Highway Dedication Guidelines

Regional Official Plan Guidelines

Halton REGION

Halton Region Official Plan Guidelines

The **Regional Official Plan (ROP)** is Halton's guiding document for land use planning. It contains policies that guide decisions related to, among other things, managing growth and its effects on Halton's social, economic and natural environment.

The **ROP Guidelines** are a set of documents that clarify, inform, and aid in the implementation of the Plan's policies.

"This Plan calls for the preparation of certain guidelines or protocols to provide more detailed directions in the implementation of its *policies*."

Halton Region Official Plan – Section 192
as adopted by Regional Council, December 16, 2009

The Guidelines have been prepared in accordance with Section 192 of the ROP. They provide direction and outline approaches that can be used to satisfy the relevant policies of the Plan. They do not introduce additional policy requirements, and, in the event of a conflict between the Guidelines and the Regional Official Plan, the Plan shall prevail.

The Guidelines may be updated from time to time as required through a report to Regional Council.

For more information, visit **halton.ca/ROP** or **halton.ca/ROPguidelines**, or call 311.

Highway Dedication Guidelines

The **Highway Dedication Guidelines** provide guidance regarding the Region's process for acquiring land through the development process to accommodate road widening and other transportation related facilities and infrastructure.

Purpose	The purpose of the **Highway Dedications Guidelines** is to: • **clarify** the application of Regional Official Plan policy for highway dedications; • **identify** when a highway dedication is required as part of a development application; • **provide guidance** on when additional right-of-way requirements above and beyond what is established in the Regional Official Plan will be required; and • **illustrate** the transportation related facilities and infrastructure that may be constructed within the Region's right-of-way.
Application & Use	Section 173(5) of the Regional Official Plan outlines the Region's policies regarding securing Arterial Road rights-of-way through the development application process. The Guidelines should be used to understand this process and are applicable to a variety of users, including: • **Regional, Local and external agency staff**: as a resource when reviewing development applications that may require a highway dedication; • the **development industry**: for clarity on the application of Regional Official Plan policy regarding highway dedication and related requirements; and • the **public**: to understand how land is acquired and what it is acquired for in the context of accommodating increasing traffic demands, roadway design, and an enhanced public realm.
Supporting Documents	In addition to the policy direction provided by the Regional Official Plan, the following documents should be considered alongside this Guideline, as appropriate: • Provincial Policy Statement, 2014 • The Road to Change Halton Region Transportation Master Plan (2031) • Halton Region Right-Of-Way Guidelines • Halton Region Roundabout Guidelines • Local Official Plan & Zoning By-law
Version	**Version 1.0 |** This version of the Highway Dedication Guidelines was brought before the Inter-Municipal Liaison Committee on June, 18 2014 through Report No. IMLC01-14.

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1.0 Introduction

1.1 Purpose

The purpose of these Guidelines is to assist in the implementation of Regional Official Plan policies concerning required road widening for Major Arterial Roads within Halton Region. Major Arterial Roads are shown on Map 3 of the Regional Official Plan.

While Regional Official Plan policies apply to all Major Transportation Facilities within Halton Region regardless of the ownership of the highways, these Guidelines apply only to Regional roads and intersections under the jurisdiction of Halton Region.

1.2 Policy Context

A Regional Municipality may acquire and hold land within the Municipality for the purpose of developing any feature of the Regional Official Plan. Section 173(5) of Regional Official Plan states that it is a policy of the Region to secure Arterial Road rights-of-way during the development application process. Section 173(6) calls for the preparation of Guidelines to aid in the application of Section 173(5) through the development process which may include: plans of subdivision and condominium, part-lot control applications, consents, site plan approvals, minor variances, and Parkway Belt West Plan and Niagara Escarpment Plan applications. This policy approach is supported by the Provincial Policy Statement, 2014 which states that planning authorities shall plan for and protect corridors and rights-of-way (ROW) for transportation, transit and infrastructure facilities to meet current and projected needs of the Municipality.

The submission of a development application allows Halton Region to require the dedication of defined lands from the owner provided that the land to be acquired by Halton Region abuts the lands being developed and that the highway to be widened and the extent of the proposed widening are depicted on Map 4 or described in Section IV – Healthy Communities Policies, Transportation of the Regional Official Plan. All lands dedicated to the Region must be free and clear of all encumbrances (this includes all mortgages, notices, and other municipal agreements, etc. registered on title to the lands).

In order to accommodate the construction of new road infrastructure, additional ROW may be required above what is designated in the Regional Official Plan. As referenced in the Regional Official Plan, the Region can, based on engineering or Environmental Assessment (EA) studies, vary the alignment and ROW requirement of specific roadway sections and secure the lands from the developer through the planning process.

In addition, for specific transportation facilities, the Region may require dedication of additional lands at intersections to provide for exclusive turning lanes, daylight triangles and other special treatments including, but not limited to the construction of bridges, overpasses and transit related facilities. Such additional ROW requirements will be determined during the EA process or at the time of the design of the road facilities and will become part of the total required ROW. Refer to Figure 1 which illustrates a minimum standard when additional lands are required at an intersection and Figure 2 which illustrates a minimum standard when additional lands are required for a grade separation.

For the purpose of these Guidelines, a “dedication” is defined as the provision of lands abutting a Major Arterial Road by the landowner to Halton Region at no expense to the Municipality.

1.3 Application and Use

These Guidelines provide detailed technical criteria for implementing specific sections of the Regional Official Plan.

It is the intention of Regional Council to use these guidelines for all development proposed in Halton Region.

The Commissioner of Legislative & Planning Service, the Commissioner of Public Works, Commissioner of Corporate Services, the Chief Planning Official or their delegate(s) shall implement these Council adopted guidelines in the course of exercising their duties as employees of the Regional Corporation. The approval or denial by any of the aforementioned employees shall be viewed as an approval or a denial by Regional Council unless it is expressly stated otherwise in these Guidelines.

2.0 Need for Highway Widenings

2.1 Purpose of a Highway

Under the Highway Traffic Act, the definition of "highway" includes: "a common and public road, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle, any part of which is intended for or used by the general public for the passage of vehicles and includes the area between the lateral property lines thereof". The actual travelled portion of a highway is only a portion of the ROW requirements of a highway widening.

The Halton Transportation Master Plan (2012-2031) and Appendix A (Regional ROW Guidelines) identify the design elements for the Region's ROW categories: Rural/NHS, Corridor and Node. These Guidelines provide a comprehensive illustration and coordination of the elements within the Regional Road right-of–ways and formulate the "base-case" conditions from which more detailed street and public realm designs can be created.

In addition, within the ROW of a highway, allowances may be made for the following, which, although they may not affect the function of the roadway, are required in order to provide a service and meet the needs of the surrounding environment. These include: street furniture, parking, traffic control devices, pedestrian sidewalks, boulevards, traffic islands, cycling lanes, drainage, snow storage, landscaping, transit related facilities including stops and stations and underground or overhead utilities.

Undulating topography or other structural elements such as retaining walls may have to be incorporated within the ROW of a highway when it is being widened. Changes to horizontal and vertical alignments, which may affect sight lines, must also be accounted for in the design or widening of a highway. Such variations have to be accommodated within the ROW of a highway. This is particularly notable at intersecting roadways and daylight triangles. Daylight triangle lands are also acquired through the development process and incorporated into the ROW.

In order to protect the function of the highway and control access, in addition to the ROW requirement, the Region may require the dedication of a 0.3 m reserve along the frontages of all Major Arterials as identified on Map 3 of the Regional Official Plan.

2.2 Basis for Requiring Highway Dedications

Many existing highways were designed and constructed before current safety and design standards were in place and do not account for the growth that Halton Region is currently experiencing and expecting to experience to 2031. As a result, securing the necessary road widening lands for highway widening to accommodate increasing traffic demands, roadway design, and safety purposes, at the time of an impending development is for the good of the general public and is sanctioned by the Planning Act, the Municipal Act, 2001 and the Provincial Policy Statement, 2014. Otherwise, the necessary lands for highway widening will have to be purchased or expropriated by the Municipality at considerable expense. It is possible that the Municipality will not be able to acquire the road widening lands, given the extent of development on the property adjacent to the existing ROW and this produces constraints in regards to meeting the needs of the Regional transportation road network.

In many cases, the requirement for highway widening may be triggered by the proposed development itself. The benefits derived by the owner of the land as a result of land use changes through the development process and the improved transportation system may partially or totally offset the value of the land dedicated for highway widening.

These ROW lands will generally be acquired of equal distance on either side of the centerline of the original road allowance. Exceptions to this could occur where it is not possible to acquire ROW due to constraints beyond Halton Region's control or where an Environmental Assessment, engineering study or functional design study recommends an asymmetric alignment.

Additional ROW may be required above what is designated in the Regional Official Plan in order to accommodate the design of new road infrastructure. As referenced in the Regional Official Plan, the Region can, based on detailed engineering studies or Environmental Assessments, vary the alignment and ROW requirement of specific roadway sections and secure the lands gratuitously from the developer through the planning process.

For specific transportation infrastructure, the Region may require additional lands at intersections to provide for exclusive turning lanes and daylight triangles and other special treatments including, but not limited to, the construction of bridges, overpasses and transit related facilities. Such additional ROW requirements will be determined during the EA process or at the time of the design of the road facilities and will become part of the total required ROW. An example shown in Figure 1 illustrates a minimum standard when additional lands are taken at an intersection and Figure 2 illustrates a minimum standard when additional lands are required for a grade separation.

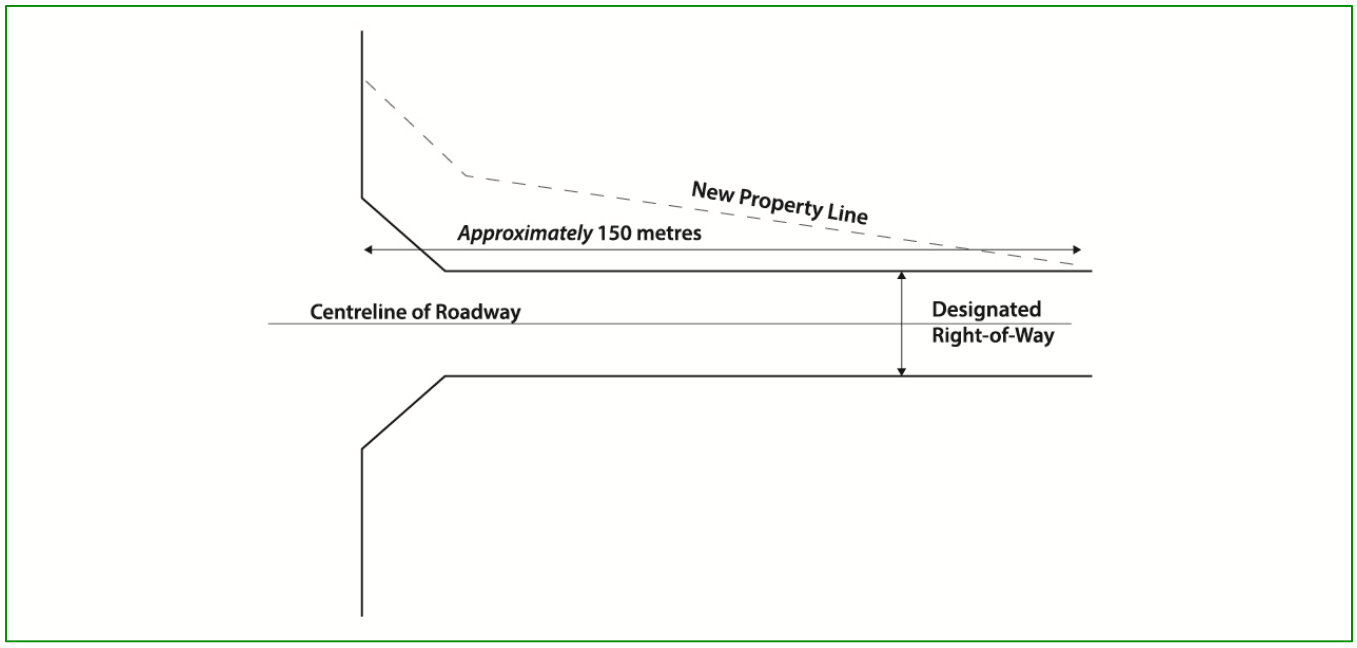

Figure 1 – Additional Property Required at an Intersection

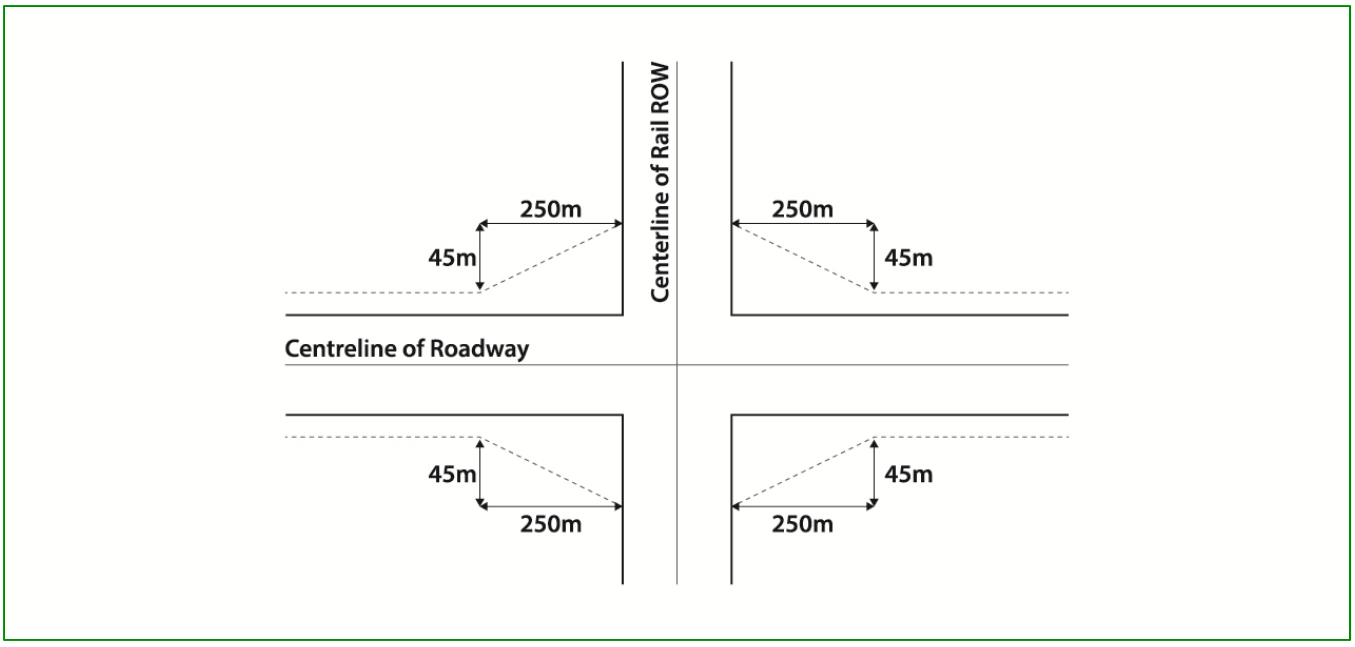

Figure 2 – Additional Land Required for a Grade Separation

All lands to be dedicated to the Region must come to the Region free and clear of all encumbrances. This includes all mortgages, notices and other Municipal agreements etc. registered on the title to the lands.

2.3 Typical Cross-sections

Beyond accommodating traffic movements, the demands on Regional roads are changing in that they also need to address multiple roles related to other users including transit riders, cyclists, and pedestrians. Regional roads are also an integral element in promoting high quality urban design, serving as entryways to communities and encouraging the development of pedestrian-friendly and transit-oriented neighbourhoods.

Halton Region has created Regional ROW Guidelines which group the functional classification of roadways into three categories – Rural/NHS, Corridor and Node – and then provide corresponding Typical Cross-Sections and their ROW requirements. The three categories reinforce an urban structure model that directs growth away from rural and natural heritage areas and towards identified urban growth areas within the Regional Official Plan. These cross-sections are provided in Appendix A.

In addition to the above referenced Regional ROW Guidelines, Halton Region has Council approved "Guidelines for the use of Modern Roundabouts on Regional Arterial Roadways", approved by Regional Council by Report PW-44-12 on July 11, 2012. The option and approval for the implementation of a Roundabout is reviewed, in most cases, during the Class Environmental Assessment (EA) Study process and/or the Detailed Design Phase following the EA Study. The most common reason for installing properly designed roundabouts is greater safety. Roundabouts have been proven to reduce the number and severity of vehicle collisions compared to stop controlled or signalized intersections. Roundabouts are safer due to the lower vehicle speeds, fewer conflict points and less severe collision types. Intersection efficiency is improved, improved access is gained and the roundabouts act as traffic calming due to vehicle speed reductions. Fuel consumption and vehicle emissions are lessened by reducing vehicle delays. Halton's Roundabout Guideline is provided in Appendix B.

3.0 Exemptions from the Requirement for Highway Dedications

The following are circumstances when Halton Region will not require the dedication of its designated ROW:

3.1 Consent Exemptions

A consent application is exempt from highway dedication if it is for:

- a private right of way or an easement;
- a mortgage or charge; or
- a correction of title.

3.2 Minor Variance Exemptions

A Minor Variance application is exempt from highway dedication.

3.3 Niagara Escarpment Commission Development Control Permit Exemptions

A Niagara Escarpment Development Permit Application under the Niagara Escarpment Planning and Development Act is exempt from a highway dedication.

3.4 Zoning Bylaw Amendment Exemptions

A Zoning Bylaw amendment is exempt from a highway dedication.

3.5 Land Acquisition from Exempted Properties

When properties are exempt from highway dedication as described above, Halton Region will acquire the necessary ROW widths for highway widening through other means as appropriate.

4.0 Variances from Dedicating the ROW Widths As Shown on Map 4 of the Regional Official Plan

The following is a set of circumstances where Halton Region will consider a variance from the ROW requirements with the objective to protect a designated Heritage Building, Cultural Heritage Resource, Hamlet or Rural Cluster and as directed through a detailed engineering study.

4.1 Heritage Buildings or Cultural Heritage Resources

When the highway widening involves:

a) a Heritage Building or District designated under the Ontario Heritage Act, or

b) a Cultural Heritage Resource as described under Sections 167(1) and 224 of the Regional Official Plan

Regional staff, assisted by local municipal staff as appropriate, will negotiate with the land owner as to the location and extent of the highway dedication, with the objective of preserving the Heritage Building or Cultural Heritage Resource as much as reasonably possible. If a satisfactory agreement cannot be reached between the Region and local municipality, a staff report will be brought forward to Regional Council for a decision.

4.2 Hamlets & Rural Clusters

Recognizing the need to preserve the character of Hamlets and Rural Clusters (as defined in Section 103 and 104 of the Regional Official Plan), Regional Council will consider a variance from the ROW width requirements as shown in Map 4 of the Regional Official Plan within the boundaries of the Hamlet as defined in the Local Official Plan as follows:

a) As part of the preparation of the Area-Specific Plan for the Hamlet in accordance with Section 106(1) of the Regional Official Plan, a detailed traffic and land use study, carried out by the local municipality in consultation with Regional staff, has demonstrated a different ROW requirement than what is shown in Map 4 of the Regional Official Plan. The Area-Specific Plan, showing the different requirements, has been adopted by both Local and Regional Councils.

b) As part of the preparation of development guidelines for the Rural Cluster in accordance with Section 106(4)e) of the Regional Official Plan, a detailed traffic and land use study, carried out by the local municipality in consultation with Region staff, has demonstrated a different ROW requirement than what is shown in Map 4 of the Regional Official Plan. The development guidelines, showing different requirements, have been adopted by both Local and Regional Councils.

c) As an alternative to Section (a) and (b), Regional Council, after consulting the Local Council, adopts by resolution an interim ROW requirement to be used until such time as the Area-Specific Plan for the Hamlet has been updated in accordance with section 4.2(a) and development guidelines for the Rural Cluster have been updated in accordance with Section 4.2(b).

4.3 Engineering Studies

The location and extent of the ROW requirements as shown in Map 4 of the Regional Official Plan may be varied more or less provided that:

- A detailed engineering study or Environmental Assessment study showing the variances has been carried out by the Region or the local municipality; and

- Regional Council is satisfied that the public and affected land owners have been consulted in the study process.

These ROW lands will generally be acquired of equal distance on either side of the centre line of the original road allowance. Exceptions to this could occur where it is not possible to acquire ROW due to constraints beyond Halton Region's control or where an Environmental Assessment, engineering study or recommends an asymmetric alignment.

5.0 Related Matters

5.1 Buildings or Encroachments on Lands to Be Dedicated

In the event that buildings, landscaping or other encroachments are present on lands to be dedicated for highway widening, Halton Region may consider securing the widening beyond the building/encroachment envelopes. Should the Region find it necessary to allow the encroachments to remain, Halton Region will enter into appropriate agreements with the land owner to the effect that the transfer of the remaining lands needed for the widening will take place at the actual time of project implementation or when the buildings/encroachments are removed, whichever occurs first. The purpose of the encroachment agreement is to permit the encroachment until Halton Region requires use of the lands for the highway. At the time of entering into an encroachment agreement, the owner covenants and agrees that the removal of any encroachment on Regional lands is at the sole expense of the owner, within six months after receipt of a notice from the Region's Commissioner of Public Works that Halton Region intends to use the Regional lands in such a way that the continuance of the encroachment is no longer acceptable. Ideally, it is in Halton Region's best interest to have all lands dedicated with clear title, free and clear of encumbrances.

5.2 Disposal of Surplus Land

Where Halton Region decides that all or part of those lands acquired for highway widening purposes are surplus to its needs, Halton Region will first offer the excess land to the abutting property owners at a price which is considered to be fair market value and is satisfactory to Halton Region. Where Halton Region obtained the lands by way of dedication and where the owner of the lands is the original grantor of the lands, Halton Region shall return such lands at a nominal sum to the grantor.

5.3 Advanced Purchases of Lands for Highway Widening

Halton Region may purchase lands for highway widening purposes in advance of need, provided that such purchases are in the best public interest.

5.4 Boundary Highways with Neighbouring Municipalities

If the Official Plan of a neighbouring Regional or local municipality illustrates a ROW width requirement for a boundary road different from that shown on Map 4 of the Regional Official Plan, Halton Region will secure the greatest identified designated right-of-way width.

Appendix A – Halton Region Right-of-Way Guidelines

The Road to Change

Halton Region Transportation Master Plan

Regional Right-of-Way Guidelines

Halton REGION

2031

July 2011

Final Report


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1.0 INTRODUCTION

1.1 Study Purpose and Contents

This document provides a set of implementable Regional Road right-of-way guidelines in support of the Transportation Master Plan. These guidelines are meant to be consulted at the beginning of any process or project undertaken that involves Regional Roads.

The guidelines are illustrated with a set of typical cross sections and plan view drawings that reflect and accommodate the range of functional requirements anticipated to the year 2031. Conceptual images of future Regional Roads are illustrated through imagery and photomontage. Each category of guidelines – Rural, Corridor and Node - is supported with applicable regional planning policy and illustrated with a complete drawing set. Site specific conditions may require modifications to the guidelines and these will be reflected during the Class EA process.

1.2 Balanced Transportation

Traditionally, the role of Regional Roads has been limited to being thoroughfares primarily designed to move vehicular traffic. These guidelines reflect a shift in direction towards the delivery of a balanced transportation system that aims to reduce automobile dependency in the transportation network. In terms of functional right-of-way requirements, a balanced transportation system provides an allocation of right-of-way and road design to accommodate options for multi-modal transportation, including transit and active transportation[1]. In the context of sustainability, balanced transportation works toward easing congestion and commute times, and reducing transportation-related emissions and greenhouse gases. Balanced transportation also supports Regional health initiatives to promote transportation as a form of regular physical activity through the provision of transit and active transportation infrastructure[2].

[1] Active transportation is defined as non-motorized travel such as walking, cycling, rollerblading and the use of mobility devices (e.g. wheelchairs).

[2] As per Halton Region Health Department: *Creating Walkable and Transit-Supportive Communities in Halton*, February 2009.

Regional right-of-ways play a role in creating a balanced transportation system by:

- Promoting transit-supportive development and the viability and optimization of transit infrastructure by including functional requirements for dedicated transitways, High Occupancy Vehicle lanes (HOV), reserved bus lanes and other transit priority measures;

- Encouraging active transportation with continuous sidewalks, multi-use paths, designated on-road cycling facilities, and their respective crossing treatments; and

- Supporting motorized travel through dedicated turning lanes and signals, HOV lanes, and where appropriate, with on-street parking.

1.3 Integrating Balanced Transportation with Land Use

The integration of transportation planning, transportation investment, and land use planning comes together with the practice of *placemaking*, or the transformation of Regional Roads from single purpose roads into multi-faceted corridors where people will live and work, where residents and visitors can come, shop or gather. Through attractive and context-sensitive design, Regional Roads can become a platform for long-term growth and economic development in urban areas. By thinking over the long-term, Regional Roads can be built with the flexibility to respond to the gradual maturing of neighbourhoods and an expanding mix of uses. In order for Regional Roads to be experienced as actual places, *placemaking* needs to be reinforced with a land use mix that supports investments in transit and active transportation. Supportive land use policies would minimize instances of rear-lotting onto or parallel to Regional Roads and favour development with fronting uses that animate and define the street edge. In rural areas, *placemaking* means respecting the natural qualities of a rural setting.

2.0 POLICY CONTEXT

Over the past few years the Province issued the *Places to Grow Growth Plan for the Greater Golden Horseshoe* (2006), created a new regional transportation agency (Metrolinx), and prepared a new transportation plan for Greater Toronto and Hamilton (*The Big Move*, 2008). In response to these Provincial initiatives, Halton Region has prepared Regional Official Plan Amendment (ROPA) 38 that will provide a long term plan for the Region to the year 2031, as well as a Transportation Master Plan to the year 2031. ROPA 38 identifies where growth in population and employment will occur. The illustration in Figure 1 indicates the location of Regional Roads – in red – in relation to that growth. The design of Regional Roads will need to support this growth by anticipating the appropriate density and land use mix of future and existing communities through which Regional Roads travel.

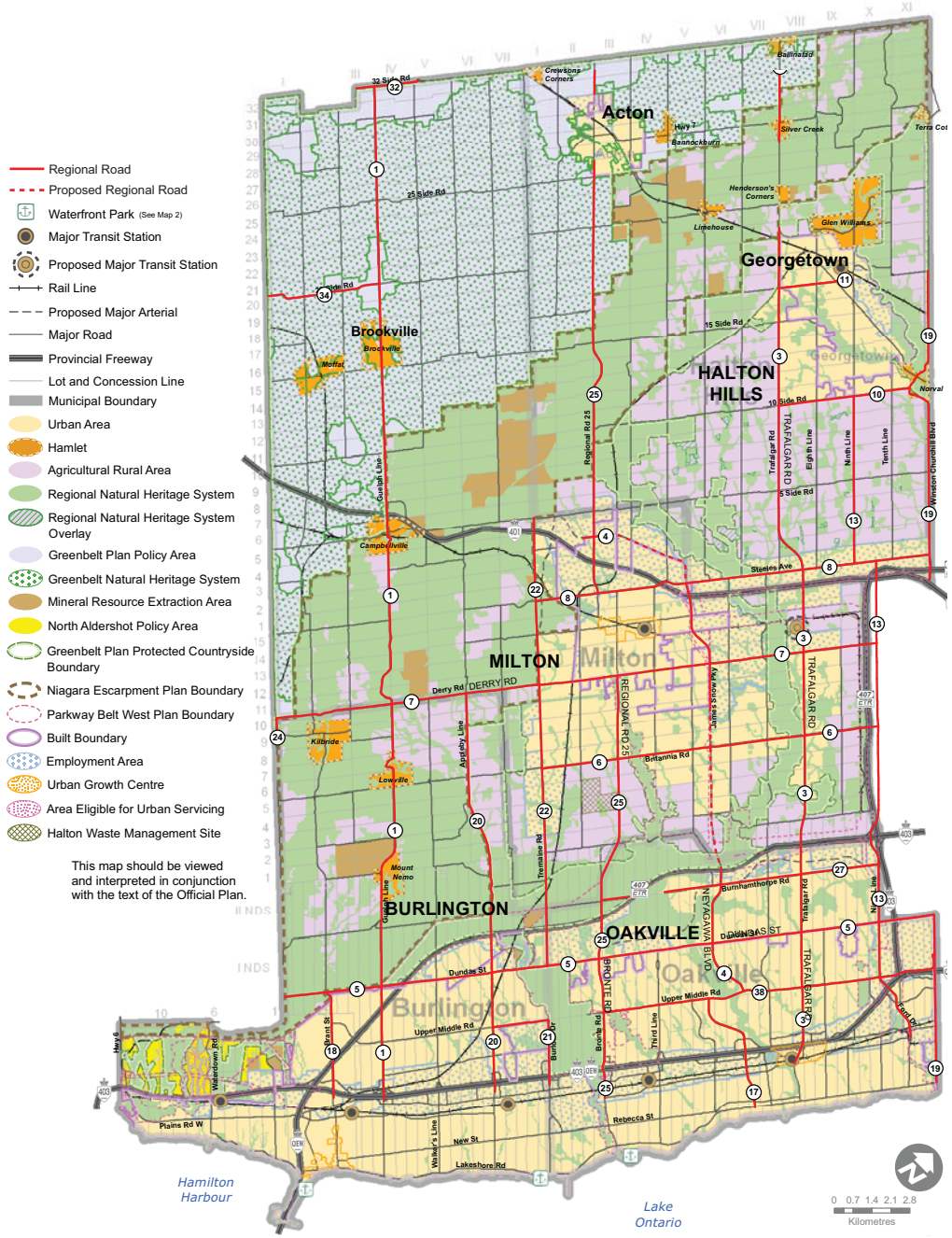


Figure 1: Regional Structure
Source: ROPA 38, as approved by Council December 2009

3.0 ROADWAY DESIGN

3.1 Right-of-Way Categories

The guidelines are grouped into three categories: Rural/Natural Heritage System, Corridor and Node. They reinforce an urban structure model that directs growth away from rural and natural heritage areas and towards identified intensification areas[3].

1. Rural / Natural Heritage System

Rural lands are designated areas for agriculture and protection of infrastructure that supports farming, and Natural Heritage Systems are lands designated for natural area conservation. In planning for intensification and new urban lands, the Region is seeking to minimize development of prime agricultural lands. Regional Roads in Rural / NHS lands should respect the rural character of the area.

2. Corridors

Corridors are intensification areas identified along major roads, arterials or higher order transit corridors that have the potential to provide a focus for higher density mixed-use development and employment use consistent with planned transit service levels[4]. The design and physical appearance of corridors contribute directly to livability and economic success, and therefore should offer a positive community environment and convenient access for residents and businesses to a variety of goods and services.

Corridors will generally vary in use along their length, and their design needs to reflect the change in surroundings. Over time, corridors should include a mix of uses, such as: sidewalk-fronting shops or businesses, offices, civic uses, appropriately scaled and designed public spaces, and a broad mix of residential forms and densities. Corridors that travel through employment lands should provide for development of a quality business environment and include a range of offices, industrial-type buildings, and services supporting employment, such as business-related retail and restaurants, located in buildings with doors and windows that front the street.

3. Node

Nodes are defined as compact, transit-oriented, pedestrian-friendly and mixed-use/residential neighbourhood centres that are areas of more intensive urban uses within a community. They provide area residents with a hub to meet a variety of daily needs (goods and services) and serve as a social focus for the community and as concentrations of office employment uses. Nodes are generally located at the intersections of major transit corridors within the identified intensification areas, and extend approximately 200-400 metres from the intersection.

[3] Intensification areas are lands identified to be the focus for accommodating intensification, or the development of a property, site or area at a higher density than currently exists. Intensification areas include urban growth centres, intensification corridors, nodes, major transit station areas, infill, redevelopment, and the expansion and conversion of existing buildings or developed areas

[4] ROPA 38

3.2 Design Elements

Different design elements are to be accommodated within the right-of-way according to their rural, corridor or node category. Generally, design elements will vary according to population, travel, and land use demands, adding more design elements as development intensifies. For instance, design elements in rural road sections include a paved shoulder, ditch / swale, trees and plantings, whereas design elements in a corridor could include transit priority measures (e.g. HOV or transitway), a multi use path for active transportation, planted boulevard, and pedestrian scale lighting in key activity areas. The table opposite is provided as a quick-reference guide to distinguish among the road categories. A glossary of design elements is provided at the back of this report.

	RIGHT-OF-WAY CATEGORY		
DESIGN ELEMENT	**Rural / NHS** 	**Corridor**  Employment  Mixed-use	**Node** 
paved shoulder	yes	n/a	n/a
ditch / swale	yes	n/a	n/a
transit facility	n/a	variable (transit priority / HOV / RBL / transitway)	variable (transit priority / HOV / RBL / transitway)
pedestrian facility	n/a	sidewalk / multi-use path	sidewalk
bicycle facility	paved shoulder	variable (multi-use path / wide curb lane / bicycle lane)	variable (wide curb lane and / or bicycle lane)
parking	n/a	n/a	off-peak (optional)*
trees in boulevard	n/a	yes	yes (potentially in tree pits)
pedestrian scale lighting	n/a	near transit stops, support services & higher density areas	yes
building setback	n/a	variable	minimized

Figure 2: Quick Reference Table

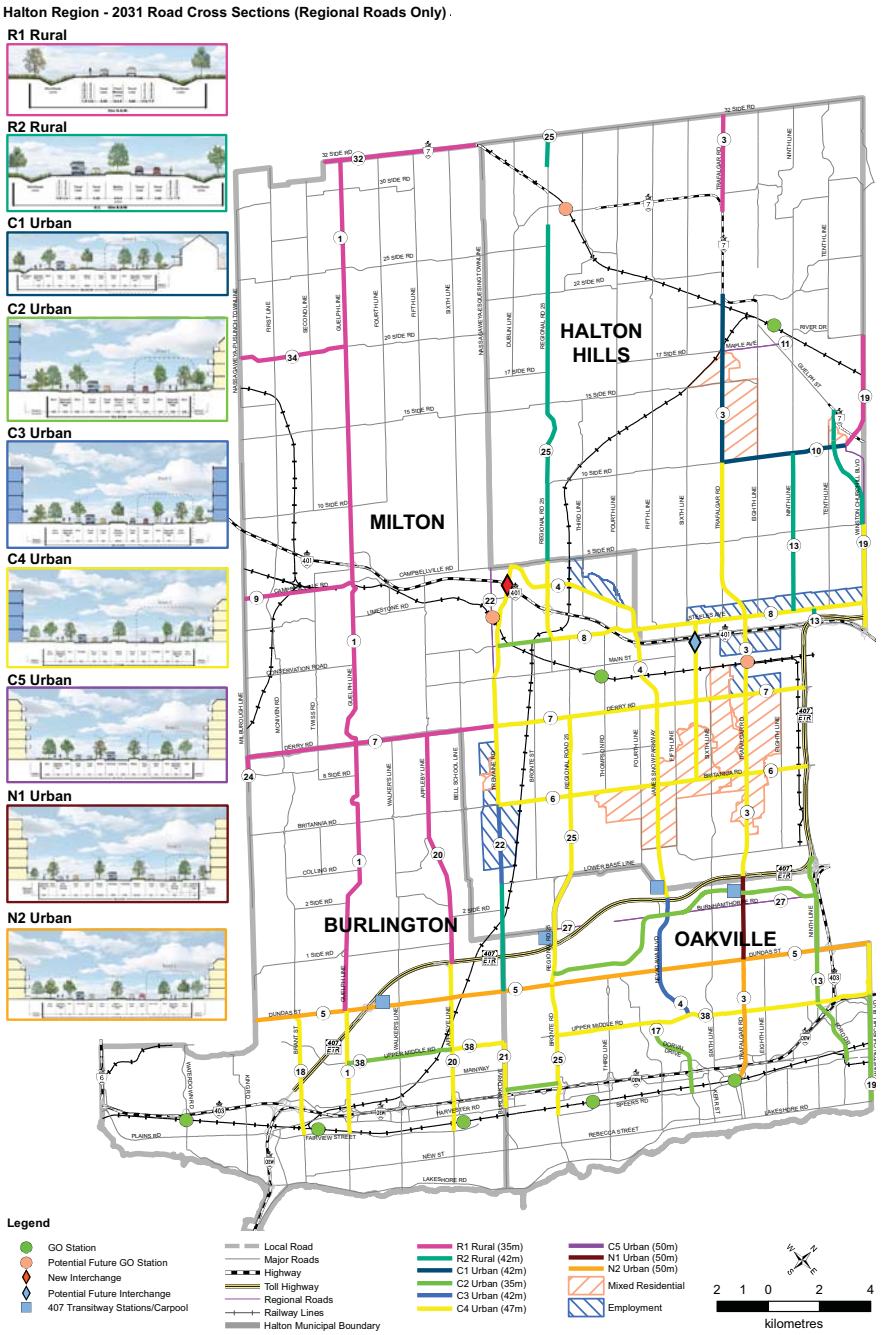
* Trafalgar Road between Dundas Street and Highway 407

3.3 Right-of-Way Classification Code

Each variation within the rural, corridor and node categories is assigned a code, as per the figure below, according to the right-of-way width, the number of shared travel lanes, and presence or absence of priority lanes. Definitions for these terms may be found in the glossary in Appendix C.

Code	Right-of-Way Width	No. of Shared Travel Lanes	No. of Priority Lanes
Rural (R)			
R(1)	35m	2	n/a
R(2)	42m	4	n/a
Corridor (C)			
C(1)	42m	4	n/a
C(2)	35m	4	n/a
C(3)	42m	4	n/a
C(4)	47m	4	HOV / RBL (2)
C(5)	50m	4	Transitway (2)
Node (N)			
N(1)	50m	4	HOV (2); Transitway (2)
N(2)	50m	4	HOV / RBL (2)

Figure 3: Right-of-Way Classification Code



4.0 General Guidelines

4.1 Pedestrian Facilities

To encourage pedestrian presence on streets, perceived and actual safety and comfort must be priorities. Implementation of pedestrian facilities shall consider the following:

1. Integrate pedestrian crossings at all street intersections, where possible, and:
    a. Provide pedestrian crosswalks on all sides of the road;
    b. Ensure that pedestrian crossings are a natural and convenient extension of the overall pedestrian network;
    c. Provide pedestrian crossings at locations that are convenient to transit stops; and
    d. Provide pedestrian crossings whenever a multi-use path crosses an intersection.

1. Provide pedestrian-scale lighting:
    a. At and within proximity to transit stops / stations;
    b. Throughout nodes; and
    c. Within corridors at locations of support services and higher density areas.

2. Avoid pedestrian islands where possible at intersections where pedestrian priority is desirable, including nodes, high activity areas, areas of mixed use, areas of retail, and other areas where pedestrians are encouraged to gather. This will improve the pedestrian experience.

3. Design facilities according to Accessibility for Ontarians with Disabilities Act (AODA).

4.2 Bicycle Facilities

In order to encourage and promote cycling, the following will be considered:

1. Provide cycling facilities on all Regional Roads. On-road facility options include: a paved shoulder at a minimum width of 1.5 metres, shared HOV lanes at a minimum width of 4.2 metres, bicycle lanes at a minimum width of 1.8 metres; and sidewalk / multi-use paths at a minimum width of 3.0m metres.

2. Consider special design treatments at high traffic intersections to reduce conflict for all travel modes, and particularly to avoid conflict between right-turning motorized vehicles and cyclists who are continuing straight through the intersection.

3. Employ standardized street signage to indicate the cycling facility (e.g. signage to mark exclusive bicycle facilities).

4. Increase cyclist safety and comfort by:
   a. Ensuring a minimum curb lane width of 4.2 metres in the absence of a dedicated cycling facility.
   b. Minimizing or avoiding, by appropriate design, conflict in and near transit stops.
   c. Employing signage or other markings in wide curb lanes, bicycle lanes and multi-use paths to remind motorists and passengers to check for cyclists before opening a car door.
   d. Minimizing or avoiding, by appropriate design, conflict between cyclists and pedestrians in the design of multi- use paths (i.e. consideration of a separation between bicycles and pedestrians).
   e Supporting safe crossings for cyclists through an intersection.

4.3 Transit Facilities

In order to encourage transit use, the following will be considered:

1. Promote transit use through the provision of HOV lanes, Reserved Bus Lanes, Transitways, and where appropriate, additional transit priority measures (e.g. queue jump lanes).
2. Plan HOV and Reserved Bus Lanes in a manner that allows for the flexibility to convert from one to the other.
3. Employ standardized street signage to indicate transit priority (e.g. signage for HOV lanes and Reserved Bus Lanes).
4. Provide sheltered seating at transit stops / stations.
5. Provide pedestrian infrastructure (e.g. multi-use path or sidewalk) to and from transit stops.
6. Provide pedestrian-scale lighting at and in proximity to transit stops.
7. Design facilities according to Accessibility for Ontarians with Disabilities Act standards.

4.4 Landscaping

Landscaping of medians and boulevards on Regional Roads contributes to a sense of place, comfort, and street beautification. Although landscaped boulevards and medians are suitable to a variety of roads, they are most important on wide rights-of-way, where they provide spatial definition and a comfortable sense of enclosure that encourages motorists to slow down, increases the enjoyment of pedestrians, and adds character to the street. Landscaping can also be used to protect pedestrians from the elements and to buffer them from passing vehicles.

The goal in establishing the following guidelines is to ensure a standard of landscaping initiatives - in particular the planting of trees - that will result in healthy trees and plantings that will thrive for generations. Additional information on how to establish healthy trees is located in Appendix A.

In recognition of the above, landscaping practices will consider the following:

1. Encourage a minimum median and / or boulevard width sufficient to support the growth of a row of trees where possible.

2. Plant trees in a row at sufficient distance from each other to promote healthy root growth. Generally, it is recommended that a row of trees planted in urban conditions be planted at a distance of between 8 and 10 metre intervals.

3. Provide approximately 30m^3 of high quality soil for a single tree, whether planted in softscaping or hardscaping; high quality soil is defined as fertile, friable, and free of calcium carbonate, subsoil, refuse, heavy clay, noxious weed seeds, large debris, and other deleterious substances.

4. In instances where a row of trees is to be planted in hardscaping (e.g. sidewalks), provide sufficient volume of high quality soil to support tree growth, at a minimum average soil volume of 15m^3 per tree in shared soil conditions (e.g. continuous soil planters or soil cells). Soil volume closer to 30m^3 per tree is encouraged in shared soil conditions where feasible in order to foster species maturity (refer to Appendix for further details).

5. In instances of a double row of trees where the distance between the centre of one row of trees and the other row of trees is less than 6.0 metres, the two rows should be staggered slightly rather than planted directly opposite each other.

6. Retain and reuse any high quality soil located on-site, or replace it with soil of equal or better quality.

7. Protect soils from compaction during construction in order to allow for healthy growth of tree roots.

8. Encourage vegetation to improve the appearance of the street, to buffer pedestrians from vehicular traffic, and in places where unique identity or profile is desirable.

9. Plant drought-resistant, non-invasive species and encourage the planting of native species.

10. Protect trees against snow clearing and de-icing activities by planting them at a minimum of 1.5 metres between the curb and the centre of the tree or by planting in a raised median or boulevard where possible.

11. Implement a watering program for the first three years for young and newly transplanted trees.

4.5 Ecopassage Considerations

The Region's Natural Heritage System (NHS) identifies the opportunity to coordinate and implement a parallel network of ecopassages with the Regional Road Network. Ecopassages provide critical movement corridors for a variety of wildlife - from small mammals to reptiles - by ensuring their ability cross physical barriers. A network of ecopassages can be identified by overlaying the NHS with the existing and future road network to locate the most strategic wildlife movement corridors. Identifying ecopassages early in the process will make the best use of existing linkages and enable the formation of a coordinated ecopassage network.

4.6 Traffic Calming Considerations

The Regional Road Network is comprised of major arterial roadways whose primary function is to serve mainly inter-regional and regional travel demands and to facilitate relatively high traffic volumes, including commercial traffic, in a safe and efficient manner. Therefore, many traditional traffic calming techniques such as speed humps and bump outs are not suitable for implementation on Regional roads due to the requirements to safely and efficiently handle higher traffic speeds and serve as a critical transportation system for the movement of goods while accommodating all vehicle types such as emergency, heavy trucks and buses.

Typical treatments that may be considered for Regional Roads would be more non-evasive or tactile devices such as textured pavements and crosswalks, gateway treatments, and pavement lane narrowing through the use of pavement markings or median islands. The Traffic Calming techniques or applications that may be considered appropriate for Regional Roads should be based on the suitability to a particular location or situation relative to the specific operational characteristics of the roadway section. As such, these measures will be considered on a case by case basis, and where possible coordinated with capital construction projects.

The following table lists potential traffic calming treatments that may be considered on Regional Roads:

Non-physical Measures	Enforcement measures Radar message board
Tactile Devices	Transverse rumble strips Textured pavements and crosswalks
Horizontal Displacement Devices	Gateway treatments Median islands Roadway narrowing through pavement markings
Signage Measures	Traffic calmed signage
Pavement Measures	Higher visibility crosswalk Colored pavement Textured pavements Transverse pavement markings

Figure 4: Traffic Calming Elements

5.0 Guidelines by Classification Code

5.1 Rural / Natural Heritage System

General Rural (R) Guidelines

On Rural (R) roads, it shall be a general policy of the Region to:

1. Set a maximum lane width of 3.65 metres, not including any bicycle facilities.

2. Pave and stripe a minimum shoulder width of 1.5 metres on both sides of the street.

3. Provide a minimum unpaved shoulder width of 1.0 metres on both sides of the street.

4. Provide a ditch / swale for drainage.

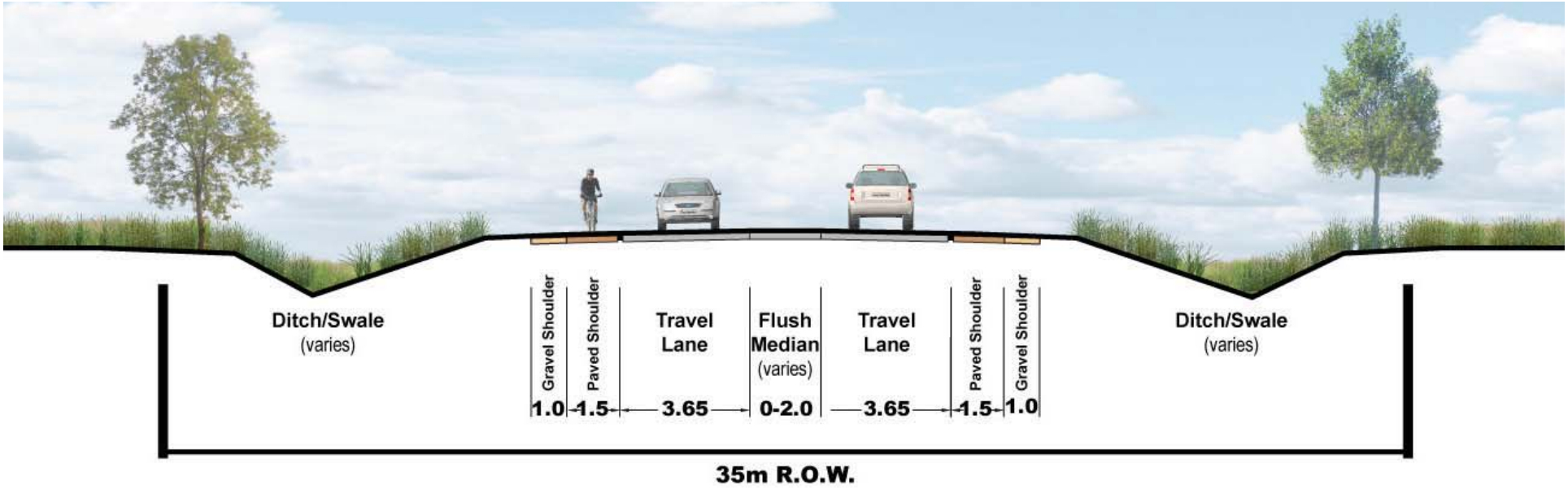
5. Plant a row of trees on the outside edge of the ditch / swale.

6. Plant native trees and non-invasive plant species in support of the NHS designation.

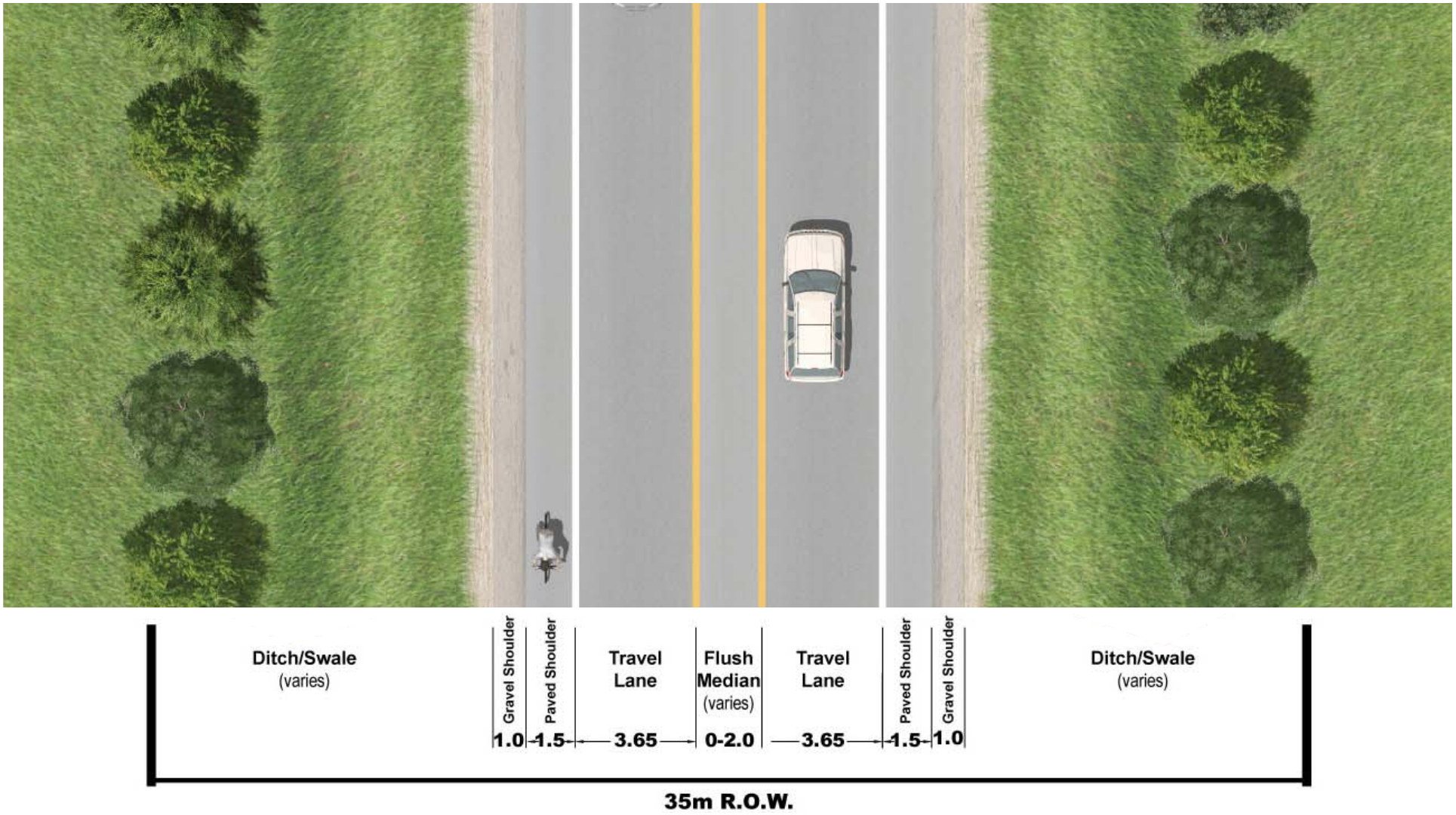
Rural / NHS (R)	Right-of-Way Width	No. of Shared Travel Lanes	Priority Lanes
R(1)	35m	2	n/a
R(2)	42m	4	n/a

Figure 5: Rural (R) Classification Codes

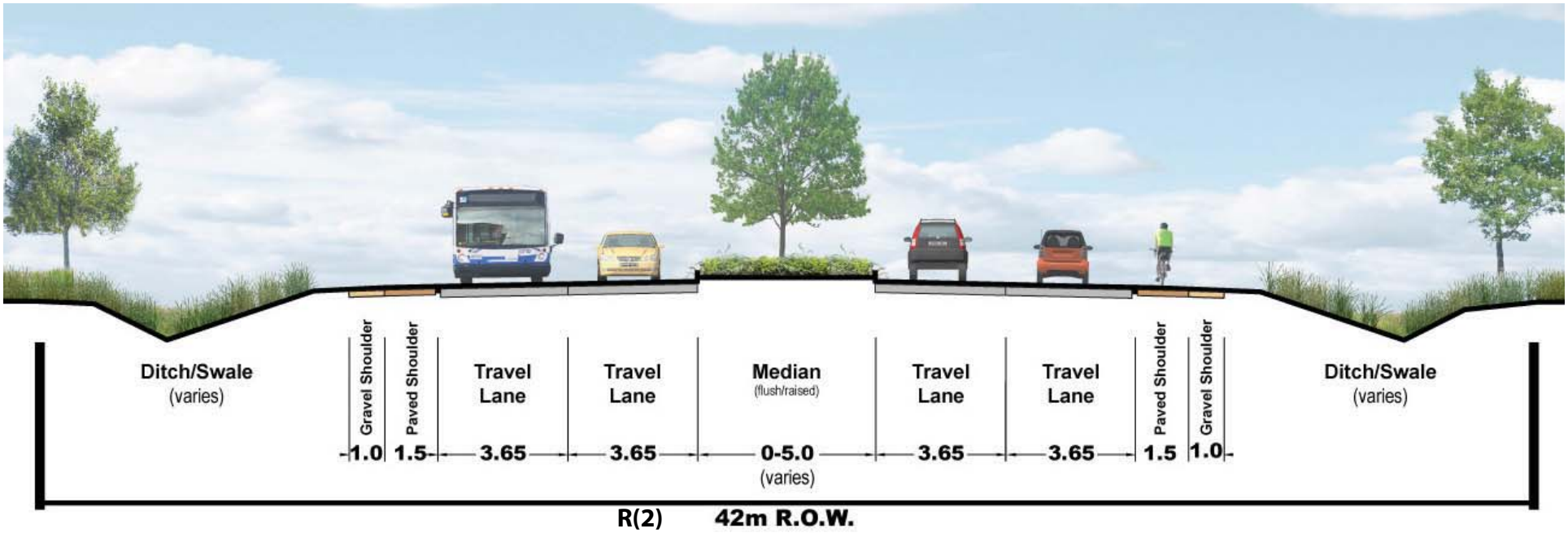
R(1) Rural


Ditch/Swale
(varies)
Gravel Shoulder
Paved Shoulder
Travel Lane
Flush Median
(varies)
Travel Lane
Paved Shoulder
Gravel Shoulder
1.0
1.5
3.65
0-2.0
3.65
1.5
1.0
Ditch/Swale
(varies)
35m R.O.W.

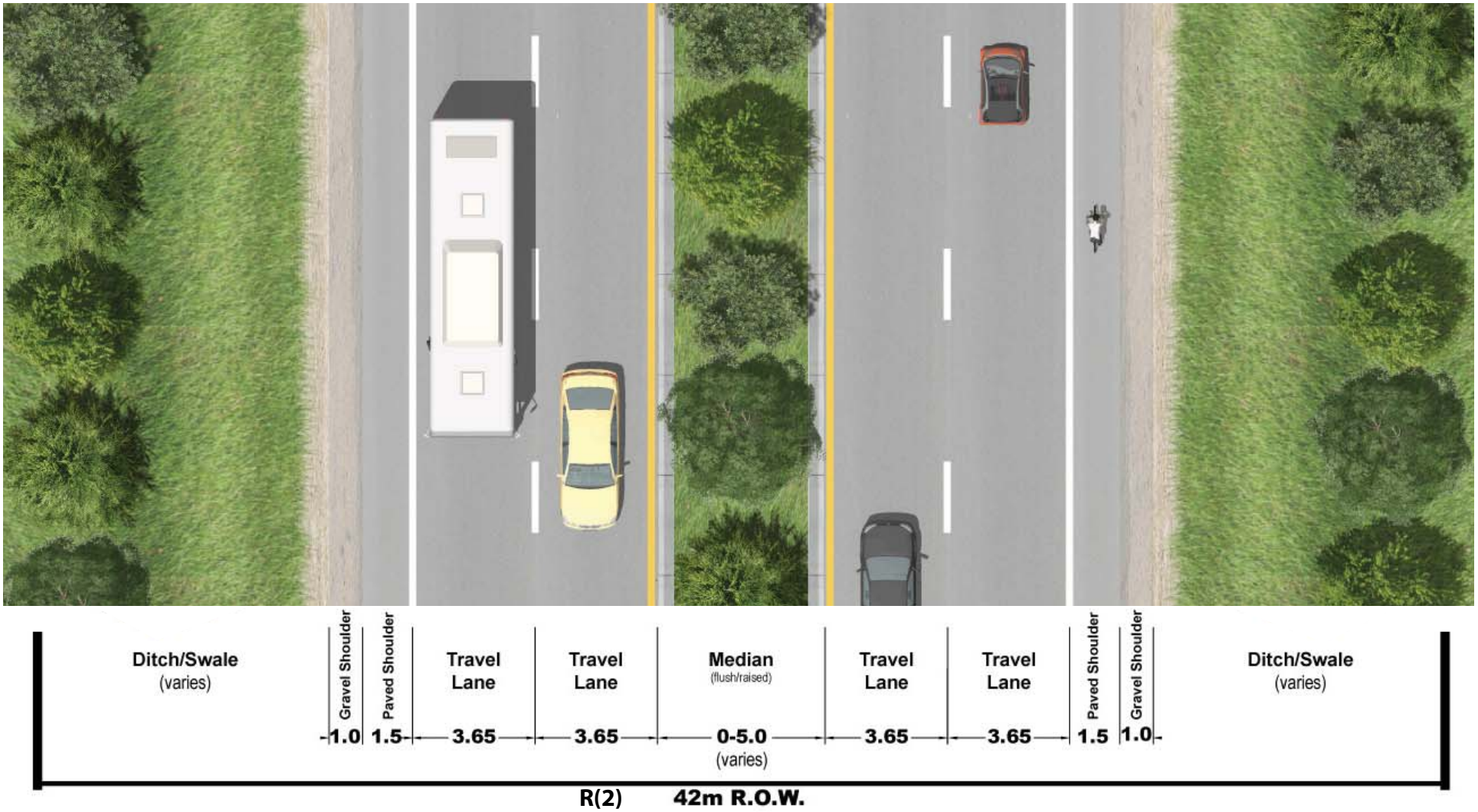
R(1) Rural


Ditch/Swale
(varies)
Gravel Shoulder
Paved Shoulder
Travel Lane
Flush Median
(varies)
Travel Lane
Paved Shoulder
Gravel Shoulder
Ditch/Swale
(varies)
1.0
1.5
3.65
0-2.0
3.65
1.5
1.0
35m R.O.W.

R(2) Rural


Ditch/Swale
(varies)
Gravel Shoulder
Paved Shoulder
Travel Lane
Travel Lane
Median
(flush/raised)
Travel Lane
Travel Lane
Paved Shoulder
Gravel Shoulder
Ditch/Swale
(varies)
1.0
1.5
3.65
3.65
0-5.0
(varies)
3.65
3.65
1.5
1.0
R(2) 42m R.O.W.

R(2) Rural


Ditch/Swale
(varies)
Gravel Shoulder
1.0
Paved Shoulder
1.5
Travel Lane
3.65
Travel Lane
3.65
Median
(flush/raised)
0-5.0
(varies)
Travel Lane
3.65
Travel Lane
3.65
Paved Shoulder
1.5
Gravel Shoulder
1.0
Ditch/Swale
(varies)
R(2) 42m R.O.W.

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5.2 Corridor guidelines

General Corridor (C) Guidelines

On Corridor (C) roads, it shall be a general policy of the Region to:

1. Set an inside lane width of 3.5 metres.

2. Provide pedestrian and bicycle facilities on both sides of the street according to either Detail 1 or Detail 2:

   a. Detail 1 sets a curb lane width of 4.2 metres and provides a shared pedestrian-bicycle multi-use path at a minimum width of 3.0 metres.

   b. Detail 2 sets a curb lane width of 3.5 metres, an on-road bike lane of 1.8 metres, and a sidewalk/multi-use path at a minimum width of 3.0 metres.

3. Whenever width is sufficient, plant a row of trees in medians.

   a. Sufficient width for tree growth is encouraged, and considered to be 3.0 metres for medians, not including the curb).

4. Plant of a row of trees in the boulevards on both sides of the sidewalk / multi-use path.

5. When a transitway is provided, provide a permanent, raised, tree-lined median on both sides of the transitway.

6. Provide transit stops with sheltered seating in the boulevards; for the transitway in C(5), provide transit stops / stations with sheltered seating in the medians.

7. Provide standardized street lights at regular intervals on boulevards and medians.

8. Provide pedestrian scale lighting at transit stops / stations, support services and higher density areas.

Corridor (C)	Right-of-Way Width	No. of Shared Travel Lanes	Priority Lanes
C(1)	42m	4	n/a
C(2)	35m	4	n/a
C(3)	42m	4	n/a
C(4)	47m	4	HOV/RBL (2)
C(5)	50m	4	Transitway (2)

Figure 6: Corridor (C) Classification Codes

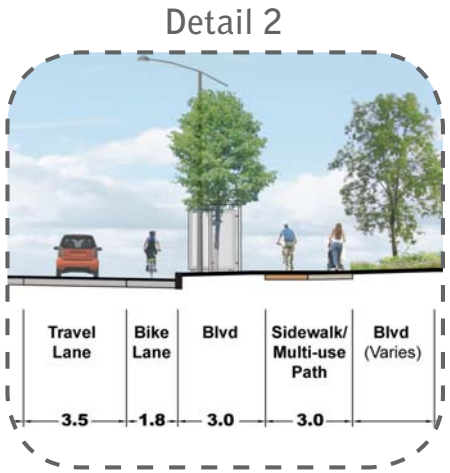
C(1) Rural/Urban

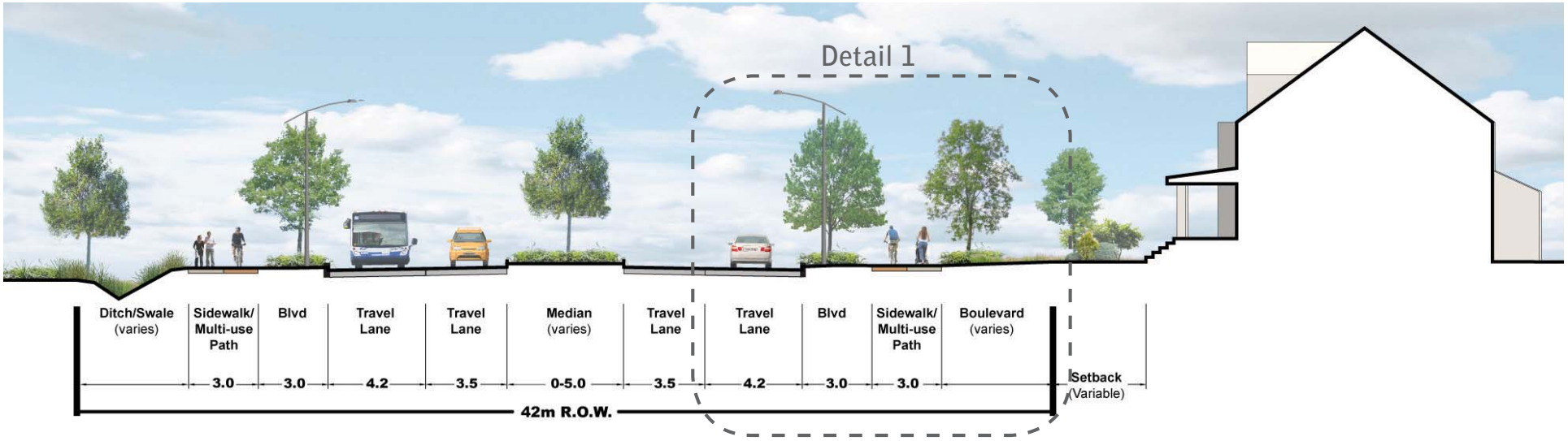
In addition to the general Corridor (C) policy, on C(1) roads the following will be considered:

1. Provide a variable centre median.
2. Recognize the transition between rural and urban conditions by employing different design elements for each:

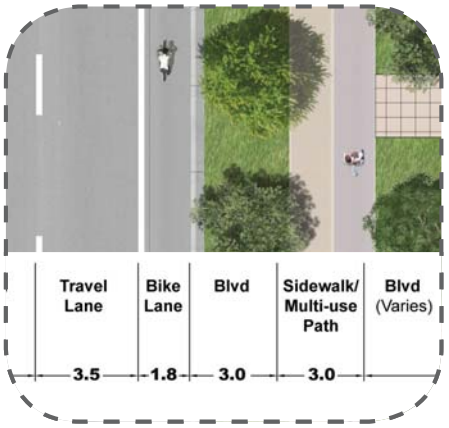
   In rural conditions:
   a. Provide a ditch / swale.
   b. Plant a row of trees on the outside edge of the ditch / swale and a row of trees in the boulevard.

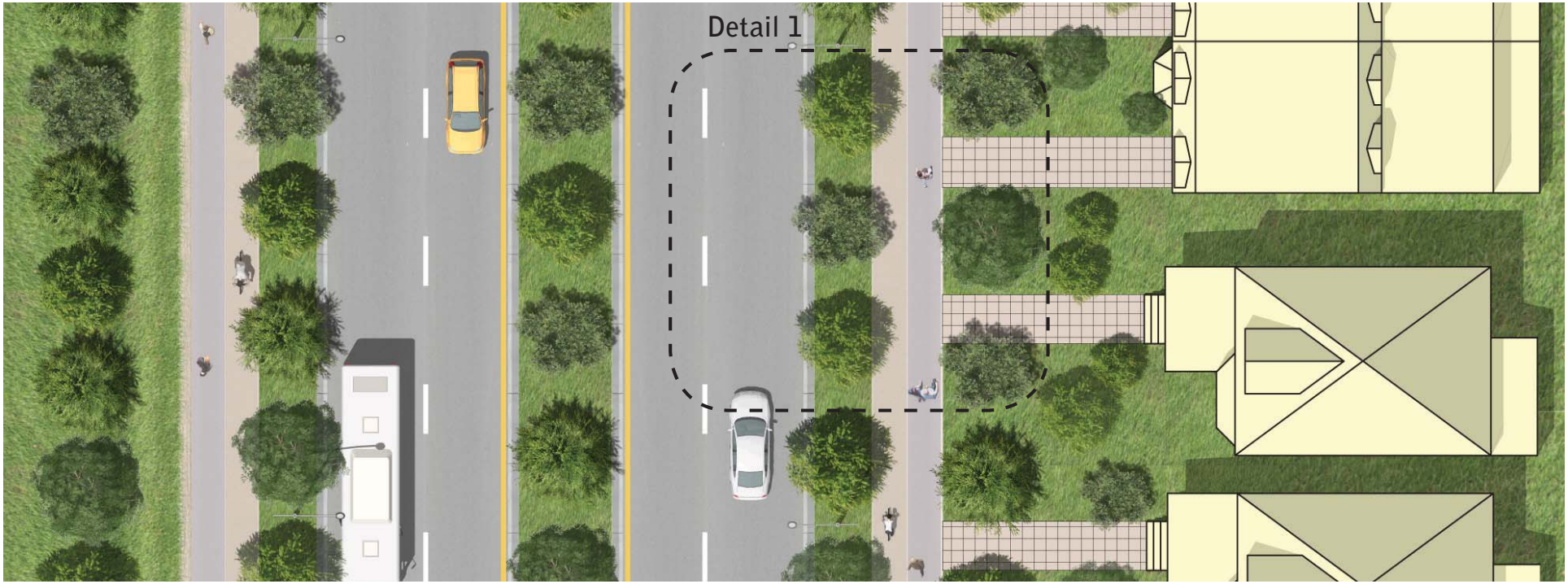
   In urban conditions:
   c. Provide a tree-lined boulevard on both sides of the sidewalk / multi-use path.



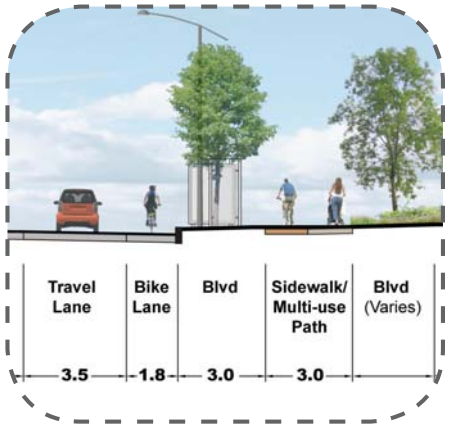


C(1) Rural/Urban





C(2) Urban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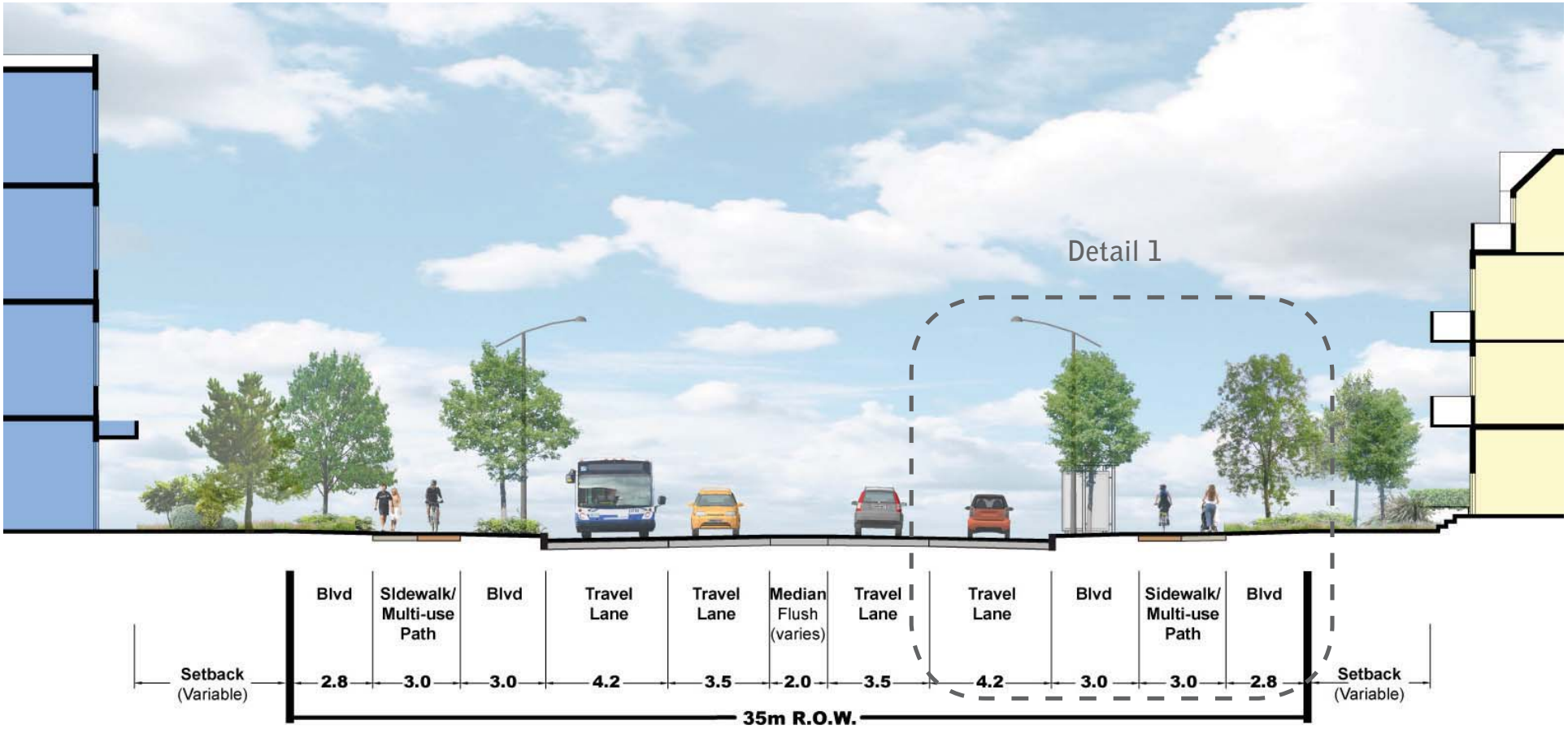
Travel Lane
Bike Lane
Blvd
Sidewalk/ Multi-use Path
Blvd (Varies)
3.5
1.8
3.0
3.0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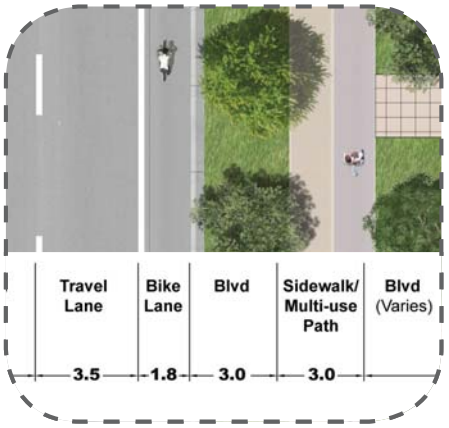
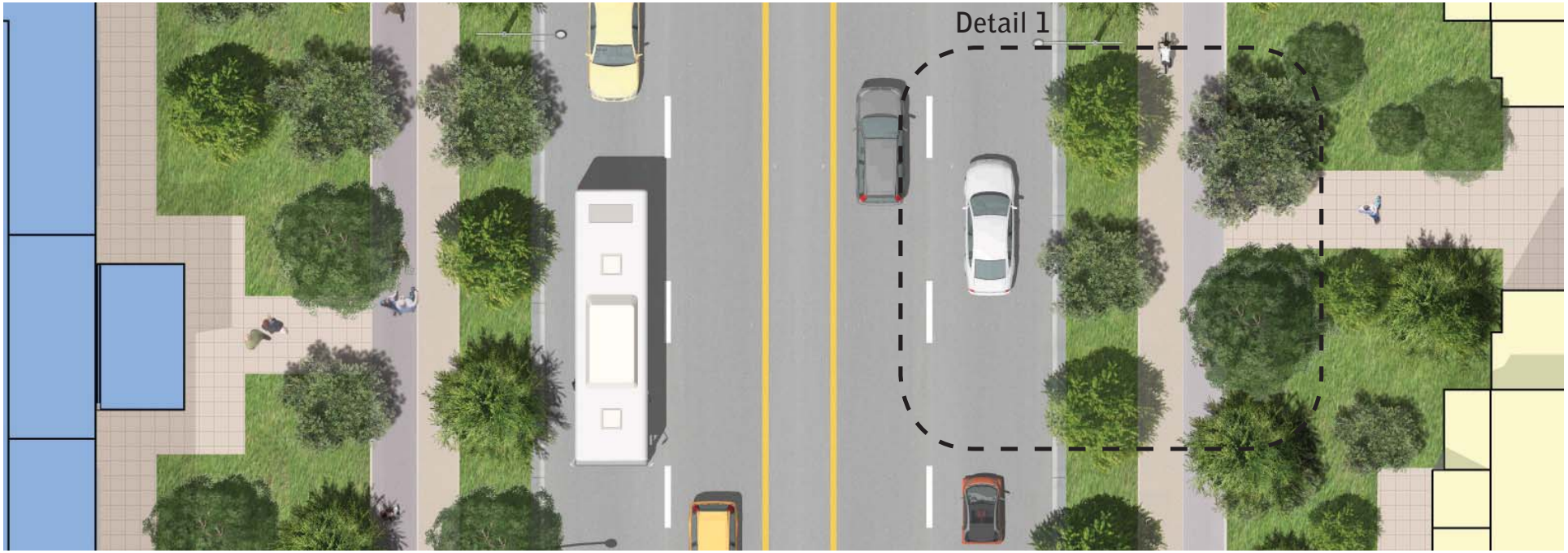
Setback (Variable)
Blvd
2.8
Sidewalk/ Multi-use Path
3.0
Blvd
3.0
Travel Lane
4.2
Travel Lane
3.5
Median Flush (varies)
2.0
Travel Lane
3.5
Travel Lane
4.2
Blvd
3.0
Sidewalk/ Multi-use Path
3.0
Blvd
2.8
Setback (Variable)
35m R.O.W.

C(2) Urban


Detail 2
Travel Lane
Bike Lane
Blvd
Sidewalk/ Multi-use Path
Blvd (Varies)
3.5
1.8
3.0
3.0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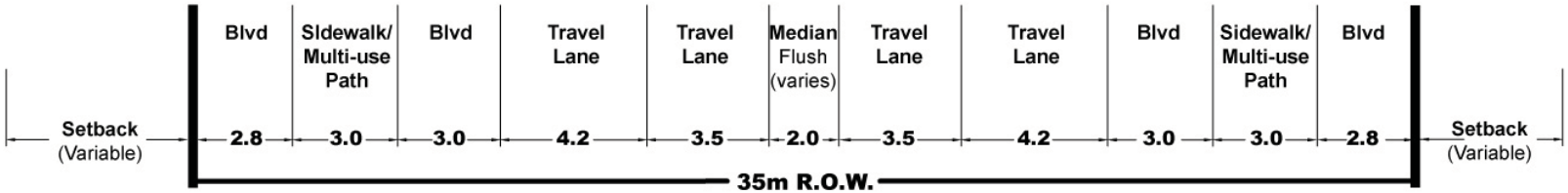
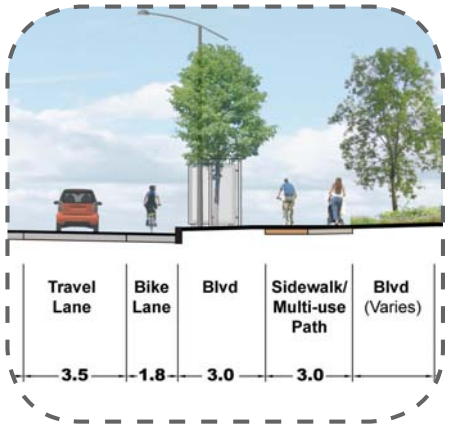
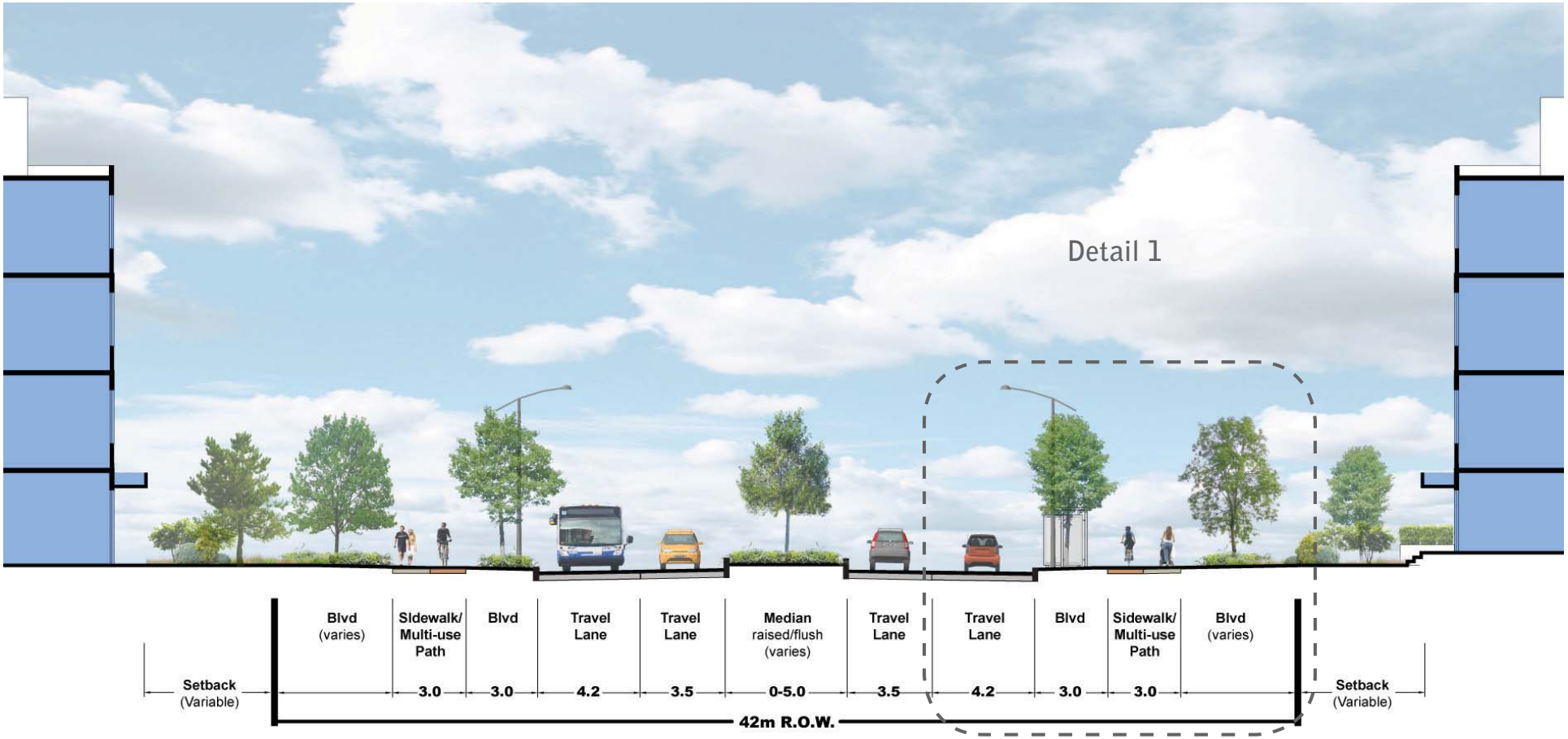
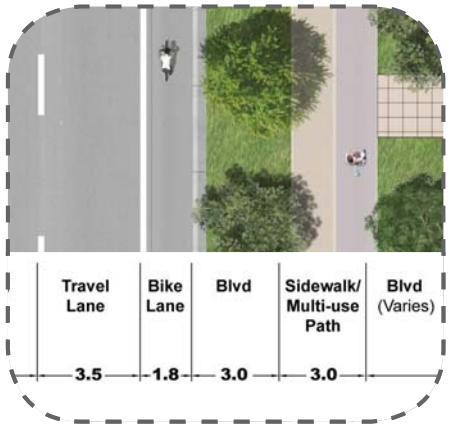

Setback (Variable)
Blvd
2.8
Sidewalk/ Multi-use Path
3.0
Blvd
3.0
Travel Lane
4.2
Travel Lane
3.5
Median Flush (varies)
2.0
Travel Lane
3.5
Travel Lane
4.2
Blvd
3.0
Sidewalk/ Multi-use Path
3.0
Blvd
2.8
Setback (Variable)
35m R.O.W.

C(3) Urban


Detail 2
Travel Lane
Bike Lane
Blvd
Sidewalk/ Multi-use Path
Blvd (Varies)
3.5
1.8
3.0
3.0


Detail 1
Setback (Variable)
Blvd (varies)
Sidewalk/ Multi-use Path
Blvd
Travel Lane
Travel Lane
Median raised/flush (varies)
Travel Lane
Travel Lane
Blvd
Sidewalk/ Multi-use Path
Blvd (varies)
Setback (Variable)
3.0
3.0
4.2
3.5
0-5.0
3.5
4.2
3.0
3.0
42m R.O.W.

C(3) Urban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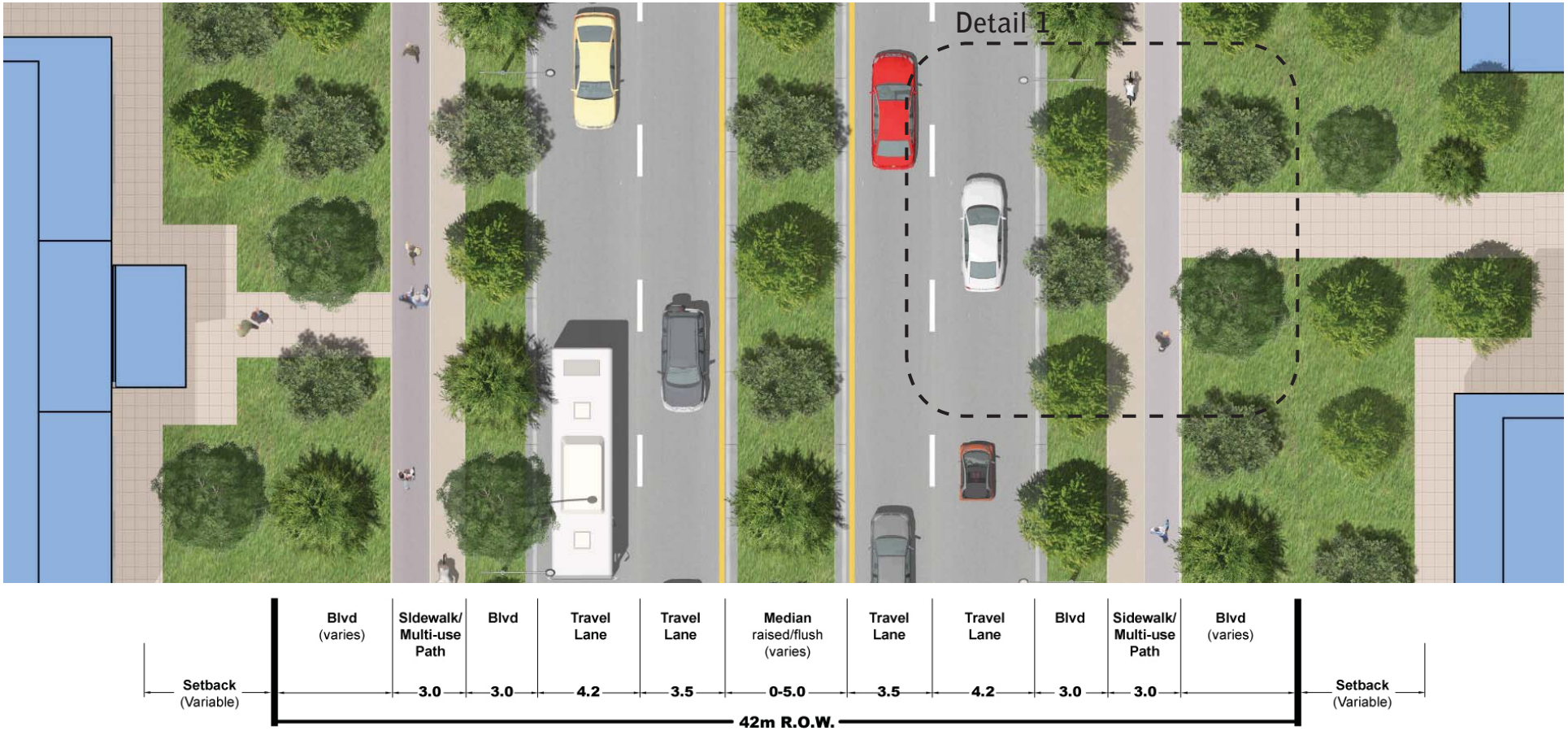
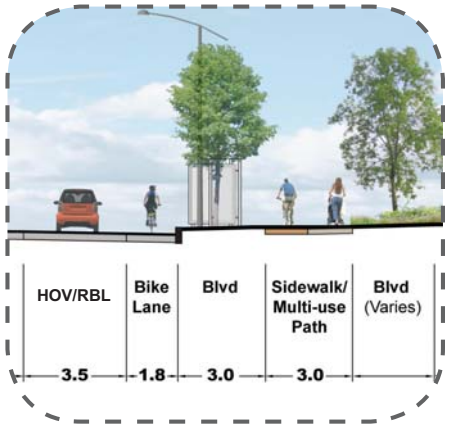
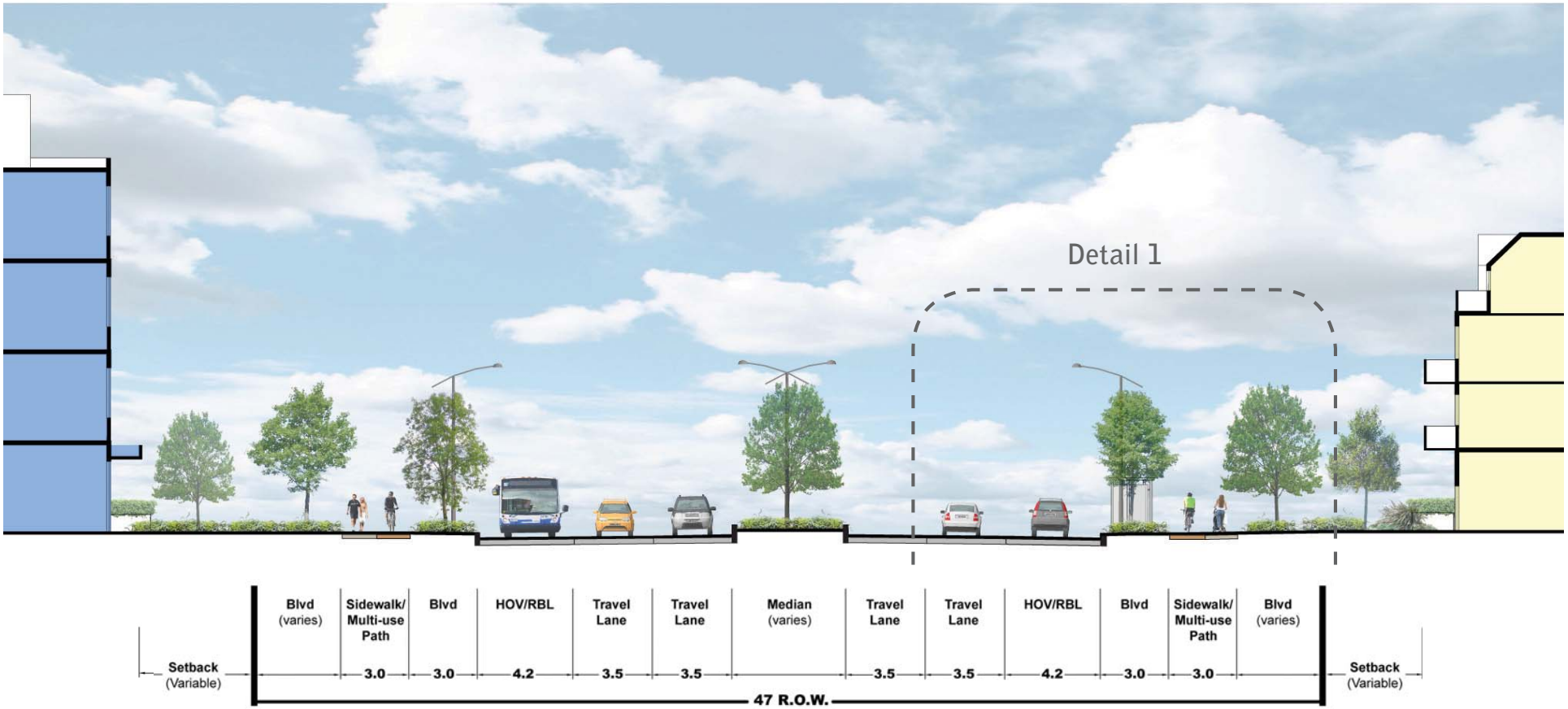
Travel Lane
Bike Lane
Blvd
Sidewalk/ Multi-use Path
Blvd (Varies)
3.5
1.8
3.0
3.0


Detail 1
Setback (Variable)
Blvd (varies)
Sidewalk/ Multi-use Path
3.0
Blvd
3.0
Travel Lane
4.2
Travel Lane
3.5
Median raised/flush (varies)
0-5.0
Travel Lane
3.5
Travel Lane
4.2
Blvd
3.0
Sidewalk/ Multi-use Path
3.0
Blvd (varies)
Setback (Variable)
42m R.O.W.

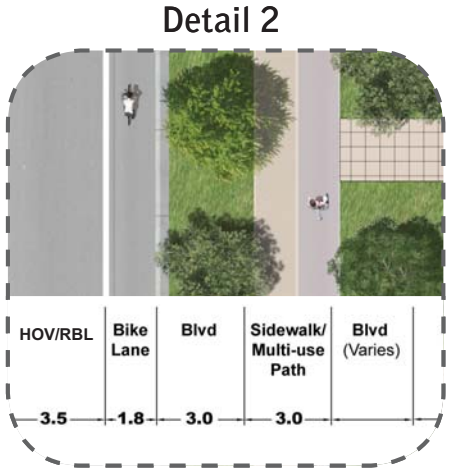
C(4) Urban

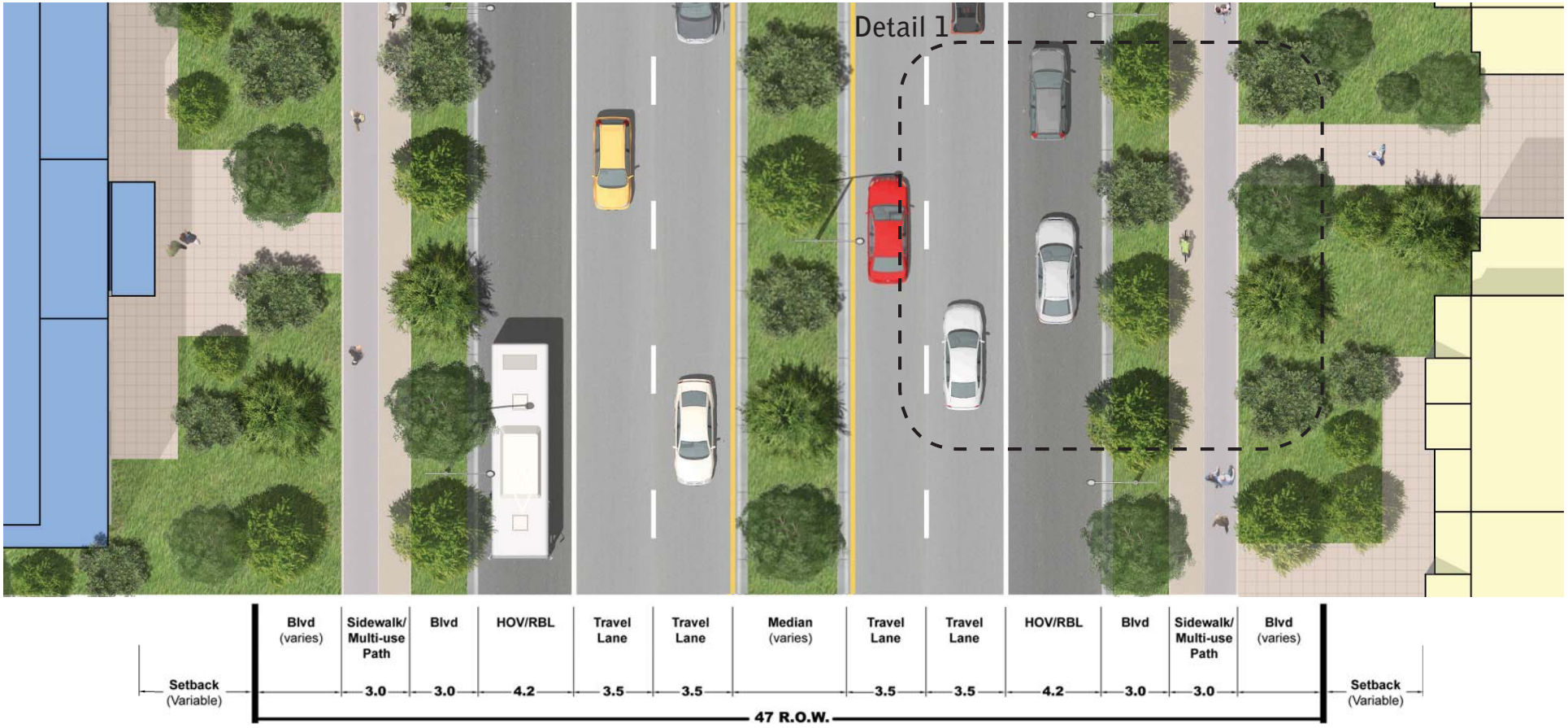
Detail 2



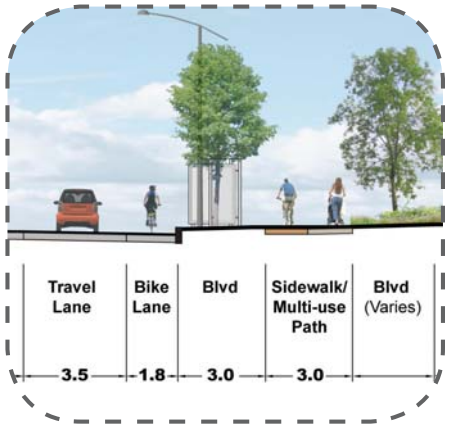


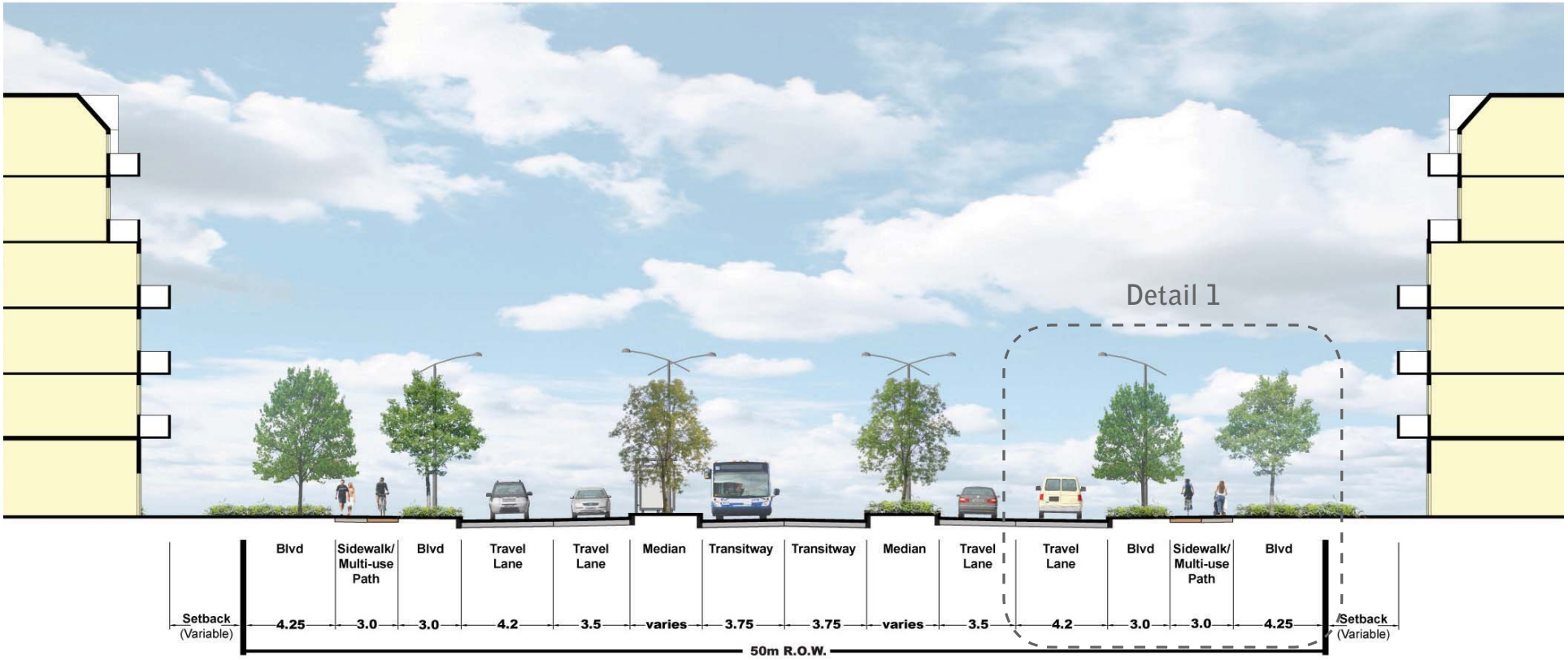
C(4) Urban


Detail 2
HOV/RBL
Bike Lane
Blvd
Sidewalk/ Multi-use Path
Blvd (Varies)
3.5
1.8
3.0
3.0


Detail 1
Setback (Variable)
Blvd (varies)
Sidewalk/ Multi-use Path
Blvd
HOV/RBL
Travel Lane
Travel Lane
Median (varies)
Travel Lane
Travel Lane
HOV/RBL
Blvd
Sidewalk/ Multi-use Path
Blvd (varies)
Setback (Variable)
3.0
3.0
4.2
3.5
3.5
3.5
3.5
4.2
3.0
3.0
47 R.O.W.

C(5) Urban


Detail 2
Travel Lane
Bike Lane
Blvd
Sidewalk/ Multi-use Path
Blvd (Varies)
3.5
1.8
3.0
3.0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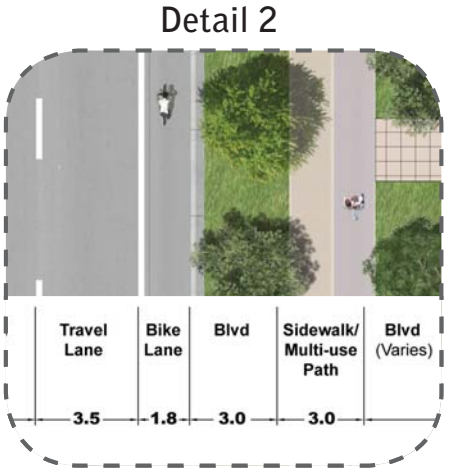
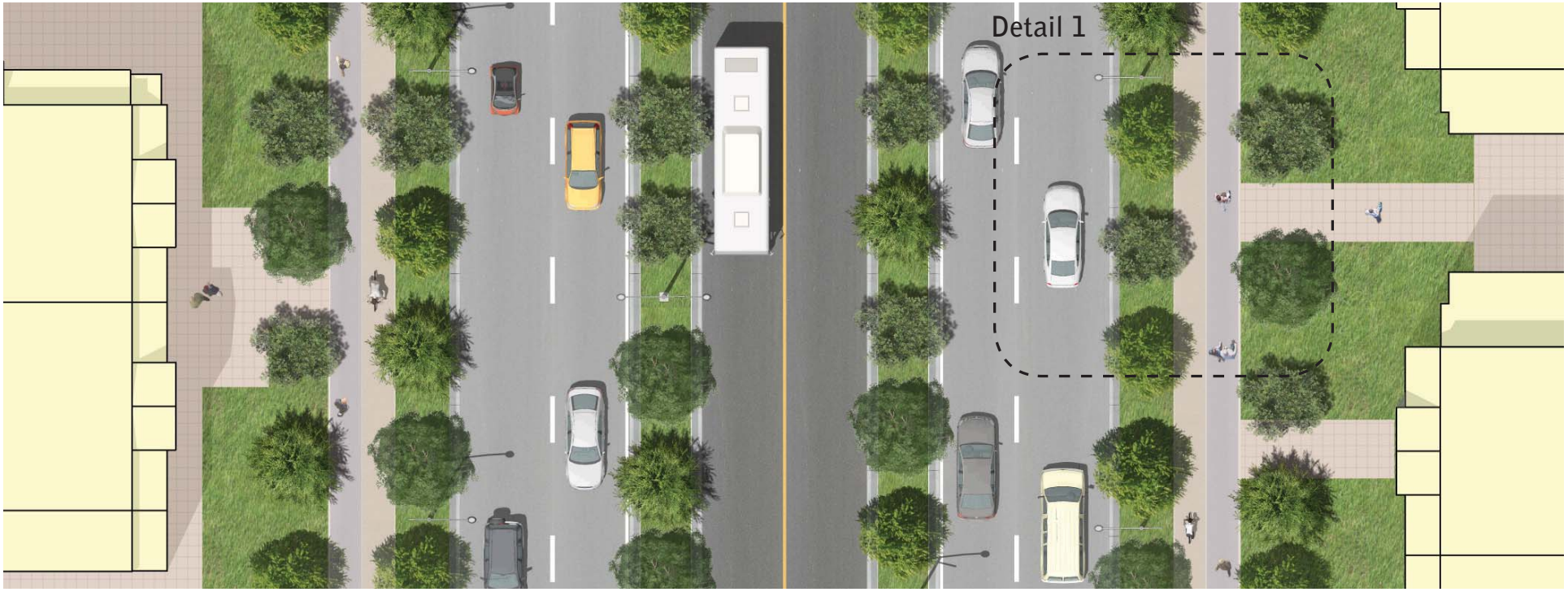
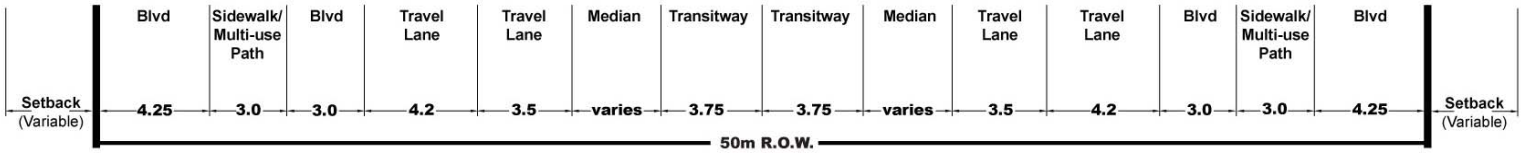
Setback (Variable)
Blvd
Sidewalk/ Multi-use Path
Blvd
Travel Lane
Travel Lane
Median
Transitway
Transitway
Median
Travel Lane
Travel Lane
Blvd
Sidewalk/ Multi-use Path
Blvd
Setback (Variable)
4.25
3.0
3.0
4.2
3.5
varies
3.75
3.75
varies
3.5
4.2
3.0
3.0
4.25
50m R.O.W.

C(5) Urban


Detail 2
Travel Lane
Bike Lane
Blvd
Sidewalk/ Multi-use Path
Blvd (Varies)
3.5
1.8
3.0
3.0


Detail 1


Setback (Variable)
Blvd
4.25
Sidewalk/ Multi-use Path
3.0
Blvd
3.0
Travel Lane
4.2
Travel Lane
3.5
Median
varies
Transitway
3.75
Transitway
3.75
Median
varies
Travel Lane
3.5
Travel Lane
4.2
Blvd
3.0
Sidewalk/ Multi-use Path
3.0
Blvd
4.25
Setback (Variable)
50m R.O.W.

page intentionally left blank

5.3 Node Guidelines

General Node (N) Guidelines

On Node (N) roads, it shall be a general policy of the Region to:

1. Set an inside lane width of 3.5 metres.

2. Provide pedestrian and bicycle facilities on both sides of the street according to either Detail 1 or Detail 2:

   a. Detail 1 sets a curb lane width of 4.2 metres and provides a shared pedestrian-bicycle multi-use path at a minimum width of 3.0 metres.

   b. Detail 2 sets a curb lane width of 3.5 metres, an on-road bike lane of 1.8 metres, and a sidewalk/multi-use path at a minumum width of 3.0 metres.

3. Plant of a row of trees on both sides of the sidewalk/multi-use path; for N(1), the second row of trees is dependent on sufficient width in the setback.

4. Provide transit stops / stations with sheltered seating in the medians and / or boulevards, as applicable.

5. Provide standardized, pedestrian scale street lights at regular intervals in the medians such that they illuminate both the transitway and the travel lanes.

6. Provide standardized, pedestrian scale street lights at regular intervals on the boulevards.

7. Encourage building setbacks to be minimized.

8. Consider on-street parking on Regional Roads in N(1) during off-peak hours.

Node (N)	Right-of-Way Width	No. of Shared Travel Lanes	Priority Lanes
N(1)	50m	4	HOV (2); Transitway (2)
N(2)	50m	4	HOV / RBL (2)

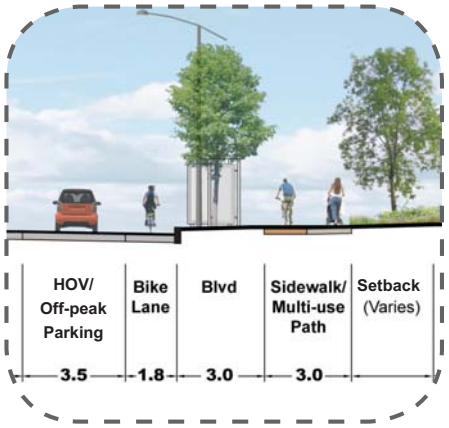
Figure 7: Node (N) Classification Codes

N(1) Urban

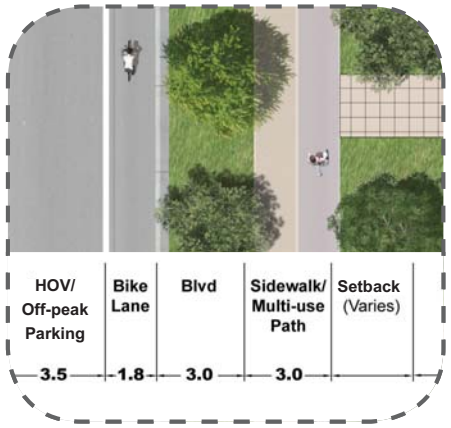
1. Provide one transitway lane per direction in the centre of the raodway at a width of 3.75 metres per lane.

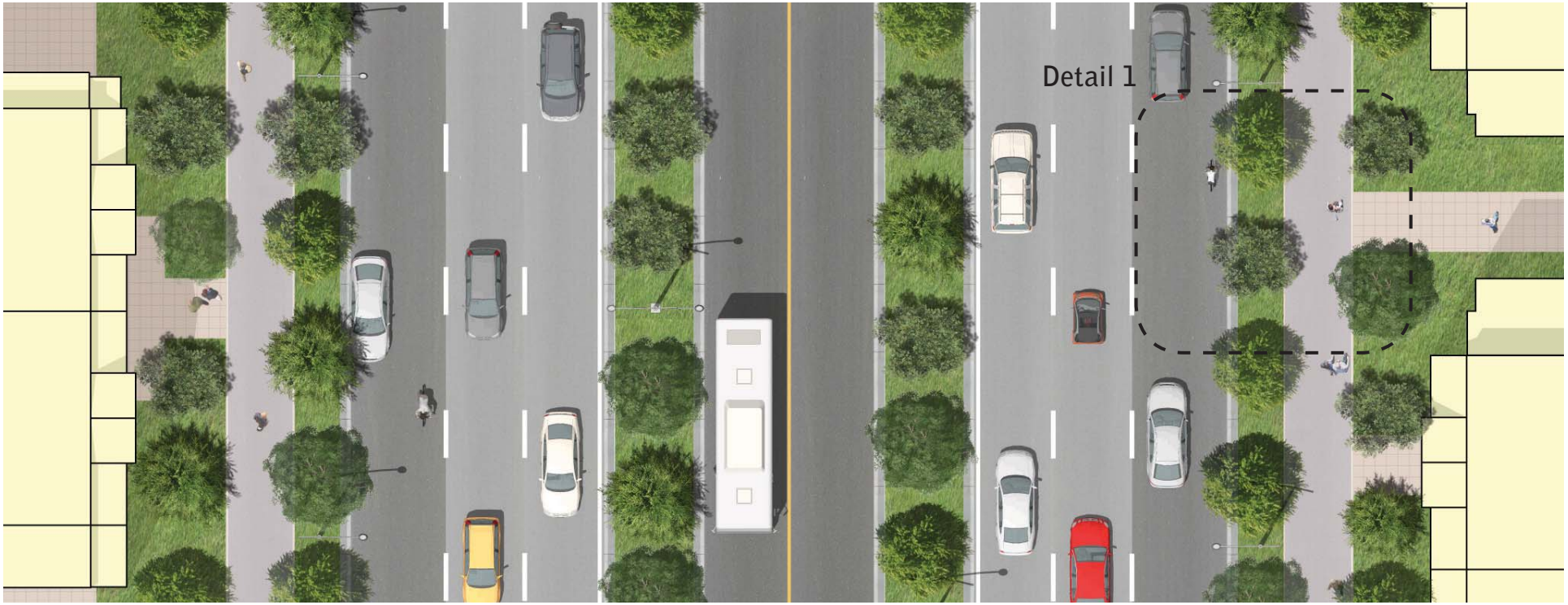
2. Provide a permanent, raised, tree-lined median on both sides of the transitway.

Detail 2



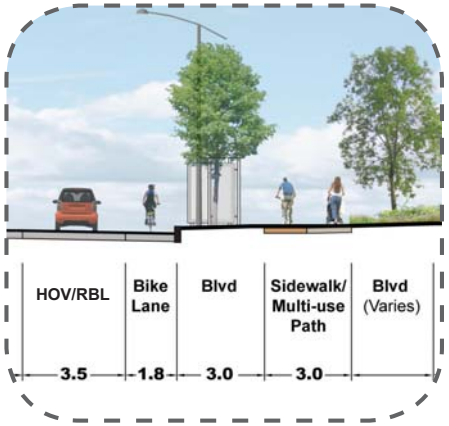
N(1) Urban

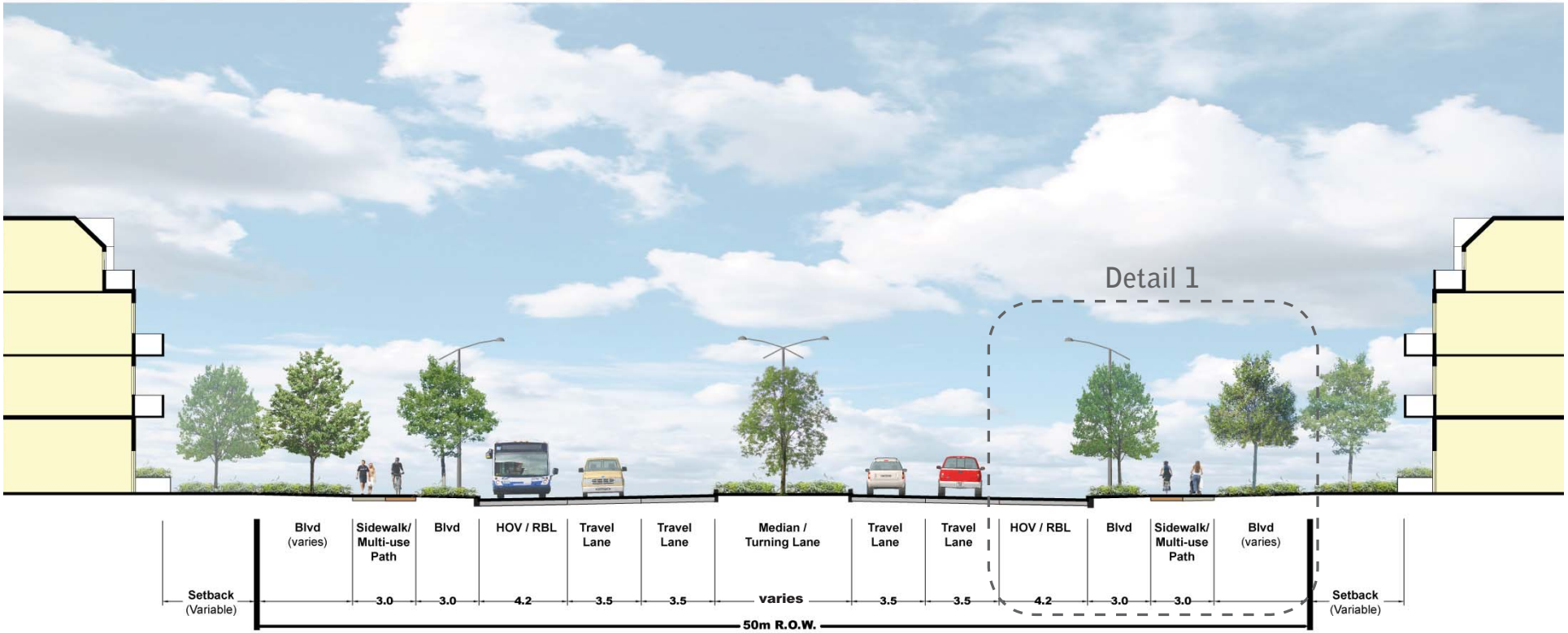

Detail 2
HOV/ Off-peak Parking
Bike Lane
Blvd
Sidewalk/ Multi-use Path
Setback (Varies)
3.5
1.8
3.0
3.0


Detail 1
Minimized Setback (Variable)
Sidewalk/ Multi-use Path
Blvd (varies)
HOV/ Off-peak Parking
Travel Lane
Travel Lane
Median
Transitway
Transitway
Median
Travel Lane
Travel Lane
HOV/ Off-peak Parking
Blvd (varies)
Sidewalk/ Multi-use Path
Minimized Setback (Variable)
3.0
4.2
3.5
3.5
varies
3.75
3.75
varies
3.5
3.5
4.2
3.0
50m R.O.W.

N(2) Urban

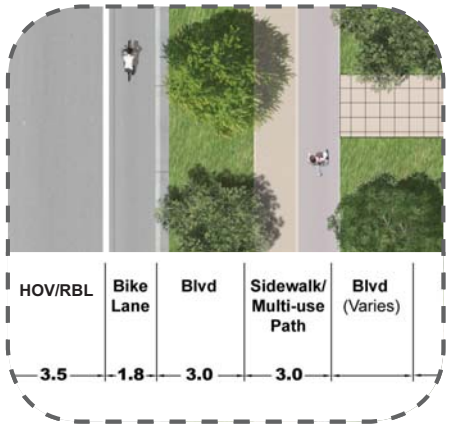
Detail 2

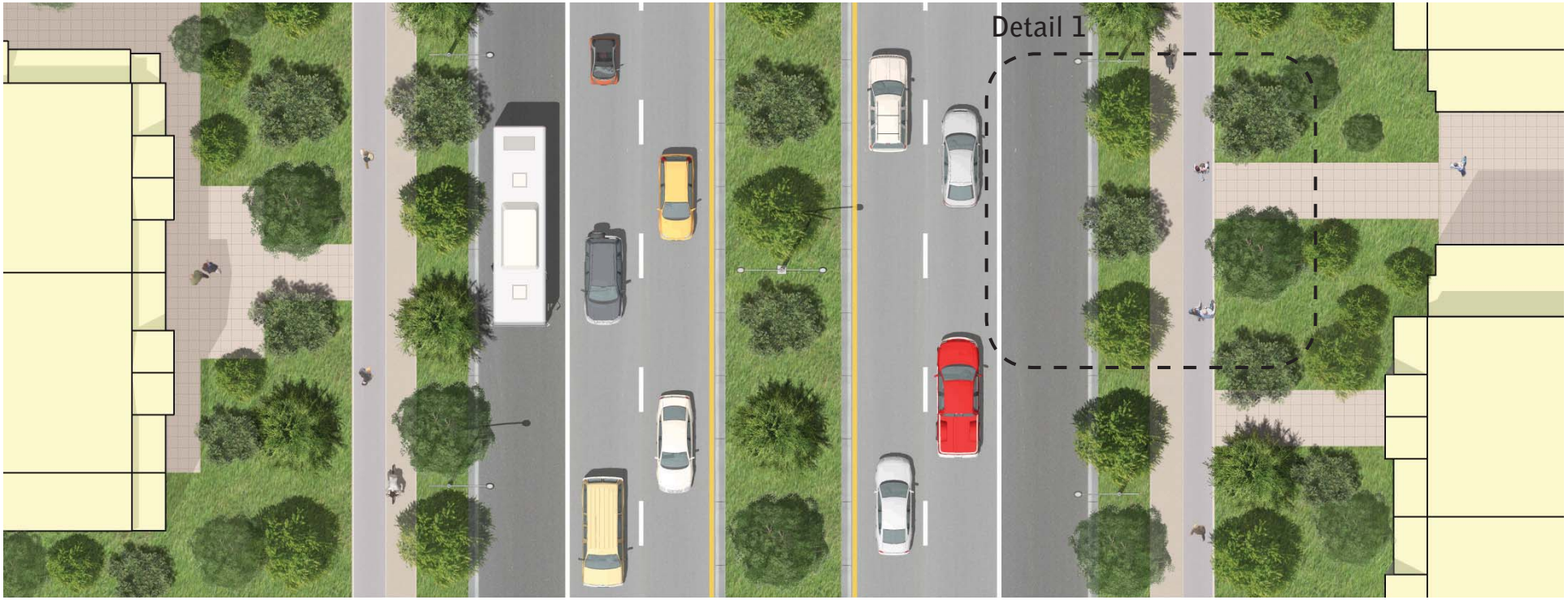


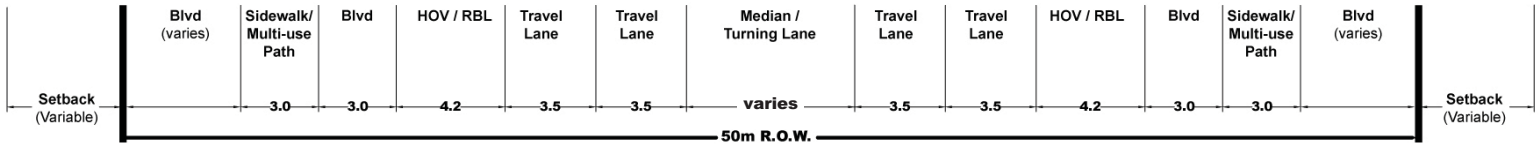


N(2) Urban

Detail 2







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Appendices

Appendix A: Photo Renderings

R(1) Rural

This image illustrates the R(1) road category.

R(1) Rural

This image illustrates a typical rural road.

C(1) Rural/Urban

The before and after images illustrate how an existing Regional Road could be transformed over time into a C(1) road category. In this example, the rural character is preserved on one side of the street.

Before

C(1) Rural/Urban

After

C(4) Urban

The before and after images illustrate how an existing Regional Road could be transformed over time into a C(4) road category.

Before

C(4) Urban Detail 1 and Detail 2

After - Detail 1 Wide Curb Lane

After - Detail 2 Bicycle Lane

C(4) Urban

The before and after images illustrate how a new Regional Road could be transformed over time into a C(4) road category.

Before

C(4) Urban

After

C(5) Urban)

The before and after images illustrate how an existing regional road could be transformed over time into a C(5) road category.

Before

C(5) Urban

After

N(1) Urban

The before and after images illustrate how an existing Regional Road could be transformed over time into a N(1) road category.

Before

N(1) Urban

After

N(2) Urban

The before and after images illustrate how an existing regional road could be transformed over time into a N(2) road category.

Before

N(2) Urban

After

Appendix B: Planting Trees Along Regional Roads

The following information is provided to assist the Region in growing healthy trees. Generally, there are three critical elements to healthy tree growth: high soil quality, adequate soil volume, and for the first three years after planting, a watering and maintenance program.

Soil Quality

High soil quality is extremely important to the health of a tree. During construction, however, it is common for the nutrient-rich topsoil layer to be removed, resulting in the planting of trees in poor quality soil or rock substrate. This situation can be remediated by returning the topsoil layer prior to the planting of trees, or by replacing the original topsoil layer with high quality soil. In general, high quality soil is fertile, friable (a crumbly texture ideal for the root growth of plants), obtained from well drained, arable land, and free of calcium carbonate, subsoil, refuse, heavy clay, noxious weed seeds, large debris, and other deleterious substances. The recommended soil profile (Sandy Loam) is: 50-60% sand, 20-40% silt, 6-10% clay, and 2-5% organic. A pH of between 6.5 and 7 is also recommended. Compost can be used to increase soil organic matter and increase water retention over the lifetime of a tree. Soils may also be tested for fertility and supplemented as required to ensure the desired tree growth (0.6 kg/m^3 of bonemeal is recommended for fertilizer).

Soil Volume

Tree roots generally grow to a depth of between 30-60cm, but grow horizontally from the trunk outwards at much greater distance. For this reason, trees should be planted at a distance of between 8 and 10 metres apart; providing tree roots with adequate surface area to grow horizontally is absolutely critical to attaining species maturity. Generally, it is recommended that a single tree, planted in hardscaping (e.g. sidewalks) or softscaping (e.g. planted medians), be provided with about 30m^3 of soil calculated at a depth of between 0.8 metres to 1.2 metres above a well drained sub soil or drainage layer. The higher the volume of soil per tree, the higher the instance of trees reaching species maturity. Groups of two or more trees may share soil volume when planted in a continuous soil planter/trench, or equivalent, provided that a minimum volume of 15m^3 is calculated per tree; however, trees that are planted at the minimum of 15m^3 per tree

are more likely to reach a reasonable growth size appropriate for an urban setting and less likely to reach species maturity. For example, a planting strip that is:

- 2.5m wide would yield approximately 30m^3 of soil per tree at a soil depth of 1.2 metres and a planting distance of 10 metres.

- 3.0m wide would yield approximately 30m^3 of soil per tree at a soil depth of 1.0 metres and a planting distance of 10 metres.

Watering and Maintenance

The absorbing roots of a tree are responsible for water uptake. These roots generally extend beyond the dripline, and are located within the upper 20-30 cm of soil. In general, frequent short watering encourages shallow root growth, whereas less frequent (every 7-10 days) and long watering encourages deep root growth. The deeper tree roots grow, the more tolerant a tree will be to drought. Young trees and trees that have been recently transplanted have less established root systems and therefore require more frequent watering than mature, established trees. For this reason, for the first three years young and/or transplanted trees should be placed on a regular watering schedule while the roots are established, whereas established trees generally only need to be watered during periods of little or no rain. In general, it is better to water trees in the morning, when evaporation levels are low.

Appendix C: Glossary of Roadway Elements

Bicycle facilities

- Portion of the right-of way for use by bicycles, including their exclusive use in bike lanes and cross bikes, and their shared use in HOV lanes, travel lanes, and on multi-use paths.

Ditch / Swale

- Drainage system designed to remove silt and pollution from surface runoff water, consisting of a swaled drainage course with gently sloped sides and filled with vegetation, compost and/or gravel/rocks. The wide and shallow nature of a swale is designed to maximize the time water spends in it, which aids the trapping of pollutants and silt. Swale conditions occur only in Rural/Natural Heritage System areas.

Boulevard

- Landscaped transition zone between the curb lane and the multi-use path and / or sidewalk; this is also the area where street furniture, transit stops and light standards are located.

Building setback

- Distance between the front of the building and the public right-of-way.

High Occupancy Vehicle (HOV)

- HOV lanes are located in the curb lane and reserved for vehicles with two or more people, including buses and taxis; bicycles may share the lane. HOV and RBL widths are interchangeable, allowing for the flexibility to accommodate either one at any given time.

Median

- The area which separates opposing lanes of traffic. Medians can be flush with the roadway, raised, and/or landscaped with plantings and trees to beautify a street. Transit stops on transitways are located in the median. At intersections, medians may be converted into turning lanes.

Multi-use path

- Allocated portion of the public roadway right-of-way for shared use by non-motorized transportation, such as walking, jogging, cycling, rollerblading and mobility devices (e.g. wheel chairs).

Parking

Generally, Regional Roads do not accommodate on-street parking. However, in nodes and higher density areas, on-street parking may be contemplated (e.g. Trafalgar Road north of Dundas Street to Highway 407).

Pedestrian facilities

- Portion of the public roadway right-of way for use by pedestrians, including their exclusive use on sidewalks and crosswalks and shared use on multi-use paths.

Pedestrian scale lighting

- Refers to lighting at a height and level of illumination that encourages walking and increases the sense of comfort and safety at transit stops.

Priority Lane

- Lane designated for High Occupancy Vehicles (HOV), Reserved Bus Lanes (RBL), and transitways.

Reserved bus lane (RBL)

- Dedicated lane for exclusive use of transit, located in the curb lane. HOV and RBL widths are interchangeable, allowing for the flexibility to accommodate either one at any given time.

Shared travel lane

- Lane of travel shared by all road users, without transportation priority measures.

Shoulder

- Portion of the roadway located between the outside travel lane and the swale. Shoulder conditions occur only in Rural/NHS areas.

Transitway

- High order transit located in 2 centre lanes.

Appendix B – Halton Region Roundabout Guideline

Attachment #1
to PW-44-12

Guidelines for the use of Modern Roundabouts on Regional Arterial Roadways

Purpose

This document provides guidelines for the use of modern roundabouts on Regional arterial roadways. Modern roundabouts have been increasing in popularity in North America, primarily based on their ability to improve traffic safety. The unique circular design characteristics of roundabouts reduce the number of conflict points by 75 percent (32 vs. 8) over traditional intersection design, resulting in lowering collision rates.

Modern roundabouts are an alternative to all-way stops or traffic signals for intersection traffic control. Slower vehicle speeds and the requirement to yield on entry to the roundabout allows traffic circulating within it to have the right-of-way, which minimizes congestion resulting in a more efficient operation with fewer delays. There are essentially three reasons why motorists are safer at roundabouts:

- Lower vehicle speeds - There is more time to avoid a crash, and if a crash does occur it will be less severe.
- Fewer conflict points - A four-way intersection has 32 vehicle conflict points. While some of these conflicts are separated by time at a stop sign or traffic signal controlled intersection, running a stop sign or red indication can result in the most serious crashes. A roundabout, by contrast, has only eight vehicle-vehicle conflict points.
- Less severe collision types - The most serious crashes – head-on and right angle – are not common at roundabouts. They are replaced with potentially less serious types such as rear-end, sideswipe and loss of control crashes.

Pedestrians are also safer at roundabouts for the following reasons:

- Shorter crossing distances - Pedestrian crossing distances are often shorter because extra lanes (such as left-turn lanes) are not needed on an approach. Where splitter islands are present the crossing is done in two stages.
- Look in one direction only - Pedestrians only have to look in one direction for oncoming traffic whereas at signalized intersections vehicles approach a crosswalk from the left and the right, often at steep angles outside of peripheral vision.
- Lower vehicle speeds - There is more time to make eye contact with a motorist and avoid a crash and if a crash does occur, it will be less severe.

There have been no conclusive studies of pedestrian safety at roundabouts in North America because of insufficient data. However, studies internationally have shown that roundabouts can lessen the frequency and severity of pedestrian-involved collisions by 50 to 80 percent.

Vehicle greenhouse gas emissions are also significantly reduced. Furthermore, roundabouts can be used as aesthetic gateways into communities or to provide a transition zone from a rural to an urban setting to accommodate the required reduction in vehicle speeds.

The overall goal for implementing modern roundabouts is to provide an intersection control which improves safety, efficiency and environmental impacts for all affected users.

Scope

Public Works, through a consultative process with the public, internal and external agencies, and Regional and Local Councillors, is responsible for investigating, evaluating and recommending modern roundabouts installations on Regional roads. A comprehensible feasibility assessment will be completed at all proposed locations to ensure that the roundabout can be reasonably and cost effectively implemented.

When designing roundabouts, one size does not fit all. The size and shape of a roundabout will vary according to the traffic demand, type of traffic, geometry, and classification of intersection. For design, two documents provide guidelines for best practice – The USA based Federal Highway Administration publication titled "Roundabouts: An Informational Guide" (FHWA-RD-00-067) and the "Synthesis of North American Roundabout Practice" – Transportation Association of Canada (TAC). Staff can also draw on assistance from other municipalities and consultants for detailed design and construction implementation. In the case of any development related roundabout installations staff will provide typical design standards and work with the developers to ensure that Regional standards and objectives are met.

Responsibility

The evaluation, planning design and construction of roundabouts within the Regional Road system will typically be undertaken by Public Works through the implementation of capital improvements.

Roundabout Implementation Considerations

The following should be considered when deciding whether to implement a roundabout:

- Right-of-way - Is there enough space for a roundabout, or is additional right-of-way or property required? The size of a roundabout will depend on the design vehicle to be accommodated, and traffic flows that dictate whether the roundabout needs to be single-lane or multi-lane.
- Safety - Are there high numbers of angle and turning movement collisions that could be mitigated with a roundabout?

- Delays or queues - Are there high delays or long vehicle queues being experienced that could be mitigated with a roundabout?
- Traffic flows - Are existing or forecast traffic flows relatively balanced between approaches? (Unbalanced flows do not necessarily mean a roundabout is not a suitable alternative, as there are other benefits to roundabouts such as safety.) Is there a high percentage of turning movements? High left turn flows, for instance, favors roundabouts because of signal lost time.
- Intersection geometry - Does the intersection have an offset, high skew angle, or more than four legs? Roundabouts can accommodate unusual geometry if there is sufficient right-of-way.
- Nearby driveways - Do any driveways need to be relocated because of splitter islands?
- Vulnerable road users - Is the intersection likely to have high numbers of bicyclists, or visually-impaired pedestrians? Traffic signals are sometimes preferred in these cases.
- Schools and parks - Are there schools or parks at the intersection? They allow more space for a roundabout and flexibility in the design. They also can mean higher pedestrian volumes. Would school crossing guards be required at a roundabout?
- Traffic calming - Are high traffic speeds likely, due to the design of the road and the surrounding land uses?
- Nearby structures or traffic control - Is the location near a structure? A roundabout may not require additional approach lanes, and therefore not require that a nearby overpass or underpass be widened. Is it near a signalized intersection where queues may spill back into the roundabout? Is it located near a railway crossing, where queues may block the railway tracks? Traffic signals can be interconnected with a railway crossing, but not a roundabout.
- Land use context - Is there a land use transition where a roundabout could notify motorists of a change in the road environment? Can they be used at either end of a commercial corridor to accommodate U-turns, allowing access driveways to be right turns only? This can mean more commercial sites served with driveways spaced closer together.
- Technical constraints - Are there any steep grades, unusual drainage, possible difficulties with meeting sight distance requirements, etc. that may preclude a roundabout?

While one or more of the reasons for considering a roundabout may apply to a given intersection, there are other considerations that must be taken into account. Some of them are:

- New versus existing intersections - New locations offer more flexibility with design. Existing locations usually offer a constrained site with design challenges, the potential for compromised operations due to design trade-offs, and potential complexity and cost issues with utilities and traffic control. However, existing locations also offer the opportunity for a roundabout to solve an actual operational or safety problem.

- Urban versus rural intersections - Rural locations tend to be isolated with lower traffic volumes, higher approach speeds and fewer right-of-way impacts. Urban locations tend to be the opposite, and may be close to other intersections.
- Local history - A location can be close to other roundabouts where the public recognizes and accepts them. A location can also represent the first roundabout in an area, requiring greater emphasis on public outreach and education. Finally, a location can be in an area with real (or even perceived) negative experience with roundabouts, necessitating extensive effort to correct previous mistakes and overcome misconceptions.

Suitability Factors for Roundabouts

A number of suitability factors for roundabouts are outlined in Table 1 shown below. Not all of these factors may be applicable at new or planned intersections.

Table 1 – Proposed Suitability Factors for Roundabouts

No.	Suitability Factor	Outcome
1	Is there a historical safety problem at the intersection for motorists or pedestrians?	Yes □ No □
2	Are capacity problems currently being experienced or expected in the future?	Yes □ No □
3	Is there a high proportion of turning movements at the intersection?	Yes □ No □
4	Are traffic signals warranted, or expected to be warranted in the future?	Yes □ No □
5	Does the intersection experience high side-street delays under stop control (but not enough to warrant traffic signals)?	Yes □ No □
6	Is there sufficient property at the intersection (i.e. over 50 metres clear diameter if considering a single-lane roundabout, and over 65 metres clear diameter if considering a two-lane roundabout)?	Yes □ No □
7	Does the intersection have more than 4 legs, or unusual geometry?	Yes □ No □
8	Will planned modifications to the intersection require that nearby structures be widened (i.e. to accommodate left turn lanes)?	Yes □ No □
9	Is the intersection located at a transition between rural and urban environments (i.e. an urban boundary) such that a roundabout could act as a means of speed transition?	Yes □ No □

10	Is the intersection located at a neighbourhood or commercial entry such that a roundabout could act as a gateway feature?	Yes □ No □

If "Yes" is indicated for two or more of the suitability factors, then a roundabout should be considered in more detail.

Contra-Indications for Roundabouts

There are location and site context conditions that can be problematic for installing roundabouts. Some of them can be problematic for stop-controlled or signalized intersections as well. Problematic site conditions such as those listed in Table 2 (see below) should not necessarily preclude a roundabout from consideration, but should warrant extra caution.

Table 2 – Proposed Contra-Indications for Roundabouts

No.	Contra-Indication	Outcome
1	Are there any approaches where stopping sight distance (SSD) of a roundabout yield line may not be attainable (i.e. the intersection is on a crest vertical curve)?	Yes □ No □
2	Is there an existing uncontrolled approach with a grade in excess of 4 percent?	Yes □ No □
3	Is there a closely-spaced traffic signal or railway crossing that would not be controlled with a nearby roundabout?	Yes □ No □
4	Is the intersection part of a coordinated arterial signal system, such that a roundabout would disrupt traffic platoons?	Yes □ No □
5	Does the intersection experience a heavy flow of through traffic on the major street opposed by relatively light traffic on the minor street?	Yes □ No □
6	Are there one-way streets or reversible traffic lanes approaching the intersection?	Yes □ No □
7	Are there known visually-impaired pedestrians that cross the intersection?	Yes □ No □

If "Yes" is indicated for one or more of the contra-indications, then a roundabout may be problematic at the subject location. This does not mean that a roundabout is not applicable, but design difficulties or high costs may be encountered.

The foregoing suitability factors and contra-indications provide guidance in screening locations for roundabouts. These locations could include areas of local development such as commercial or industrial uses, or even new residential areas.

A more rigorous means of determining the suitability of a roundabout is appropriate at Regional Road intersections. To this end it is proposed that a roundabout be considered for implementation under the following criteria:

- A new intersection on a Regional Road.
- An existing intersection on a Regional Road where traffic signals are warranted.
- An existing intersection on a Regional Road which is programmed for modifications to address an identified capacity or safety problem.
- Any other location as determined by staff or Regional Council.

If a location meets one or more of these criteria then a Roundabout Screening Assessment shall be completed. This is a high-level comparison of intersection control alternatives such as conversion from stop to traffic signal control, or modifications to an existing signalized intersection, versus conversion to a roundabout. The comparison should include some documentation of existing capacity or safety problems (if applicable), and an estimation of construction and life cycle costs for each alternative. Life cycle costs are typically stated as present costs. The evaluation should consider the benefit of accident avoidance as used in developing Safety Performance Functions (SPF's) as part of Halton Comprehensive Road Safety Action Plan (CROSAP).

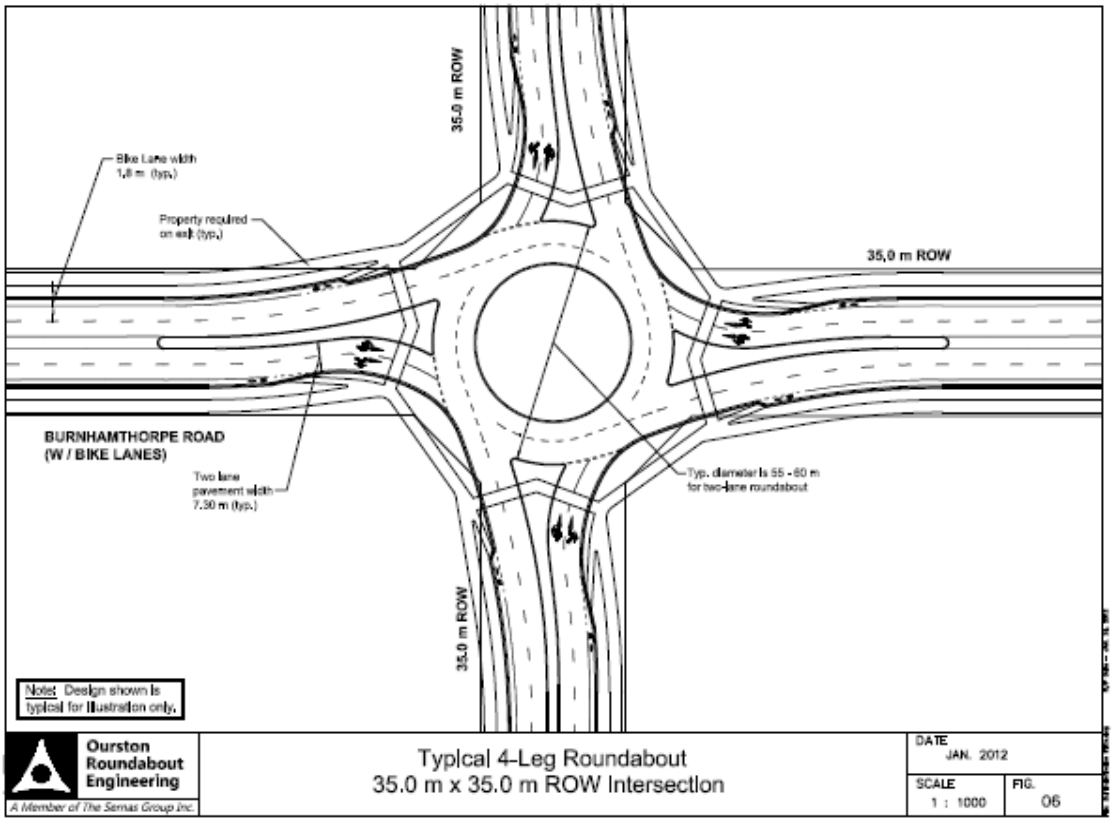
This process will screen out many possible locations for roundabouts, such as densely-developed urban areas, because the cost to construct a roundabout will be prohibitive compared to its potential benefit in terms of life cycle costs. Locations where screening indicates that a roundabout may be of benefit would be subjected to a more detailed comparison. Such comparisons have been called Traffic Control Studies, Intersection Control Studies or Intersection Control Evaluations.

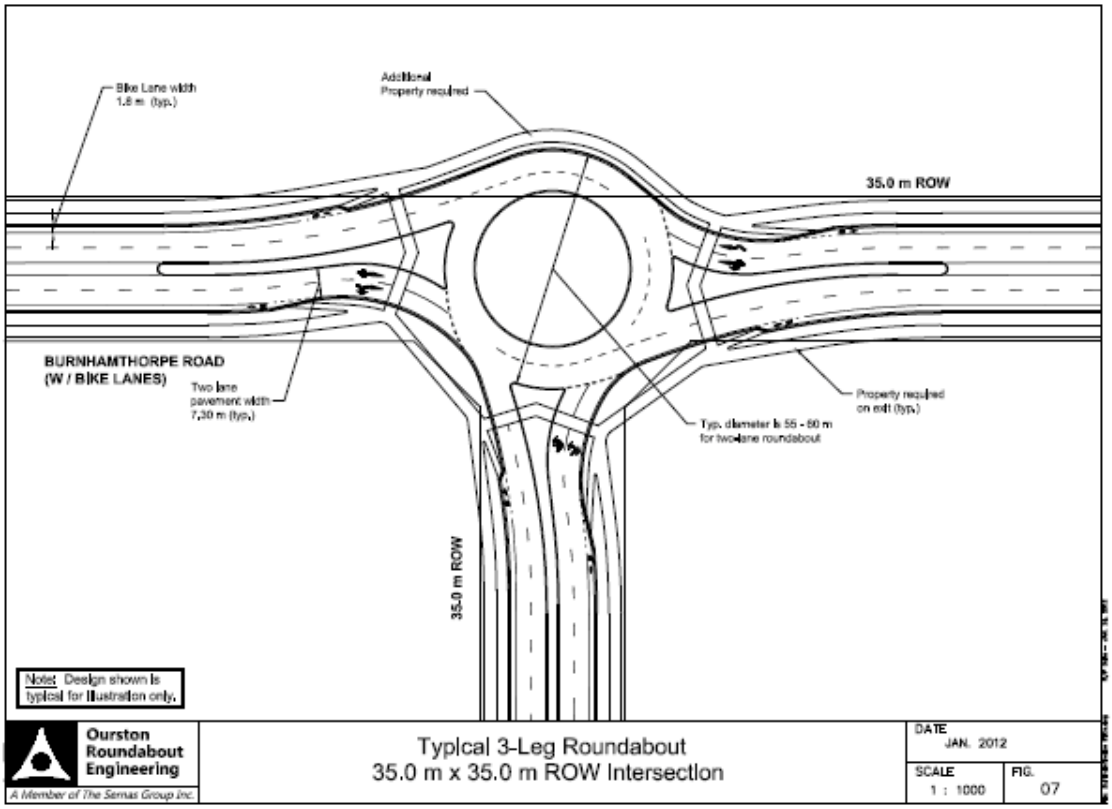
In such a comparison, the alternatives under consideration are examined on the basis of several economic and non-economic criteria. Economic criteria include construction and life cycle costs, evaluated in more detail than at the screening stage. Non-economic criteria may include safety, speed control, access management, impacts to transit and emergency services, conditions for pedestrians and cyclists, environmental considerations, need for public outreach, etc. These criteria would need to be evaluated more subjectively.

The economic and non-economic comparisons often result in the same recommendation. If they do not then their relative importance will have to be weighed against each other to determine which intersection control alternative is preferred.

Exhibit 1 -Roundabout Typical Drawing

The typical roundabout drawings are only intended to be used as a guideline for determining whether a roundabout may fit within a given intersection, and what property impacts are likely. It is not a standard for design.





Definitions

The following is a partial list of more commonly used definitions associated with modern roundabout installations:

Modern Roundabouts - a circular intersection varying in size depending on traffic volumes and roadway geometry, and typically found on major roadways. The key elements include a raised central island placed at the center of an intersection; raised splitter islands located at each entry to the intersecting, counter clockwise circulation, yield control at all approaches to the intersection. They may have a single or multiple circulating lanes of traffic. Roundabouts are generally used in place of traffic signals on major roadways. The benefits of roundabouts are that they slow traffic and reduce the number of right-angle and turning movement collisions, while providing a more efficient and environmentally friendly operation.

Inscribed Circle Diameter - measure of the size of a roundabout. Governed by the number of entry and exit lanes, size of design vehicle and property constraints.

Yield Line - denotes where entering drivers give way to circulating traffic and generally inscribes the outside diameter of the roundabout.

Circulatory Road - the minimum width is equal to the widest entry. In multi-lane roundabouts pavement markings in the circulatory road are usually used to denote lane use, recognizing that trucks may need to take up more than one lane.

Central Island - a central non-overrun area. Sightlines shall be maintained around the outside but blocked through the middle using landscaping or other means.

Truck Apron - an overrun area for trucks. Usually necessary for single-lane roundabouts to avoid a very wide circulatory road or small central island.

Entry Radius - the smallest curb radius before or at the yield line. Not the same as entry path radius or deflection.

Entry Angle - half the angle between the entry and the next exit. A higher angle means the entry is more perpendicular to the circulatory road. If the angle is too flat entering, drivers will have to turn too much to the left to see circulating traffic.

Entry Width - width at the roundabout entry measured to curb face. Must be sized to accommodate design vehicle yet not be overly large at single-lane roundabouts. The distance over which the approach widens to the entry is the flare length.

Exit Width - width at the roundabout exit measured to the curb face. Two exit lanes can reduce to one lane over a 15:1 to 20:1 taper depending on volume and speed of traffic.

Splitter Island - directs drivers to circulate counter-clockwise and provides refuge area for pedestrians.

Pedestrian Crossing - two-stage crossing located one car length or multiple behind the yield line.

Bicycle Lane Termination and Re-Entry - forces bicyclists to choose between navigating roundabout as a vehicle by taking the traffic lane or as a pedestrian by providing access to a sidewalk