



Streetscape Elements





Streetscape Elements

This section provides a description of the design elements and theme for the corridor, including recommendations for stormwater management, street furnishing, and trees.

5.1 Establish the Green Ribbon

The underlying theme of the Centre Street Corridor Streetscape Plan is “The Green Ribbon”; an intertwined linear green ribbon of planting/rain gardens and structural soil running the extent of the study area. This design strategy is being proposed as a regional pilot project within the City of Vaughan.

This system differs in its application across the corridor as described in the Streetscape Typologies section. The differences stemming primarily from the interface with adjacent urban characters.

The major differences across the different character areas are:

1. An **unstructured** edge treatment for a Greenway typology including a bioswale system and naturalized grasses and meadow species, and;
2. A **structured** edge treatment for the Avenue and Boulevard typologies consisting of an open and/or grated planting system including rain gardens and structural soil bridging between planting beds.

Beyond the provision of a green amenity space, this streetscape design strategy is integrated into the civil infrastructure. This green system would serve as an amenity for community while entrenching environmental principles into the streetscape framework. The provision of a new community amenity and open space network would add value to the neighbourhood. Furthermore, the construction of a naturalized system reduces stormwater, drainage and detention infrastructure, having significant potential cost savings.

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Streetscape Elements

AVENUE

- Structured system
- Structural soil systems
- Biofiltration Beds/Rain Gardens
- Grated planting areas

BOULEVARD

- Structured system
- Structural soil systems
- Biofiltration Beds/Rain Gardens
- Open planting areas

GREENWAY

- Unstructured system
- Natural edged alternating swales
- open planting areas

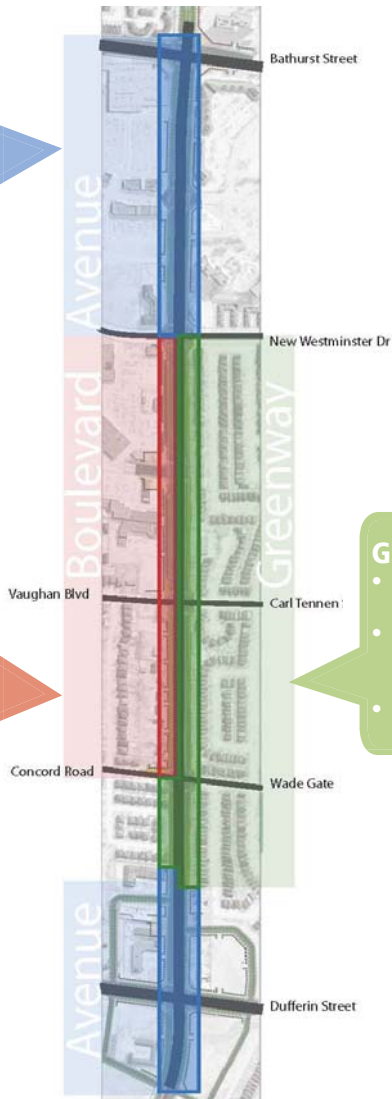


Figure 5.1: Streetscape Key Map

5.1.1 Stormwater Integration

The stormwater management process is integrated into the landscape through the creation of a linking green ribbon along the streetscape – like an expanding coil or twine. The stormwater corridors serve natural hydrologic needs, become linkages to community and regional parks, enhance property values, improve habitat, provide aesthetic amenities, and an improved quality of life. The existing developments or Centre Street were designed with the release rate of 1.0 cfs/acre for drainage control. The increase in stormwater runoff results from new developments shall be effectively controlled by combining the techniques of Low Impact Development with standard stormwater practises. As part of the urbanization review, the feasibility study shall justify the flow system based on the topography in the area.

5.1.2 Soil Systems

- The north side of the street would include a structural soil cell system on each block at intersections.
- Structural soil bridging will be used to increase soil volume to allow for adequate root development under sidewalk areas.
- Large soil areas – 16m³ per tree min. 30m³ preferred in continuous soil pits.
- As soil volume increases, the ability to filter/flush contaminants and maintain tree health increases.



Figure 5.2: Structural soil cells below public realm

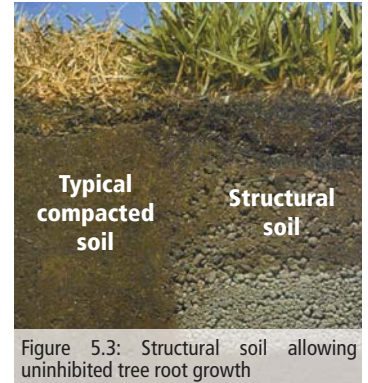


Figure 5.3: Structural soil allowing uninhibited tree root growth

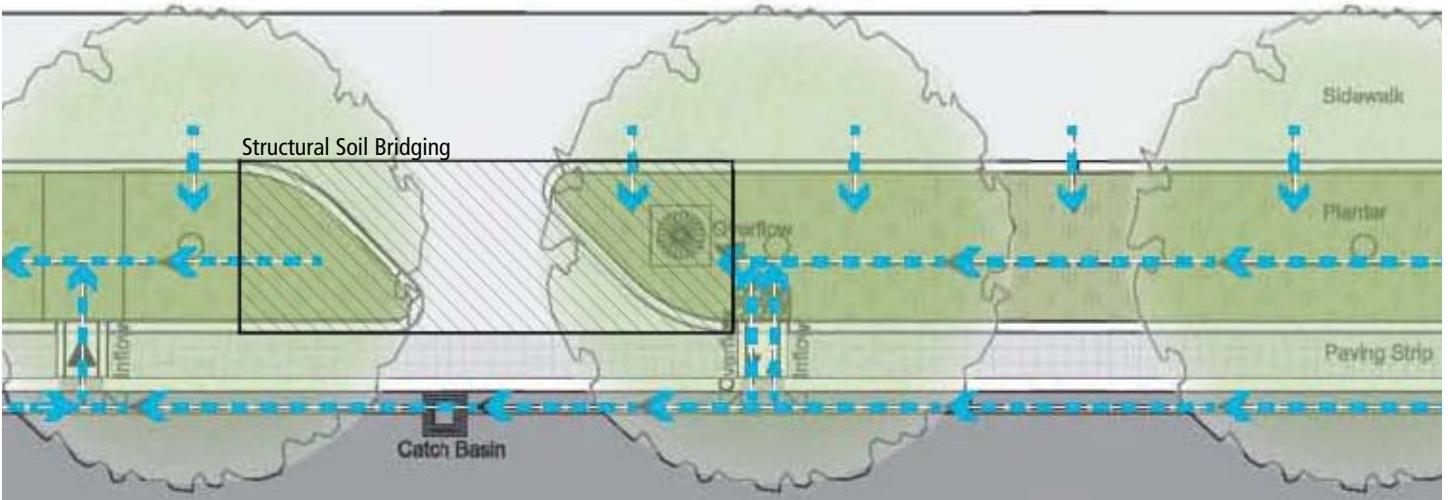


Figure 5.4: Typical rain garden directional flow - plan

5.1.3 Rain Gardens - North Side (Boulevards)

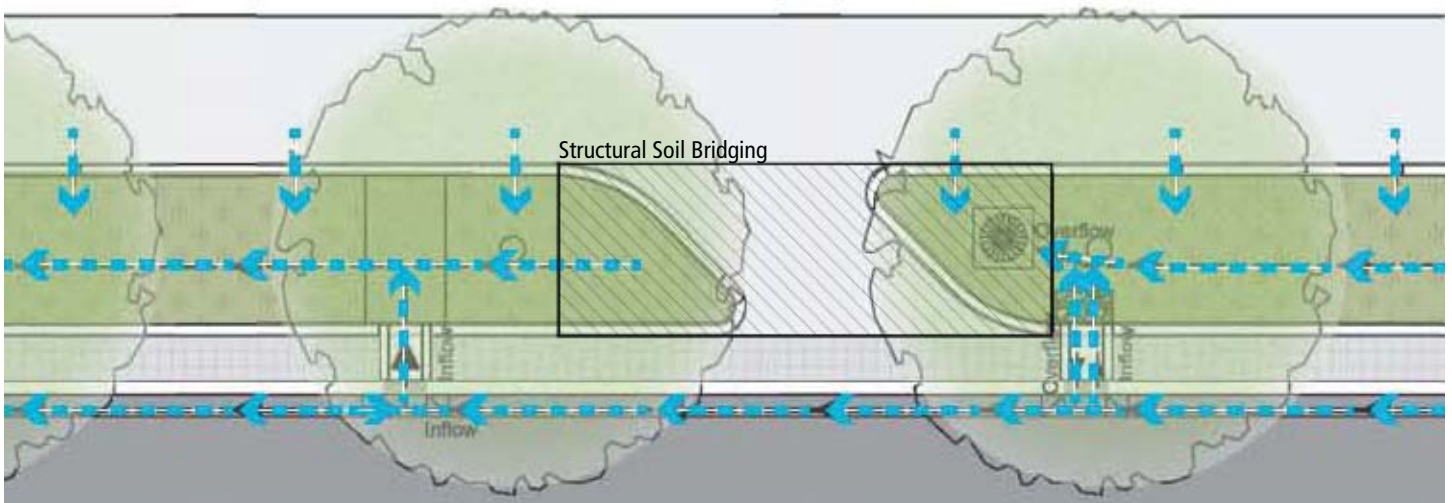
- Rain gardens with integrated grit separators at designated curb openings.
- Sidewalk/ public realm surface water would be directed into planting beds.
- First flush water storage is appended as an additional layer to existing storm system.
- Storm overflow from rain gardens directed into existing storm system.
- Rain gardens will be by-passed in winter/spring crossover flows to allow for continuous water management.
- Rain gardens will be installed with an overflow riser and be designed to slope towards roads and storm water facilities protecting local residents and businesses from potential water damage.
- Grated or open planting areas - dependent on street usage.
- Wet meadow type planting – to thrive in both extremes of wet and dry soils (soil saturation and extended periods with no water input).
- Rain garden introduced as a regional pilot project.
- Tree planting within rain garden swale to include urban hardy tree species – alternate species should be native species and selection could be increased to include the 'Urban Zone'. Urban zone trees to consider: Black Locust, Cottonwood or other.
- Given the relatively flat condition of Centre Street, topography does not restrict the placement of rain garden swale along this segment of the rapidway.
- Use of rain gardens determined based on soil type and condition.



Figure 5.5: Rain Garden/Biofiltration bed - Kitchener, ON



Figure 5.6: Rain Gardens/Biofiltration beds with curb openings - Kitchener, ON



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Streetscape Elements



Figure 5.7: Bio-filtration swale - Madison WI, USA



Figure 5.8: Bio-filtration with wet meadow type planting - Mt. Vernon WA, USA



Figure 5.9: Bio-filtration swale - High Point, Seattle WA, USA

5.2 General Guidelines

5.1.4 Bio-filtration Swales (South Side Passive Green Linkage)

- Natural edged alternating swales
- Wet meadow type planting - to thrive in both extremes of wet and dry soils (soil saturation and extend periods with no water inputs).
- Bio-filtration swale linked together by underground culverts allowing for greater water storage volumes.
- Storm system designed to integrate with regional stormwater requirements
- A 1.8m accessible path undulates through swale system
- Path system would read as a recreational park/trail system
- Planting would enhance privacy of rear-lotting residents
- Path system is designed to have look and feel of a recreational trail system. A hybrid of urban and rural.
- Clean out points to be considered and located in coordination with maintenance standards

A coordinated system of streetscape elements is important in establishing a uniform identity for the length of the streetscape. Despite the differing character areas along Centre Street, the general guidelines for the corridor have been established to reinforce Centre Street as an important corridor, and the following recommendations should help to inform detailed design phases.

The general intent of the streetscape element strategy is to provide a uniform, consistent and complementary palette of tree furnishings, gateway treatments, lighting, trees and paving that enhance and reinforce a unique sense of place for the Centre Street corridor.



Figure 5.10: Coordinated streetscape palette - Boise, USA



Figure 5.11: The establishment of a special place - Disera Drive, Vaughan, Canada



Figure 5.12: Wayfinding strategies easing movement and orientation. Illustration by The Planning Partnership

4.2.1 Wayfinding Guidelines

Establish a pedestrian way-finding system to provide direction and civic information.

- Signage design to be consistent with the streetscape palette.
- Strategically locate signage to identify points of interest and direction.
- Use high quality, vandal proof materials

5.2.2 Street Signage Guidelines

- Markers and streetscape treatments will help to identify neighborhoods and provide separation between commercial areas and adjoining residential areas
- Install neighbourhood markers approximately one half block east or west of Centre Street on side streets that enter residential neighborhoods
- Scale neighborhood markers to the pedestrian, but also ensure markers are recognizable to vehicular traffic
- Develop markers that are unique to each area but with some commonality to tie them together throughout the corridor
- Include neighborhood associations in the design and placement of the markers
- Optional future use of place-making banners on streetlight post



Figure 5.13: Modern lighting design 'Capella Lighting'

5.2.3 Accessibility

- All streetscape elements to comply with Ontario Accessible Built Environment Standards
- Depressed curbs and grooved directional pavers at intersections as per VivaNext standards

5.2.4 Crosswalks

- Clearly delineated
- As per VivaNext design
- Coloured to coordinate with intersections and highlight locations of YRRT stations

5.2.5 Tree Grates

Custom walkable linear tree grates to be used in high traffic areas. These grates would allow for a balance of the human and ecological needs, protecting the trees from pedestrian traffic while maximizing pedestrian movement and stormwater inflow (Figure 4.14).



Figure 5.14: Uniquely patterned tree grates (Illustration by The Planning Partnership)

- Pattern to be 'Oblio' by Iron Age Design per VivaNext Standards (See Figure 4.15)
- Colour to match VivaNext standards
- Grating will be heel friendly with small openings so garbage and cigarette butts do not stick in openings
- Easily removable for cleaning and maintenance purposes

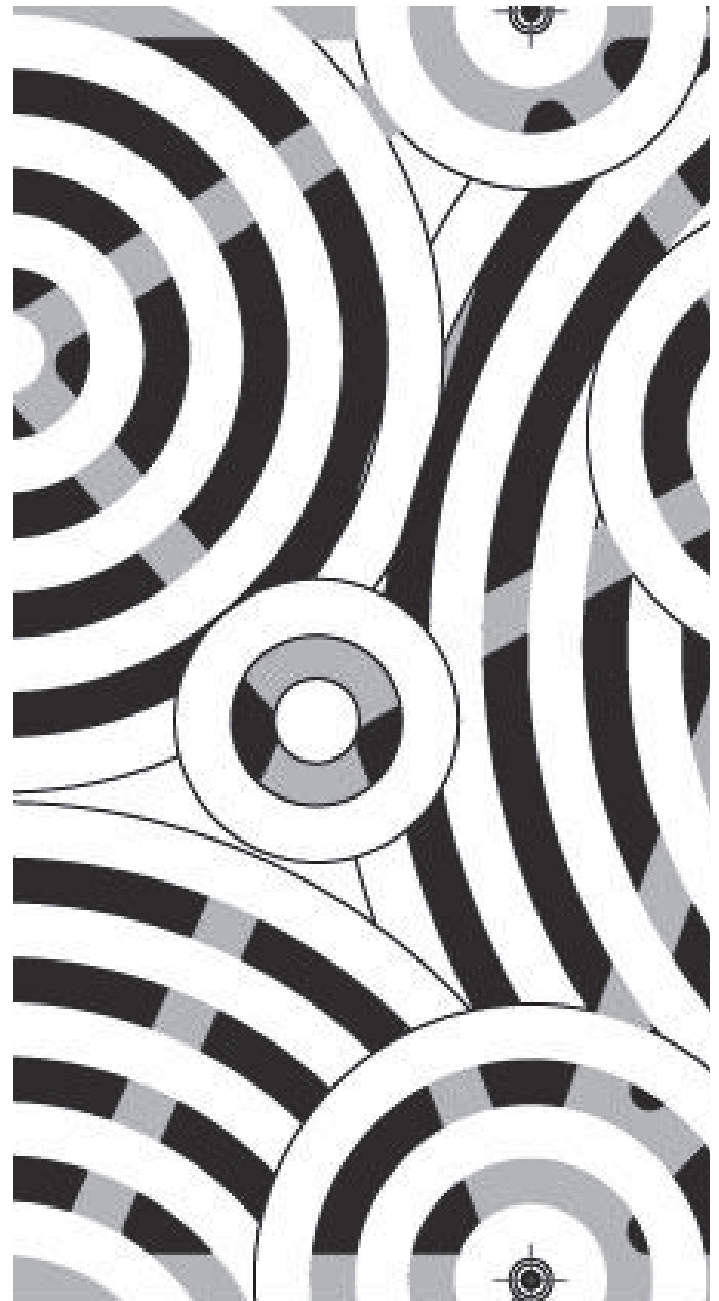


Figure 5.15: Iron Age Designs 'Oblio' tree grate pattern

5.2.6 Paving

- Organized into a mosaic that changes in pattern intensity with proximity to intersections/nodes
- The patterning of pavers will animate the pedestrian realm while making it clear to motorists that there is increased pedestrian activity in this area, thus providing a safer and more comfortable environment for all users.
- Continuity Strip: 200mm x 300mm 'Umbriano' Concrete Unit Pavers by Unilock in running bond pattern. Colours: Midnight Sky and Winter Marvel
- 60m from Intersections: 200mm x 200mm 'Umbriano' Concrete Unit Pavers in a mosaic made up of Midnight Sky and Winter Marvels colours
- Tree and Furnishing Zone: 200mm x 200mm 'Umbriano' Concrete Unit Pavers by Unilock in Running Bond Pattern. Colours: Midnight Sky and Winter's Marvel
- Midblock Sidewalks: Concrete per VivaNext Standards
- Mosaic Pattern: Utilizing a blend of 'Umbriano' Concrete Unit Pavers in a stacked bond pattern and 'Midnight Sky' and 'Winters Marvel' colours, the mosaic pattern is to visually shift in intensity by transitioning from a field of predominantly lighter colours gradually to a field of darker pavers (see Figure 4.17).



Figure 5.16: Example of a paving mosaic

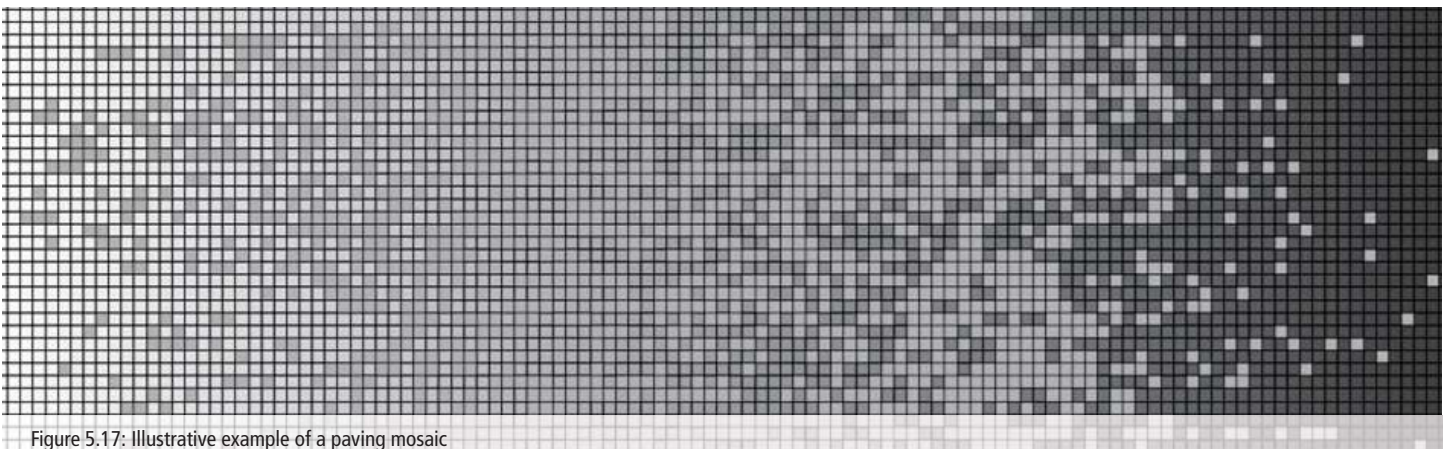


Figure 5.17: Illustrative example of a paving mosaic



Figure 5.20: Unilock 'Umbriano' Midnight Sky colour



Figure 5.18: Unilock 'Umbriano' Winter Marvel



Figure 5.19: Tactile grooved pavers for use at pedestrian ramps



Figure 5.20: Shops at Don Mills (Toronto, ON) "Flex street example"

5.2.7a Custom Benches

- Seating is to be built-in to planting beds within the Avenue and Boulevards at approximately 40m spacing (see Figure 4.26)
- Built-in seating to be similar in nature to VivaNext Standard benches (see Figure 4.25)
- Benches have raised edges where precast seating can be built into the edge walls

5.2.7b VivaNext Benches

- Installed as per VivaNext standard 'Swerve'



Figure 5.21: YRRT/VivaNext furnishing strategy - backless benches



Figure 5.22: YRRT/VivaNext furnishing strategy - backed bench

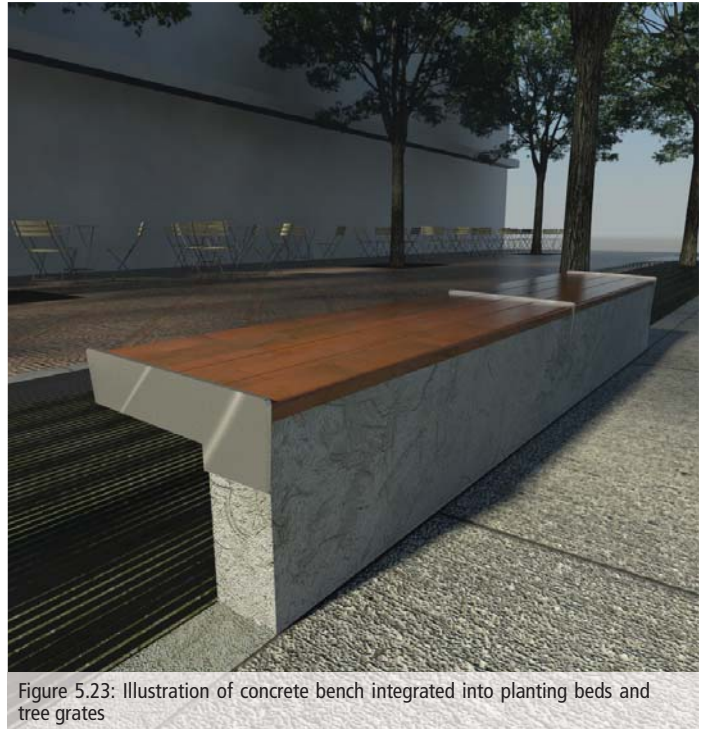


Figure 5.23: Illustration of concrete bench integrated into planting beds and tree grates

5.2.8 Street and Pedestrian Lighting

Lighting contributes to a greater urban environment by extending the life of a street beyond work hours. All too often, however, city streets are lit for the benefit of motorists, while ignoring the sidewalk. Appropriate design and application of lighting can help to privilege the scale and experience of pedestrians. For Centre Street, pedestrian lighting is suggested at key intersections and through urban cross-sections to complement street lighting. All lighting design to be coordinated with implemented VivaNext project.

- 'Capella' Fixture by Philips Lumec to be used for street lighting per VivaNext Standards
- Pedestrian lighting is to be 'Capella' fixture by Philips Lumec per VivaNext Standards

- Pedestrian lighting fixtures and arms are to be installed on street lighting poles within Boulevards and Avenues
- Pedestrian lighting on 14' (4.27m) poles is to be installed along second row of trees within boulevards and avenues. Poles should be offset from street lights in order to provide even lighting.
- Pedestrian lighting to supplement street lighting fixtures.
- Pedestrian lighting to provide for consistent pedestrian lighting levels in event of on street parking.



Figure 5.24: 'Capella' fixture for street and pedestrian lighting



Figure 5.25: 'Capella' fixture with pole



Figure 5.26: Range of Philips Lumec 'Capella' series



Figure 5.27: Differentiated paving pattern for lay-by lanes

5.2.9 Parking Lay-Bys

Lay-by parking is an important streetscape design feature that can contribute significantly to the appearance of a safe and attractive streetscape and a more urban street environment. Lay-by parking that has been placed strategically can increase economic activity by improving ease of access to local services as well as making areas more vibrant and attractive to consumers.

Lay-by parking is also effective in communicating to drivers that they are entering an environment where the emphasis is on the street being a shared space, reducing speeds and providing a safer and more appropriate pedestrian realm.

- Parking lay-by to be delineated with different paving pattern or colour from travel lanes.
- Curb extensions / bulb-outs to be provided at all driveway accesses and intersections.
- Any section of lay-by lane must commence and end with a taper not less than six metres in length.

5.2.10 Utility Boxes

Utility boxes should be located in areas that do not impede user flow along any portion of the streetscape. They should be located in areas that are not high volume or high visibility, where feasible.

Where utility boxes need to be located in areas of high traffic or visibility, they should be sufficiently screened by use of 'unique' utility box designs or planting.

5.2.11 Centre Median

Centre median treatment will conform to YRRT details with the addition of new tree plantings where feasible.

- Medians will not be designed to include stormwater retention facilities.
- Lower power walls (350mm) to be incorporated into drawing package.
- Maximize soil volume per tree as per York Region standard.

5.2.12 Street Trees

In order to achieve a healthy urban forest condition that is resilient to biotic (ie. pests and pathogens) and abiotic (ie. salt and temperature extremes) influences, there needs to be a diversity in species. Tree selection for Centre Street has been done to address biodiversity and hardiness requirements for the creation of a healthy urban forest.

One of the primary objectives of the Plan is to design and create the condition for large street trees to thrive and mature. In the GTA and throughout North America, the average downtown street tree survives for only 7 years. One of the primary reasons for this is the low volumes of and highly compacted nature of soil inherent to development. To overcome problems associated with low soil volumes, compacted soils, and limited root growth capacity, long, continuous shared soil beds are proposed for the trees on both sides of Centre Street, which will significantly contribute to their growth and longevity.

In order to further increase the survivability of the street trees on Centre Street, a series of soil “bridges” are proposed beneath hardscape areas adjacent to trees, which provide roots an opportunity to connect with soil volumes beyond the isolated planting beds.

In addition to visual and air quality benefits from street trees, these expanded planting areas detain storm water through infiltration, reduce the volume of water entering the stormwater system, and lessen the discharge of pollutants into local water bodies during storms.

Street tree spacing should reflect the role of the street and reinforce it as a pedestrian space, while enforcing the roles of the bioswales and stormwater infrastructure that exists below the surface treatment. To this end, street tree recommendations are in tune with the need for species that are moisture and salt tolerant.



Figure 5.28: Consideration of scale of the tree when matured is important



Figure 5.29: Proper spacing of trees can reflect the role of the street

Choosing the Right Tree

- When selecting a tree consider the mature height and spread of a tree to ensure that the surrounding or proposed structures will not impede on the growth of the tree. (For example medium or large trees should not be planted under overhead wires.)
- Street trees should have a considerable tolerance to salt and be a City of Vaughan and Region of York approved Street Tree.

Specific tree, shrub and grass recommendations the two planting zones along the corridor are as follows:

Zone 1 Roadside planters and bioswales - Extreme resiliency

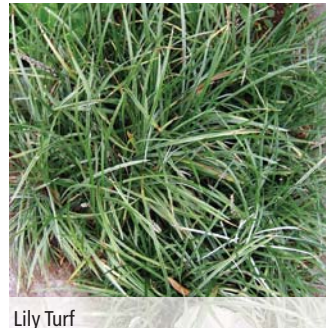
Tree	Shrub	Grass
Black Locust <i>Robinia pseudoacacia</i>	Fragrant Sumac	Indian Grass
Black Gum <i>Nyssa sylvatica</i>	Cotoneaster	Northern Sea Oats
Maidenhair Tree <i>Ginkgo biloba</i>	Dwarf Bush Honeysuckle	Switch Grass



Switch Grass



Sedge



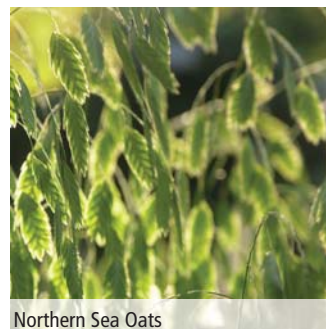
Lily Turf



Little Bluestem

Zone 2 Secondary/parallel planters and bioswales - High resiliency

Tree	Shrub	Grass
Swamp White Oak <i>Quercus bicolor</i>	Chokecherry	Little Bluestem
Chinese Scholar Tree <i>Styphnolobium japonicum</i>	Potentilla	Sedge
Japanese Zelkova <i>Zelkova serrata</i>	Serviceberry	Lily Turf



Northern Sea Oats



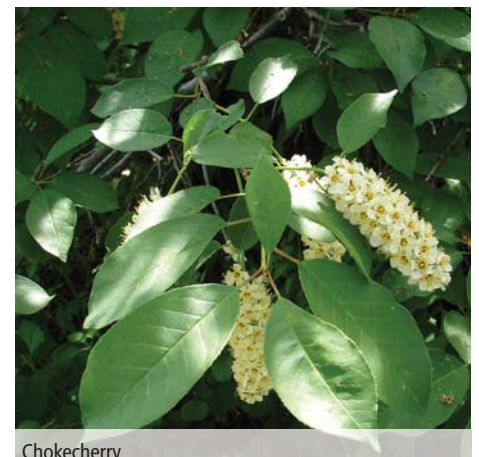
Indian Grass



Bush Honeysuckle



Cotoneaster



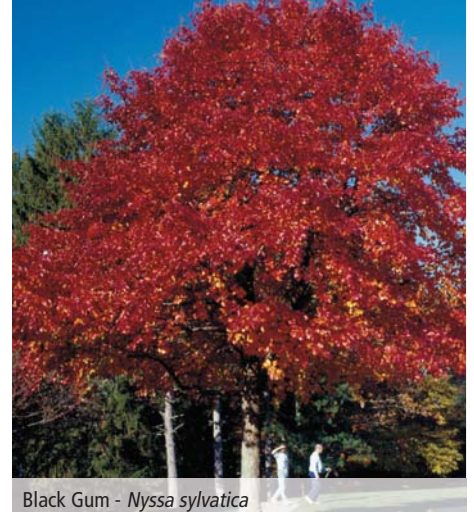
Chokecherry



Japanese Zelkova - *Zelkova serrata*



Swamp White Oak - *Quercus bicolor*



Black Gum - *Nyssa sylvatica*



Chinese Scholar Tree - *Styphnolobium japonicum*



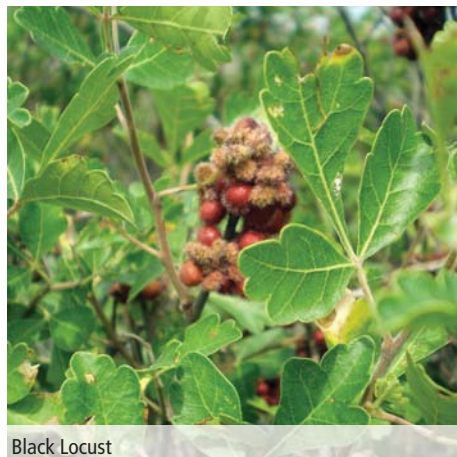
Black Locust - *Robinia pseudoacacia*



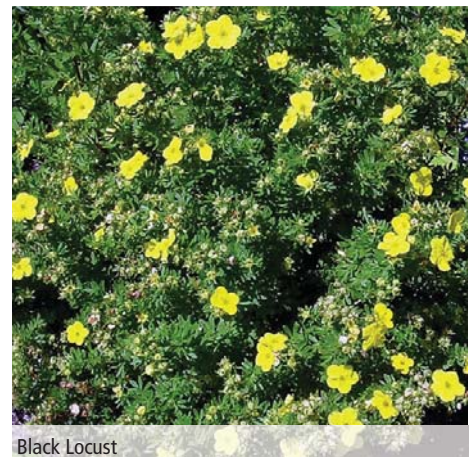
Maidenhair Tree - *Ginkgo biloba*



Black Locust



Black Locust



Black Locust



Figure 5.30: Appropriate soil replacement or equivalent is recommended



Figure 5.31: Proper spacing of trees can reflect the role of the street



Figure 5.32: To ensure properly irrigated new trees, gator bags are recommended

Tree distribution should be nearly completely random to add variety in scale, colour, form and textures and visual interest. Varied distribution also ensures that if disease should affect some trees, the problem would not become widespread, and replacement would be straight forward.

Spacing of Street Trees

- Minimum distance between streets trees is 8m.
- Do not plant trees in front of entrances of buildings.
- Trees require a minimum of 16m³ meters of soil to allow for ample growing space for the roots. The ideal minimum tree pit size is 1.5m x 9m x 1m.
- Growing Soil and Top Soil quality should meet the requirements specified by York Region and City of Vaughan
- Planting trees must be planted while dormant – spring planting (March 15 - May 15) and fall planting (October 15 – December 1).

Parks and Forestry

- Irrigation and proper drainage is required for all planters.
- No annuals or hanging baskets.

Watering

- All newly planted trees require a minimum of 20 gallons of water to thoroughly saturate the soil. This quantity may fluctuate depending on weather conditions.
- Water should not cause uprooting or expose the roots.
- This quantity may fluctuate depending on weather conditions.
- The initial 2 years of development should specify the use of gator bags for the continual drip irrigation needed by newly establishing plants.

Tree Care

- Street trees require maintenance (weeding, cultivating, pruning, soil replacement, and repair).
- All dead, broken, bruised or crossing branches should be pruned with a clean cut. The crowns of young trees must not be cut back.
- The base of the tree should have adequate opening between pavers or tree grate surface (a minimum of .4m opening). Pavers may be removed to increase the tree opening as the diameter of the trunk increases. Tree grates must be adjusted if the opening becomes too small for the tree.

Tree Protection

- All trees should be protected from being damaged from bicycles being locked to the trees and from car/truck doors opening on the tree.
- Ideally the trees should be protected by using a tree guard. Alternatively a mesh wrap and signage can be used to prevent and educate bicycles locks from being wrapped around the tree. If a mesh is being used as a protection strategy the diameter of the mesh must be increased as the tree grows to prevent it from choking the tree.

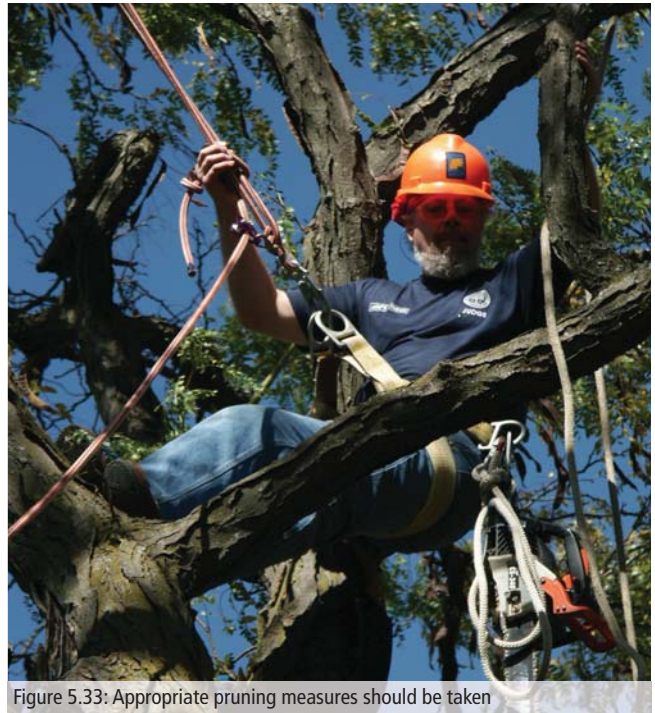


Figure 5.33: Appropriate pruning measures should be taken




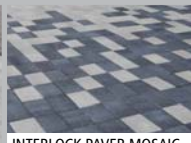
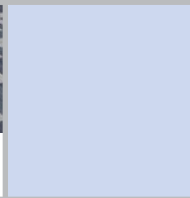




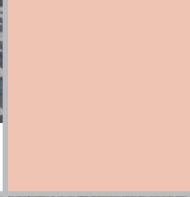
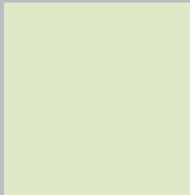

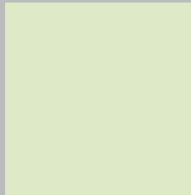




Figure 5.34: Gator bags provide continual drip irrigation











5.3 Streetscape Element Matrix

Centre Street Typical and Enhanced Streetscape Elements

PAVING

	Typical midblock sidewalk	Continuity Strip	Tree / Furnishing zone paving	Corner Treatment	Greenway Trail
AVENUE	 CAST-IN-PLACE CONCRETE SIDEWALK	 MIDNIGHT SKY + WINTER MARVEL INTERLOCK PAVER BANDING	 MEDIUM TONED INTERLOCK PAVER	 INTERLOCK PAVER MOSAIC WITH INCREASED INTENSITY FROM LIGHT TO DARK	
BOULEVARD	 CAST-IN-PLACE CONCRETE SIDEWALK	 MIDNIGHT SKY + WINTER MARVEL INTERLOCK PAVER BANDING	 MEDIUM SITES INTERLOCK PAVER	 PAVER MOSAIC WITH INCREASED INTENSITY FROM LIGHT TO DARK	
GREENWAY		 MIDNIGHT SKY + WINTER MARVEL INTERLOCK PAVER BANDING		 PAVER MOSAIC WITH INCREASED INTENSITY FROM LIGHT TO DARK	 PERMEABLE CONCRETE

FURNISHINGS


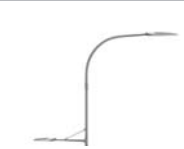













	Tree grates	Benches	Integrated benches	Transit shelters
AVENUE	 CUSTOM LINEAR TREE GRATES	 YRRT VIVANEXT STANDARD BENCH	 INTEGRATED DESIGNER BENCH	 YRRT VIVANEXT STANDARD SHELTER DESIGN
BOULEVARD	 CUSTOM LINEAR TREE GRATES	 YRRT VIVANEXT STANDARD BENCH	 INTEGRATED DESIGNER BENCH	 YRRT VIVANEXT STANDARD SHELTER DESIGN
GREENWAY		 YRRT VIVANEXT STANDARD BENCH		 YRRT VIVANEXT STANDARD SHELTER DESIGN

5

Streetscape Elements

LIGHTING

SIGNAGE

	Street Lighting	Pedestrian Light Fixture	Pedestrian Lighting	Banners (Future Option)	Gateway Signage (Future Option)	Wayfinding / Directional (Future Option)
AVENUE	 STATE-OF-THE ART STREET LIGHTING	 COMBINED PEDESTRIAN AND STREET LIGHT	 SINGLE LIGHTING ALONG TRAILS AND SIDEWALKS	 INTERCHANGEABLE SEASONAL BANNERS	 PROMINENT PLACE SENSITIVE GATEWAY FEATURES	 CENTRE STREET SPECIFIC WAYFINDING & SIGNAGE
BOULEVARD	 STATE-OF-THE ART STREET LIGHTING	 COMBINED PEDESTRIAN AND STREET LIGHT	 DOUBLE LIGHTING AT HIGH USE AREAS	 INTERCHANGEABLE SEASONAL BANNERS	 PROMINENT PLACE SENSITIVE GATEWAY FEATURES	 CENTRE STREET SPECIFIC WAYFINDING & SIGNAGE
GREENWAY	 STATE-OF-THE ART STREET LIGHTING				 PROMINENT PLACE SENSITIVE GATEWAY FEATURES	 CENTRE STREET SPECIFIC WAYFINDING & SIGNAGE

LANDSCAPING

	<i>Street Trees in Tree Grates</i>	<i>Curbed Bioswales</i>	<i>Naturalized Bioswales</i>
AVENUE	 <p>CONTINUOUS PLANTER WITH GRATE</p>		
BOULEVARD	 <p>CONTINUOUS PLANTER WITH GRATE</p>	 <p>CONTINUOUS PLANTER WITH GRATES</p>	
GREENWAY			 <p>NATURALIZED NATIVE WET MEADOW BIOSWALE</p>