance;
• Landscape maintenance including grass cutting, shrub and tree pruning in the summer; and
• Replacement of landscaped material as required.

7.3.3.1 Operation Mitigation

Maintenance Management Plan
A Maintenance Management Plan for the AVTC will be prepared by the City of Ottawa. The plan will outline the level of maintenance required for the entire facility including the maintenance of all landscaping features.

7.4 Assessment of the Preferred Design

7.4.1 Assessment Methodology

An impact analysis was undertaken to identify and mitigate the potential effects, both positive and negative of the pre-construction, construction, and operational activities associated with project implementation. The evaluation criteria and indicators established during the evaluation process were used as the basis for assessing the effects of the Preferred Design on the social, physical, and biological environments. The impact analysis involved applying the following steps:

Step 1: Identify and analyze activities where the project (as described in the preceding section) may interact with existing environmental conditions.
Step 2: Acknowledge predetermined project activities that act as built-in mitigation measures.
Step 3: Identify the residual environmental effects, if any.
Step 4: Identify opportunities for further mitigation of residual effects, if possible/practical, including monitoring.
Step 5: Determine the significance of the residual environmental effects, after further mitigation.

The potential effects of project implementation were described based on their level of significance. Analyses and professional experience formed the basis for identifying environmental effects and mitigation measures. The analysis was based primarily on comparing the existing environment with the anticipated future environment, prior to, during, and after construction. The prediction of effects considered:

• The interaction between a project activity and the valued environmental components;
• The effects of the project activities on the environmental values; and
• The combined effects of multiple activities and/or multiple effects.

Within this context, consideration was given to:

• The magnitude, spatial extent, and duration of effects;
• The proportion of a population or community affected;
• Direct or indirect effects;
• The degree to which the predicted effect responds to mitigation; and
• The level of uncertainty about the possible effect.

In this assessment, “residual” environmental effects are defined as changes to the environment caused by the project, and vice versa, when compared to existing conditions and taking into account all built-in mitigation measures. Potential residual environmental effects were assessed as to their significance, including spatial and temporal considerations, and were categorized according to the following definitions:
“Negligible” means an effect that may exhibit one or more of the following characteristics:
- nearly-zero or hardly discernible effect; or
- affecting a population or a specific group of individuals at a localized area and/or over a short period in such a way that the effect is similar to random small changes but would have no measurable effect on the population as a whole.

“Insignificant” means an effect that may exhibit one or more of the following characteristics:
- not widespread;
- temporary or short-term duration (i.e., only during construction phase);
- recurring effect lasting for short periods of time during or after project implementation;
- a permanent effect that does not result in a transcendence or contravention of legislation, standards, or environmental guidelines or objectives;
- affecting a specific group of individuals in a population or community at a localized area or over a short period, but not affecting other trophic levels or the integrity of the population or community; or
- not permanent, so that after the stimulus (i.e., project activity) is removed, the integrity of the environmental component would be resumed.

“Significant” means an effect that may exhibit one or more of the following characteristics:
- widespread;
- permanent transcendence or contravention of legislation, standards, or environmental guidelines or objectives;
- permanent reduction in species diversity or population of a species in sufficient magnitude to cause a decline in abundance and/or change in distribution beyond which natural reproduction or immigration would not return that population, or any species dependant on it, to its former level within several generations;
- permanent loss of critical/productive habitat;
- permanent loss of important community archaeological/heritage resources; or
- permanent alteration to community characteristics or services, established land use patterns, which is severe and undesirable to the community as a whole.

“Positive” means an effect which results in an improvement to the existing or future conditions.

The above definitions of significance were adopted for use in this assessment because some of the impacts could not be quantified in absolute terms, although changes and trends can be predicted. The definitions provide guidance and are intended to minimize personal bias.

Once potential effects were predicted, mitigation measures were identified. Often these mitigation measures were sufficient to reduce potential negative effects to an insignificant or negligible status. Mitigation included avoidance, rehabilitation and replacement. Construction Best Management Practices (BMPs) are also included in the mitigation of effects.

Monitoring is important to verify the accuracy of predicting effects. Monitoring was recommended to determine what effects would actually occur with project implementation, and may result in the modification of mitigation measures to improve their effectiveness. Identified monitoring measures included inspection, surveillance, and compliance monitoring.

A detailed explanation of the predicted effects and recommended mitigation is contained in Appendix G. The following is a summary of the assessment results.
Table 7-1: Summary of Potential Environmental Effects

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Potential Effect</th>
<th>Mitigation</th>
<th>Significance</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Greenspace and Open Space</td>
<td>Diminish the amount of existing greenspace and open space</td>
<td>Allow/encourage/improve access and use of remaining open space and greenspace</td>
<td>Insignificant</td>
<td>None recommended</td>
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<tr>
<td></td>
<td></td>
<td>Landscaping Plan</td>
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<td>Integrated Recreational Pathway</td>
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<tr>
<td>Allotment Gardens</td>
<td>Disruption of garden plots Displacement of garden plots</td>
<td>Communications Plan to control access during construction Relocation of some or all of the plots within the AVTC</td>
<td>Insignificant</td>
<td>None recommended</td>
</tr>
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</tr>
<tr>
<td>Landscape and Views</td>
<td>Active construction site Alteration of the overall appearance of the AVTC</td>
<td>Landscape Plan BMPs during construction</td>
<td>Insignificant</td>
<td>Monitor new landscaping for 1 year Construction surveillance of BMPs</td>
</tr>
<tr>
<td></td>
<td>Alteration of the overall appearance of the AVTC</td>
<td>Appropriate infilling as per OP and zoning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Impacts</td>
<td>Alteration of existing land uses in the AVTC during construction and operation</td>
<td>Maintain and improve formal and informal linkages BMPs during construction</td>
<td>Insignificant with positive aspects due to traffic management</td>
<td>None recommended</td>
</tr>
<tr>
<td></td>
<td>Reduction in cut-through traffic</td>
<td>None required for cut-through traffic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of life</td>
<td>Access to amenities will be disrupted during construction but improved during operation</td>
<td>Construction and Traffic Management Plan BMPs during construction</td>
<td>Insignificant with positive aspects due to improved access</td>
<td>None recommended</td>
</tr>
<tr>
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<tr>
<td>Air Quality</td>
<td>Degradation due to construction equipment and activities Overall decrease in total vehicle emissions due to improve traffic flow</td>
<td>BMPs during construction MOE 24 hour criteria for criteria air contaminants are not expected to be exceeded</td>
<td>Insignificant</td>
<td>None recommended</td>
</tr>
<tr>
<td>Noise</td>
<td>Increase in noise levels during construction and operation</td>
<td>Construct noise barriers where necessary Detailed noise assessment for apartments near Riverside Drive</td>
<td>Insignificant</td>
<td>Monitoring of noise levels at the apartment near Riverside Drive will aid in determining appropriate mitigation measures</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Criteria</td>
<td>Potential Effect</td>
<td>Mitigation</td>
<td>Significance</td>
<td>Monitoring</td>
</tr>
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<td>----------------------------------</td>
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</tr>
<tr>
<td><strong>Vibration</strong></td>
<td>Increase in vibration levels during construction and operation</td>
<td>BMPs during construction. Vibrations from operations will not cause damage and will be only marginally perceptible. No mitigation is recommended</td>
<td>Insignificant</td>
<td>None recommended</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>Emergency vehicle delay during construction with improved mobility once operational Additional user facilities (pathways, sidewalk, lighting)</td>
<td>Construction and Traffic Management Plan, BMPs during construction, Two lanes of traffic will need to be maintained on Riverside Drive at all times</td>
<td>Insignificant</td>
<td>None recommended</td>
</tr>
<tr>
<td><strong>Consistency with Planning Policies</strong></td>
<td>Consistent with arterial road designation, cycling and pathways</td>
<td>None required</td>
<td>Positive</td>
<td>None recommended</td>
</tr>
<tr>
<td><strong>Heritage Features and Archaeology</strong></td>
<td>Potential for disruption / disturbance of resources during construction</td>
<td>Stage 2 Archaeological investigations</td>
<td>Insignificant</td>
<td>Implement monitoring as recommended in the Stage 2 report</td>
</tr>
<tr>
<td><strong>Road Based Mobility</strong></td>
<td>Construction related delays. Completing the City's Arterial Road network, however, there is a potential capacity limitation at Hwy 417</td>
<td>Construction and Traffic Management Plan, a Staging Plan, and a Public Communications Plan.</td>
<td>Insignificant</td>
<td>Monitor 417 capacity to be addressed through subsequent TMP</td>
</tr>
<tr>
<td><strong>Walking and Cycling-based Mobility</strong></td>
<td>Disruption during construction. Improvement of cycling and pedestrian facilities</td>
<td>Construction and Traffic Management Plan, a Staging Plan, and a Public Communications Plan.</td>
<td>Insignificant</td>
<td>None recommended</td>
</tr>
<tr>
<td><strong>Transit Based Mobility</strong></td>
<td>Disruption during construction. Compatibility with existing and future transit facilities</td>
<td>Construction and Traffic Management Plan, a Staging Plan, and a Public Communications Plan.</td>
<td>Insignificant</td>
<td>Annual TransPlan planning and consultation</td>
</tr>
<tr>
<td><strong>Intersection Safety</strong></td>
<td>Increased intersection but with reduced traffic volumes</td>
<td>Pedestrian crossing signals and appropriate design</td>
<td>Insignificant</td>
<td>Monitor intersections in accordance with City procedures</td>
</tr>
<tr>
<td>Criteria</td>
<td>Potential Effect</td>
<td>Mitigation</td>
<td>Significance</td>
<td>Monitoring</td>
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<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>Operation and maintenance costs</td>
<td>Operational budgeting</td>
<td>Not applicable</td>
<td>Budget planning and consultation</td>
</tr>
<tr>
<td>Urban Woodlots</td>
<td>1.62 ha of Hospital Woods disturbed 0.22 ha of Rideau River Park Woods disturbed</td>
<td>Limit area of disturbance during design BMPs during construction Tree Protection Measures Planting native species to increase diversity</td>
<td>Insignificant</td>
<td>Monitor new plantings Construction Monitoring UNA Planning and consultation</td>
</tr>
<tr>
<td>Ecological Processes</td>
<td>Diminish wooded area and open fields</td>
<td>Limit area of disturbance during design Planting native species to increase diversity</td>
<td>Insignificant</td>
<td>Monitor new plantings Construction Monitoring</td>
</tr>
<tr>
<td>Wildlife</td>
<td>Area avoidance during construction and operation Disruption of amphibian breeding pools in Hospital Woods</td>
<td>Limit area of disturbance during design BMPs during construction Nesting and breeding pool survey or construction windows</td>
<td>Insignificant</td>
<td>Construction Monitoring</td>
</tr>
<tr>
<td>Aquatic Habitat</td>
<td>Disruption of habitat from bridge construction and operation</td>
<td>Limit area of disturbance during design Fisheries compensation plan (DFO Approval required) BMPs during construction</td>
<td>Insignificant</td>
<td>Construction Monitoring</td>
</tr>
<tr>
<td>Surface Drainage</td>
<td>Increased runoff from new impermeable surfaces Additional stormwater management facilities</td>
<td>BMPs during construction Detailed Stormwater Management Plan Quality and quantity control of new and existing drainage</td>
<td>Positive</td>
<td>Construction Monitoring As recommended in Detailed Stormwater Management Plan</td>
</tr>
<tr>
<td>Global Warming</td>
<td>Improved traffic flow will decrease GHG emissions overall Loss of existing trees</td>
<td>Landscape Plan</td>
<td>Positive</td>
<td>Monitor new plantings</td>
</tr>
<tr>
<td>Contamination</td>
<td>Spread or exposure to contaminated soils and groundwater Settlement of constructed facilities</td>
<td>Phase II and III Environmental Site Assessment Detailed Geotechnical Investigations Landfill Management Plan (section 46 EPA) BMPs during construction</td>
<td>Insignificant</td>
<td>As detailed in Geotechnical and ESA investigations</td>
</tr>
<tr>
<td>Flooding and Erosion</td>
<td>Construction within the floodline</td>
<td>Flood proofing and scour protection during detailed design RVCA Approvals BMPs during construction</td>
<td>Insignificant</td>
<td>Construction Monitoring As per RVCA Approvals</td>
</tr>
<tr>
<td>Criteria</td>
<td>Potential Effect</td>
<td>Mitigation</td>
<td>Significance</td>
<td>Monitoring</td>
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</tr>
<tr>
<td>Surface Water</td>
<td>Degradation of water quality due to construction activities</td>
<td>BMPs during construction</td>
<td>Insignificant</td>
<td>Construction Monitoring</td>
</tr>
<tr>
<td>Quality</td>
<td></td>
<td></td>
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<tr>
<td>Groundwater</td>
<td>Degradation of water quality due to construction activities Exposure of shale may</td>
<td>BMPs during construction Detailed Hydrogeological Investigation Groundwater</td>
<td>Insignificant</td>
<td>As detailed in Hydrogeological Investigations</td>
</tr>
<tr>
<td></td>
<td>result in lower groundwater table</td>
<td>Management Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soils</td>
<td>Disturbance and compact of soils during construction Accidental exposure</td>
<td>BMPs during construction Appropriate slopes assessed during detailed design</td>
<td>Insignificant</td>
<td>Construction Monitoring</td>
</tr>
<tr>
<td></td>
<td>contaminants</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Bedrock</td>
<td>Blasting required for installation for services Exposure of shale</td>
<td>see groundwater BMPs during construction Construction Materials Management</td>
<td>Insignificant</td>
<td>Construction Monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plan for excess Pre-condition Blast surveys Detailed Geotechnical Investigation</td>
<td></td>
<td>Post-conditions Blast surveys as required</td>
</tr>
</tbody>
</table>
8.0 PROJECT STAGING

8.1 Rationale for Project Staging

Following the completion of the Alta Vista Drive/Smyth Road Transportation Strategy, in August 2000, Regional Council approved the following recommendations:

To ensure the timely delivery of the section of the Alta Vista Parkway between Riverside Drive and Smyth Road…appropriate funds need to be identified to complete the Environmental Assessment (EA) Study for the Alta Vista Parkway between Conroy Road and the Queensway.

This recommendation was identified and approved to ensure there is appropriate transportation infrastructure in place to accommodate the existing and projected travel demand to and from planned growth within the Health Sciences Centre and adjacent lands. The City’s objective was further defined at the November 20, 2002 Transportation Committee at which the following resolution was carried:

Therefore, be it resolved that once the Alta Vista Transportation Corridor Environmental Assessment is completed and approved, that the General Manager of Development Services be directed to present to the Transportation and Transit Committee and City Council for implementation, only those sections of the Environmental Assessment that provide transportation solutions for the Ottawa Hospital Complex; and

Further be it resolved that the General Manager of Development Services be directed to include in the 10 year capital budget (2003 – 2012) only funding for transportation solutions for the Ottawa Hospital Complex.

This is consistent with the TMP identified timelines for implementation of the AVTC:

- Riverside Drive to the Hospital Complex was identified as a Phase 1 (about 2008);
- Highway 417/Nicholas interchange to Riverside Drive as a Phase 2 (2013 to 2021); and
- From the Hospital Complex south to Smyth Road and on to Walkley Road as a Phase 3 (about 2021).

The EA’s Stage 1 focused on the best design solution for this section of the AVTC, hereafter, referred to as the Hospital Link, as confirmed at the September 21, 2005 Transportation Committee. However, so as not to piecemeal the project, it was necessary that the EA address the entire Corridor to ensure that the design and location of the initial Hospital Link is compatible with the future design solution for the Corridor as a whole. With the ultimate design solution having been identified, refined and its effects mitigated to the extent possible, the assessment could proceed to determining the Preferred Design for the Hospital Link.

Therefore be it resolved that Council receive the results of The Alta Vista Transportation Corridor E.A. on the basis that it is Council’s position to implement only the Hospital Link section between Riverside Drive and the Hospital Complex (not through to Smyth Road) and that any further development of the corridor not occur until after the matter of the corridor has been reviewed in the Official Plan Reviews of 2008 and 2013.
8.2 Stage 1 - Hospital Link

The purpose of the Hospital Link portion of the AVTC is to provide a transportation link from Riverside Drive and the Southeast Transitway easterly to the Ottawa Hospital Complex. This link is needed to improve transit service to the area and to accommodate projected growth in vehicle travel demand related to ongoing development of the Ottawa Hospital Complex, including the NDMC Lands.

The Hospital Link would relieve pressure on the adjacent sections of Alta Vista Drive and Smyth Road. Nevertheless, this is only a short-term solution to traffic reduction. Furthermore, it will have no effect on improving congested conditions at downstream intersections, such as the Riverside/Industrial intersection, which will continue to fail.

The overall intent of the EA process is for any initial phase of a facility in the AVTC to be compatible with the recommended design for the ultimate facility. On this basis, the choices for the initial Hospital Link were: a) for it to be some portion of the ultimate facility from Riverside Drive through to the Ottawa Hospital Complex, or b) for it to be removed from the location of the ultimate facility so as not to preclude its ability to be constructed if/when required. Due to the combination of: the recommended alignment of the ultimate design; the limited available right-of-way in certain locations within this section of the Corridor; the geometric complexities of passing under the railway tracks and over Riverside Drive; and the desire to minimize throw-away costs if/when the ultimate facility is built, it was determined the Hospital Link would be some portion of recommended ultimate facility as per the overall Preferred Design.

With regard to transit, the Transit Services Branch of the City has estimated that if the design solution for the whole Corridor were in place, bus volumes in the peak direction would be in the 12 to 30 vph range. Accordingly, for the initial Hospital Link, these volumes would be significantly less. Based on these relatively low hourly bus volumes, combined with the potential to provide bus priority, there is no need to provide a bus-only link from the Southeast Transitway into the Hospital Complex as part of the initial stage. The Transit Services Branch, in working with the Study Team, has identified how the Hospital Complex can be efficiently and effectively served by transit for both the initial Hospital Link and for the ultimate design solution, without the provision of a bus-only facility in the Corridor.

With regard to the initial Hospital Link’s capacity requirements, the first decision to be made is whether two or four lanes are required. Based on the following factors, it was determined that a two-lane facility will be sufficient for the initial Hospital Link:

- A two-lane road, with a per lane capacity of 1000 to 1200 vph, can accommodate traffic from a significant amount of mixed-use development on the Ottawa Hospital Complex;
- Providing four lanes initially would be a significant initial overbuild, and an inefficient use of City funds; and
- The recommended ultimate design/operation is for two regular traffic lanes and two lanes for HOV. Since there will not be sufficient buses initially to warrant their own lane, and as the short section of road from Riverside Drive to the Ottawa Hospital Complex is not appropriate for HOV operation, providing a third and fourth lane initially for HOV does not make sense from either an operational or capital cost perspective.

Having determined that the Hospital Link would comprise two lanes of the ultimate design, the next decision was to determine which two lanes. The criteria used to select the preferred two lanes were:

- Minimize impact on adjacent communities;
- Most compatible with planned development on the Ottawa Hospital Complex, including NDMC lands;
• Least cost; and
• Operates safely and efficiently.

Based on these criteria, the southerly two lanes of the ultimate four-lane design were selected. These two lanes are the furthest removed from the Riverview Park community to the north, would delay relocation of a hydro tower, and would allow the recreational pathway connection from the Ottawa Hospital Complex to the NCC’s Rideau River pathway system to be located in its ultimate location from day one. The southerly two lanes, as would the northerly two lanes, result in safe and efficient traffic operations and would also allow the required bridge structures over the Transitway and Realigned Riverside Drive to each be built in two sections thereby resulting in significant initial cost savings.

8.2.1 Detailed Description of the Hospital Link

The preferred design for the Hospital Link is illustrated on Figure 8-1. The ultimate cross-section of these two lanes is 9.25m comprised of a 2.0m wide bicycle lane and a 3.5m outside vehicle (HOV) lane and a 3.75m inside regular traffic lane. Initially, when these two lanes operate as two-way, the 9.25m will be divided equally eastbound and westbound.

The eastern terminus of the Hospital Link is recommended to be a “T” intersection with the Hospital Ring Road located to the north of the University of Ottawa’s Roger Guindon Building. Two southbound lanes will be required as it approaches the Ring Road, to accommodate left and right-turn movements. The intersection could be STOP sign controlled initially, with future counts determining if/when traffic control signals are required. The 3m wide asphalt recreational pathway will be provided adjacent to the south, and the intersection will tie in with the existing recreational pathway that connects to the adjacent Riverview Park community.

Heading west, the alignment swings to the south to where a “T” intersection is recommended at the future connecting road to the NDMC lands. This intersection is located approximately mid-point between the Alta Vista Drive and Ring Road intersections in order to provide appropriate spacing between future signalized intersections. The location of the NDMC intersection is not definitively fixed at this time. There is approximately 50m in location flexibility to ensure optimal integration with the land use and transportation plan currently being developed for the Ottawa Hospital Complex. Functionally, the intersection will include an eastbound right-turn lane, and two northbound lanes to accommodate left and right-turn movements. The intersection could be STOP sign or traffic signal controlled, depending on volumes.

Proceeding west, the Hospital Link connects at-grade with Alta Vista Drive at a signalized intersection. This intersection can be designed to allow all turn movements, with the option to prohibit certain turn movements if this is the preference of the City and the adjacent communities. Regarding turning lanes, the following are recommended as a minimum:

• A westbound left-turn lane;
• A northbound left-turn lane; and
• An eastbound right-turn lane.

The two above-noted left-turn lanes could be opposed by an eastbound left-turn lane or a southbound left-turn lane. As these two turn lanes could contribute to additional traffic on Alta Vista Drive north of the Hospital Link, as opposed to these vehicles using Riverside Drive to connect to the Link, they could be “painted-out” and signed to prohibit the movement, if desired. There is also the option for a westbound right-turn lane, however, for the same reason as above, there may be a desire to prohibit this move. In this instance, the lane would be used as a bus-only lane to provide westbound buses with priority at the traffic signal. The westbound right-turn movement could be prohibited with signage.
Figure 8-1: Stage 1 - Hospital Link
Immediately south of the proposed signalized intersection, there exist all-movement intersections serving the church parking lot and the NDMC access road. Due to the close proximity of these intersections and the proposed northbound left-turn lane, it is recommended that both the Alta Vista/NDMC intersection and the Alta Vista/North Church driveway intersection be restricted to right-in/right-out.

On the west side of the intersection, in addition to the aforementioned through and turn lanes, a number of bus priority measures are recommended. These include:

- A short length of eastbound bus-only lane which accesses a median-located bus stop and provides bus priority at the traffic signal;
- An eastbound bus-only ramp extending from the Southeast Transitway beneath the CN Rail Line to merge with the eastbound lane of the Link shortly before the start of the bus-priority lane; and
- A westbound bus-only lane which extends from the Alta Vista Drive intersection west to the bus-only ramp that connects to the Southwest Transitway. This lane serves a bus stop adjacent to the west of Alta Vista Drive, and also can receive the westbound bus lane on the east side of the intersection, if necessary.

The Hospital Link passes beneath the CN Rail Line and over top of the Transitway. The ultimate rail underpass structure would have to be fully constructed, as it cannot be done in stages. The structure would have to be long enough to accommodate: the recommended ultimate design, the ramps to/from the Transitway, and the future east-west rapid transit facility, which is being protected for in a 15m wide corridor adjacent to the southern edge of the AVTC.

Bus ramps are shown in their ultimate location, as are the sidewalk connections to Old Riverside Drive, the 3.0m wide recreational pathway adjacent to the south, and the emergency vehicle connection between the westbound bus ramp and Old Riverside Drive. As the two-lane Hospital Link extends over the Transitway and Realigned Riverside Drive, only the southern half of both structures will be provided.

The realignment of Riverside Drive is necessary in order to create sufficient offset from the Transitway overpass so that acceptable vertical clearance can be attained between the Hospital Link overpass and the Realigned Riverside Drive. With the overpass, the Riverside/Frobisher intersection can remain at-grade, signalized and with all-movements permitted.

Once past realigned Riverside Drive, the Hospital Link extends north to intersect with Riverside Drive as the west leg of the Riverside/Hincks intersection. Through this section, the westerly two lanes of the ultimate four-lane design are constructed. On the approach to Riverside Drive, two eastbound lanes are provided to accommodate eastbound right and left turns. The intersection will be traffic signal controlled and a northbound left-turn lane and a southbound right-turn lane will be provided on Riverside Drive.

8.2.2 Impact Assessment of the Hospital Link

Many of the potential environmental effects and mitigation associated with the ultimate facility as per the Preferred Design will also be experienced/required for the Hospital Link. Accordingly, the recommended mitigation, monitoring, and other required approvals for the Preferred Design are also recommended for the Hospital Link stage.

To address the noise impact, it is recommended that the relevant noise mitigation measures for the ultimate Preferred Design be implemented at the initial stage. This includes the 2.0m high berm from the approximate new NDMC access road intersection west of Alta Vista Drive, and a 2.0m high noise fence from Alta Vista Drive west to the railway underpass. Apart from resolving the noise impacts on the one
residential apartment building at the southeast corner of the proposed Hospital Link and Old Riverside Drive, no other noise mitigation is required.

With regard to visual mitigation, it is recommended that the landscaping associated with the noise attenuation berms, and other landscaping that would not be impacted by any subsequent site alteration activities related to the construction of the Hospital Link as a four lane facility, be in place as part of the Hospital Link project.

8.3 **Staging of Preferred Design - Full Corridor**

In review of the Corridor, the TMP timelines, and based on a logical/progressive way of providing primary road network connectivity, the following are the sections of the Corridor (from north to south) that could be provided in stages:

- Highway 417/Nicholas Interchange south to Riverside Drive;
- Riverside Drive and Southeast Transitway east and south to Smyth Road; and
- Smyth Road south to the Walkley/Conroy intersection.

The proceeding Sub-section 8.1, described the City’s rationale/preference for Stage 1 of the AVTC, the Hospital Link. Also recommended was the initial need for only two lanes on this Link. In the relatively near future, following implementation of the Hospital Link, there will likely be the need to extend the facility south to Smyth Road in order to alleviate growing traffic pressures on the adjacent section of Smyth Road. Initially, the connection to Smyth Road will be provided by the construction of an east-west street located north of, and parallel to, Smyth Road that will provide access to the newly constructed Hospital parking lots (in the AVTC), and will connect the Hospital Ring Road with Roger Guindon Drive. Traffic can then by-pass the congested Smyth/General Hospital intersection by using the Ring Road – New Road - Roger Guindon link. As traffic increases, and as use of the Ring Road by non-local traffic becomes problematic, there will be pressures to extend the Hospital Link east and south to Smyth Road.

Based on the foregoing, the following is the recommended staging of the preferred design for AVTC:

**Stage 1:** Riverside Drive and Southeast Transitway east to the Ottawa Hospital Complex, initially as a two-lane facility plus the required bus priority lanes at the Alta Vista Drive intersection and the bus ramps to/from the Transitway.

**Stage 2:** Ottawa Hospital Complex south to Smyth Road.

**Stage 3:** Highway 417/Nicholas interchange south to Riverside Drive.

**Stage 4:** Smyth Road south to the Walkley/Conroy intersection.

8.3.1 **Traffic Assessment of Recommended Project Stages**

To clarify the effects of the recommended staging, the following is a brief overview of the existing and projected traffic in the area.

**Existing Traffic Conditions on Area Streets and Intersections**

With regard to existing levels of service, many of the area’s signalized intersections are currently operating at, or close to, capacity in peak periods as follows:
Existing Hospital Complex Traffic Generation and Distribution

- Current traffic counts at Hospital Complex’s connections to Smyth Road indicate a peak hour traffic generation of approximately 2000 vph two-way total in both the morning and afternoon peak hours. This will continue to increase with the significant development planned for the Hospitals and with the planned increased supply in parking.
- Approximately 60% of the traffic is to/from the west on Smyth Road and 40% is to/from the east on Smyth Road.

Projected NDMC Site Development Traffic Generation

- Based on the range of land use options presented to date for the Ottawa Hospital Complex Study, traffic generation for the eventual preferred land use plan, at full development of the NDMC lands, will likely be in the order of an additional 1200 vph to 1700 vph. The following volumes reflect the low end of this range.

Stage 1 Transportation Effects

The Stage 1 - Hospital Link would potentially achieve the following:

- Provide a more direct connection, for use by transit, to the NDMC Lands and the Ottawa Hospital Complex;
- Remove up to 460 vph two-way total of existing Hospital-generated traffic from Smyth Road; and
- Accommodate at least 600 vph (50%) two-way total of traffic from the NDMC lands at its full development.

There will, however, remain a significant amount of existing Hospital-generated traffic, new Hospital-generated traffic and NDMC lands redevelopment-traffic that will/would continue to use Smyth Road as its primary means of site access regardless of whether the Hospital Link is in place or not. As the amount of NDMC lands traffic at full site development that would use Smyth Road could total 600 vph two-way total, and as future new Hospital Complex traffic and continued background traffic growth will also add traffic volumes in the hundreds, traffic on the adjacent sections of Smyth Road and Alta Vista Drive will eventually increase above existing levels, even with the Hospital Link in place.

With regard to intersection operations, in the shorter-term, following completion of the Hospital Link, the level of service of the Alta Vista/Smyth intersection and of the Hospital Complex’s two intersections with Smyth Road will improve. However, as area development and traffic increases, volumes will return to and surpass current levels and the intersection levels of service will be reduced. Downstream intersections such as Riverside/Industrial and Alta Vista/Industrial will continue to operate at a failure level even with the Hospital Link in place. This will be due to planned growth in the Train Lands and the fact that the Hospital Link in itself, does not remove any volumes from the Riverside/Industrial intersection.
These continuing downstream intersections, and downstream transportation network capacity are best resolved by the implementation of the next stages of the preferred design solution for the AVTC.

**Stage 2 Transportation Effects**
The section of the Preferred Design from the Hospital Complex south to Smyth Road would potentially achieve the following:

- Facilitate improved bus routings to and through the Ottawa Hospital Complex;
- Remove up to 250 vph two-way total of existing Hospital-generated traffic from Smyth Road between the Hospital’s Ring Road intersections related to traffic to/from the east on Smyth Road;
- Remove a minimal amount of traffic to/from the Ottawa Life Sciences Park from the section of Smyth Road west of the Roger Guindon intersection;
- Act as a by-pass route for non-hospital traffic currently using Alta Vista Drive north of Smyth Road and Smyth Road east of Alta Vista Drive; and
- Accommodate approximately 360 vph two-way total traffic generated by the NDMC land at its full development.

The total of the foregoing is approximately 750 vph two-way total that would potentially use the Hospital Link Extension to Smyth Road. If the extension were not in place, traffic on Smyth Road adjacent to the Hospital Complex would increase by approximately 460 vph (100 + 360), thereby adding to the intersection congestion on this section of Smyth Road.

**Stage 3 Transportation Effects**
The primary benefits of extending the Preferred Design north to the Highway 417/Nicholas interchange would be to remove traffic from Main Street (and therefore Smyth Road), and from Alta Vista Drive and Riverside Drive north of Smyth Road. This connection would attract the majority of regional-type traffic to/from the north and west of the Ottawa Hospital Complex, and would:

- Remove up to 360 vph two-way total of existing Hospital-generated traffic from Main Street west of Riverside Drive;
- Remove up to 110 vph two-way of existing Hospital-generated traffic from Riverside Drive and Alta Vista Drive north of Smyth Road;
- Attract at least 500 vph two-way total of two-way total traffic generated by the NDMC lands at full development; and
- Attract a significant amount of regional-type commuter traffic unrelated to the Ottawa Hospital Complex that currently uses Main Street and Alta Vista Drive as a means to access Highway 417 West and the Downtown area from the Southeast Sector.

**Stage 4 Transportation Effects**
The section of the Preferred Design from Smyth Road to the Walkley/Conroy intersection would potentially achieve the following:

- Provision of a continuous facility in the AVTC would allow new transit routes to be introduced to provide direct transit service from the Greenboro/Hunt Club residential area, and the Conroy/St. Laurent commercial area to Hurdman Station via Conroy Road and the AVTC. This new service would also improve the travel mode choices for people in the residential areas within walking distance of the new transit stops along the facility in the AVTC. Together, these improvements to the transit network would result in increased transit ridership in support of the City’s long-term goals;
• Reduce traffic on Smyth Road east of the Hospital Complex. An estimated 40% (800 vph two-way total) of existing Hospital traffic is from the south via St. Laurent or Highway 417, and would switch to this more direct link;
• Remove a small amount of existing Hospital-generated traffic from Alta Vista Drive south of Smyth Road, that would find the link to Walkley Road more direct;
• Attract up to 240 vph two-way of the traffic from full development of the NDMC Lands that would otherwise use Smyth Road to the east of the Hospital Complex; and
• Attract a significant amount of arterial road commuter traffic and local street cut-through traffic that currently use either Riverside Drive, Alta Vista Drive, Main Street, St. Laurent Boulevard and north-south local streets in the Alta Vista and Elmvale Acres communities as a means to travel from Southeast Ottawa to Highway 417 west and to Downtown Ottawa.

8.3.2 Timing of Stages

The timing of when the Hospital Link is widened to four lanes, or when Stages 2, 3 or 4 are implemented as two or four lanes will be driven/determined by a combination of:

• The rate of background traffic growth on the area’s arterial road network and the resultant congestion and intersection failure that will exist on area roads;
• The increases in cut-through traffic on Study Area local streets;
• The rate of development in the Ottawa Hospital Complex and its traffic generation;
• The rate and amount of development on the NDMC Lands, and its traffic generation;
• The level of transit ridership achieved for the whole of the Ottawa Hospital Complex;
• The success of the North-South LRT project in attracting transit ridership in the Southeast Sector;
• Funding availability; and
• Decisions of the City’s Transportation Committee and Council on the status of the AVTC in the Official Plan (Reviews of 2008 and 2013).

8.4 Capital Cost Estimates

The capital cost estimates, in 2005 dollars, for the preferred designs for both the Stage 1 Hospital Link and for the Ultimate Facility in the Corridor as a whole, are as follows.

<table>
<thead>
<tr>
<th>Capital Cost (2005 Dollars)</th>
<th>Hospital Link</th>
<th>Ultimate Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property and Right-of-Way</td>
<td>$2.2M</td>
<td>$2.2M</td>
</tr>
<tr>
<td>Engineering</td>
<td>$7.6M</td>
<td>$17.8M</td>
</tr>
<tr>
<td>Construction</td>
<td>$34.5M</td>
<td>$80.8M</td>
</tr>
<tr>
<td>Project Management</td>
<td>$5.7M</td>
<td>$13.3M</td>
</tr>
<tr>
<td>Contingencies</td>
<td>$5.0M</td>
<td>$11.4M</td>
</tr>
<tr>
<td>GST</td>
<td>$3.8M</td>
<td>$8.8M</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$58.8M</strong></td>
<td><strong>$134.3M</strong></td>
</tr>
</tbody>
</table>

Note that the cost for the Ultimate Facility includes the Stage 1 costs.
9.0 IMPLEMENTATION AND APPROVALS

9.1 Implementation Plan

Following the approval of this EA, the final phases of the process are to be completed. These implementation activities include:

- detailed design and contract drawings;
- approvals;
- construction;
- operation; and
- monitoring.

The following sub-sections describe the general requirements of an implementation plan that should be prepared to guide the advancement of the project. The implementation process to be followed describes the course of action for the City, as the undertaking’s proponent. This will ensure that future work conforms to the standards and principles of the Environmental Assessment Act, without requiring explicit approval under the Act for future work, except when major changes to the undertaking are proposed. The process will allow future changes to be made to the undertaking in a manner which is both environmentally and socially responsive.

The implementation plan should have several key objectives, as follows:

- To ensure that the principles of Environmental Assessment in Ontario are actively upheld and embodied in all future stages of the facility’s planning and design;

- To continue the commitment of the City of Ottawa to responsible planning and protection of the public interests. The City promotes progressive planning and maintains a practice of undertaking public consultation which often surpasses typical requirements;

- That the approved project will be reviewed at appropriate points in time to make certain the continued validity for the opportunities, constraints, assumptions, policies and decisions upon which the undertaking is based; and

- To allow appropriate flexibility so that necessary changes to the project may be made. The uncertainties involved in identifying needs and evaluating alternative designs within extended time horizons means that long-term transportation plans are inherently conditional. The undertaking’s validity is based on, and vulnerable to future changes in:

  - federal, provincial and municipal policies;
  - land use plans and expectations;
  - population and employment trends;
  - travel behaviour expectations;
  - transportation technologies;
  - environmental conditions;
  - environmental standards; and,
  - public concerns.

The plan should incorporate procedures allowing revisions to the undertaking to be made in a manner responsive to both the public and the environment.
9.2 Subsequent Approval Requirements

Based on the assessment of potential environmental effects and consideration of staging and implementation matters, the following additional approval requirements have been identified:

- An Environmental Screening, in accordance with the requirements of the Canadian Environmental Assessment Act, as required to meet NCC procedures related to the acquisition by the City of lands now owned by the NCC, and as required by other federal authorities related to EA triggers;

- A Federal Land Use Approval, issued by the NCC related to the above-noted property requirements;

- A Federal Fisheries Approval in accordance with the Fisheries Act, and an approval under the Navigable Waters Protection Act, both related to proposed construction activities in the Rideau River related to the proposed Rideau River crossing structure;

- A permit for Fill, Construction and Alteration to Waterways, in accordance with relevant Rideau Valley Conservation Authority (RVCA) requirements and pursuant to Section 28 of the Conservation Authorities Act;

- An approval by the Ontario Minister of the Environment pursuant to Section 46 of the Environmental Protection Act, pertaining to the required site alteration and construction within a former landfill area;

- Approval of the MTO in matters pertaining to Hwy 417 interchange and portions of the design within 400m of it;

- Approvals that may be required related to the relocation of Hydro towers and associated real property matters, as may be determined by the Province of Ontario’s Management Board Secretariat, it’s agents the Ontario Realty Corporation, and/or Hydro One;

- Approvals that may be required by CN Rail related to construction in the vicinity of its corridor east of Riverside Drive and associated real property matters;

- An Official Plan Amendment to redesignate the facility from Arterial – Conceptual (Alignment Undefined) to Arterial – Proposed (Alignment Defined), in accordance with City of Ottawa Official Plan policy 2.3.1.31; and

- Other approvals and related decisions that may be required by Council of the City of Ottawa.

Obtaining these and other required approvals will be one of the essential steps of the implementation process, prior to construction. Some additional public and agency involvement opportunities may be available during this process (Figure 9-1).
Figure 9-1: Potential AVTC Implementation Approval Requirements

Provincial EA Process

Phase 1-Problem or Opportunity
Phase 2-Alternative Solution
Phase 3-Alternative Design
  Concept for Preferred Solution
Phase 4-Environmental Study Report
Phase 5-Implementation

Hospital Link

Stage 1 • • • • •
- Preliminary Design
- Detailed Design
- NCC Lands-CEAA/FLUA
- CN Rail Detour-Design Approvals
- Provincial Permits (MOE, MBS)
- Tender Documents
- Consultation as Required
- Construct
- Monitor
- Operate

Stage 2 • • • • •
- Hospital Complex to Smyth
  - Preliminary Design
  - Detailed Design
  - NCC Lands-CEAA/FLUA
  - CEAA Screening Report

Stage 3 • • • • •
- HWY 417 to Riverside
  - Preliminary Design
  - Detailed Design
  - NCC Lands-CEAA/FLUA
  - DFO, Transport Canada Approvals for Rideau River Crossing-CEAA
  - CEAA Screening Report
  - Provincial Permits (MOE, MTO, RVCA, MNR)
  - Tender Documents
  - Consultation as Required
  - Construct
  - Monitor
  - Operate

Stage 4 • • • • •
- Smyth to Walkley Conroy Intersection
  - Preliminary Design
  - Detailed Design
  - Provincial Permits (MOE)
  - Tender Documents
  - Consultation as Required
  - Construct
  - Monitor
  - Operate
9.3 Modifying the Preferred Design

In discussing the process to change the Preferred Design at some time in the future once the EA process is completed and prior to construction, it is necessary to distinguish between minor and major changes. A major design change would require completion of an amendment to this EA, while a minor change would not. For either kind of change, it is the responsibility of the City of Ottawa, as proponent, to ensure that all possible concerns of the public and affected agencies are addressed.

Minor design changes may be defined as those which do not appreciably change the expected net impacts associated with the project. For example, a design change in lighting treatment, landscaping, noise attenuation, median width, vehicle lane widths, permitted intersection movements, pathway connections, and underground infrastructure to be modified, would be considered minor. Such changes could likely be dealt with during the design phase and would remain the responsibility of the City of Ottawa to ensure that all relevant issues are taken into account.

Due to unforeseen circumstances, it may not be feasible to implement the project as described in this environmental assessment report. Accordingly, any major modification to the project or major change in the environmental setting for the project which occurs after filing and obtaining approval of this environmental assessment shall be reviewed by the City of Ottawa and an addendum to the environmental assessment shall be prepared, as required. An example of a major change would result from a proposed shift in the preferred design alignment which would warrant changes in mitigation as described in the EA. If the proposed modification is beyond the identified right-of-way, the recommendations and conclusions in this report would require updating. An addendum to the EA would be required to document the change and allow related concerns to be addressed and reviewed by the appropriate stakeholders.
10.0 CONCLUSION

Projects such as the recommended design for the proposed facility in the Alta Vista Transportation Corridor have the potential to affect the surrounding environments. The purpose of this environmental assessment is to predict these changes and suggest measures which may be taken to minimize the negative effects and enhance or broaden the positive environmental effects.

In this study, the Purpose and Need for the project were presented, Existing Conditions were described, Alternative Solutions were identified and evaluated, Alternative Designs were identified and evaluated, and section-by-section plans demonstrating the Preferred Design were produced. These plans illustrated built-in mitigation measures including noise attenuation measures and landscaping in keeping with the facility’s designated Scenic Route function. Transit, cycling, and pedestrian priority measures were integrated into the design. An initial staging proposal, the Hospital Link, was also identified and assessed and mitigation measures were recommended. Subsequent phases of the entire facility were also identified.

Throughout the process, the project benefited from far-reaching public and agency participation including Community Meetings, Public Open Houses, Public Meetings, various Stakeholder Meetings, consultation with the Technical Advisory Committee and Public Advisory Committee, and three presentations to the City’s Transportation Committee. In part, from the feedback from these meetings, the Project Team was able to identify and mitigate, where possible, localized impacts for both facility users and residents/landowners immediately adjacent to the proposed project. This involvement also maximized, to the extent possible, public and agency confidence in the selection of a Preferred Design, as well as the process which led to relevant decisions.

During the construction phase, each individual section, which together form the entire facility, will be an active construction site. Traffic disruptions, noise, dust and visual interruptions will be inevitable. Ongoing communications by the City of Ottawa with the affected public will go a long way in alleviating potential concerns and ensuring that timely information about the project is disseminated.

Following the construction phase, there will be many positive effects, primarily related to increased pedestrian, cyclist, transit, and vehicular movement through the Corridor. While the AVTC project has the potential to have negative effects on the human and biophysical environments in its vicinity, these effects can be sufficiently mitigated with prescribed design features and sound environmental management practices, where possible and practical. Additional approvals that may be required as part of the subsequent detailed design process have been identified. By incorporating the mitigation measures identified, no “significant” adverse environmental effects are expected to prevail after mitigation.

In accordance with the provisions of the Class EA process for Schedule “C” projects, the study results are documented in this Environmental Study Report (ESR) which is available for a 30-day public review period. During this period, there will be an opportunity for an individual to request a Part II Order which is a request for the project to be “bumped-up” to an Individual Environmental Assessment.

Once all approvals are in place, the project will proceed to the Detailed Design phase for Stage 1, Hospital Link. This will result in detailed designs, specifications, and tender documents, as well as other associated approvals for the initial stage of construction. The detailed project mitigation features and plans will be created during this phase. The project will then be tendered and constructed in accordance with the plans and details.