

Alternative Development Standards:

A Guide for Practitioners

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Affordability and Choice Today (ACT)

Affordability and Choice Today (ACT) provides grants to help modify planning and building regulations that can improve housing affordability and choice. The program is funded by Canada Mortgage and Housing Corporation and delivered by the Federation of Canadian Municipalities in collaboration with the Canadian Home Builders' Association and the Canadian Housing and Renewal Association.

The **Federation of Canadian Municipalities (FCM)** has been the national voice of municipal governments since 1901. FCM fosters sustainable communities enjoying a high quality of life by promoting strong, effective and accountable municipal government.

Canada Mortgage and Housing Corporation (CMHC). Backed by 60 years of experience, CMHC works with community organizations, the private sector, non-profit agencies and all orders of government to help create innovative solutions to today's housing challenges, anticipate tomorrow's needs and improve the quality of life for all Canadians.

The **Canadian Home Builders' Association (CHBA)** is "the voice of Canada's residential construction industry," representing more than 8,000 member firms across Canada. CHBA members include new home builders, residential developers, home renovators and suppliers of building materials, components and consulting services. Associate members include CMHC and a number of local associations and municipal governments.

The **Canadian Housing and Renewal Association (CHRA)** is a national non-profit organization representing those who manage and deliver housing programs in communities across Canada. Our mission is to promote access to adequate and affordable housing by influencing housing policies and programs across the country.

Affordability and Choice Today (ACT)

Federation of
Canadian Municipalities

www.actprogram.com
info@actprogram.com

24 Clarence Street
Ottawa, ON KIN 5P3
Tel: 613-907-6242
Fax: 613-244-1515

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Ce document est aussi disponible en français au site www.programmeact.com.

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At the ACT website (www.actprogram.com) you can find:

- **an electronic version of this guide in PDF format; and**
- **a customizable PowerPoint presentation, complete with speaking notes, to introduce alternative development standards to your peers, elected officials and other stakeholders.**



Introduction



About this guide

The Affordability and Choice Today (ACT) program promotes greater housing affordability and choice through regulatory reform. Since 1990, it has generated a wealth of practical and proven solutions from its grant projects. Individual case studies and solution sheets available on the ACT website at www.actprogram.com help practitioners to understand, emulate and adapt innovations undertaken by others.

One focus of the ACT program is alternative development standards (ADS). This guide draws from the results of two dozen ACT grant projects, as well as non-ACT projects across Canada. It is intended to be a user-friendly overview of the subject for development professionals such as engineers, planners and builders. It presents technical information and guidance with the intent of communicating both the "how to" and "lessons learned" of ADS. It is not intended to be an exhaustive review, and does not represent a complete assessment of best practices. Interested readers will find additional references and links at the end of the guide that offer more valuable information and access to expertise in a range of related fields.

What are alternative development standards?

Development standards are the rules that municipalities use to guide the planning, design and construction of residential communities. They determine the size and arrangement of lots, the design of streets, the amount of parking, methods of managing stormwater, and the location of sewer, water and utility lines. Ultimately, they affect the cost and environmental impact of new developments, and the quality of life enjoyed by a community's residents.

Development standards should reflect the social, economic, technical and environmental conditions and objectives of their time. However, many conventional development standards were established in the 1950s and 1960s when land costs were low, environmental awareness was less developed, and the nuclear family was dominant. Those standards have been dated, if not rendered obsolete, by the rapid emergence of sustainability as a principal objective of all orders of government.

In contrast, alternative development standards represent flexible and innovative approaches to shaping residential development in a way that is consistent with improved environmental performance of communities, with benefits for affordability, diversity, liveability and environmental health. A growing acceptance of ADS in Canada is evidenced by the creation of "neo-traditional" or "new urbanist" communities, several of which have involved a comprehensive reinvention of conventional development standards and have been the subject of extensive public and professional attention.

Types

In general, ADS can take two different forms:

- Planning policies and regulations – Official plans, neighbourhood plans and zoning bylaws set overall targets for development densities, the acceptable dimensions and configurations of individual lots, requirements for parking, and the acceptable types and sizes of homes and other buildings. By doing so, they can lay the foundation for housing affordability and diversity.
- Engineering standards – Municipalities identify rules that shape the locations, dimensions and designs of rights-of-way, roads, curbs, sidewalks, boulevards, street trees, street lighting, stormwater and sanitary sewer drains, water distribution pipes and linear utilities (electricity, telecommunications and natural gas). They may also identify acceptable construction materials and techniques. By reducing the dimensions and resource requirements of physical infrastructure, these standards can contribute to housing affordability.

Scales of application

ADS can be applied at several different scales:

- Individual lots – Redevelopment or infill projects may involve mixed uses or higher densities, and may not be feasible under conventional development standards. More flexible standards can optimize development outcomes in the face of unique constraints.
- Subdivisions – Larger developments involving multiple lots are the most common application of ADS.
- Communities – ADS can be applied to the creation of entire neighbourhoods involving residential, commercial, recreational and institutional elements.

Regardless of the form or scale of ADS measures, they must actively take into account local circumstances. Topography, soils, hydrology, winter conditions, community support and the proximity to natural or built features can all affect the choice of development standards and the likelihood of successful implementation.

Benefits of alternative development standards

Two decades ago, ADS approaches were an experiment driven largely by economic considerations. Today, they have emerged as a credible, strategic tool to improve many aspects of community quality of life.

Increased housing affordability

ADS can reduce the average amount of land and physical infrastructure (length of pipe, area of paved surface) required to support a housing unit, with the resulting cost savings passed on to consumers.

Increased housing choice

ADS can benefit people of diverse backgrounds and incomes by enabling adaptability and flexibility in design. Residential projects that include a range of home sizes and costs are more likely to attract residents of different ages and incomes.

Reduced municipal costs

Having less infrastructure under municipal ownership implies lower costs for construction, operation, maintenance and rehabilitation. Compact, walkable communities with mixed land uses are also easier to serve efficiently with transit service, and can generate higher ridership and fares.

Reduced environmental footprint

Communities built with ADS offer a direct alternative to conventional patterns of suburban development by consuming less land, requiring less concrete and asphalt, preserving natural habitats and ecosystems, and discharging less contaminated stormwater into streams, rivers, lakes and oceans.

Increased marketability

Housing consumers are increasingly interested in "green" living and homes with a reduced environmental footprint. In this marketplace, compact and ecologically sensitive communities can enjoy a competitive advantage.

Increased quality of life

Compact, mixed-use communities offer transportation choice and make healthy alternatives like walking and cycling more convenient and attractive. More compact lot arrangements can yield more free land for parks and other public uses. Neighbourhoods with a mix of land uses can encourage resident interaction and round-the-clock usage, which enhances safety.

Barriers and success strategies

The experiences of Canadian communities with ADS have yielded some important lessons about the key challenges to implementation, and ways to overcome them.

Aversion to risk

Conventional engineering standards reflect built-in safety factors, and are only likely to be relaxed where there is clear evidence that doing so can provide public benefits without undue risk. The onus is therefore on planners, developers and other champions of ADS to explain why conventional standards are unduly conservative in terms of risk avoidance, or to find ways of mitigating the added risk implied by the alternatives.

The challenge of changing conventional engineering standards can be addressed in several ways. First is a thorough risk assessment, using available data from implemented projects and considering multiple perspectives (e.g. financial, technical,

environmental). This assessment can be supported by demonstrating the acceptance of ADS in comparable municipalities. Second, small-scale pilot projects that entail limited risk (e.g. one narrow street in a new subdivision) can help bring skeptics onside. Finally, ADS pilot projects can be enabled by an agreement to provide a backup solution based on conventional standards—an approach that has been used (at substantial extra cost) for innovative stormwater management strategies, and one that would not be applied after the alternative is shown to function acceptably.

Lack of understanding and support

ADS can involve or affect many different participants: elected officials, planners, engineers, construction managers, environmental professionals, parks staff, emergency service providers, developers, builders, contractors, homebuyers and the general public. To varying degrees, their understanding and support is essential to the successful adoption and implementation of ADS—but it can be challenging to engage, involve and inform this range of potential participants.

Proponents of ADS can address this challenge by engaging those with a vested interest. An open, inclusive and informed dialogue can elicit varying perspectives and help identify

potential roadblocks and practical solutions early in the process. By identifying and involving articulate champions, ADS proponents can overcome resistance to change and help build support for new approaches. One way to engage municipal staff effectively is to emphasize opportunities for them to learn from innovation and to attract public recognition for their efforts.

Conflicting financial perspectives

The bottom line is important to both developers and municipalities. However, these key stakeholders account for their investment costs and benefits differently, making it difficult to paint a financial picture that everyone can agree on. Developers are concerned primarily with the costs of land, services, construction and regulatory approvals, while governments are

more sensitive to long-term operating and maintenance costs. Tradeoffs between developer and municipal costs can therefore be contentious—for example, right-of-way reductions can reduce initial construction costs but increase the effort and expense of snow removal. Complicating these discussions is the fact that it may be fairly easy to demonstrate capital cost reductions from ADS, but more difficult to find convincing evidence of their longer-term benefits.

This challenge can be addressed through the development of a well-researched, clear and comprehensive financial assessment of the proposed development standards that, to the extent possible, identifies short-term and long-term costs to all those involved. Forming a technical committee of key participants to identify and resolve differences can also facilitate effective negotiations and better decision-making.

Complex and costly municipal approval processes

Where new development standards are first proposed in a development application, the involved parties must negotiate the application of the standards as well as how to share costs and responsibilities. These negotiations add extra risk to already long and costly approval processes, and may deter all but the most risk-tolerant and financially secure developers.

This challenge is best addressed by developing and approving alternative standards outside the context of a particular development application, for example by creating a new development zone in a zoning bylaw. Where this is not possible, risks can be minimized through the establishment of a collaborative, rather than adversarial, process for development application and approval. Collaboration among participants with differing perspectives can lead to integrated and practical long-term solutions.

Piecemeal application

The aggregation of several alternative standards in one development may yield a different result than the simple sum of its parts. Without a "big picture" view to ensure that various standards work together harmoniously, one may undermine another. For example, reduced lot sizes and landscaped boulevard widths can increase the proportion of land covered by impervious surfaces (e.g. roofs, pavement) and thus increase the volume and rate of stormwater runoff—thereby supporting two objectives (affordability and lesser consumption of land) while opposing another (reduced stormwater flows). For another example, significantly denser communities that are not accompanied by an equally heightened quality of design can seem less, not more, liveable.

This challenge requires alternative standards to be considered as a package, and their outcomes to be assessed at a system level. Planners and developers are responsible for ensuring that individual and collective ADS measures improve the overall product while reducing costs and impacts. Conscious thought and effort, and possibly additional investment, are required to balance alternative standards with the needs and conditions of each development and its market. Large-scale developments that incorporate a variety of alternative designs into a single package that responds to unique local circumstances (e.g. Garrison Woods in Calgary, Bois Franc in Montreal) are perhaps the best example of this idea.

Building Lots

Development standards guide the subdivision of land into individual building lots. Conventional standards requiring large, rectilinear or pie-shaped lots make it difficult to create compact, walkable communities with a range of housing types. Alternative approaches can address these shortcomings.

Lot size

Over the last two decades, smaller lots have become more common in new suburban developments. They increase yield for developers and reduce the average cost of each home by spreading many costs (e.g. land purchase, road construction, hard service installation, park development, marketing) over more units. However, experience has shown that smaller lots can pose some challenges. They tend to increase the proportion of impermeable surfaces within a development, which can negatively impact stormwater management and should be balanced by efforts to improve stormwater infiltration and detention. They also constrain private amenity space (e.g. front and rear yards) and should be balanced by improvements to the design of private space as well as public open space (e.g. rights-of-way, parks).

Reduced frontage, area and setbacks

Many communities have reduced conventional requirements for minimum lot dimensions and building setbacks, without similar reductions in dwelling size. Other communities have permitted smaller lots in conjunction with reduced home footprints or attached housing, an approach that can increase housing choice and affordability by giving developers the flexibility to offer a range of products and prices.

Reduced area of rural lots

Minimum rural lot sizes are often determined by the needs of conventional septic disposal systems. However, innovations in sewage treatment (see page 16) have created the opportunity to reduce rural lot sizes by eliminating the need for each home to have a large dedicated septic leaching field. This enables clustered development that can reduce land consumption and protect sensitive features (see page 8).

Alternative Standards for Lot Size

City of Surrey, B.C. – East Clayton district – Detached homes

Dimension	Conventional (RF zone)	Alternative (RF-12 zone)	Alternative (RF-9 zone)
Frontage	15.0 m	12.0 m or 14.0 m (corner lot)	9.0 m, 10.5 m (corner lot) or 7.9 m (up to 33% of lots)
Depth	28.0 m	26.0 m	28.0 m
Area	560 m^2	320 m^2	250 m^2
Front yard setback	7.5 m	4.0 – 6.0 m	2.0 – 3.5 m
Side yard setback	1.8 m	1.2 m	1.2 m

Note: Alternative standards included a limit on combined impervious (built and paved) surface area, and a minimum area for front yard landscaping, to reduce the cumulative impacts of small lots on stormwater drainage.

City of Surrey

District of Hope, B.C. – Detached homes

Dimension	Conventional (RS-1 zone)	Alternative (RS-2 zone)
Frontage	15.24 m or 10% of lot perimeter	No change
Area	464.5 m^2	375 m^2
Front yard setback	7.5 m	6.0 m
Side yard setback	1.5 m (interior side lot) or 3.6 m (exterior side lot)	1.2 m (interior side lot) or 2.5 m (exterior side lot)
Dwelling footprint coverage	35% maximum	45% maximum

District of Hope

City of Ottawa, Ont. – Pineglade Pilot Project – Semi-detached homes

Dimension	Conventional	Alternative
Frontage	9.0 m	6.0 m
Area	270 m^2	140 m^2
Front yard setback	5.5 – 6.5 m	4.0 m
Side yard setback	3.0 m	1.2 m
Yield	28 units/hectare	40 units/hectare

Note: Resulting land cost dropped by 33% or more than $4,000/unit (1998 dollars).

Jeffrey van der Poll

Beaubassin Planning Commission, Cap-Pelé, N.B. – Rural detached homes

Dimension	Conventional	Alternative
Area	0.4 ha	0.2 ha

Note: Alternative standard for lot size applies only with a provincially approved sewage disposal system. Adoption of this standard reduced the approval period for smaller lots from one year to 12 weeks or less.

More information on these projects is available in the solution sheets and case studies at www.actprogram.com.

Lot configuration

Conventional approaches to lot configuration can make inefficient use of both land and infrastructure. For example, pie-shaped building lots tend to consume excessive land. Traditional side-by-side lots with wide frontages along a right-of-way require a high ratio of linear infrastructure (e.g. pavement, service mains) per lot.

Lot shapes and arrangements

Some communities have challenged conventional approaches to lot configuration through alternatives (e.g. herringbone arrangements, flag lots) that increase yield, reduce average servicing costs, and support more compact development.

Lot distribution

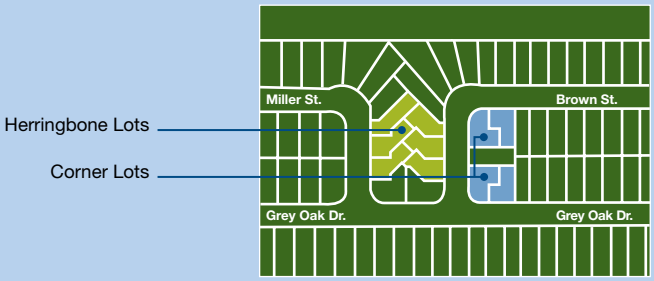
Conventional subdivision developments tend to spread individual lots evenly across a development area. This consumes more land than necessary, requires more infrastructure for roads and services, and minimizes opportunities to protect ecologically sensitive areas.

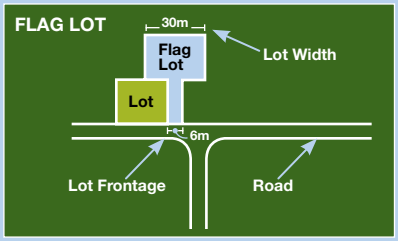
Clustered development

By reducing the size of each lot and arranging them in clusters, developers can build the same number of units and lessen their road and utility infrastructure obligations, while preserving more land as natural areas or open space. In rural clusters, water and septic systems may not be located on individual lots but in shared open space areas. Those areas can also support effective stormwater management measures, or recreational facilities that build a sense of community and improve quality of life.

Alternative Standards for Lot Configuration

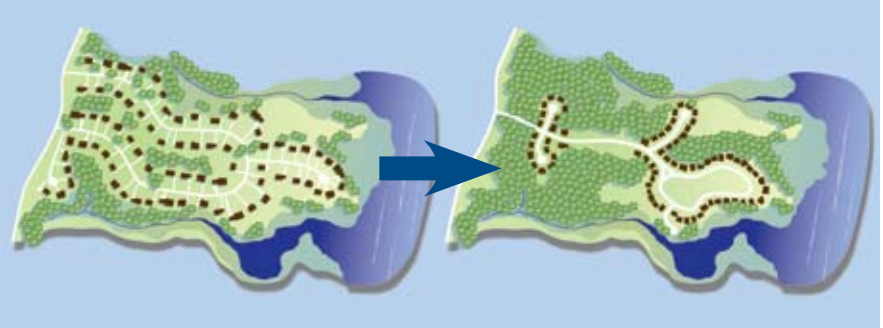
Community and project	Features
City of Guelph, Ont. Actarea site, Pine Ridge East subdivision	• Herringbone lot arrangements used space more efficiently than conventional pie-shaped lots • L-shaped corner lots improved privacy and architectural potential • These alternative configurations allowed 23 lots to be created, versus 19 using conventional standards
Town of Sackville, N.B. New subdivision bylaw	• Permission given by right for "flag" lots at the rear of regular street-front lots, accessed by a narrow right-of-way • Flag lots reduce the average length of water, sewer and road infrastructure required for each lot





More information on these projects is available in the solution sheets and case studies at www.actprogram.com.

Clustered Development Concept



Adapted from Province of New Brunswick

Streets and Parking

Many conventional road and parking standards do not support local policies that emphasize the need for more balanced, multimodal transportation systems. Alternative standards offer a number of approaches to reconciling practical transportation needs with the objective of improving environmental performance.

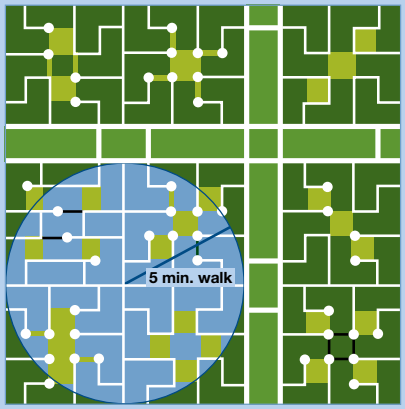
Street layout

Conventional suburban street layouts are often characterized by crescents and dead ends, which can limit the availability of safe and convenient routes for pedestrians and cyclists.

Grid-based street layouts

"Pure grid" layouts in residential areas maximize connectivity for all modes, but can encourage the use of local streets by short-cutting traffic and lead to high ratios of paved surfaces. Many new urbanist or neo-traditional neighbourhoods have applied a "modified grid" approach that tempers some of these negative aspects. As another alternative, Canada Mortgage and Housing Corporation has researched and developed a hybrid street layout called the "fused grid." It involves a traditional grid at the neighbourhood and district level, but adopts a discontinuous street network at the block scale accompanied by connected pathways and parks that create efficient routes for active transportation users. By doing so, the fused grid optimizes pedestrian connectivity while minimizing traffic volumes on local streets.

Fused Grid Concept



More information on the fused grid street layout is available at the "Fused Grid" page at www.cmhc.ca.

Adapted from Canada Mortgage and Housing Corporation

Right-of-way dimensions

Road allowances consume a considerable portion of the land required by new developments. Conventional right-of-way standards accommodate liberal widths for traffic and parking lanes and the burial of utilities in separate trenches, leading to broad streets with high capital costs and limited opportunities to plant and sustain street trees.

Reduced road width

Narrow roads cost less to build and maintain, use fewer materials, and reduce stormwater runoff and utility installation costs. They allow more land to be used for additional dwellings or parks. They provide more room for trees that can shade the street, but which otherwise might have insufficient rooting space. They also encourage slower traffic and create a more pedestrian-friendly streetscape—facts that, over the last decade or so, have led many traffic engineers to favour narrower roads.

Narrow roads can present challenges. In some cases, they can reduce room for snow storage and increase snow removal costs. Where they are achieved by eliminating on-street parking, residents and visitors may be concerned about parking capacity. Very narrow roads may also conflict with the minimum access requirements of large fire protection vehicles. Resolution of these issues requires local stakeholders to consider the pros and cons of a particular road width, and to reach a consensus on its acceptability and any required mitigation.

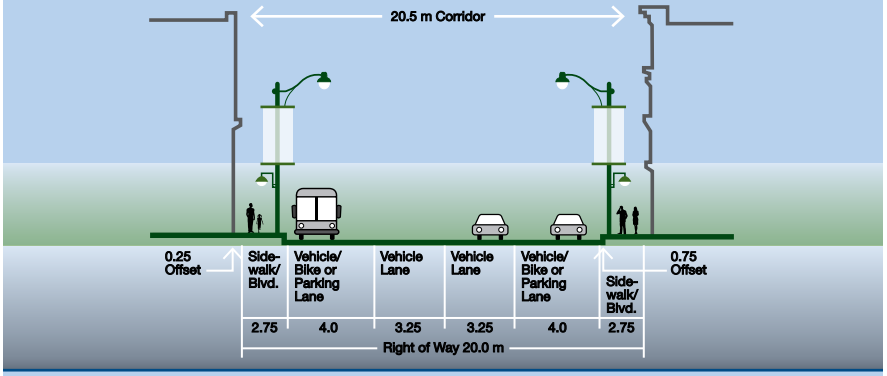
Reduced boulevard width

Narrower street boulevards (the space between the street curb and the edge of the right-of-way) can reduce land costs and allow more land to be used for additional dwellings or parks. They bring the fronts of homes closer to the street, creating a more neighbourly feel.

Boulevard width can be reduced by eliminating one or both sidewalks, but this strategy may undermine the preservation of safe and convenient neighbourhood walking routes. An alternative approach that does not compromise walkability is to locate utilities (telephone, cable, electricity, natural gas) in shared trenches and/or beneath the sidewalk rather than beneath a landscaped boulevard (see page 16 for more detailed discussion of this strategy).

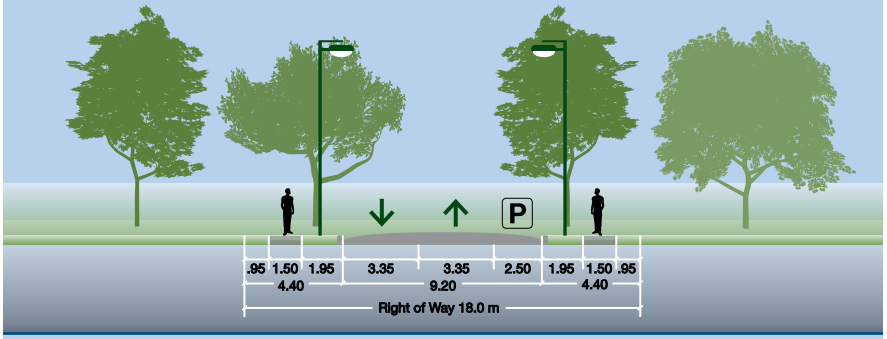
Alternative Standards for Right-of-Way Width

Community and project	Street type	Conventional width	Alternative width
City of Surrey, B.C. East Clayton	Collector	20.0 m	18.0 m
City of Ottawa, Ont. Pineglade Pilot Project	Local	20.0 m (8.5 m paved)	16.0 m (8.0 m paved)
City of Ottawa, Ont. Road corridor design guidelines	Main street (constrained environment)	26.0 m	20.0 m



Adapted from City of Ottawa

City of Montreal, Que. Bois Franc	Local	20.0 m (9.0 m paved) for two-way streets	18.0 m (9.2 m paved) for two-way streets (see image), 15.0 m (6.2 m paved) for one-way streets



Adapted from City of Montreal

Town of Sackville, N.B. New subdivision bylaw	Local	20.0 m	16.0 m
Town of Truro, N.S. Farmington Village	Local	15.24 m	12.2 m

More information on the project in Surrey, B.C., is available in "Research Highlight: The Headwaters Project—East Clayton Neighbourhood Concept Plan" at www.cmhc.ca.

More information on the projects in Ottawa, Ont., (Pineglade), Sackville, N.B., and Truro, N.S., is available in the solution sheets and case studies at www.actprogram.com.

More information on the Pineglade project in Ottawa, Ont., is available in the pages on "Modifying Development Standards" at www.cmhc.ca.

More information on the guidelines in Ottawa, Ont., is available in *Regional Road Corridor Design Guidelines* (2000) at www.ottawa.ca.

Alternative Standards for Streetscape Design

Community and project	Features	
District of Ucluelet, B.C. Rainforest Drive subdivision	• Narrowed asphalt surface of 6.5 m • Pedestrian path separated from the road by elevation, rocks, trees and rock-filled swales (French drains)	 District of Ucluelet
City of Vancouver, B.C. Crown Street reconstruction	• Two-way road width reduced from 8.5 m to 6.7 m, including an asphalt strip of 3.5 m edged with borders comprising 1.0 m of concrete and 0.6 m of structurally reinforced grass (a porous load-bearing surface that allows grass to grow through it) • Portion of the road diverges around a vegetated swale using two one-way lanes (see photo) with an asphalt strip of 2.2 m and concrete borders of 0.4 m • Meandering alignment of driving surface within right-of-way • Curbless design drains to shallow, vegetated swales and detention ponds	 City of Vancouver

More information on the project in Vancouver, B.C., is available at the "Crown Street sustainable streetscape" page at www.vancouver.ca.

Streetscape design

Traditional street design gives cyclists and pedestrians little separation from motorized vehicles, encourages higher traffic speeds, offers little opportunity to integrate natural ecological features, and typically leads rainwater directly into storm sewers. Even when there is no desire or opportunity to reduce a street right-of-way, innovative design features can create a more liveable and natural alternative to conventional streetscapes.

Environmentally sensitive design

Within conventional rights-of-way, narrowing the paved portion of a street yields opportunities to use the remaining space in a more innovative way than conventional curb, sidewalk and boulevard designs. Some of these opportunities support parallel objectives such as stormwater management, as discussed on page 14.

Parking for single-family dwellings

Conventional parking standards for single-family dwellings typically require two parking spaces located on each property, with at least one in a garage. These standards may exceed actual demand for many homes in order to ensure spare capacity and minimize on-street parking activity. Excessive parking supply increases housing costs and creates the need for large setbacks.

Rear lanes

Parking accessed from rear lanes eliminates the requirement for a street-facing garage, making home facades and streetscapes more attractive. Rear lanes also enable reductions in both lot width and front setbacks, but do tend to increase a development's proportion of paved surfaces.

Flexible parking location

The land consumed for parking can be reduced by moving parking underground, by providing clustered parking in nearby shared spaces (see next paragraph), or by allowing outdoor parking spaces to encroach on the boulevard portion of the right-of-way.

Unbundled parking

The emerging concept of "unbundling" parking spaces from dwelling units would reduce the number of on-site parking spaces while allowing homeowners to rent additional parking spaces in shared parking lots a short distance away. Under the assumption that not all homeowners require the standard number of parking spaces, this strategy can reduce the total amount of land consumed for parking, reduce the average cost of a home, and provide a financial incentive for homeowners to reduce the number of vehicles they own.

Parking for multiple-family and mixed-use developments

Conventional parking standards for larger condominium or apartment buildings give developers little flexibility to reduce costs and boost affordability by tailoring parking supply to the expected needs of occupants. Unnecessary parking has a substantial economic impact, given that the construction cost of an underground or structured parking space can average $20,000.

Reduced parking requirements

Multiple-family dwellings near quality transit service are likely to attract residents with lower levels of car ownership, as are dwellings oriented to seniors and lower-income families. Reduced minimum parking requirements for these uses allows developers to estimate and provide the number of parking spaces that are truly needed. A smaller supply of parking can also be warranted for developments that unbundle parking (e.g. where residents do not receive parking spaces automatically, but rather rent or purchase them separately), or those that integrate car-sharing services and allow some residents to eliminate their need for a private car.

Shared parking

Mixed-use developments, which are desirable elements of sustainable communities, offer opportunities to reduce total parking supply. Since different uses (e.g. office and residential) experience peak parking demand at different times, it should be possible to share some parking spaces between uses without compromising the ability to meet the maximum total demand.

Travel options

Developers can reduce parking demands by encouraging tenants and visitors to use travel options other than cars. Transportation demand management (TDM) measures, such as building transit passes into the cost of condominium units, providing an on-site car-sharing service or including secure bicycle storage, can both improve marketability and reduce the need for residents to own and use their own cars.

Alternative Standards for Parking: Single-Family Dwellings

Community and project	Features
Town of Banff, Alta. Sundance Court	• Surface parking permitted for townhomes, rather than requiring garages
City of Ottawa, Ont. Pineglade Pilot Project	• One of two required parking spaces per unit permitted to encroach up to 1.5 m into boulevard portion of street right-of-way
City of Montreal, Que. Bois Franc	• All parking underground, accessed from rear of lot • Driveway width reduced from 6.0 m to 4.0 m

Banff Housing Corporation

More information on the projects in Banff, Alta., and Ottawa, Ont., is available in the solution sheets and case studies at www.actprogram.com.

More information on the project in Ottawa, Ont., is available in the pages on "Modifying Development Standards" at www.cmhc.ca.

Alternative Standards for Parking: Multiple-Family and Mixed-Use Developments

Community and project	Features
District of Saanich, B.C. Short Street redevelopment	• Parking requirements reduced by 32 spaces (21%) in return for providing new residents with a transit pass for two years, a car-share vehicle for the development with membership for each unit, and secure underground bicycle storage • Residents share commercial parking spaces after 6:00 p.m.

District of Saanich

City of Mississauga, Ont. Condominium apartments	• Resident parking requirement reduced from 1.75 spaces per unit to 1.25 spaces per one-bedroom unit and 1.40 spaces per two-bedroom unit
City of Mississauga, Ont. Social housing	• Resident parking requirement reduced from 1.18 to 0.75 spaces per one-bedroom unit, from 1.36 to 0.90 spaces per two-bedroom unit, and from 1.50 to 1.14 spaces per three-bedroom unit.

More information on the project in Saanich, B.C., is available in "Transit Oriented Development Case Study: Short Street Project, Saanich, B.C." at www.cmhc.ca.

More information on the projects in Mississauga, Ont., is available in the solution sheets and case studies at www.actprogram.com.



Stormwater and Servicing

Reducing the need for stormwater management infrastructure and other buried services can make homes more affordable. Stormwater management is also an important determinant of a development's effects on adjacent ecosystems as well as those further "downstream."

Stormwater management

Conventional development standards treat stormwater management as a waste disposal issue, draining rainwater into storm sewers or streams before it can filter into the ground. In contrast, alternative approaches to stormwater management can:

- increase infiltration that helps restore natural water table levels and hydrologic cycles;
- reduce contaminants in open water bodies by removing pollutants such as road salt, oil and grit, pesticides, fertilizers and pet waste from runoff (including up to 60 per cent to 90 per cent of total suspended solids and phosphorous);
- reduce flooding and erosion impacts on property and natural habitats;
- reduce chemicals and energy used to treat and convey stormwater;
- reduce costs for expanding conventional stormwater infrastructure;
- facilitate infill development and intensification that might otherwise be constrained by existing sewer capacity; and
- support trees and other landscape features, improving aesthetics and reducing the need for irrigation using treated water.

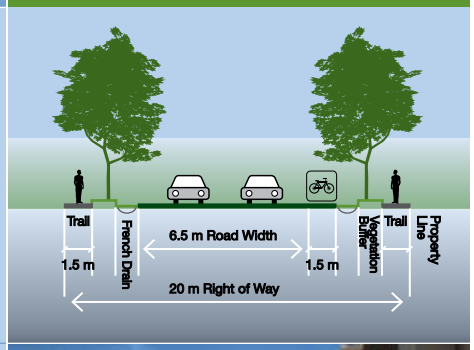
Since alternative stormwater management measures are often located on private property, their ongoing performance is sometimes cited as a concern. For this and other reasons, their successful implementation requires close collaboration among municipal departments (e.g. planning, engineering, maintenance, environment, parks).

Permeable surfaces

As discussed elsewhere in this guide (see pages 9 to 10), alternative standards that reduce the paved width of streets can increase stormwater infiltration. However, other alternative standards that reduce the dimensions of landscaped yards or boulevards in road rights-of-way can work in the opposite direction, reducing the proportion of permeable surfaces in a development.

Regardless of the overall form of a development, the use of more permeable (rather than impermeable) materials can aid infiltration, protect waterways and riparian vegetation, and slow the release of stormwater into watercourses. Conventional asphalt and concrete can be replaced by materials such as interlocking pavers with engineered joints that maximize infiltration, crushed stone, or permeable asphalt and concrete for parking areas, laneways, driveways and walkways. As a side benefit, these permeable materials can also have lower heat absorption rates that reduce the "urban heat island" effect.

Alternative Standards for Stormwater Management

Community and project	Features	
District of Ucluelet, B.C. Rainforest Drive subdivision	• Stormwater drains to rock-filled swales designed as French drains with layers of sediment and rocks • At the bottom of the drain, a small pipe is surrounded by large rocks and covered with a thick layer of rocks that decrease in size toward the surface	 District of Ucluelet
City of Victoria, B.C. Dockside Green	• Stormwater handled on-site using a creek that runs through the development to the ocean, slowing runoff flow and using plants to filter contaminants • Creek is a valuable feature that creates greenspace and attracts wildlife	 Dockside Green
District of Saanich, B.C. Willowbrook and Glanford Station	• Wetland restoration and creek reconstruction were fundamental to the development of these two subdivisions • Stormwater pond creation allowed the building site to be removed from the 200-year floodplain • Eliminating on-site stormwater treatment facilities increased lot yield and profitability • Accelerated approvals reduced carrying costs sufficiently to recover extra capital costs	 Aqua-Tex Scientific Consulting
City of Vancouver, B.C. Crown Street reconstruction	• Curbless design drains to shallow, vegetated swales and detention ponds • Natural drainage courses allow stormwater to infiltrate rather than be carried away in the sewer system • Ecological benefits include stabilized base flows in nearby creeks, filtration of pollutants and reduced demand on the stormwater system	 City of Vancouver
City of Chilliwack, B.C. Subdivision Development Control Bylaw	• Requirement for new developments to not increase flows into watercourses • Several subdivisions include infiltration galleries, rock pits and detention ponds to manage up to 10-year storm events • Developers build conventional rainwater infrastructure for greater than 10-year events • City could save $20 million (2003 dollars) over the next 20 years by avoiding the need to upgrade its trunk sewer, pump station or canal	

More information on the project in Victoria, B.C., is available in *Dockside Green: Brownfield to Sustainable Development* final project report at www.gmf.fcm.ca.

More information on the project in Saanich, B.C., is available in *Nature's Revenue Streams: Five Ecological Value Case Studies* at www.cmhc.ca (availability pending).

More information on the project in Vancouver, B.C., is available at the "Crown Street sustainable streetscape" page at www.vancouver.ca.

More information on the project in Chilliwack, B.C., is available in *Policy and Design Criteria Manual for Surface Water Management* at www.chilliwack.ca.

Stormwater collection and detention

There are a number of approaches to delaying the movement of stormwater from the surface of the ground into storm sewers and natural watercourses. Doing so increases opportunities for infiltration, settling of suspended solids, and filtering of contaminants through absorption by vegetation. Examples include:

- temporary detention areas such as vegetated swales (or bioswales) that delay flow into stormwater systems, providing an opportunity for runoff to infiltrate the ground or be filtered by vegetation;
- rain gardens on individual lots, located in highly permeable locations, that receive rainwater from roof downspouts and overland flow;
- exfiltration trenches or tanks (also known as infiltration basins or soak-away pits) that use pipes to direct stormwater into rock-filled ditches or underground pits, slowing its release and encouraging groundwater recharge;
- rain water harvesting measures that treat runoff as an important resource, collecting and storing it in a cistern or underground tank for reuse in irrigation or toilet flushing; and
- restored or reconstructed wetlands that create an alternative to conventional stormwater collection and treatment facilities, using natural processes to decontaminate runoff and support healthy ecosystems.

Utilities and services

Conventional approaches to locating utilities and services—namely, the provision of separate trenches for water, sewer, telephone, hydro and cable services—take more land, increase construction costs and reduce housing affordability.

Shared trenches

The use of a common trench for some utilities or services can reduce right-of-way requirements and decrease the infrastructure costs borne by homeowners. Due to minimum requirements for the separation of potable water and sewer lines, this approach is usually more applicable to natural gas, hydro and telephone utilities. There may also be cost implications for utility companies because future excavation to repair or replace services can be more expensive.

Trench location

In some cases, utility lines in a shared trench may be located under the sidewalk rather than beneath the adjacent, landscaped right-of-way. This further reduces right-of-way requirements, but may increase future utility company costs unless the lines are placed in a conduit that can be accessed without requiring excavation and reconstruction of the sidewalk.

Sewage treatment

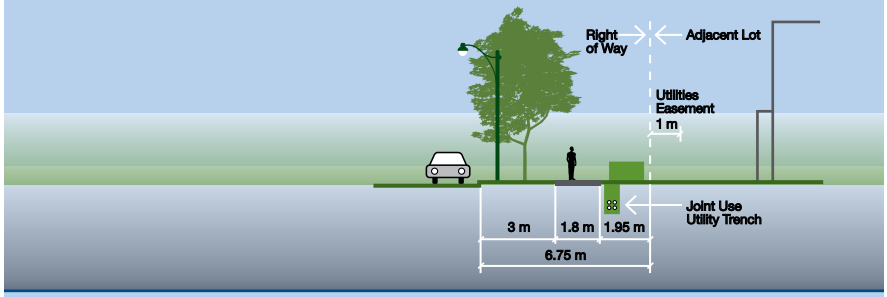
In rural areas, the requirement for a conventional septic tank and leaching field dedicated to each individual property leads to large minimum lot sizes.

Alternative treatment systems

Alternatives to requiring a conventional septic bed for each home can enable smaller lots. They include individual peat bed sewage disposal systems, community disposal fields and artificial ponds. The latter two options can be important enablers of more compact, clustered development (as discussed on page 8) that helps reduce land consumption and protect sensitive features—goals that are especially desirable for many villages.

Alternative Standards for Utilities and Services

Community and project	Features
City of Ottawa, Ont. Road corridor planning and design guidelines	• Design options for collector streets with reduced rights-of-way include a shared utility trench adjacent to the sidewalk
City of Ottawa, Ont. Pineglade Pilot Project	• Shared trench for utilities from mains to homes along property line (versus former standard of one trench per home, reducing trench costs by $120 per unit, in 1998 dollars)
City of Moncton, N.B. Various standards and regulations	• Shared trench under road for water, sewer and stormwater lines considered on a case-by-base basis (versus former standard of three trenches 3 m apart) • Shared trench for services from mains to homes along property line considered on a case-by-case basis (versus former standard of one trench per home, reducing trench costs in right-of-way by 16%) • Maximum distance between manholes increased from 152.5 m to 183 m (saving $2,500 per manhole eliminated, in 1995 dollars) • Curved sewer pipes permitted on a case-by-case basis (versus former standard of straight pipes only) • Elimination of requirement for a sluicebox at each catch basin (saving $400 per catch basin, in 1995 dollars)



Adapted from City of Ottawa

More information on the projects in Ottawa, Ont., (Pineglade) and Moncton, N.B., is available in the solution sheets and case studies at www.actprogram.com, and in the pages on "Modifying Development Standards" at www.cmhc.ca.

More information on the guidelines in Ottawa, Ont., is available in *Road Corridor Planning & Design Guidelines: Urban & Village Collectors*, *Rural Arterials & Collectors* at www.ottawa.ca.

Alternative Standards for Sewage Treatment

Community	Features
Beaubassin Planning Commission, Cap-Pelé, N.B.	• Consideration given to approving non-septic sewage disposal systems for rural lots to enable smaller lot sizes (0.2 ha versus 0.4 ha) or the addition of a secondary building (e.g. workshop, office, in-law suite) to standard lots

More information on this project is available in the solution sheets and case studies at www.actprogram.com.

Resources

These organizations offer valuable information, tools, guidance and assistance. Readers are also encouraged to seek out other organizations in their community, region or province.

Affordability and Choice Today (ACT)
www.actprogram.com

- ACT grants
- Awards for best practice in regulatory reform
- Solutions and case studies for projects supported by ACT grants

Canada Mortgage and Housing Corporation (CMHC)
www.cmhc.ca

- Guidance for industry professionals and other audiences
- Extensive research, best practices, case studies and tools on sustainable community planning

Canadian Home Builders' Association (CHBA)
www.chba.ca

- Guidance for home builders and buyers
- Guidelines for environmentally responsible development
- News, research, resources and links

Canadian Housing and Renewal Association (CHRA)
www.chra-achru.ca

- Affordable housing research, news, events, advocacy, capacity building and library of resources

Green Municipal Fund™ (GMF), Federation of Canadian Municipalities (FCM)
www.gmf.fcm.ca

- Green Municipal Fund grants and loans
- Case studies, award winner profiles and Webinar podcasts on sustainable community development

Canadian Standards Association (CSA)
www.csa.ca/infrastructure

- Information on the Municipal Infrastructure Solutions Program
- Standards publications
- Professional development opportunities

More information on alternative development standards

- Solution sheets and case studies of ACT-supported projects at www.actprogram.com
- "Modifying Development Standards" pages at www.cmhc.ca
- Research reports, bulletins, tools and links from the James Taylor Chair in Landscape and Liveable Environments at the University of British Columbia at www.jtc.sala.ubc.ca
- Various tools within the "Smart Bylaws Guide" of West Coast Environmental Law at www.wcel.org

Notes

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Affordability and Choice Today (ACT)

Federation of
Canadian Municipalities

24 Clarence Street
Ottawa, ON KIN 5P3
Tel: 613-907-6242
Fax: 613-244-1515

www.actprogram.com
info@actprogram.com