

Town of Westford – Local Code Assessment

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Section 2.3.6.b and 2.3.6.c of the United States Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NDPES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (referred to herein as “2016 Small MS4 General Permit”) requires permittees within four (4) years of the Permit effective date to develop a report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover and to develop a report evaluating existing local regulations to determine the feasibility of making the following green infrastructure practices allowable when appropriate site conditions exist:

- Green roofs;
- Infiltration practices, such as rain gardens, curb extensions, planter gardens, porous and pervious pavements, and other designs to manage stormwater using landscaping and structured or augmented soils; and
- Water harvesting devices, such as rain barrels and cisterns, and the use of stormwater for non-potable uses.

The following memorandum summarizes Tighe & Bond’s assessment of Westford’s local code related to these practices with potential to impact stormwater runoff. The assessment included review of current street design and parking lot guidelines that affect the creation of impervious cover and requirements related to stormwater management to allow the Town to determine if changes to design standards for streets and parking lots can be made to support low impact design options as required by the 2016 Small MS4 General Permit. The assessment also included review of allowable green infrastructure practices and under what circumstances they are allowed. To document our review of local code and understand opportunities for improvement, Tighe & Bond used Mass Audubon’s *Bylaw Review for LID & Climate-Smart, Nature Based Solutions*.¹ This Excel worksheet will be delivered to the Town electronically.

According to the 2016 Small MS4 General Permit:

Section 2.3.6.b. related to generation of impervious cover: *If the assessment indicates that changes can be made, the **assessment shall include recommendations and proposed schedules** to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment.*

¹ Mass Audubon. *Bylaw Review: Encouraging Nature-Based Solutions*. URL: <https://www.massaudubon.org/our-conservation-work/policy-advocacy/shaping-climate-resilient-communities/publications-community-resources/bylaw-review>

Section 2.3.6.c. related to allowing specific practices: *If the practices are not allowed, the **permittee shall determine what hinders the use of these practices, what changes in local regulations may be made to make them allowable, and provide a schedule for implementation of recommendations.** The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment.*

Recommended changes to the Town's Bylaws and Regulations are outlined in this memo, and should be refined through collaboration with the Town's Planning Board, Department of Public Works, and Fire Department.

Review of Existing Bylaws and Regulations

The following existing bylaws and regulations of the Town of Westford were assessed relative to requirements that affect the creation of impervious cover or implementation of green infrastructure practices.

- Town of Westford Subdivision Rules and Regulations (as amended September 2013)
- Town of Westford Zoning Bylaw (as amended June 12, 2021)
- Town of Westford Stormwater Management Bylaw (as adopted May 9, 2008)
- Westford Planning Board Rules and Regulations for Stormwater Management (as amended June 21, 2021)
- Town of Westford Complete Streets Policy (as approved April 26, 2016)

The Town of Westford General Bylaws (as amended June 12, 2021) were reviewed, but no provisions related to street design or parking, or green infrastructure were included. There is some commentary in the checklist related to the Scenic Roads Bylaw, Earth Removal Bylaw, and Wetlands Bylaw. Likewise, the Town of Westford Wetlands Rules and Regulations were reviewed and several sections had applicable requirements, these requirements are largely governed by Massachusetts Protection Act and Regulations (310 CMR 10.00). Because these Regulations and the Massachusetts Stormwater Management Handbook are being updates, no changes are recommended at this time.

Tighe & Bond met with the Town on February 10th to obtain initial input on this assessment. The Town also provided input on the checklist, this memorandum, and recommendations.

Summary of Findings

Subdivision of Land

The Subdivision Rules and Regulations (as amended September 2013) by the Town of Westford, Massachusetts (herein referred to as the "Subdivision Regulations") contain paved street width, cul-de-sac radius, and sidewalk requirements that affect the creation of impervious cover associated with subdivisions. The Subdivision Regulations set forward street layout and design standards that regulate the location, alignment, intersections, drainage, widths, and access of the streets of Westford.

The sections below outline the applicable standards within the Subdivision Regulations relative to the creation of impervious cover and green infrastructure within Westford.

In general, streets shall be designed to provide safe vehicular travel through the proper provision of adequate sight distances, width of pavement, grades, intersection design, and other engineering standards.

Street Location, Alignment, and Width

Streets are classified and designed according to their intended use and relationship to other streets in the hierarchy. Specific classifications of streets include major streets, secondary streets and minor streets. A cul-de-sac shall not be approved wherever a through street or loop is practicable, except where the cul-de-sac is clearly the only practical design of the subdivision. There are limitations to the length of dead-end streets and the number of dwelling units on separate lots served by a common driveway shall not exceed five. Section 218-13.A. Streets of the Subdivision Regulations presents the following design requirements:

- Driveways shall be at least twelve (12) feet wide and have a curb return at the roadway of two (2) feet in radius if vertical granite is used. Sloped granite when used shall terminate into driveways avoiding sharp projections. Driveways shall be no greater than twenty-four (24) feet in width at the curb line. Any two driveways shall not be within thirty (30) feet of each other at their intersections with the front lot line.
- Any sites that are over 1 acre in disturbed area or for other reasons are required to submit a NPDES Stormwater permit [i.e., Construction General Permit) under the EPA shall be required to submit to the Town Engineer a copy of the original submission, approved permit, all plans, calculations and other relevant information used to indicate compliance.

Section 218-13.A outlines the required minimum widths of roads in local streets, as shown in TABLE 1. For each section of road, the width should be designed with reference to this simplified table and also with consideration of site specifics, including, but not limited to:

- Whether it is a single access or multiple access configuration;
- The number of houses accessed;
- The width and nature of the existing road(s) providing access to the new road(s); whether the road is to include curbing;
- Wetlands and other environmental resources that may be affected by construction;
- Topography and proposed cuts and fills; and
- Any extraordinary safety concerns arising from the proposed design.

TABLE 1
Design Standards

Classification		Pavement Width (ft)	Right-of-Way Width (ft)	Maximum Grade (%)	Number of Sidewalks
Major street		40	60	5	2
Secondary street	Non-residential	30	60	7	2
	Residential	27	50	7	2
Minor street		22	50	9	2
Private street		18	50	9	2
Common driveway		16	30	10	1

Sidewalks

For secondary and minor streets in residential subdivisions, two (2) sidewalks are required, one on each side of the proposed roadway. Its horizontal alignment may vary within the fifty

(50) foot right-of-way; however, there shall be required a planting strip of a minimum of five (5) feet between the roadway pavement and the sidewalk.

The width of the sidewalk(s) shall be five (5) feet. They shall have a finished grade to two and zero-tenths percent (2.0%) sloping toward the roadway.

Common Driveways

By grant of a special permit, pursuant to the provisions of Section 173-13 of the Zoning Bylaw, the Planning Board may approve a common driveway serving two (2), three (3), four (4), or five (5) lots, each with approved frontage, and subject to the requirements described in Section 218-13.A.5 of the Subdivision Regulations.

Trees

Trees, not less than twelve (12) feet in height and at least two and one-half (2½) inches in diameter measured at twelve (12) inches above finished grade and of a native species approved by the Board shall be planted on the lots approximately ten (10) feet, but not more than twenty (20) feet behind the exterior street lines, including within cul-de-sac center islands in the right of way, in the subdivision wherever, in the opinion of the Board, existing woodlands or suitable individual trees are not retained. Placement of trees shall be in naturalized formations at intervals averaging fifty (50) feet apart on center along both sides of each street. In cul-de-sac center islands there shall be a minimum of three (3) trees planted if existing vegetation is unable to be preserved. The Applicant shall be responsible for any trees, which do not remain upright, and in good health until the street has been accepted by the Town or in the case of a private street the Board has released the performance guarantee.

Easements

Easements for utilities across lots or centered on rear or side lot lines shall be provided where necessary and shall be at least twelve (12) feet wide for electric and telephone and twenty-five (25) feet wide for drainage, sewerage and water.

Where a subdivision is traversed by a watercourse, drainageway, channel, or stream, the Board may require that there be provided a stormwater easement or drainage right-of-way of adequate width to conform to the lines of such watercourse, drainageway, channel, or stream and to provide for construction or other necessary purpose.

A 20-foot-wide temporary easement shall be provided on both sides of the roadway right-of-way for the purposes of grading, street tree installation, erosion control and maintenance access that will be in full effect until street acceptance.

Stormwater Management

In order to avoid flood hazards, the following steps shall be taken:

- a) Subdivision design shall be consistent with the need to minimize flood damage within the flood-prone area through the use of clustering, open space preservation, street profile design, and drainage.
- b) All public utilities and facilities, such as sewer, gas, electrical, and water systems, shall be located and constructed to minimize or eliminate flood damage.
- c) Drainage systems shall be designed in consideration of possible flooding to the base flood elevation.

Drainage

Definitive Subdivision Plans are subject to the Stormwater Management Bylaw and Regulations and must obtain a separate Stormwater Management Permit through the Planning Board. Additional drainage design criteria can be found in Section 218-13.B of the Subdivision Regulations, and includes the following requirements:

- Storm drains, culverts and related facilities shall be designed to permit the unimpeded flow of all natural watercourses, to ensure adequate drainage at all low points along streets and to control erosion.
- To the maximum extent feasible, stormwater shall be recharged rather than piped to surface waters. Over critical aquifer recharge areas, this may require the use of open drainage systems along streets in a subdivision. Applicants are encouraged to implement current stormwater management guidelines as established by the Department of Environmental Protection.
- Grassed open drainage systems are not recommended in preference to closed drainage systems except when otherwise approved by the Town Engineer to mitigate flow on a Common Driveway or other minor roadway. A retention pond in which there is always some water is preferred as more attractive and useful than a detention basin.
- Curbs and gutters will be required to handle runoff for the section of the roadway to which they are applied or, where necessary, for the maintenance of the pavement and prevention of pavement edge raveling.
- Curbs and gutters may be eliminated along certain roadways where drainage is provided in swales and/or detention basins as desirable to recharge the groundwater aquifer.

Environmental Protection

Vegetative cover and runoff characteristics shall be maintained as close as possible to conditions before development by reducing cut and fill and other considerations.

Important local water resources shall be protected, including floodplains, wetlands, aquifer recharge areas, and Town well fields.

Unique natural features shall be preserved, including but not limited to watercourses, vernal pools, scenic vista points, historic areas, clusters of evergreens or flowering trees, or rock outcroppings. The area around a vernal pool may be significant habitat of the animals that breed in the pool.

Erosion and Sediment Control

In order to reduce erosion accompanying the installation of ways, utilities and drainage systems, a sediment control plan shall be prepared and implemented, including control methods such as berms, dikes, detention ponds, mulching, and temporary sodding.

Utilities and Municipal Services

Provisions shall be made for water supply and fire protection to each lot. Whenever feasible, the water supply shall be from a public water system and a fire protection system shall use fire hydrants located along the streets of the subdivision. When a subdivision is to be served by public water, then the hydrants shall be installed and the water supply connected to the hydrants and the system shall be functional and accepted by the Fire Chief prior to the issuance of any building permits for lots within the subdivision. When a subdivision is not to be served by public water, then water storage cisterns, or other system, in a size and in locations as approved by the Fire Chief shall be shown on the Definitive Plan and shall be

installed and functional and accepted by the Fire Chief prior to the issuance of any building permits for lots within the subdivision.

Since there is no public sewerage system in the Town, disposal of sanitary sewage wastes shall be by on-site sewage disposal systems in accordance with the requirements of Title 5 of the State Environmental Code and the regulations of the local Board of Health.

Other utilities required in a subdivision include stormwater drainage, telephone, electricity, and street lighting and may include gas, fire alarm systems, and cable television. All required utilities, exclusive of transformers, shall be placed underground. In the case of cable television, this utility shall be installed in coordination with the local cable television provider at the same time the trench dug for installation of other utilities is open. If this is not possible, then Schedule 40 PVC conduits shall be installed to allow for future installation of cable television in the conduit without excavation or disruption of the street surface, curb, sidewalks, drainage structures, and any and all other utilities and infrastructure serving the subdivision.

No structures or appurtenances, including but not limited to catch basins, manholes, hydrants, stone bounds, or poles, shall be located within five (5) feet of driveway entrances. Proposed driveways shall conform to the standards set out in the Town Detail Sheets in the Appendix of the Subdivision Regulations.

Underground utilities design criteria can be found in Section 218-13.C of the Subdivision Regulations. Water utility design criteria can be found in Section 218-13.D of the Subdivision Regulations.

Curbing

In all subdivisions, curbing shall be installed along each edge of the roadway. Curbing shall be either standard vertical or sloping granite. Dead-end streets shall have a landscaped center island, which shall not be required to have curbing.

Pedestrian and Bicycle Circulation Systems

Public sidewalks or bikeways are required in all subdivisions to provide access to schools, recreation areas, shopping facilities, or other community facilities.

Sidewalks shall be provided along both sides of each road in all subdivisions. The horizontal layout of the sidewalk may take a meandering path parallel to the roadway, provided that certain critical dimensions are maintained as enumerated in Section 218-13.F of the Subdivision Regulations.

Pedestrian-vehicular separation shall be considered where possible. Design solutions, which achieve this separation, shall receive priority consideration.

Walkways through protected open space lands should be constructed wherever reasonable and should connect to existing trails on adjoining property.

Accessibility

Notwithstanding any of the requirements for the construction of the new way as listed in these rules and regulations, all streets and sidewalks and all other relevant aspects of the proposed improvements shall be designed and constructed in strict conformity with the requirements of the Massachusetts Architectural Access Board and the Federal Americans with Disabilities Act.

Open Spaces

Before approval of a plan, the Board may also in proper cases require the plan to show a park or parks suitably located for playground or recreation purposes or for providing light and air. The park or parks shall not be unreasonable in area in relation to the land being subdivided and to the prospective uses of such land. The Board may, by appropriate endorsement on the plan, require that no building be erected in such park or parks for a period of not more than three (3) years without its approval.

Green Infrastructure

The Subdivision Regulations do not include any direct references to allowing or prohibiting the use of green infrastructure such as green roofs, rain gardens, curb extensions, planter gardens, or porous and pervious pavements, low impact development (LID) techniques, or water harvesting devices such as rain barrels. The existing Subdivision Regulations promote the recharge of stormwater rather than piping stormwater to surface waters. However, grassed open drainage systems are also not recommended in preference to closed drainage systems.

Town of Westford Zoning Bylaw

The Town of Westford Zoning Bylaw (herein referred to as the "Zoning Bylaw") was enacted to promote the purposes set forth in 1975 Mass. Acts 808, which include, but are not limited to, the following: to lessen congestion in the streets; to conserve health; to secure safety from fire, flood, panic and other dangers; to provide adequate light and air; to prevent overcrowding of land, to avoid undue concentration of population; to encourage housing for persons of all income levels; to facilitate the adequate provision of transportation, water, water supply, drainage, sewerage, schools, parks, open space and other public requirements; to conserve the value of land and buildings, including the conservation of natural resources and the prevention of blight and pollution of the environment; to encourage the most appropriate use of land throughout the town, including consideration of the recommendations of the most recent Master Plan adopted by the Planning Board and the comprehensive plan, if any, of the regional planning agency; and to preserve and increase amenities by the promulgation of regulations to fulfill said objectives.

The sections below outline the applicable standards in the Zoning Bylaw as it relates to street design, parking, impervious cover, and green infrastructure.

Parking

Section 5.1 of the Zoning Bylaw presents off-street parking regulations. In general, off-street parking spaces shall be provided for every new building, the enlargement of an existing building, the development of a new land use or any change in any existing use in accordance with the Table of Off-Street Parking Regulations in Appendix D of the Zoning Bylaw. TABLE 221 presents parking minimums for residential and commercial uses. For the complete requirements for all uses, see the Table of Off-Street Parking Regulations in Appendix D of the Zoning Bylaw.

TABLE 2
Schedule of Parking Area Requirements

Principal Use	Parking Minimum
Single-family dwelling	2 per dwelling unit
Conversion of dwelling	2 per dwelling unit
Open space residential development	2 per dwelling unit
Flexible development	2 per dwelling unit
Assisted living facility	As set forth in Section 7 of the Zoning Bylaw
Nursing or convalescent home	3 per bed
Funeral home	1 for each two seats
Hotel	1 per 600 square feet of gross floor area
Restaurant	1 for each three seats
Restaurant, drive-in	N/A
Restaurant, fast-food	1 for each 3 seats
Business or professional office	1 per 200 square feet of gross floor area
Bank, financial agency	1 per 200 square feet of gross floor area
Printing establishment; newspaper	1 per 200 square feet of gross floor area
Nonexempt educational use	1 space for each teacher and each employee and 1 space for each 4 students
Nonprofit membership club	1 for each three seats
Indoor and outdoor commercial recreation	As may be determined by the Planning Board during site plan review
Winter commercial recreation	As may be determined by the Planning Board during site plan review
Horseback riding academy	As may be determined by the Planning Board during site plan review
Place of amusement or assembly	1 per 200 square feet of gross floor area
Indoor motion-picture establishment	1 for each three seats
Golf course; golf club	As may be determined by the Planning Board during site plan review
Personal service establishment	1 per 200 square feet of gross floor area
General service establishment	1 per 200 square feet of gross floor area
Planned commercial development	As may be determined by the Planning Board during site plan review
Commercial parking lot	N/A
Adult entertainment establishment	1 for each three seats
Massage establishment	N/A
Body art establishment	1 per 200 square feet of gross floor area
Bakery, laundry or dry cleaning plant not operated at retail	1 per 300 square feet of gross floor area

Parking standards such as parking space size, allowance for compact cars, accessible parking spaces, and lighting are provided in Section 5.1.5 of the Zoning Bylaw. Additional standards must be met for areas with more than five spaces and for areas in Industrial B districts, which can be found in Sections 5.1.6 and 5.1.8 of the Zoning Bylaw, respectively.

Notwithstanding any other provisions of the Zoning Bylaw, common parking areas may be permitted by the Planning Board, subject to site plan approval, for the purpose of servicing two or more principal uses on the same or separate lots, provided that the criteria in Section 5.1.3 of the Zoning Bylaw are met.

Parking requirements for flexible development and Assisted Living Facilities (ALF) are specified in Sections 7.2.9.3 and 7.3.5.6, respectively. Specific parking requirements for the Senior Residential Multifamily Overlay District (SRMOD) and Mill Conversion Overlay District (MCO) are presented in Sections 8.4.6.4 and 8.5.8.4, respectively.

Vegetation and Landscaping

In order to protect against potential noxious, visual or disruptive effects of adjacent land uses of different character, buffer areas shall be provided in all Commercial Highway, Industrial Highway, Industrial C, Industrial D, and Business, Limited Districts. Section 5.4 presents landscaping requirements for these districts. Planned Commercial Developments (PCD) and Planned Industrial Developments (PID) must also conform to the specific provisions for buffer areas provided for Commercial Highway and Industrial Districts in Section 5.4.

Landscaping requirements for parking areas are presented in Section 5.1.7 of the Zoning Bylaw.

Sections 7.3.5.3 and 7.3.5.4 of the Zoning Bylaw presents standards on buffer areas and vegetation in ALF. No vegetation in the buffer area can be disturbed, destroyed or removed, except for normal maintenance. The Planning Board may require additional vegetative screening in the buffer area. To allow some flexibility in achieving the best design for a parcel, the Planning Board may waive the buffer requirement along particular lot lines or portions of lot lines when it determines that a smaller buffer will suffice. Within the site, no clear cutting shall be permitted, except incidental to construction of buildings, roads, trails and parking areas.

Section 8.4.4.3 of the Zoning Bylaw presents similar standards on buffer areas for SRMODs. Section 8.4.6.10 defines landscaping standards: The site shall be preserved and enhanced by retaining and protecting trees, shrubs, ground cover, stone walls, and other site features insofar as practicable. Additional new plant materials shall be added for privacy, shade, beauty of building and grounds, and to screen features which the Board deems detrimental to the aesthetics of the development, and as otherwise required by the Planning Board through the site plan review process.

The standards for buffer areas and vegetation within the MCO are defined in Sections 8.5.8.1 and 8.5.8.2. The standards for buffer areas for Flexible Development are defined in Section 7.2.9.4. These standards are similar to the standards for ALF and SRMODs.

Section 9.3A.4 defines Special Permit Performance Standards for Major Commercial Projects and Major Retail Projects, specifically for landscaping. These standards relate to buffer strips, parking areas, retaining walls, berms, screened areas, and landscaping maintenance. Section 9.3A.5 includes site development standards that encourage the reduction of unnecessary land disturbance and the preservation of existing vegetation.

For Large-Scale Solar Energy Systems, clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of solar energy system or otherwise prescribed by applicable laws, regulations, and bylaws/ordinances, as stated in Section 9.4.7.2.d.i.

Impervious Surfaces

In the Zoning Bylaw, impervious surfaces are defined as material or structure on, above, or below the ground that does not allow precipitation to penetrate into the soil. Standards as they relate to impervious surfaces include:

Section 7.3.5 – ALF: Maximum lot coverage by buildings in the Residence Districts shall not exceed 30%; maximum lot coverage by impervious surfaces in the Residence Districts shall not exceed 50%. The remaining space, to the extent possible, should be used for conservation, historic preservation and education, outdoor education, recreation, park purposes, agriculture, horticulture, forestry, or for a combination of these uses.

Section 8.1.7 – Water Resource Protection Districts (WRPD): Within WRPD II, uses that render impervious more than 15 percent of the lot, or 2,500 sq. ft., whichever is greater, excluding operations associated with the construction or occupancy of a single-family dwelling require a special permit.

Common Land and Open Space

Common land is defined as any parcel or parcels of land set aside in an open space residential development, designed and intended for the use, benefit and enjoyment of the residents of the subdivision or the Town of Westford. Standards as they relate to impervious surfaces include:

Sections 7.1.6, 7.1.8, 7.1.9 relate to common land within Open Space Residential Development (OSRD). They define minimum area requirements for common land and legal requirements for common land ownership and maintenance.

Open space is defined as open space located in the Town of Westford, suitable, in the opinion of the Planning Board, to be used for conservation, historic preservation and education, outdoor education, recreation, park purposes, agriculture, horticulture, forestry, or for a combination of these uses, and shall be served by suitable access for such purposes.

Sections 7.2.10 and 7.2.11 define standards for contiguous open space within Flexible Development, including minimum area standards, allowed uses, and ownership.

Section 8.4.4.5 states that within a SRMD, land designated as open space shall not be used for any other purposes. Section 8.4.6.11 further defines open space and open space standards within a SRMD.

Stormwater Management

Any project that results in a total land disturbance of one acre or more are subject to the Stormwater Management Bylaw and Regulations and must obtain a separate Stormwater Management Permit through the Planning Board.

Within OSRD, natural surface drainage channels shall be either incorporated into the overall design or preserved as part of the common land. The developed areas shall be served by storm sewers.

Within Flexible Development or MCOB, stormwater management shall be consistent with the requirements for subdivisions set forth in the Rules and Regulations of the Planning Board.

For ALF, the surface drainage system shall be designed in accordance with the Regulations of the Planning Board, Board of Health and Conservation Commission.

Within the SRMOD, natural surface drainage channels shall be either incorporated into the overall design or preserved as part of the common land. The development area shall be served by storm sewers.

Section 8.1.9 states that within WRPD II, for any proposed activity on a lot which will render more than 15 percent of the total lot area or more than 2,500 sq. ft. impervious, a system for groundwater recharge must be provided that does not degrade groundwater quality, by stormwater infiltration basins or similar system covered with natural vegetation. Dry wells shall be used only where other methods are infeasible. Such basins and wells shall be preceded by oil, grease and sediment traps to facilitate removal of contaminants.

Section 8.2.5 states that within the Floodplain Overlay District (FOD), all subdivision proposals must be designed to assure that: a. such proposals minimize flood damage; b. all public utilities and facilities are located and constructed to minimize or eliminate flood damage; and c. adequate drainage is provided to reduce exposure to flood hazards.

Section 8.6.54.d states that a Registered Marijuana Dispensary (RMD) shall have adequate water supply, stormwater systems, sewage disposal, and surface and subsurface drainage.

One of the Special Permit Performance Standards for Major Commercial Projects and Major Retail Projects (Section 9.3A.4.4) is that all development shall comply with the Department of Environmental Protection's (DEP) Stormwater Management Policy (including Phase II Stormwater Management requirements), to ensure that the rate of surface water run-off from the site shall not be increased after construction. Section 9.3A.4.5.A states that site/building design shall preserve natural topography, reduce unnecessary land disturbance and preserve natural drainage on the site to the extent possible, as a Special Permit Performance Standard. Another Special Permit Performance Standard for Major Commercial Projects and Major Retail Projects is defined in Section 9.3A.4.8: Building design may make use of water-conserving plumbing and minimize the amount of stormwater runoff through the use of best management practices for storm water management.

Environmental Protection

Standards as they relate to environmental protection include Section 8.4.6.14 – Senior Residential Multifamily Overlay District: There shall be no filling, draining, altering or relocation of any stream, lake, pond, river, or wetland or work within applicable buffer zones except that performed in full compliance with applicable laws, the requirements of pertinent governmental agencies and the requirements of the Westford Conservation Commission. Provisions for wastewater treatment and/or disposal shall be completed in accordance with the provisions of applicable regulations of the Commonwealth of Massachusetts Department of Environmental Protection and applicable regulations of the Westford Board of Health.

Curbing

Section 7.3.5.12 describes paving and curbing standards for ALF: Where the roadway is or may be ultimately intended for dedication and acceptance by the Town of Westford, granite curbing, gray in color, is required, except in areas of very low traffic volume where no curbing will be required. Rolled asphalt (Cape Cod berm) curbing is unacceptable in all such ways. Curbing is to be sloped or cut to provide a barrier free transition at road crossings and building

entrances. Paving should be textured or of different materials at pedestrian crossings and walkways. The use of stone, brick or cultured stone pavers for entrance walkway borders is encouraged. The use of textured materials for walkway borders is encouraged.

As stated in Section 9.3A.4.6.B, for special permits for Major Commercial Projects or Major Retail Projects, curb cuts shall be limited to the minimum width for safe entering and exiting, and shall in no case exceed 30 feet in width unless waived by the Planning Board for commercial truck traffic.

Stormwater Management Bylaw and Regulations

The Stormwater Management Bylaw was adopted on May 9, 2008. The Westford Planning Board Rules and Regulations for Stormwater Management (herein referred to as the "Stormwater Management Regulations") was amended on June 21, 2021.

Section 7.0 of the Stormwater Management Regulations define performance standards for stormwater management. For compliance with Performance Standards of these Regulations, the applicant must show that site design, construction site stormwater runoff control, and post-construction stormwater management will meet the standards set by the Planning Board in these Regulations, which include all applicable standards of the Massachusetts Department of Environmental Protection's Stormwater Management Standards and Handbook and shall be at least as stringent as the relevant requirements of the MS4 Permit. Additionally, Low Impact Development (LID) site planning and design strategies must be utilized to the maximum extent feasible. Within the Stormwater Management Regulations, LID is defined as "Site planning and design strategies that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product." Site plans and landscape plans for all proposed projects must take appropriate steps to minimize water use for irrigation and to allow for natural recharge of groundwater.

The Stormwater Management Regulations present performance standards and design criteria for new development, redevelopment sites, and sensitive areas. The Stormwater Management Regulations require the use of LID to the extent feasible, but does not contain specific design criteria promoting or prohibiting the use of alternative green infrastructure practices such as green roofs, porous pavement, or rain barrels.

Complete Streets Policy

The Town of Westford set forth the Complete Streets Policy on April 26, 2016. The guidelines for road design indicate the Town's preference for Complete Streets whenever possible. The policy indicates the Town's desire to accommodate as many modes of travel as practical within the transportation network which includes many miles of narrow, two lane roads. Complete Streets are designed and operated to provide safety and accessibility for all the users of our roadways, trails and transit systems, including pedestrians, bicyclists, transit riders, motorists, commercial vehicles, and emergency vehicles and for people of all ages and of all abilities.

The Complete Streets Policy states that Complete Streets and Complete Streets Infrastructure to the maximum extent practical should be considered when developing new policies, planning, and designing of public and private projects; including new construction, reconstruction, rehabilitation, repair, and maintenance of transportation facilities on streets and redevelopment projects. Specific design standards are not defined, but the following are

listed as resources that should be consulted for the design guidance, standards, and recommendations:

- The Massachusetts Department of Transportation Project Design and Development Guidebook (2006);
- Sustainable Neighborhood Road Design: A Guidebook for Massachusetts Cities and Towns, May 2011; American Planning Association – Massachusetts Chapter and Homebuilders Association of Massachusetts;
- The latest edition of American Association of State Highway Transportation Officials (AASHTO) A Policy on Geometric Design of Highway and Streets;
- The United States Department of Transportation Federal Highway Administration’s Manual on Uniform Traffic Design Controls (2009);
- The Architectural Access Board (AAB) 521CMR Rules and Regulations; and
- Documents and plans created for the Town of Westford, such as bicycle and pedestrian network plans, Subdivision Regulations, Stormwater Rules and Regulations, the Comprehensive Master Plan, and the Route 110 Master Plan.

Recommendations

Tighe & Bond’s recommendations are limited to updates to the Subdivision Regulations and the Zoning Bylaw, which have the most opportunity to generate impervious cover through construction of buildings, parking, streets, and sidewalks. We have provided recommended areas for potential improvement. However, the ultimate updates to Town code will be determined after careful consideration by the Town’s professional staff in Engineering and Planning, discussion with the Planning Board and other enforcing entities, and a process for public input. With some exceptions, updates to the Zoning Bylaw would need to be adopted by a two-thirds vote of a town meeting.²

While the Stormwater Management Regulations require LID to the maximum extent practicable, green roofs, rainwater harvesting, or EPA’s recommended infiltration practices are not specifically encouraged nor prohibited. Rather than create additional requirements, we recommend that the Town encourage these practices through non-regulatory measures such as Stormwater Utility Fee Credits and other educational programs and incentives.

Recommended Revisions to Subdivision Regulations

Responsible Parties: Planning Board and Engineering Department

Target Completion Date: July 2025

Subdivision Regulations would benefit from modifications designed to promote the use of LID and stormwater management techniques. In general, such modifications would reduce impervious area, incorporate more LID stormwater practices, and better preserve open space.

The list below provides more specific recommendations on how to further promote LID in the Town of Westford for discussion and collaboration with the Town’s Planning Board, Department of Public Works, and the Fire Department based on recommendations from the Massachusetts Low Impact Development Toolkit³ and the American Planning Association

² Under the economic development legislation of 2020, Chapter 40A of the General Laws (i.e., Zoning Act), [Section 5](#) now allows for a simple majority at Town Meeting for certain kinds of zoning bylaws such as ORSD by right and other smart growth zoning districts.

³ URL: <https://www.mapc.org/resource-library/low-impact-development-toolkit>

(APA) guidebook, *Sustainable Neighborhood Road Design: A Guidebook for Massachusetts Cities and Towns*.⁴

Street Design

- There are opportunities within the Town's various requirements for street design to encourage green infrastructure and reduce pavement. For example, Section 218-13.A.3.f. Street Design: Specific Design Requirements, *Dead-end streets shall be provided with a circular turnaround at the end having an outside curb radius of not less than seventy (70) feet. There shall be a landscaped center island, which shall not be required to have curbing.* This minimum diameter is considered a "better" practice, and the Town is unlikely to allow a smaller radius at this time due to vehicle access requirements for trash & recycling pick up. The vegetated center landscaping could specifically be a **Bioretention Area** (sometimes called a **Rain Garden**) for stormwater management.
- In Section 218-13.A. Streets, consider minimizing residential road widths to the extent possible. Consider allowing narrow widths where there are no houses, buildings, intersections, or where on-street parking is not anticipated. See Table 3 for a comparison of current requirements compared to recommendations in *Sustainable Neighborhood Road Design: A Guidebook for Massachusetts Cities and Towns*. Section 218-13.A(3)(a) also specifies that "A new road shall not be less than four hundred (400) feet in length" which may result in additional unneeded impervious area. This will require meeting with the Fire Department to resolve conflicts between standards in Subdivision Regulations and requirements and/or preferences of the Fire Department for emergency vehicle access. Note that the Fire Department often objects to road widths less than 22 feet for emergency vehicle access, and Public Works may have similar concerns for winter plowing.

Stormwater Management

- Because Definitive Subdivision Plans explicitly require a permit under the Town's Stormwater Management Bylaw and Regulations, these projects will meet the most up-to-date State and Federal design requirements. Modifications to Sections 218-12 and 218-13 could be updated for consistency with the Stormwater Regulations, MA Stormwater Handbook, and the Town's current design preferences. Although there are maintenance concerns for green infrastructure, consider encouraging certain practices where deemed appropriate.
- Green infrastructure could count toward open space for certain types of Subdivisions. Consider adding language such as "Low impact development techniques such as **bioretention areas, rain gardens, vegetated swales, and filter strips** may be located within the open space area and count towards the open space requirement." This is currently not the Planning Board policy and additional discussion and research may be needed.
- Consider requirements to address runoff from roofs. Roof runoff is not specifically required to be infiltrated or directed to landscaped or naturally vegetated areas capable of absorbing clean water. **Green Roofs** are allowed but could be encouraged in some cases through the permitting process or for Stormwater Utility Fee Credits. **Downspout Disconnection** and **Rainwater Harvesting** are both considered green infrastructure elements.⁵

⁴ URL: https://www.apa-ma.org/wp-content/uploads/2018/12/NRB_Guidebook_2011.pdf

⁵ U.S. EPA. *What is Green Infrastructure?* URL: <https://www.epa.gov/green-infrastructure/what-green-infrastructure>

- Explore establishing limits of extent of lawn area on residential lots, either by area or by percentage of lots, to reduce outdoor water use for irrigation as well as application of chemicals for lawn maintenance that causes stormwater pollution. Other design requirements may be considered to achieve these same water conservation and pollution reduction goals if outright limiting lawn area is impractical.

Driveways

- In Section 218-13.A.3.i, which addresses driveways, the Town could reduce impervious area by reducing the maximum driveway width to 12 ft for 1-way and 18 ft for 2-way. Consider allowing pervious materials for single-family home driveways.

Sidewalks & Pedestrians

- Providing opportunities for walking and biking is a priority for the Town, and sidewalk construction must meet Americans with Disabilities Act (ADA) standards and guidelines. For example, if sidewalks are less than 5 feet wide, passing spaces that are at least 5 feet on all sides must be constructed every 200 feet (which could be a driveway). For this reason, we do not recommend reducing the sidewalk width requirements. Rather, the Town should consider reducing or eliminating some sidewalk requirements (particularly for Common Driveways) and requiring sidewalk on one side of the street instead of both sides (Section 218-12.D.2.).

TABLE 3

Comparison of Current Requirements for Residential Secondary Streets with Recommendations for Residential Road Design Parameters from Sustainable Neighborhood Road Design: A Guidebook for Massachusetts Cities and Towns

Parameter	Current Requirement for Residential Secondary Streets	Recommendations for Residential Road Design Parameters Relative to Roadside Width		
		Single Use Residential - Wide	Single Use Residential - Medium	Single Use Residential - Narrow
Traveled Way				
Typical ADT	N/A	4,999 ≤ 1,500	1,500 ≤ 400	400 < 0
Design Speed	N/A	25-30 mph	20 mph	20 mph
Number of Through Lanes	N/A	2	2	2
Lane Width	N/A	10-12 feet	10-12 feet	10 feet
Shoulder	5 feet	2 feet	2 feet	2 feet
Bike Lanes	N/A	Shared road or 6 feet wide ¹	Shared road	Shared road
Utility Easement Width	12-25 feet	---	---	10 feet
Range of ROW Width	40-60 feet	40-50 feet	36-40 feet	33-36 feet
Roadside				
Desirable Roadside Width (Pedestrian, Swale, and Planting Strip)	N/A	5.5-12 feet	5.5-10 feet	5.5 feet
Grass Plot / Planting Strip	5 feet	0-6 feet	0-6 feet	0-6 feet
Minimum Sidewalk Width	5 feet	4 feet one side ok	4 feet / shared road	Shared road

¹ MassDOT standards recommend 5 feet wide.

Recommended Revisions to the Zoning Bylaw

Responsible Parties: Planning Board

Target Completion Date: July 2026

The Town's Zoning Bylaw has established OSRD and Flexible Development, which allows for more flexible dimensional requirements to create open space. Assisted Living Facilities and certain Overlay Districts also have requirements for the creation of less impervious surface and better stormwater management.

The list below provides more specific recommendations on how to further promote LID and reduce impervious area in the Town of Westford for discussion and collaboration with the Town's Planning Board and Department of Public Works based on recommendations from the Massachusetts Low Impact Development Toolkit⁶ and the American Planning Association (APA) guidebook, Sustainable Neighborhood Road Design: A Guidebook for Massachusetts Cities and Towns.⁷

Parking Requirements and Standards

- The Zoning Bylaw already includes many provisions that are considered "Best" or "Better" practices, such as allowing for Common Driveways for two or more lots, allowing for Shared Parking (i.e., common off-street parking areas), and standard parking spaces are 9' x 18' with allowance for a percentage of smaller spaces for compact cars at certain businesses. The Town may be able to further reduce impervious area creation while still providing reasonable parking accommodations by revising Appendix D – Table of Parking Requirements. Consider setting maximum parking ratios and requirements.
- Section 5.1.4 may be modified to allow a reduction in the required number of parking spaces through a Planning Board Special Permit without the requirement that the full number of parking spaces could be constructed on the lot. Currently, this can only be done via variance from the Zoning Board of Appeals.
- Consider allowing the Planning Board to waive the actual installation of one or more parking spaces (i.e., green bank or land bank parking spaces) provided that site drainage is designed to accommodate full build-out, provided that the Building Commissioner can require installation of some of the land banked parking spaces if needed. Land banking allows for designating a portion of land on a site that would be required for parking to be held and preserved as open space, rather than constructed as parking. Allowing a certain percentage (e.g., up to 25%) of the required parking spaces could be added to the Site Plan Review process.
- Consider allowing pervious materials for some stalls and spillover areas. Consider adding language such as: "Pervious materials such as porous pavers, paving stones, reinforced grass, and pervious pavement may be allowed in lower volume stalls or overflow parking areas." The Operation & Maintenance Plan must account for specialized maintenance in these areas.
- Section 5.1.7 Landscaping in Parking Areas calls for plantings and trees within off-street parking areas. In many cases curbed planting strips are specified. Explore allowing or requiring stormwater practices in islands, landscaped areas and setbacks. Consider adding language such to this section as: "Low impact stormwater management techniques such as bioretention areas, rain gardens, vegetated swales, and filter strips may be located within the landscaped areas and count towards the

⁶ URL: <https://www.mapc.org/resource-library/low-impact-development-toolkit/>

⁷ URL: https://www.apa-ma.org/wp-content/uploads/2018/12/NRB_Guidebook_2011.pdf

requirement.” This would require planting strips to be lower than the paved area with curb cuts to allow runoff into the landscaped area.

Lot Layout and Dimensional and Density Requirements

- In low-density areas, consider establishing limits on impervious lot coverage. (Not appropriate for town centers or moderate density neighborhoods where compact development should be encouraged).
- Where permitted under the Massachusetts Stormwater Handbook, consider permitting the location of green infrastructure and LID techniques in setback areas and buffer strips to meet the Landscaping Requirements in Section 5.4.
- In Appendix C – Table of Dimensional and Density Regulations, look for opportunities to examine minimum setback requirements in certain districts such as Commercial Highway and Industrial Highway (at a minimum). Some of the current requirements may result in unneeded impervious area.

Stormwater Management and Landscaping Requirements

- Projects that will disturb one acre of land or more will require a permit under the Town’s Stormwater Management Bylaw and Regulations.
- Green infrastructure could count toward fulfillment of landscaping / open space requirements. Consider adding language such as “Low impact development techniques such as **bioretention areas, rain gardens, vegetated swales, and filter strips** may be located within the open space area and count towards the requirement.”
- Consider requirements to address runoff from roofs. Roof runoff is not specifically required to be infiltrated or directed to landscaped or naturally vegetated areas capable of absorbing clean water. **Green Roofs** are allowed but could be encouraged in some cases through the permitting process or for Stormwater Utility Fee Credits. **Downspout Disconnection** and **Rainwater Harvesting** are both considered green infrastructure elements.⁸

Non-Regulatory Recommendations

Responsible Parties: Highway Department/Building Commissioner

Target Completion Date: July 2025

- Determine if local building codes prohibit use of permeable paving, narrow driveways, green roofs, and other LID techniques.
- Verify that State and local code allows for reuse of harvested rainwater, such as interior non-potable uses such as toilet flushing.
- Provide opportunities for staff participation in LID workshops or conferences.
- Implement a new green infrastructure or LID demonstration project on Town-owned property.
- Participate in a rain barrel sale and distribution program such as those offered by the Great American Rain Barrel Company.¹⁵

⁸ U.S. EPA. *What is Green Infrastructure?* URL: <https://www.epa.gov/green-infrastructure/what-green-infrastructure>

¹⁵ URL: <https://www.greatamericanrainbarrel.com/>

- Modify and distribute public education materials available from MassDEP and EPA regarding design, uses, and appropriate site conditions for green infrastructure such as rain gardens and porous pavement.^{16 17 18 19 20}

Next Steps

The proposed recommendations for revision presented herein should be discussed and refined through a joint working meeting of relevant boards and commissions including the Town's Planning Board, Highway Department, and Fire Department. Per the 2016 Small MS4 General Permit, recommended changes must have a corresponding proposed schedule to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs. The joint meeting should also include development of a schedule of implementation of proposed revisions and recommended actions.

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¹⁶ URL: <https://www.epa.gov/green-infrastructure/overcoming-barriers-green-infrastructure>

¹⁷ URL: <https://www.epa.gov/soakuptherain>

¹⁸ URL: <https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/BMPRetrofit.pdf>

¹⁹ URL: <https://www.thinkbluemassachusetts.org/>

²⁰ URL: <https://www.mass.gov/guides/stormwater-outreach-materials-to-help-towns-comply-with-the-ms4-permit>