

YORK REGION

# STREET TREE AND HORTICULTURAL DESIGN GUIDELINES

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**FORESTRY**

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**York Region**

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# 1. STREET TREE AND HORTICULTURAL DESIGN GUIDELINES OVERVIEW

## 1.1 Introduction

Trees and woodlands cover almost one-third of York Region, an area stretching north from the City of Toronto to the shores of Lake Simcoe, and from Peel Region and the Holland River in the west to Durham Region in the east. These forest resources, which are made up of privately and publicly owned forests as well as trees in parks and cemeteries, along streets and on farms, in residents' front and back yards and other private lands, greatly benefit York Region's residents and its environment.

With York Region ranked as one of Canada's fastest growing regions, continuing development pressure is putting its natural heritage, including trees, increasingly at risk. Demand for development land in both existing and planned urban areas is reducing the space available for trees and increasing the stress on those that remain. On top of growth pressures are serious threats from exotic insects, diseases, and invasive plants, as well as from climate change.

A growing body of evidence shows that tree canopy cover has major environmental, economic, social, and public health value, especially in urban areas. Trees in towns and cities help prevent dangerous heat buildup in summer and protect against the cold of winter. They clean the air of pollutants and store carbon that would otherwise contribute to global warming. As trees connect to form larger woodland areas, they provide habitat for plants and wildlife, including species at risk of extinction, and offer residents recreational opportunities like hiking and snowshoeing.

York Regional Council adopted a Forest Management Plan in November 2016 to maximize the benefits of all trees in the Region and to combat threats. Two key pillars of the plan are:

- Recognizing the value of all trees, not just those in woodland areas, and taking them into account as living, green infrastructure assets, and
- Working to increase the tree canopy cover in all settings.

These pillars reflect the changing face of York Region. As the pace of urbanization has quickened, the Region's forestry responsibilities have expanded to include not just protecting large woodlands but also planting and caring for thousands of trees in urban settings. All nine local municipalities are also putting increasing resources into trees in parks and along streets, as well as managing natural areas. The two conservation authorities operating in the Region have also intensified their efforts. Proper management and understanding of what has been gained from these investments is critical, as is support for future activities.

A significant driver to changes in the urban forestry program are the changing needs of our transportation system. Streetscape design plays an important role in city building and the establishment of a sense of place. Evolving best practices call for cross-disciplinary collaboration and approaches to street design that integrate boulevard and roadway design while recognizing the unique attributes of the area and land uses.



This approach is often called Context Sensitive Solutions (CSS). It shifts the focus from planning for vehicle capacity to planning for streets that provide greater mobility for all users and greater integration with the community.

The Complete Streets movement is also related to CSS. This movement, championed by the National Association of City Transportation Officials and the Toronto Centre for Active Transportation calls for the provision of safe, convenient, and comfortable travel for all users regardless of mode of transportation. Many of the design approaches recommended through Complete Streets support CSS, including an increase of pedestrian accessibility, safe cycling facilities and priorities for transit while decreasing the emphasis on vehicle movement. This significant shift of emphasis coupled with the increased usage of hardscapes that incorporate trees, shrubs and perennials presented a need for consistent design standards for long-term survivability.

## **1.2 Purpose**

The Street Tree and Horticultural Design Guidelines aim to provide a selection of standard design options for street tree, shrub, and perennial planting in both soft and hardscape conditions. The intent of these guidelines is to encourage better tree planting practices resulting in larger trees in the Regional road allowance to increase the ecosystem services they provide. While many factors contribute to the health, size and longevity of a street tree, these guidelines focus on the sustainable site design of the planting environment to ensure greater viability.

## **1.3 How to Use the Guidelines**

The economic value that a tree provides is not always considered along with other standard assets. Trees provide many immediate and long-term benefits that need to be considered when planning for development and integrating tree planting. Improper design and poor tree installation too often result in high tree failure and loss of investment. Education for contractors, developers, landscape architects and Regional staff is imperative to ensuring the success of the urban forest.

- Section One of this manual identifies the value of green infrastructure and benefits of the urban forest, the challenges they face, and strategies to ensure tree success.
- Section Two identifies the requirements of a street tree and horticultural design submission for a Regional road allowance.
- Section Three identifies the design requirements based on road section type.
- Section Four provides a list of resources to support these design requirements.

Three road section types have been categorized within these guidelines including urban, suburban, and rural. Urban road sections are highly urbanized and constrained cross sections. This 4-6 lane road section type includes the use of a large amount of hardscape materials including landscaped medians and boulevard planters. Speed limits tend to be slower than in a suburban road section type. Designing streetscapes for this site context differs greatly from designing grassed boulevards.

The suburban road section is used to connect urban centres. This 4-6 lane cross section tends to have higher speeds than an urban road section, requiring greater setbacks but lack the number of constraints. These cross sections may incorporate landscaped medians and grassed boulevards. To manage stormwater, these roads may have curbs or gravel shoulders with catch basins or have drainage swales.

Rural road sections differ greatly from urban and suburban cross sections due to lower densities and traffic volumes and a greater variety of adjacent land uses. This 2-4 lane cross section tends to have higher speeds than the suburban road section, requiring greater setbacks but lack the number of constraints. These cross sections may or may not include sidewalks, multi-use paths and cycling facilities. These grassed boulevards generally incorporate drainage swales for road stormwater management.

By identifying the road section type for a project or development submission, the user of these guidelines will be able to understand and incorporate the guiding principles into a successful design. Once the road section type is determined, adhere to the requirements provided in these guidelines as well as any applicable Streetscape and Natural Heritage and Forestry guidelines, specifications, and standard drawings.

## 1.4 York Region Guiding Documents

There are a variety of documents that must be considered when designing the Regional roadway, including but not limited to the documents listed below. Users of this manual shall reference the most current version of these documents.

- [York Region Street Tree and Forest Preservation Guidelines, January 2022](#)
- [York Region Irrigation Design Guidelines, February 2022](#)
- York Region Street Tree Health Assessment, 2020
- York Region Green Infrastructure Asset Management Plan, 2019
- [Designing Great Streets Guidelines, 2019](#)
- [Pedestrian and Cycling Planning and Design Guidelines, 2018](#)
- [York Region Forest Management Plan, 2016](#)
- [Streetscape Design Review Manual, 2014](#)
- [York Region Sight Triangle Manual](#)
- [York Region Road Design Guidelines](#)
- [South Yonge Street Corridor Streetscape Master Plan](#)
- [Yonge Street and Davis Drive Streetscape Master Plan](#)

## 1.5 Alignment with Designing Great Streets

In recognition of the 2019 Designing Great Streets Guidelines document (hereafter the ‘DGS Guidelines’), the Street Tree and Horticultural Design Guidelines align with and provide further details about the softscape elements and urban design attributes of the six road typologies. In each road section type of this manual, the related DGS Guideline road typologies will be referenced. Additional requirements for each DGS road typology shall be reviewed in the main document [available online](#).

**DGS GUIDELINES  
ALIGNMENT**

## 1.6 The Value of Green Infrastructure

Green infrastructure refers to both natural and human-modified elements that provide ecological and hydrological functions and processes. York Region has evaluated its portfolio of green infrastructure to understand how important these assets are to the social and economic well-being of York Region and its residents.

One of the three key asset groups in this portfolio is the urban forest, which consists of street trees and landscape planting along the Region’s roadways. It also includes the infrastructure required to support trees and enhanced landscaping, such as irrigation systems and planters. These elements all contribute to increased overall canopy cover.

Biological assets that make up the urban forest include street trees, shrubs and perennials, and the soils in which these assets are planted. As development and transportation continues to evolve, complex civil assets are required to support the urban forest, including tree grates, planters, and irrigation systems.

To ensure the benefits of green infrastructure are present along our Regional roadways, innovative streetscape solutions are often being considered. Fortunately, creating space for trees also provides opportunities for other landscape opportunities which supports some of the strategic actions in York Region’s *Vision*.

- Design streets as public spaces that contribute to healthy living by encouraging active transportation and enhance the attractiveness of the Region and its natural systems.
- Promote the use of urban tree canopies to protect against extreme heat events and identify and value other ecological and health benefits of the urban forest.



## 1.7 The Benefits of Trees

Research shows that trees in all settings provide valuable ecosystem services. Ecosystem services are measurable benefits to the environment and people including:

- Creating oxygen and removing pollutants and particulate matter from the air
- Saving energy by reducing the need for air-conditioning in the summer and heating in the winter
- Capturing carbon for long-term storage, a process also known as sequestration that is valuable in mitigating climate change
- Reducing stormwater runoff and improving water quality
- Providing habitat for birds and other wildlife

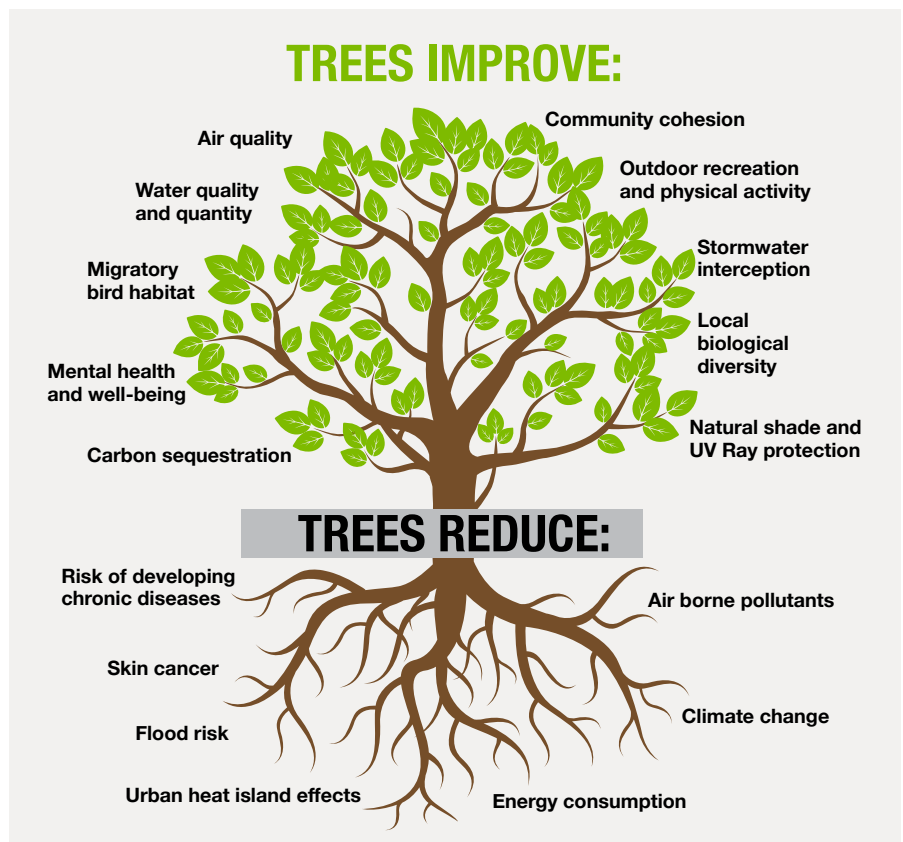
The 2021 Ecosystem Services Quantification Report of York Region Green Infrastructure found that trees and shrubs on Regional roadways improved local air quality by absorbing gaseous pollutants or binding particulates to leaf and bark surfaces. These trees and shrubs remove approximately 7.4 tonnes of pollutants annually and produce over 675 tonnes of oxygen. Additionally, they sequester over 250 tonnes of carbon annually. These benefits are anticipated to increase into the future as our street trees grow and mature.

Some services that a tree provides are easier to understand and feel on a summer day. For example, the ability of trees to provide shade and cool the air by expelling water through their leaves helps to offset what is known as the urban heat island effect, where lack of trees and vegetation around buildings and paved areas can increase air temperatures in urban areas.

As trees form larger groups and eventually woodlands, they provide additional ecosystem services through their complex relationships with other tree species, plant, birds, animals, and other life forms.

Additional benefits more difficult to quantify, but nonetheless important, range from improved public health and well-being to increased property values.

There are approximately 70,000 trees on York Region roadways. Although street trees represent a small proportion of the total tree canopy, they are extremely significant in their contribution to the quality of the urban environment. Increasing both the number and size of street trees in York Region will not only benefit the urban forest, but also greatly enhance the livability of the Region.



**Figure 1 - Examples of the value of trees and their benefits**

## 1.8 Street Tree and Plant Health

When developing a street tree and horticultural design, it is important to know the physiological growing habits of a tree and other plants. For example, tree roots are predominantly found in the upper metre of soil and extend well beyond the crown of the tree.

Threats to trees and landscapes in the urban environment are due to a number of impacts including site characteristics, climate and environmental conditions, infrastructure conflicts, and cultural and management practices. Key challenges to Regional street trees and horticulture are discussed below.

### 1.8.1 Site Conditions

Physical challenges in the streetscape environment include microclimate, maintenance practices, increased drought, and salt and air pollution. The streetscape environment creates microclimate extremes due to wind tunneling, reflected heat from asphalt and concrete and reflected light and shade from surrounding structures. Inadvertent damage caused by vehicles, snowplows, lawn equipment and vandalism threaten the health of trees and plants and make them more susceptible to insects and diseases.

### 1.8.2 Space

For trees to sustain good health and achieve their growth potential, and consequently provide the most benefits, trees must have sufficient room to grow. Trees are competing for available space in the boulevard. This space is crowded with:

- Infrastructure to accommodate vehicular, pedestrian and cycling traffic, and
- Utility infrastructure above and below ground such as communication lines, gas, water, wastewater, and hydro lines.

Another space challenge is the placement of trees relative to the road surface. According to the 2020 Street Tree Health Assessment and other industry research, trees closer to the edge of the road are overall at a greater risk. Trees in, what may be called this “winter threat zone,” are more likely to show signs of poor health because of winter road maintenance activities and salt spray. When planting trees within 3.0m from the face of curb, trees require additional protective measures such as raised planter beds or other soil improvement techniques to mitigate those impacts.

There is also a need to ensure that pedestrians and cyclists are provided with safe spaces to enjoy their community. Through the creation of the 2019 Designing Great Streets document, York Region has been able to develop a streetscape vision that recognizes the needs of all stakeholders, including residents. The buffer that trees and enhanced landscapes provide between the road and pedestrians and cyclists creates an enjoyable space for all users.



### 1.8.3 Soil

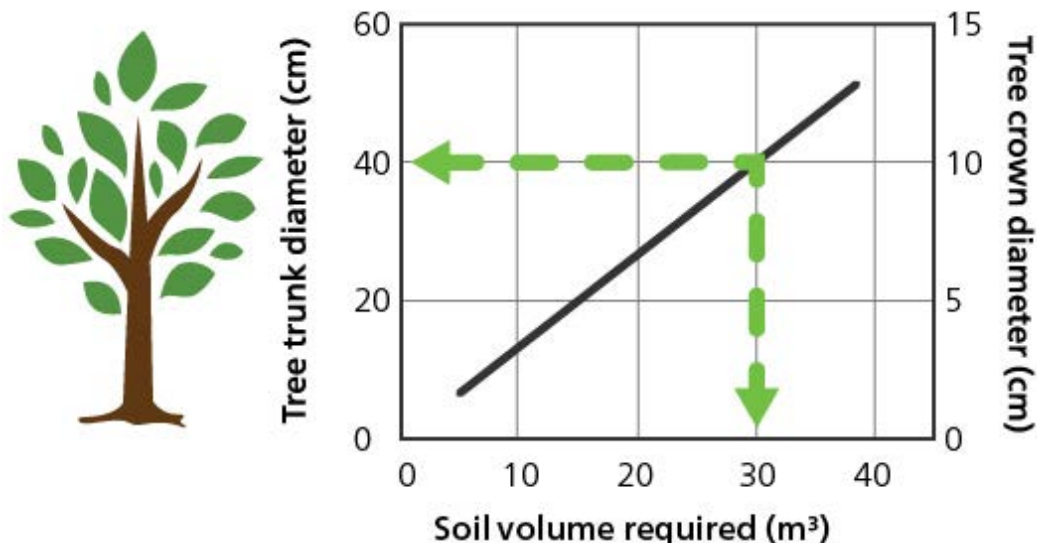
The successful growth and survivability of a tree and surrounding landscapes is fundamentally linked to the quantity and quality of soil in which it grows. Typical construction practices leave sites bare of native topsoil and with high levels of compaction that create an inhospitable place for anything to grow. Soil compaction eliminates pore space preventing roots from penetrating the soil and limits the tree or plants access to water and oxygen. Topsoil stripping and stockpiling introduces composition and texture variability, modified pH, interrupted nutrient cycling, temperature extremes, reduced soil organism activity and contamination with waste materials. All these factors combined make it very difficult for trees and plants to grow its root system and survive.

York Region has developed an Engineered Growing Media specification to mitigate the challenges trees and plants face in developing strong root systems within Regional road allowances. This media is made up of approximately 50% coarse sand, 40% topsoil and 10% high-lignin organic matter. This high sand planting media allows for faster water infiltration rates. As this media can only be compacted to 80% proctor density, it also ensures that the soil will not become compacted over time with vehicle vibration, allowing for proper root system development. The high-lignin organic matter is slower to decompose, providing trees with nutrients for a longer period. It is critical to install the Engineered Growing Media in lifts of 15-30 centimetres (cm) and be compacted during installation, to also ensure limited settlement over time.



**Figure 2 - Various soil components of the York Region Engineered Growing Media**

Soil volume is another large consideration. There have been many studies done on tree root development, soil volumes and tree size or age projections. There is a direct relationship between the size of a tree and the amount of quality soil it has access to. A tree with 30m<sup>3</sup> of soil will grow to the size of 40cm in diameter at breast height (DBH) or 40 years in age. Growing large canopy trees is critical to achieving the canopy cover targets mandated in the York Region Forest Management Plan.



**Figure 3 - A graphic that shows a tree's potential crown spread when various soil volumes are provided based on concepts from James Urban's 1992 article from the Journal of Arboriculture 18(2)85-90.**



## 1.8.4 Species Selection

Each species has unique requirements, and the streetscape environment exposes trees and plants to continual and unique stresses. Matching any species to site conditions gives that living organism a better chance at survival. A great deal of thought needs to be incorporated into a landscape design. Consideration should be given to the following factors:

- Road section type and offsets from the road or other infrastructure
- Variability in stock origin and quality and local gene conservation
- Age diversity and ability of species to resist disease and insect impacts
- Exotic pests, diseases, and invasive species
- Adaptation to changing climate

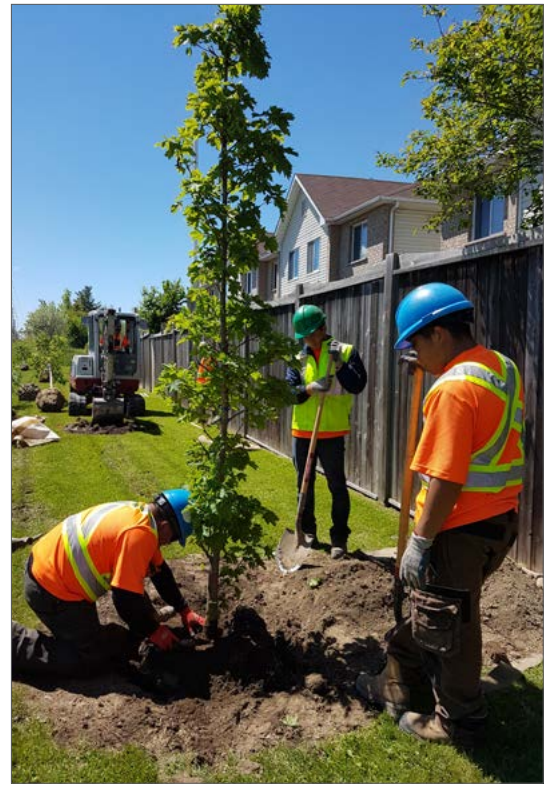
York Region has developed species lists that provide proven and notable performers that are acceptable to plant within Regional road allowances. One list provides acceptable tree species separated by typical overhead wire limitations. The other list provides plant species including deciduous and coniferous shrubs, herbaceous perennials, and perennial grasses for enhanced landscaping opportunities.

## 1.8.5 Planting Installation Considerations

Although these guidelines outline the requirements for an overall successful street tree and horticultural design, users of this guide shall also consider key factors to correctly installing trees, shrubs and perennials on the Regional road allowance such as time of year, quality nursery stock and proper installation methods.

When implementing the design on the Regional road allowance, planting shall occur in the preferred spring planting window of April 15 to June 30, weather depending. A fall planting window shall only be considered for installing street trees (no shrubs and perennials) when reviewed and approved by Natural Heritage and Forestry. Allowing planting to occur outside of the spring planting window is dependent on various factors including project size, weather conditions and other considerations, and will be determined on a project-by-project basis.

It is strongly recommended that all consultants and/or contractors conduct thorough inspections of the nursery planting stock prior to being installed on the Regional road allowance. Nursery stock quality and planting quality are subject to the Region's specifications and will be inspected accordingly. Items with major stock or planting deficiencies such as stem scars, incorrect planting depths or incorrect layout may be rejected upon inspection.



Tree planting contractor installing a wire basket deciduous tree.



A surveyor's pin can be used by tree planting inspectors to determine excess soil in the root ball of a wire basket tree. Planting depth is one of the most important factors in proper tree planting.

## 2. SUBMISSION REQUIREMENTS

Street tree and horticultural designs shall complement and conform to the Region’s 2019 Designing Great Streets Guidelines. The design is to be submitted early in the design process to ensure the proposed road design allows for the inclusion of sustainable green infrastructure.

All street tree and horticultural designs for Regional road allowances are to be submitted for review and approval by York Region’s Natural Heritage and Forestry team. These submissions are to include a Tree Inventory and Tree Protection Plan, Arborist Report, Landscape Plans with Landscape Layout Plans, Landscape Planting Plans, and a Plant List Table, Irrigation Plans and all applicable construction details, specifications, and standard drawings. This section identifies all the requirements for a successful submission.

### 2.1 Tree Inventory, Tree Protection Plan and Arborist Report

All designs submitted must include a Tree Inventory, Tree Protection Plan, and an Arborist Report completed by a qualified tree professional. These documents must follow the York Region Street Tree and Forest Preservation Guidelines.

### 2.2 Landscape Plans

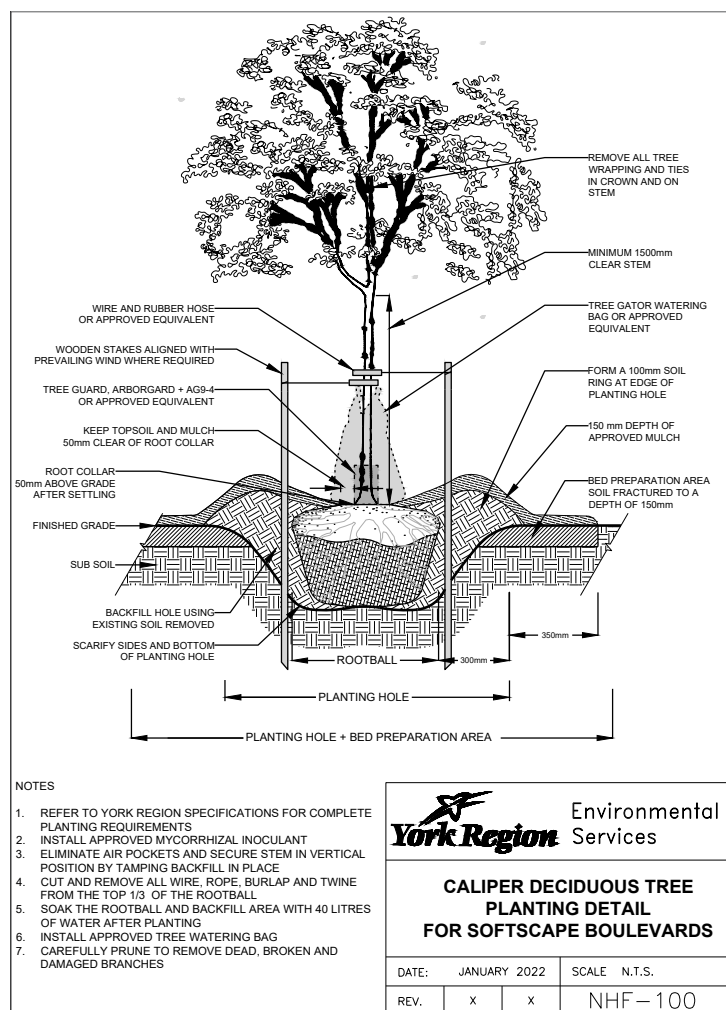
All street tree and horticultural designs must submit applicable landscape drawings, including the various components of a landscape plan described below and be completed by a professional landscape architect.

#### 2.2.1 Landscape Layout Plan

The Landscape Layout Plan depicts all elements and dimensions of the landscape design that will be incorporated on the site. The Landscape Layout Plan is to include site servicing and elements that impact the overall design, including above ground utility lines, hydro pole locations, hydrants, hand wells and streetlights. All landscape boulevard planters and landscaped medians shall include drainage connections to road stormwater management systems; these connections are to be shown on the Landscape Layout Plan. All relevant Landscape Construction Details are to be referenced on this plan.

#### 2.2.2 Landscape Planting Plan

The Landscape Planting Plan will clearly show all existing (preserved) trees and landscaping to remain on the site, as well as proposed trees, shrubs, and perennials. Vegetation shall be clearly labelled using plant keys directly linked to a Plant List Table. The Landscape Planting Plan shall conform to the design criteria described in these guidelines. All relevant Landscape Planting Details are to be referenced on this plan.



**Figure 4 - Example of a caliper tree planting standard drawing to be included in a Landscape Planting Plan**



### 2.2.3 Plant List Table

The Landscape Planting Plan shall contain a Plant List Table in addition to all required planting details. The Plant List Table shall be separated into sections for deciduous trees, coniferous trees, deciduous shrubs, coniferous shrubs, and perennials. Referencing the plant key symbols from the Landscape Planting Plan, the Plant List Table shall include each species botanical and common names, spacing, stock type and size, and quantity. A separate Plant List Table shall be provided for the Regional road allowance, which excludes other plantings, such as planting in regulated areas or private lands, and local municipal road allowances.

### 2.2.4 Landscape Construction Details

Landscape Construction Details are required for all proposed elements of the landscape design within the Regional road allowance. Detail keys are to be included for all construction details on the corresponding plans. Natural Heritage and Forestry standard drawings are to be included or referenced in the development of the Landscape Construction Details. Streetscape standards and specifications shall also be referenced and included, as applicable (see Section Four).

### 2.2.5 Construction Specifications

Construction Specifications are to be included in all York Region capital project submissions. Natural Heritage and Forestry specifications are to be used in the development of contract specifications.

## 2.3 Irrigation Plans

An Irrigation Plan is required for all sites where green infrastructure has been incorporated into hardscapes along Regional road allowances; this includes landscaped boulevard planters and landscaped medians.

Irrigation systems shall incorporate subsurface dripline components compatible with the Rain Bird IQ Centralized Irrigation Control System. These systems shall follow the York Region Irrigation Design Guidelines. All relevant Irrigation standard drawings are to be referenced on this plan.



A landscaped center median with dripline irrigation laid out before plant material is installed.

## 2.4 Typical Submission Requirements for Capital Projects

The below table summarizes the typical requirements at each stage of a capital project. These expectations align with the York Region Street Tree and Forest Preservation Guidelines and the Milestone Checklists described in the York Region Road Design Guidelines.

SUBMISSION STAGE	TREE INVENTORY, TREE PROTECTION PLAN AND ARBORIST REPORT	STREET TREE AND HORTICULTURAL DESIGN DRAWINGS
<b>30%</b>	Preliminary Tree Inventory Preliminary Tree Protection Plan	Consultation required with Natural Heritage and Forestry prior to 60% submission
<b>60%</b>	Tree Inventory/ Tree Protection Plan Preliminary Arborist Report	Landscape Plans, including Landscape Planting Plans (with soil trenches and/or Engineered Growing Media), Landscape Layout Plans (including drainage), Plant List Tables  Irrigation Plans (if applicable)
<b>90%</b> <b>(responding to 60% review comments)</b>	Tree Inventory / Tree Protection Plan Arborist Report	Landscape Plans, including Landscape Plantings (with soil trenches and/or Engineered Growing Media), Landscape Layout Plans (including drainage), Plant List Tables  Irrigation Plans (if applicable)
<b>Pre-Tender</b>	Draft Bid Form – TPZ hoarding and arboricultural services to reflect recommendations provided in Arborist Report  Draft Specifications	Draft Bid Form including Engineered Growing Media and other construction, but excluding planting not in contract  Draft Specifications  All construction specifications and details, including York Region standard drawings  A separate drawing package for York Region Natural Heritage and Forestry contractors



A landscaped center median planter before the Engineered Growing Media, trees and plant materials are installed.



# 3. DESIGN CRITERIA

Due to the diversity of adjacent land uses including commercial, industrial, institutional, and residential uses, site context is paramount in the development of the street tree and horticultural design. Transitions between these uses are imperative to unify the streetscape. The following design parameters shall be considered when incorporating green infrastructure on York Region roadways:

- Maintain visibility and sight line requirements at intersections and entrances
- Ensure public safety and security by planting appropriate species that keep their form to maintain clear visibility; Crime Prevention Through Environmental Design (CPTED) principles shall be considered
- Coordinate the location of Region green infrastructure with the site landscaping for a unified streetscape
- Introduce coniferous plant material where visual screening is appropriate such as along railway corridors, rail overpasses and parking lots
- Choose plant material with ecological compatibility that is appropriate for site conditions
- Maintain a pedestrian connection to the street; use flanking vegetation to enhance these connections
- Accommodate the practical installation of trees and planting material in softscape areas by ensuring grades do not exceed a maximum of 3:1.

## 3.1 Urban Road Section

Urban road sections are highly urbanized and constrained cross sections. This 4-6 lane road section type includes the use of a large amount of hardscape materials including landscaped medians and boulevard planters. Speed limits tend to be slower than suburban road sections. Designing streetscapes for this site context differs greatly from designing grassed boulevards.

**DGS GUIDELINES ALIGNMENT**  
City Centre Streets, Avenue, Main Street

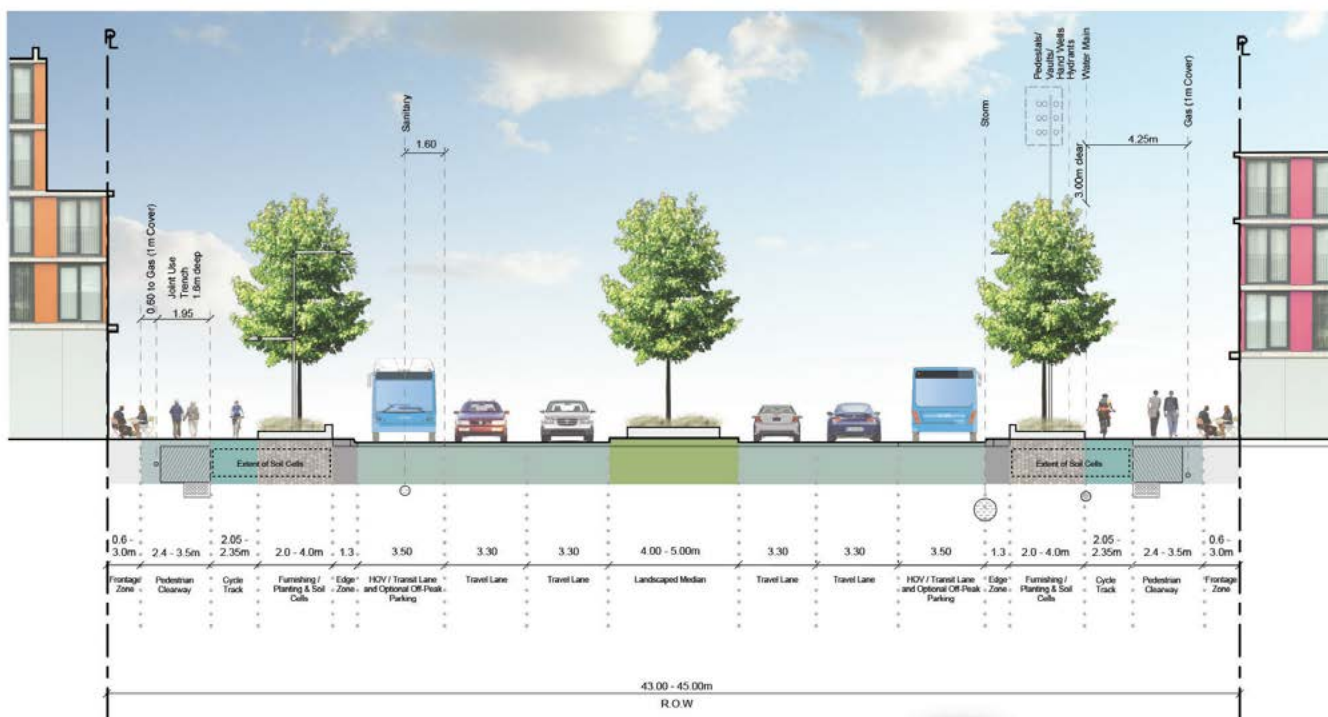


Figure 5 - Sample road cross section of the Avenue typology from DGS Guidelines

### **3.1.1 Street Tree Setbacks**

#### **3.1.1.1 Curb Offset**

In a more constrained urban road section site context, trees may be planted a minimum of 2.0 metres (m) from the face of curb if placed in a raised planter, designed with a planter wall that reduces winter impacts and provides soil and mulch containment. Inclusion of tree grate planters requires additional considerations to be determined upon design review.

#### **3.1.1.2 Intersections and Entrances**

Sight triangles, and daylight triangles, are to be maintained to ensure clear unobstructed sightlines. The York Region Sight Triangle Manual should be reviewed for further information. To ensure that tree trunks, branches and other plant material do not impede visibility the following setbacks should be implemented:

- Trees shall be planted a minimum of 9.0m from back of curb
- Trees should not be planted within 3.0m from an entranceway or driveway
- Plant material within 3.0m of an intersection, entranceway or driveway is to be no higher than 0.6m above grade at maturity

#### **3.1.1.3 Sidewalks, Multi-use Paths and Cycling Facilities**

Sidewalk construction and maintenance should be considered when planning street tree locations. To minimize construction and maintenance conflicts, trees shall be planted a preferred minimum of 1.5m from the edge of sidewalks, multi-use paths or in boulevard cycling facilities. In constrained corridors, this minimum may be reduced to 0.6m.

#### **3.1.1.4 Property Boundaries**

Where sufficient room exists between an existing sidewalk, multi-use path or cycling facility and the property boundary, tree planting may occur with a minimum offset of 0.6m from the property boundary.

#### **3.1.1.5 Energized Lines**

Optimizing full form tree planting shall always be considered a priority. Full form species may be planted under overhead wires where vertical space allows and where an offset of 3.0m can be achieved. Where 3.0m cannot be achieved or where the lowest energized line cannot accommodate full form canopies, small form trees shall be used.

#### **3.1.1.6 Non-energized Lines**

Non-energized lines like telephone or cable require no offsets for planting. Full form trees may be planted directly under overhead non-energized lines.

#### **3.1.1.7 Light Standards and Utility Poles**

To reduce maintenance and visibility conflicts, trees should not be planted within 3.0m from a utility pole or light standard.

#### **3.1.1.8 Below Ground Utility Considerations**

The minimum typical offset for any known below ground utility and/or visible cabinet, manhole or other access is 1.0m. Street tree and horticultural designs shall respect all offset requirements outlined by each utility owner to be sourced externally from these guidelines.

### 3.1.2 Street Tree Species Selection, Spacing and Layout

Street tree species are to be selected from the Region's Acceptable Tree Species for Regional Road Allowances list. Species are to be selected based on the existence or absence of overhead energized lines. Symmetry is encouraged by planting the same tree species in a series of 10-20 in a row on both sides, where similar road conditions exist. If the design requires 15 trees or less, a minimum of 2 species should be considered.

Street trees are to be spaced based on the size and form of tree species at maturity.

- Full form tree species shall be spaced at 8.0m on center when incorporated into softscape boulevards or boulevard planters
- Small form tree species may be spaced at 8.0m on center when incorporated into boulevard planters, if road symmetry is being achieved
- Small form tree species shall be spaced at 6.0m on center when incorporated into softscape boulevards
- Coniferous species and fastigate (columnar) tree form species shall be considered based on the site considerations, adjacent trees, and intended purpose (for example, headlight or utility screening)

Trees are preferably to be placed in the boulevard between the curb and the sidewalk. If additional space allows, trees are to be placed between the sidewalk and property line.

Tree planting stock shall conform to the following sizes:

- Deciduous trees shall be 50mm in caliper
- Coniferous trees shall be 1.5m in height

Refer to York Region Specifications for the Supply and Installation of Caliper Trees for more information.

### 3.1.3 Soil Requirements

To achieve a minimum desired size of 40cm DBH or greater, trees in this road section type have specific soil requirements. Due to many constraints and hardscape usage, adequate soil volumes may not be achievable using open planting beds. Soil cells may be used below hardscapes to achieve soil volume requirements.

#### 3.1.3.1 Soil Volume

With the incorporation of boulevard planters and medians, the importance of soil volume in hardscapes is paramount. The minimum required soil volume is 30m<sup>3</sup> for a single tree or 20m<sup>3</sup> of soil volume with direct access to an additional 10m<sup>3</sup> of shared soil volume for 2 or more trees. This soil volume requirement shall be met in a design that does not exceed a 1.2m soil depth. Reduced soil volume requirements for small form trees in this road context may be considered pending a thorough review of all other site factors.

Structural soil under sidewalks, multi-use paths and cycling facilities may be utilized to allow tree roots to access additional soil volume for trees in grassed boulevards. Achieving the minimum soil volume requirements in grassed boulevards can be achieved outside of the Regional road allowance if the space and design permits.

### 3.1.3.2 Soil Cells

Minimum soil volumes can be achieved through an open planter bed, subsurface soil cells or combination of both. The following design requirements are required for specified soil cells:

- To be provided at locations where other means do not achieve soil volume requirements for tree root development
- To have a proven track record of successfully providing for the healthy vigorous development of a tree rooting system which allows for good healthy tree growth
- To include a manual aeration/irrigation system with an inlet for cell charging
- To have hatches to monitor soil in soil cell areas
- That Engineered Growing Media shall not be installed using blower/ pneumatic means
- To be installed to manufacturer's specifications
- Engineered Growing Media within specified soil cells must be compacted in lifts every 15cm to a proctor density of 80%
- Must meet York Region Transportations load requirement of 300KPA
- Must be reviewed and approved by York Region. Previously approved and applied products include the Cupolex Rialto and Silva Cell soil cell systems; other systems may be considered upon review.



Installation of soil cell system within the boulevard.

### 3.1.3.3 Boulevard Engineered Growing Media Trenches

Boulevard Engineered Growing Media trenches are a requirement when installing a series of three or more trees in softscape boulevards. Existing soil is removed to a depth of 500mm and replaced with Engineered Growing Media. Boulevard Engineered Growing Media trenches must be connected by a subdrain to appropriate drainage systems in new roadway construction. Other methods to optimize drainage shall be considered and reviewed for retrofit construction projects.

Refer to York Region's Specifications for the Supply and Install of Engineered Growing Media for different boulevard types and the standard drawings.



### 3.1.4 Landscaped Medians

The soil volume and tree spacing requirements for landscaped medians is identical to boulevard planters.

Use the Minimum Acceptable Planting Areas for Medians table found below when designing median planters. The minimum inside planting width for trees is 2.0m; the preferred minimum inside planting width for shrubs and perennials is 1.1 m. The asterisks indicate the acceptable median treatments.

Medians containing trees are required to have a minimum 350mm planter wall height; medians containing only shrubs and perennials require a 150mm high curb for mulch and soil containment.

MEDIAN WIDTH <sup>1</sup>	HARDSCAPE FEATURES	PLANTING WIDTH	STREET TREES	SHRUBS	PERENNIALS	PAVING	ARTIFICIAL TURF
4.0 m and greater	Splash Strip – 300mm minimum Minimum 350 mm high planter wall (width 200mm minimum)	2.0 m and greater	*	*	*	*	*
3.5 m	Splash Strip – 300mm minimum Minimum 350 mm high planter wall (width 200mm minimum)	1.5 m		*	*	*	*
3.0 m	Splash Strip – 300mm minimum 150 mm high planter wall (width 150 mm minimum)	1.1 m		*	*	*	*
2.5 m	150 mm high planter wall (width 150 mm minimum)	1.2 m		* <sup>2</sup>	*	*	*
2.0 m	150 mm high planter wall (width 150 mm minimum)	0.7 m			* <sup>2</sup>	*	*

<sup>1</sup> Median width is from edge of pavement to edge of pavement.

<sup>2</sup> Due to limited space, species limited to select high performing species.

### 3.1.5 Tree Grate Requirements

Should tree grates be incorporated into the streetscape design, they must be used in conjunction with soil cells to provide adequate soil volumes. The following performance standards are required when selecting a tree grate fixture:

- Tree grate frames must be able to support a live load requirement of 200psi
- Tree grate frames must incorporate a floating hex nut for the securement of the tree grate cover
- Tree grate decorative cover shall have one curbside manual aeration/irrigation inlet
- Tree grate decorative cover should be 2m x 2m square with removable breakaway centre rings to allow for continued tree growth and shall be salt and corrosion resistant
- Tree grate shall be installed using recessed/countersunk stainless-steel hardware; no screws, nuts, bolts, etc. to be exposed.
- Ensure that the tree is stabilized in planting hole using an approved staking system. Stakes shall be powder coated black, approximately 2.4m in height and with an adjustable rubber strap. Previously approved and applied products include the Mega Grate Stake; other systems may be considered upon review.
- All components must be installed in accordance with manufacturers specifications
- To be designed as compatible and in accordance with York Region Irrigation Design Guidelines to facilitate tree watering and soil cell charging.
- To be reviewed and approved by York Region Natural Heritage and Forestry

### 3.1.6 Horticultural Requirements

Refer to the Acceptable Shrub and Perennial Species for Regional Road Allowances list when developing landscapes within the Regional roadway. Plant selection is to take the following criteria into consideration when designing a landscape.

#### 3.1.6.1 Height

When designing boulevard planters, planting layouts are to have higher species on the roadside and lower species on the sidewalk side. When designing a daylight triangle, higher species are to be in the back and lower species are to be planted in the front. Height of the species at maturity in a boulevard planter shall be considered to account for all required sight lines for the safety of all road users and in all areas, including intersections, midblock entrances or exits such as plazas or other private driveways; refer to the York Region Sight Triangle Manual for more information.

#### 3.1.6.2 Colour and Texture

Ensure that a variety of colours, textures and shapes are considered when selecting plant material for boulevard and median planters and daylight triangles that provide interest throughout the year.

#### 3.1.6.3 Growth

Many of the acceptable species of shrubs and perennials have aggressive growing habits. *Sorbaria sorbifolia*, *Rosa rugosa* and *Rhus aromatica* 'Gro-low' are to be contained by median or boulevard planter walls.

#### 3.1.6.4 Spacing and Size

Spacing of shrubs and perennials shall conform to the following requirements:

- Deciduous and coniferous shrubs shall be spaced 1000mm apart
- Perennials shall be spaced at 500mm apart

Shrub and perennial planting stock shall conform to the following sizes:

- Deciduous and coniferous shrubs shall be 2-gallon potted stock
- Perennials shall be 1-gallon potted stock

Shrubs and perennials, depending on species or variety, shall conform to the following offsets from the inside of the planter wall or edge of planting bed:

- Deciduous and coniferous shrubs shall be 500mm minimum from the inside of the wall or edge
- Perennials shall be 250mm minimum from the inside of the planter wall or edge



Landscaped center median with street trees and a variety of shrubs and perennials.

### 3.1.7 Irrigation Requirements

All enhanced landscaping areas, including raised boulevard planters and center medians, in the urban road section type that are to be maintained by York Region must incorporate dripline irrigation systems compatible with the most current version of the Region's RainBird IQ Centralized Irrigation Control System.

Refer to York Regions Irrigation Design Guidelines when developing irrigation plans for design criteria including placement of boulevard components, materials, specifications, and standard drawings.



Example of dripline irrigation system being installed in a boulevard planter.

## 3.2 Suburban Road Section

The suburban road section is used to connect urban centres. This 4-6 lane cross section tends to have higher speeds than urban road sections, requiring greater setbacks but lacks the number of constraints. These cross sections may incorporate landscaped centre medians and grassed boulevards. Road stormwater management systems may include curbs with catch basins or gravel shoulders with drainage swales within the suburban road section.

**DGS GUIDELINES ALIGNMENT**  
Main Street, Connector, Rural Road, Rural Hamlet

### 3.2.1 Street Tree Setbacks

#### 3.2.1.1 Curb Offset

In the suburban site context, trees should be planted a minimum of 3.0m from the face of curb. In constrained areas, trees may not be centred in the grassed boulevard strip to increase the offset from the curb or edge of road.

#### 3.2.1.2 Intersections and Entrances

Sight triangles, and daylight triangles, are to be maintained to ensure clear unobstructed sightlines. The York Region Sight Triangle Manual should be reviewed for further information. To ensure that tree trunks, branches and other plant material do not impede visibility the following setbacks should be implemented:

- Trees shall be planted a minimum of 9.0m from back of curb
- Trees should not be planted within 3.0m from an entranceway or driveway
- Plant material within 3.0m of an intersection, entranceway or driveway is to be no higher than 0.6m above grade at maturity

#### 3.2.1.3 Sidewalks, Multi-use Paths and Cycling Facilities

Sidewalk construction and maintenance should be considered when planning street tree locations. To minimize construction and maintenance conflicts, trees shall be planted a preferred minimum of 1.5m from the edge of sidewalks, multi-use paths or in boulevard cycling facilities. In constrained corridors, this minimum may be reduced to 0.6m.

#### 3.2.1.4 Property Boundaries

Where sufficient room exists between an existing sidewalk, multi-use path or cycling facility and the property boundary, tree planting may occur with a minimum offset of 0.6m from the property boundary.

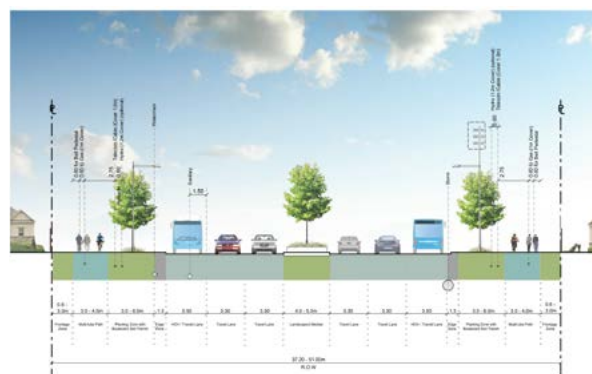


Figure 6 - Sample road cross section of the Connector typology from DGS Guidelines

### 3.2.1.5 Drainage Swales

Trees should not be located within 1.0m of the centre line of a ditch or drainage swale to allow for maintenance of the ditch. Areas where water pools temporarily may be planted, but only with species known to tolerate such site conditions. Caliper tree planting can occur on slopes of 3:1. However, any slope exceeding 3:1 shall be considered for smaller stock sizes such as container grown, potted or bare root stock.

### 3.2.1.6 Energized Lines

Full form trees are to be planted wherever possible. However, if overhead energized lines exist, the minimum offset for planting full form trees is 3.0m, unless vertical conditions allow for additional consideration. If this offset cannot be achieved, small form species are to be selected.

### 3.2.1.7 Non-energized Lines

Non-energized lines like telephone or cable require no offsets for planting. Full form trees may be planted directly under overhead non-energized lines.

### 3.2.1.8 Light Standards and Utility Poles

To reduce maintenance and visibility conflicts, trees should not be planted within 3.0m from a utility pole or light standard.

### 3.2.1.9 Below Ground Utility Considerations

The minimum typical offset for any known below ground utility and/or visible cabinet, manhole or other access is 1.0m. Street tree and horticultural designs shall respect all offset requirements outlined by each utility owner to be sourced externally from these guidelines.

## 3.2.2 Street Tree Species Selection, Spacing and Layout

Street tree species are to be selected from the Region's Acceptable Tree Species for Regional Road Allowances list. Species are to be selected based on the existence or absence of overhead energized lines. Symmetry is encouraged by planting trees in a series of 10-20 in a row on both sides, where similar road conditions exist. If the design requires 15 trees or less, a minimum of 2 species should be considered.

Street trees are to be spaced based on the size and form of tree species at maturity.

- Full form tree species shall be spaced at 8.0m on center when incorporated into softscape boulevards
- Small form tree species shall be spaced at 6.0m on center when incorporated into softscape boulevards
- Coniferous species and fastigiate (columnar) tree form species shall be considered based on the site considerations, adjacent trees, and intended purpose (for example, headlight or utility screening)

Trees are preferably to be placed in the boulevard between the curb and the sidewalk. If additional space allows, trees are to be placed between the sidewalk and property line.

Tree planting stock shall conform to the following sizes:

- Deciduous trees shall be 50mm in caliper
- Coniferous trees shall be 1.5m in height

Refer to York Region Specifications for the Supply and Installation of Caliper Trees for more information.



Tree planting contractor utilizing a mini excavator for proper tree placement in the boulevard.



### 3.2.3 Soil Requirements

To achieve the desired canopy cover outlined in the York Region Forest Management Plan, sufficient soil in the suburban road section shall be provided to optimize all planting opportunities. This requirement may include areas directly adjacent to the Regional road allowance.

#### 3.2.3.1 Soil Volume

In the suburban road context, increased soil volumes are to be achieved wherever possible by way of structural soil under sidewalks, multi-use paths and cycling facilities. This additional soil volume will allow trees to exceed the minimum 40cm DBH or 40-year lifespan.

#### 3.2.3.2 Boulevard Engineered Growing Media Trenches

Boulevard Engineered Growing Media trenches are a requirement when installing a series of three or more trees in softscape boulevards. Existing soil is removed to a depth of 500mm and replaced with Engineered Growing Media. Roadside boulevard Engineered Growing Media trenches must be connected by a subdrain to appropriate drainage systems in new roadway construction. Other methods to optimize drainage shall be considered and reviewed for retrofit construction projects.

Refer to York Region's Specifications for the Supply and Install of Engineered Growing Media for different boulevard types and various standard drawings.



A soil slinger installing the Engineered Growing Media in a median soil trench.

### 3.2.4 Landscaped Medians

The tree spacing requirements for landscaped medians is identical to boulevard planters. Refer to the Landscaped Median section in the Urban Road Section for spacing and for the Minimum Acceptable Planting Areas table (see Section 3.1.4).

The minimum inside planting width for trees is 2.0m; the preferred minimum inside planting width for shrubs and perennials is 1.1m.

Medians containing trees are required to have a minimum 350mm planter wall height; medians only containing shrubs and perennials require a 150mm high curb for mulch and soil containment.

### 3.2.5 Horticultural Requirements

Refer to the Acceptable Shrub and Perennial Species for Regional Road Allowances list when developing landscapes within the Regional roadway. Plant selection is to take the following criteria into consideration when designing a landscape.

#### 3.2.5.1 Height

When designing boulevard planters, planting layouts are to have higher species on the roadside and lower species on the sidewalk side. When designing a daylight triangle, higher species are to be in the back and lower species are to be planted in the front. Height of the species at maturity in a boulevard planter shall be considered to account for all required sight lines for the safety of all road users and in all areas, including intersections, midblock entrances or exits such as plazas or other private driveways; refer to the York Region Sight Triangle Manual for more information.

#### 3.2.5.2 Colour and Texture

Ensure that a variety of colours, textures and shapes are considered when selecting plant material for boulevard and median planters and daylight triangles that provide interest throughout the year.

### 3.2.5.3 Growth

Many of the acceptable species of shrubs and perennials have aggressive growing habits. *Sorbaria sorbifolia*, *Rosa rugosa* and *Rhus aromatica* 'Gro-low' are to be contained by median or boulevard planter walls.

### 3.2.5.4 Spacing and Size

Spacing of shrubs and perennials shall conform to the following requirements:

- Deciduous and coniferous shrubs shall be spaced 1000mm apart
- Perennials shall be spaced at 500mm apart

Shrub and perennial planting stock shall conform to the following sizes:

- Deciduous and coniferous shrubs shall be 2-gallon potted stock
- Perennials shall be 1-gallon potted stock

Shrubs and perennials, depending on species or variety, shall conform to the following offsets from the inside of the planter wall or edge of planting bed:

- Deciduous and coniferous shrubs shall be 500mm minimum from the inside of the wall or edge
- Perennials shall be 250mm minimum from the inside of the planter wall or edge

## 3.2.6 Irrigation Requirements

All median landscape planting in the suburban road section type that are to be maintained by York Region must incorporate dripline irrigation systems compatible with the most current version of the Region's RainBird IQ Centralized Irrigation Control System.

Refer to York Regions Irrigation Design Guidelines when developing irrigation plans for design criteria including placement of boulevard components, materials, specifications, and standard drawings.

## 3.3 Rural Road Section

The rural road section is found in York Region's typical rural countryside and agricultural areas. This 2-4 lane cross section tends to have higher speeds than the suburban road section type, requiring greater setbacks but lacks the number of constraints. These cross sections may or may not include sidewalks, multi-use paths and cycling facilities. These grassed boulevards generally incorporate drainage swales for road stormwater management.

**DGS GUIDELINES  
ALIGNMENT**  
Rural Road

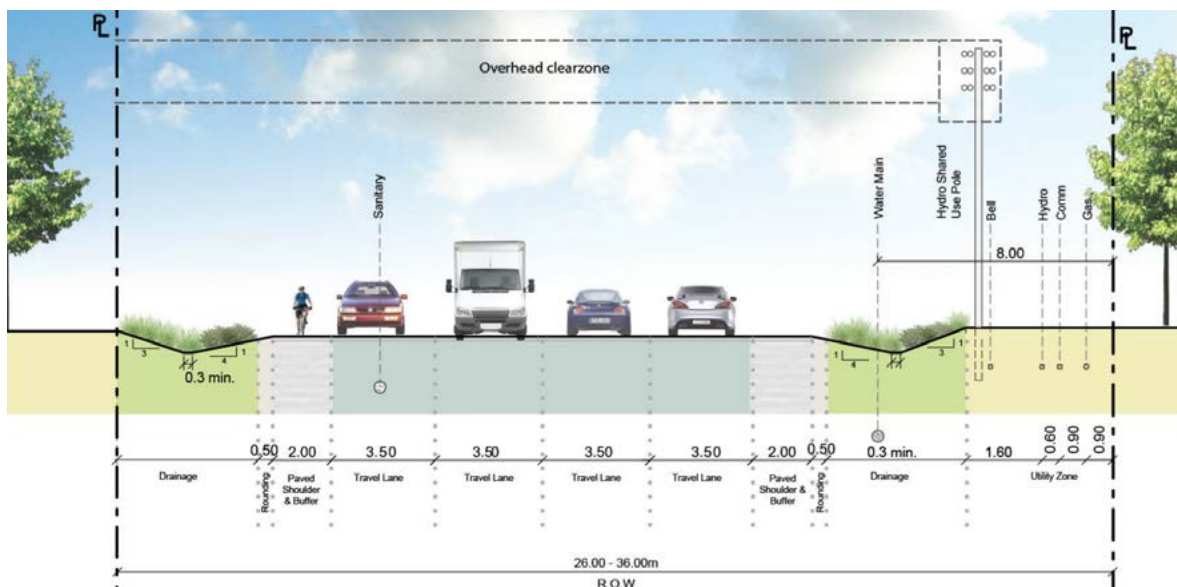


Figure 7 - Sample road cross section of the Rural Road typology from DGS Guidelines

### **3.3.1 Street Tree Setbacks**

#### **3.3.1.1 Curb Offset**

In the rural road site context, trees should be planted a minimum of 5.0 m from the face of curb or edge of pavement.

#### **3.3.1.2 Intersections and Entrances**

Sight triangles, and daylight triangles, are to be maintained to ensure clear unobstructed sightlines. The York Region Sight Triangle Manual should be reviewed for further information. To ensure that tree trunks, branches and other plant material do not impede visibility the following setbacks should be implemented:

- Trees shall be planted a minimum of 9.0m from back of curb
- Trees should not be planted within 3.0m from an entranceway or driveway
- Plant material within 3.0m of an intersection, entranceway or driveway is to be no higher than 0.6m above grade at maturity

#### **3.3.1.3 Sidewalks, Multi-use Paths and Cycling Facilities**

Sidewalk construction and maintenance should be considered when planning street tree locations. To minimize construction and maintenance conflicts, trees shall be planted a preferred minimum of 1.5m from the edge of sidewalks, multi-use paths or in boulevard cycling facilities. In constrained corridors, this minimum may be reduced to 0.6m.

#### **3.3.1.4 Property Boundaries**

Where sufficient room exists between an existing sidewalk, multi-use path or cycling facility and the property boundary, tree planting may occur with a minimum offset of 0.6m from the property boundary.

#### **3.3.1.5 Drainage Swales**

Trees should not be located within 1.0m of the centre line of a ditch or drainage swale to allow for maintenance of the ditch. Areas where water pools temporarily may be planted, but only with species known to tolerate such site conditions. Caliper tree planting can occur on slopes of 3:1. However, any slope exceeding 3:1 shall be considered for smaller stock sizes such as container grown, potted or bare root stock.

#### **3.3.1.6 Energized Lines**

Full form trees are to be planted wherever possible. However, if overhead energized lines exist, the minimum offset for planting full form trees is 3.0m, unless vertical conditions allow for additional consideration. If this offset cannot be achieved, no trees are to be planted.

#### **3.3.1.7 Non-energized Lines**

Non-energized lines like telephone or cable require no offsets for planting. Full form trees may be planted directly under overhead non-energized lines.

#### **3.3.1.8 Light Standards and Utility Poles**

To reduce maintenance and visibility conflicts, trees should not be planted within 3.0m from a utility pole or light standard.

#### **3.3.1.9 Below Ground Utility Considerations**

The minimum typical offset for any known below ground utility and/or visible cabinet, manhole or other access is 1.0m. Street tree and horticultural designs shall respect all offset requirements outlined by each utility owner to be sourced externally from these guidelines.



### 3.3.2 Street Tree Species Selection, Spacing and Layout

Street tree species are to be selected from the Region's Acceptable Tree Species for Regional Road Allowances list. Species are to be selected based on the existence or absence of overhead hydro. Symmetry is encouraged by planting trees in a series of 10-20 in a row on both sides, where similar road conditions exist. If the design requires 15 trees or less, a minimum of 2 species should be considered.

Street trees are to be spaced based on the size and form of tree species at maturity.

- Full form tree species shall be spaced at 8.0m on center when incorporated into softscape boulevards
- Coniferous species and fastigate (columnar) tree form species shall be considered based on the site considerations, adjacent trees, and intended purpose (for example, headlight or utility screening)

Tree planting stock shall conform to the following sizes:

- Deciduous trees shall be 50mm in caliper
- Coniferous trees shall be 1.5m in height

Refer to York Region Specifications for the Supply and Installation of Caliper Trees for more information.

Caliper trees may not be feasible in rural road sections where space and access are limited by drainage ditches or steep topography. Smaller nursery stock is therefore recommended, where appropriate.

If smaller stock is to be used, tree stock shall conform to the following:

- All deciduous container-grown trees shall be a minimum of 150cm in height
- All coniferous container-grown trees shall be a minimum of 100cm in height

Container size in relation to tree height shall be consistent with the 9<sup>th</sup> Edition of the Canadian Standards for Nursery Stock as published by the Canadian Nursery Landscape Association, unless specified otherwise.

## 4. SUPPLEMENTAL RESOURCES

Natural Heritage and Forestry Resources:

- Street Tree and Forest Preservation Guidelines and Standard Drawings
- Irrigation Design Guidelines and Standard Drawings
- Natural Heritage and Forestry – Street Tree and Horticultural External Specifications
- Natural Heritage and Forestry – Street Tree and Horticultural Standard Drawings
- List of Acceptable Tree Species for Regional Road Allowances
- List of Acceptable Shrub and Perennial Species for Regional Road Allowances

Streetscape Resources:

- Municipal Streetscape Partnership Program
- Streetscape Standards and Specifications
- Streetscape Policies and Guidelines Map

To provide feedback on the Street Tree and Horticultural Design Guidelines, please contact [accessyork@york.ca](mailto:accessyork@york.ca).



**FORESTRY**  
[york.ca/standards](http://york.ca/standards)