

# Report assessing local codes affecting impervious cover area

BURLINGTON, MA

## Report assessing local codes affecting impervious cover area

### Purpose

One of the requirements of the 2016 MS4 permit is to develop a report “assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover.”

*“This assessment shall be used to provide information to allow the permittee to determine if changes to design standards for streets and parking lots can be made to support low impact design options. 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. The local planning board and local transportation board should be involved in this assessment. This assessment shall be part of the SWMP. The permittee shall report in each annual report on the status of this assessment including any planned or completed changes to local regulations and guidelines.”*

Members of the Stormwater Committee worked together to review the Town’s Bylaws, regulations, rules and policies. Members utilized the Code and Ordinance Scoring Worksheet (and the Mass Audubon Analysis Tool for Local Land Use Regs.) and produced a report that serves to satisfy the requirements of Section 2.3.6(c) of the 2016 MS4 general permit.

### Existing standards

In Burlington, impervious surfaces cover about 25% of the Town (828 hectares). Roads and parking lots make up most of that area. The existing standards guiding road design and parking lot layout were established decades ago, largely without concern for environmental impacts. Consequently, outdated zoning bylaws, subdivision regulations, and road standards may not only promote excessive impervious cover, but they may effectively prohibit the application of many Low Impact Development (LID) practices (EPA Region 1, 2011).

### Procedure

Members of the Planning, Engineering and Conservation Departments collaboratively filled the Suburban form of the Code and Ordinance Worksheet (COW) Scoring Spreadsheet developed by the Center for Watershed Protection. The findings are presented below in sections that correspond to the sections in the COW Scoring Spreadsheet. Within each section, the current relevant standard is identified, and appropriate changes suggested, or further studies recommended. In general, the assessment found that many codes and regulations do not explicitly allow or prohibit designs that would allow for the reduction of impervious cover. In these cases, no change to the code is recommended.

In considering changes to some Town codes to allow for impervious cover reduction, DPW Engineering and the Fire Department were consulted to determine if public safety would be compromised before recommendations were proposed.

### Street Width

1. Is the minimum roadway width allowed for streets in neighborhoods with low volume roads (less than 400 average daily trips according to AASHTO, 2001) between 18-22 feet (where bicycle lanes are not present)?
2. Are curb extensions that narrow the roadway (such as pinchpoints, gateways, and chicanes) permissible?
3. Are permeable paving materials allowable on low-use streets and/or parking lanes?

The Subdivision Rules and Regulations denotes a minimum 24' paved width, but it can, and usually is, waived for a smaller width. The Fire Department typically seeks a 24-foot clear width for 2-way traffic, meaning that curb extensions are not preferred.

Permeable paving materials are allowed in streets, driveways and parking areas where appropriate. Section 7.5 of the Zoning Bylaws states that "In areas where contamination or other environmental factors do not preclude infiltration, porous pavement, porous concrete, and/or permeable pavers may be used in streets, driveways and parking areas. All systems shall be designed and constructed so that water falling on such areas will be directed into an approved system of pipes, or drainage structures, or Low Impact Development (LID) features."

Recommended Action: The minimum 24' ROW requirement will be reviewed and may be tightened when the Rules and Regulations are reviewed.

### Street Length

4. Does the subdivision, Planned Unit Development, or Unified Development ordinance identify reducing street length as a goal of neighborhood street design?

Reduction of street length is not addressed. This is not thought to be required or relevant in Burlington.

### Right-of-Way Width

5. Is the recommended right-of-way width for a low-volume residential street less than 45 feet?
6. Does the code allow utilities to be placed under the paved section of the right-of-way to limit clearing and allow compact development footprint?
7. If street trees are required, is the planting area required to be at least 6 feet to provide sufficient rooting space to support large trees?

In Burlington the recommended Right-of-Way width is 40 feet on a local street or collector street and 50 feet on a major or minor arterial way, with a paved width of 20-26 feet (Section 10.3 Subdivision Rules & Regulations).

The Planning Board encourages applicants to place utilities under the paved section of the right-of-way, but that is not written in any codes. The Department of Public Works in its Street Opening/Utility Connection Rules and Regulations has a policy that stormwater infiltration systems should not be under paved right-of-way. There is no direct conflict in the codes however, in practice stormwater infiltration systems for subdivisions that are placed on private properties tend not to be maintained by the homeowner. This may be considered on a case-by-case basis in the future.

The Subdivision Rules and Regulations (Section 10.7) requires two (2) street trees per lot in a subdivision with sidewalks, but there is no mention of spacing. Where sidewalks are provided, trees shall be planted in the street right-of-way no closer than 35 feet apart.

Recommended Action: the location of utilities like stormwater infiltration systems shall be considered on a case-by-case basis going forward.

### Cul-de-Sacs

8. Do the street or subdivision standards allow street layouts that minimize the use of cul-de-sacs?
9. Is the minimum radius for cul-de-sacs 48 feet or less?
10. Can a landscaped island be created within the cul-de-sac?
11. Are alternative turnarounds such as hammerheads and loop roads allowed?

Cul-de-sacs may be waived. Section 2.5 of the Subdivision Rules & Regulations allows for waivers where in the public interest. The Fire Department weighs in in such a situation. As long as the proposal shows Fire Department apparatus can safely navigate without a cul-de-sac, the Planning Board and Fire Department are generally not opposed. Section 10.4 of the Subdivision Rules & Regulations stipulates a "turning circle having an outside layout radius of not less than fifty (50) feet, and a pavement radius of not less than forty (40) feet." The Planning Board may require, where appropriate, that a planted area be placed within the turning circle of a cul-de-sac and Section 10.13 specifies the plantings, if required. Curbing or raising of the planting is not required, but no mention is made of grading the cul-de-sac to the island for stormwater treatment.

Alternative turnarounds, such as hammerheads and loop roads, are considered on case-by-case basis through the subdivision waiver process. The codes are silent on their design.

Recommended Action: The Planning Department and Board will review Section 10 of the Subdivision Rules & Regulations to address designing planted islands to incorporate stormwater features and/or treatment and to maximize permeable surfaces in a cul-de-sac.

### Vegetated Open Channels

12. Are open section vegetated channels allowed where density, topography, soils, and slope permit?
13. Are runoff reduction practices permissible within curb extensions or landscape strips?

Open section vegetated channels are allowed. The codes are silent as to runoff reduction practices within curb extensions or landscape strips, so they are assumed to be permitted. Grass-covered trenches have been used as stormwater mitigation on sidewalk projects in Burlington (Terrace Hall Avenue).

### Parking Ratios

14. Do parking ratios reflect local parking demand?
15. Are parking requirements set as maximums?

Parking ratios were developed in the 1990s. Developers are required to provide parking memos, which are usually based on ITE. Parking requirements are laid out as minimums and maximums. In order to exceed the maximum requirement, an applicant will require a Special Permit from the Planning Board. An applicant may also hold parking in reserve until they have a proven requirement to use the spaces. Article 7 of the Zoning Bylaw has a stated purpose of requiring "the minimum amount of parking spaces needed to adequately serve all land uses and properties." A minimum of 2 parking spaces is required for single family dwellings. Currently Zoning Bylaw sections 7.2.4.1 and 7.2.4.2 allows parking "within the required front, side and rear yard setbacks."

**Recommended Action:** The Planning Department and Board will address parking, especially shared parking, in their planned review of Rules and Regulations. This will include considering if parking should be prohibited in the side setbacks for one and two family dwellings, which would allow for more pervious surfaces between houses.

## Parking Codes

16. Are shared parking arrangements allowed?
17. Are parking ratios reduced if shared parking arrangements are in place?
18. Is the parking ratio reduced when multi-modal transit (e.g., mass transit, bike share or car share programs) is provided?
19. Can the number of parking spaces be reduced and additional parking be maintained as green space until needed for redevelopment projects?
20. Are parking credits provided when nearby on-street parking is available?

While there is nothing in policy or rules and regulations prohibiting shared driveways, they have generally been discouraged per the preference of the Police Department, due to the potential conflict that could be created.

The codes are silent on shared parking, however, this is dealt with on a case-by-case basis. In practice, a legal document is required from each party. This document has to reflect peak demand times. The Planning Board can waive or reduce parking requirements.

There is limited transit in Burlington, so the codes are silent regarding reducing the parking ratio when multi-modal transit is provided; we do not feel the need to address this.

**Recommended Action:** The Planning Department and Board will address parking, especially shared parking in commercial districts to meet parking demand, in their planned review of the Zoning Bylaw and Subdivision Rules and Regulations.

One objective specified in the Zoning Bylaw (Section 7.2.1.1) is to “prevent the creation of surplus amounts of parking spaces,” while another (Section 7.2.1.2) is “To encourage use of Transportation Systems Management (TSM) and Transportation Demand Management (TDM) strategies, and to provide a basis for the development of Transportation Management Plans (TMP) to reduce new Single Occupancy Vehicle (SOV) trips within the Town, particularly during peak hour periods” and (Section 7.2.1.4) “to reduce unnecessary amounts of impervious surface areas from being created.”

As mentioned above, the number of parking spaces may be reduced and additional parking be maintained as green space until needed for redevelopment projects. Additionally, under section 7.2.0 of the Zoning Bylaws, spaces may also be located on another lot within 200 feet of the lot which they serve. A Special Permit is required to increase the maximum parking space requirements and ratios by more than 10% (Zoning Bylaw 7.2.5).

## Parking Lots

21. Is the minimum stall width for a standard parking space 9 feet or less?
22. Is the minimum stall length for a standard parking space 18 feet or less?
23. Is a fixed proportion (eg., 15%) of the spaces at larger commercial parking lots required to have smaller dimensions for compact cars?
24. Can pervious materials be used for parking areas, including spillover or special event parking?

The required stall width for a standard car is 9 feet and for a compact car is 8 feet. The minimum stall length for a standard car is 18 feet and for a compact car is 15 feet (Zoning Bylaw 7.2.2). There is no requirement for larger commercial lots to have a fixed proportion of spaces for compact cars, however, this could be negotiated on a case-by-case basis. Pervious materials can be used for parking areas per section 7.5.2 of the Zoning Bylaw “In areas where contamination or other environmental factors do not preclude infiltration, porous pavement, porous concrete, and/or permeable pavers may be used in streets, driveways and parking areas.”

### Structured parking

25. Are there any incentives for developers to provide parking within garages rather than surface parking lots?

Parking structures are allowed in the Innovation District, Town Center Overlay and some Planned Development Districts. For proposals involving laboratories that would occupy 30% of the building, applicants can increase their FAR. These projects can have structured parking the first two levels of which are not counted towards the height restriction. Is it not thought that additional incentives are required.

### Parking Lot Runoff

26. Is a minimum percentage of a parking lot required to be landscaped?

27. Is the use of runoff reduction practices within landscaped areas, setbacks, or parking areas allowed?

28. Are flush curbs and/or curb cuts and depressed landscaped areas allowed so that runoff can be directed into vegetated landscaped islands or runoff reduction practices? We said yes, but where is that stated?

29. Are dimensions for landscaped areas sufficient to plant large trees? Codes are silent on dimensions for tree plantings.

30. Do vegetated stormwater management areas count toward required landscape minimums?

Burlington does not require a minimum percentage of a parking lot to be landscaped. Section 7.4.1 of the Zoning Bylaw states that landscaping provides a “visual relief and source of shade in parking lots.” No parking areas may be located within the buffer area (described in Zoning Bylaw Section 5.2.0 Density Regulation Schedule). In the approval process for a Special Permit, the Planning Board can require that existing parking spaces can be converted to pervious or landscaped areas and can stipulate that there be no net increase in the number of parking spaces and the site for which a special permit is sought (Zoning Bylaw Section 4). While the use of runoff reduction practices within landscaped areas, setbacks, or parking areas is not explicitly called out in the codes, it is not in practice denied.

In the Town Center overlay a minimum 15’ landscaped buffer in the sideyard is required where the commercial property abuts a one family dwelling (Zoning Bylaw 8.5.5.4) and “The minimum buffer to adjoining residentially zoned property shall be 20% of the average depth and/or width of the lot as applicable, with a minimum of 25’ and a maximum requirement of 50’” (Zoning Bylaw 8.5.5.5). It is not explicitly stated that vegetated stormwater management areas count toward required landscape minimums. “Within the Aquifer and Water Resource Districts, not less than forty percent (40%) of the lot shall be landscaped or if wooded, may be left in a natural state” (Zoning Bylaw Sect 8.3.8.4) Though not explicitly stated, stormwater management features could count towards that requirement.

## Open Space Design

31. Do the ordinances require or allow open space subdivisions?
32. Is land conservation or impervious cover reduction a major stated goal or objective of the open space design ordinance?
33. Is a minimum percentage of the buildable portion of the site required to be set aside as open space? (more or less than 50%?)
34. Is the open space determined through a stepwise design process where open space is identified first?
35. Is open space design a by-right form of development versus a more burdensome conditional use or warrant?
36. Are flexible site design criteria available for developers that utilize open space or cluster design options (e.g., setbacks/lot lines, road widths, lot sizes and shapes)?
37. Are density bonuses and/or penalties used to encourage use of open space design?

The purpose of Open Space Residential Development (OSRD) is to encourage the preservation of common land for conservation, agriculture, open space and recreational use (Zoning Bylaw Section 11.6.1). At least 40% of the parcel, exclusive of land set aside for roads and parking, shall be open land (Zoning Bylaw Section 11.6.5(a)). An applicant has to create a lotting plan of what could have been built in a traditional subdivision and also provide a plan showing their proposal and how much open space would be protected. Minimum dimensions for area, frontage, setbacks and buffers are laid out and an applicant may propose enhancements for discussion. Density bonuses are provided for open space designs that exceed the minimum requirements for open space protection, up to 4 dwelling units per acre or more if improvements in traffic or pedestrian uses or more open space or more affordable housing is provided.

At present, Open Space Subdivisions are allowed under Special Permit in the Residential District.

**Recommended Action:** The Planning Department and Board will address how to make Open Space Subdivisions process easier in their planned review of the Zoning Bylaw and Subdivision Rules and Regulations. Options that will be considered at that time include reducing the minimum size required and accepting a lotting plan rather than requiring a full subdivision plan. In the meantime, variances are issued on a case-by-case basis.

## Setbacks and Frontages

38. Are irregular lot shapes (e.g., pie-shaped, flag lots, zipper lots) allowed in the community?
39. Does the code allow for variances to setback and frontage requirements?

Pre-existing, non-confirming, irregular lot shapes are allowed in Burlington; these must have a minimum frontage of 20 feet. Variances to setback and frontage requirements are allowed under state law only, not a Town code.

## Sidewalks

40. Can minimum sidewalk widths for residential neighborhoods be reduced to 5 feet where safe and appropriate?
41. Can alternate pedestrian networks (e.g., paved trails through common areas, walkways and bike trails connecting cul-de-sacs to other streets) be substituted for sidewalks in the right-of-way?
42. Are alternative sidewalk designs that provide sufficient soil rooting volume for street trees (e.g., pop-outs or bulb-outs, curving sidewalks, tree islands) allowed?
43. Are alternative sidewalk construction materials that increase infiltration allowed?

According to the Subdivision Rules and Regulations, sidewalks are required to be a minimum of 4' wide, with no less than 3' of clearance in all locations. Standard practice is for sidewalks to be 5' wide. The codes are silent as to whether alternative pedestrian networks (e.g., paved trails through common areas, walkways and bike trails connecting cul-de-sacs to other streets) may be substituted for sidewalks in the right-of-way, or as to whether alternative sidewalk designs that provide sufficient soil rooting volume for street trees (e.g., pop-outs or bulb-outs, curving sidewalks, tree islands) may be allowed.

Codes are silent on alternative sidewalk construction materials that increase infiltration are but they would not be allowed in the right-of-way. Paths on private property or in recreation areas may be of any ADA-compliant material.

**Recommended Action:** The Planning Department and Board will address whether or how to approve alternative sidewalk designs or materials in their planned review of the Site Plan Rules and Regulations and possibly the Subdivision Rules and Regulations.

### Driveways

44. Are minimum driveway widths 9 feet or less (one lane) or 18 feet or less (two lanes)?
45. Can pervious materials (e.g., grass, gravel, permeable pavers, etc.) be used for residential driveways?
46. Can a "two track" design be used for residential driveways?
47. Are shared driveways permitted in residential developments?

According to the Subdivision Rules and Regulations, driveways in subdivisions shall have a minimum curb opening of 14 feet unless waived by the Planning Board. Ribbon driveway, or "two track" design (i.e. paved tire track with a pervious median), is permitted for use for residential driveways, but is not known to be used in Burlington. As stated above, shared driveways have generally been discouraged per the preference of the Police Department, due to the potential conflict that could be created.

Zoning Bylaw Section 7.5.2 allows that in the RO district or in "areas where contamination or other environmental factors do not preclude infiltration, porous pavement, porous concrete, and/or permeable pavers may be used in streets, driveways and parking areas." In other districts where contamination precludes infiltration, driveways must be paved or surfaced with impervious materials.

**Recommended Action:** The Planning Department and Board will address allowing permeable paving in Commercial lots in their planned review of the Site Plan Rules and Regulations.

### Open Space Management

48. Does the open space design ordinance require identification of an entity (e.g., conservation organization, community association) who will be responsible for managing the open space?
49. Can open space be managed by a land trust or other qualified public or private land conservation organization (e.g., municipal parks department) through conservation easements or transfer of ownership?
50. If open space cannot be managed by a third party, are there enforceable requirements to establish an association that can effectively manage the open space?
51. Are secure and permanent funding arrangements required to be established for the long-term management and maintenance of open space?
52. Are there standards for the open space requiring interconnections, prioritized lists of resources to be conserved, and access standards?



53. Are allowable and unallowable uses for open space in residential developments defined?
54. Are long-term management plans that conserve natural systems required for all open space areas?
55. Is open space in a natural condition required to be protected in perpetuity by a binding conservation easement or similar legal instrument?

Section 11.6 of the Zoning Bylaws, Open Space Residential Development establishes that a special permit for an Open Space Residential Development may be granted by the Planning Board. Section 11.6.5 specifies that the open land may be conveyed to a corporation, home association trust, or to a nonprofit organization, the principal purpose of which is the conservation of open space, or to the Conservation Commission. At least 10% of the open land must be usable for active or passive recreation. A Declaration of Covenants and Restrictions requiring provisions for maintenance assessments of all lots and mandatory membership in a homeowners association must be recorded. The length of time for the management is not specified.

Further, “open space may be used for recreational purposes including golf courses, riding trails, tennis courts, gardens, swimming pools and temporary structures (i.e., tents, stages for special events and other structures that are intended to be assembled and disassembled within a 14 day period)” or for septic systems, according to Section Zoning Bylaw Section 11.6.5(c) .

The bylaws are silent on 52. standards for the open space requiring interconnections, prioritized lists of resources to be conserved, and access standards; 53. defining allowable and unallowable uses for open space in residential developments and 55. requiring open space in a natural condition to be protected in perpetuity by a binding conservation easement or similar legal instrument. Projects and locations are considered on a case-by-case basis. These items are sometimes addressed in Project Review and often end up as conditions of approval.

### Rooftop Runoff

56. Can downspouts be disconnected such that rooftop runoff flows to storage tanks, pervious areas, runoff reduction practices, etc.?
57. Do current grading or drainage requirements allow for temporary ponding of stormwater on front yards or rooftops?
58. Is temporary storage of rainwater in storage tanks (e.g., rain barrels or cisterns) permitted?
59. Do the stormwater BMP design specifications for green roofs address structural concerns (e.g. how to determine design load of roof)?
60. Do local plumbing codes allow harvested rainwater for exterior uses such as irrigation and non-potable interior uses such as toilet flushing?

The Erosion and Sedimentation Control (Stormwater) bylaw encourages directing rooftop runoff into storage tanks or pervious areas and avoiding runoff onto neighboring properties or roadways. Water harvesting devices such as rain barrels and cisterns are not directly addressed in the Town’s Bylaws and Regulations. However, they are encompassed within the practices encouraged in the Stormwater Bylaw such as “reduction in impervious surfaces, disconnection of impervious surfaces, bioretention (rain gardens), and infiltration systems.” The Town encourages the use of rain barrels, offering them for sale every other year. There are no design specifications for green roofs in the Town codes. If the Town promulgates regulations under the Stormwater and Erosion Control Bylaw, design specifications for green roofs could be included.

Section 5.2.C of the Board of Health Regulations for Stormwater and Runoff management states that “Detention or retention basins shall be utilized only in non-residential applications. Rain gardens may be used in residential applications” with certain design stipulations. So raingardens may be used in either residential or commercial applications.

The State plumbing code does not cover use of rainwater, as it is not part of the domestic potable water distribution system for outside irrigation, but it is otherwise permitted. The use of rainwater for toilet flushing is prohibited by the plumbing code.

### Buffer Systems

61. Do the development standards in the community require a vegetated buffer along waterways?
62. Is the definition of waterway, or the regulated buffer, expansive enough to include (check all that apply): perennial streams, ephemeral and intermittent streams, lakes, estuaries and shorelines, wetlands, vernal pools?
63. Is the minimum buffer width 50 feet or more?
64. Are buffer widths greater for sensitive resources (e.g., designated high quality streams) or in certain zones (e.g., drinking water protection)?
65. Is expansion of the buffer to include adjacent wetlands, steep slopes, or the 100-year floodplain required?

The Burlington Wetlands Bylaw and Regulations impose a 100-foot buffer from defined resource areas. In Section 21.9.d (Buffer Zones) of the Regulations, one of the performance standards is that “Vegetation, particularly mature trees, shall be preserved to the maximum extent possible. Where trees within the buffer zone are cut, the Commission may require plantings of new trees as mitigation.” While Section 21.7.d of the Burlington Wetlands Regulations (Riverfront Area) states that “Proposed activity on previously developed lots within riverfront may require improvements to the riverfront, such as increasing the width of the naturally vegetated inner riparian area, planting native trees or shrubs or removing impervious surfaces. Where there is no naturally vegetated streamside buffer on the lot, the Commission may require riparian restoration when permitting any additional work within riverfront on the lot.” The regulations also stipulate that 20 feet from the resource area shall not be disturbed. The 200-foot riverfront area is extended to all named streams and tributaries to named streams, not just perennial streams.

We do not stipulate that a vegetated buffer is required along water way, but by protecting both named streams and tributaries to named streams, Burlington provides considerably more protection to waterways than the MA Wetlands Protection Act and Regulations.

The resources defined and protected in the Regulations include perennial and intermittent streams, lakes, bordering vegetated wetland and isolated wetlands, vernal pools and bordering land subject to flooding, which coincides with the 100-year floodplain. Estuaries and shorelines are not specifically defined as there are none in Burlington. The wetland buffer does not refer to steepness of slopes.

### Buffer Management

66. Does the buffer ordinance specify that a minimum percentage of the buffer be maintained with native vegetation?
67. Does the buffer ordinance outline prohibited uses and permitted uses that have little impact to the vegetated buffer?
68. Does the ordinance specify enforcement mechanisms?

69. Does the buffer ordinance specify a preference for buffers to be located on a parcel of common ownership (e.g., a homeowners' association)?

The wetlands bylaw and regulations do not specify that a minimum percentage be maintained with native vegetation but does include a linear setback from wetlands of disturbance and of building. Replacement trees and shrubs are required to be native species. The Bylaw identifies exemptions that would not have substantial impacts to the resource areas and any permit issued prohibits "any activity or portion thereof that cannot be conditioned to protect" the interests defined in the Bylaw. Both the Bylaw and the Regulations describe Enforcement mechanisms. Neither the Bylaw nor the Regulations specify a preference for buffers to be located on a parcel of common ownership, nor is that thought to be needed.

### Clearing and Grading

70. Is there any ordinance that requires the preservation of native soils, hydric soils, natural vegetation, or steep slopes at development sites?

71. Do regulations limit the total portion of the site that can be cleared?

72. Are the limits of disturbance required to be shown on construction plans and physically marked at the site?

73. Are reserve septic field areas allowed to be left undisturbed until needed?

The Wetlands Regulations allow that up to 5,000 square feet of wetland may be altered. However, it also requires replication at 2:1 ratio of what is being filled, with an unrestricted hydraulic flow and that "At least 75% of the surface of the replacement area shall be reestablished with indigenous wetland plant species within two growing seasons." It does not require the preservation of native or hydric soils or refer to steep slopes.

The Subdivision Rules & Regulation, Section 6.6.4.7 states that "the Planning Board may require that slope easement and/or retaining walls be provided on the plan to provide for more gradual slopes and to support the street or adjacent land. Slopes are also address in Section 10.4 Construction of Ways, including requirements for slope easements where necessary. Article V of the Zoning Bylaw also addresses slope with respect to size of properties but does not specifically address preserving steep slopes.

The wetland regulations require that no structures may be built within 40 feet of a resource and no disturbance may occur within 20 feet of a resource, but do not specify a limit of clearance allowed. The Zoning Bylaw, Section 11.6.5, referring to Open Space Residential Development, requires that at least 40% of the parcel exclusive of land set aside for roads and parking, shall be open land. Neither the Wetlands Bylaw nor the Regulations require the limit of disturbance to be shown on construction plans and physically marked at the site. However, the Notice of Intent submission checklist does identify details to be shown on application plans and the permits issued require the structure to be staked in the field.

Title 5, the State regulation for septic systems, requires reserve areas to be undeveloped. Town codes are silent on reserve septic fields.

Recommended Action: Measures to address soil preservation or protection will be considered when the Wetland Regulations are reviewed. At that time, the requirement to mark limits of work on submitted plans will also be added.

## Tree Conservation

74. Is a natural resources inventory required to identify and map natural areas?
75. Is there an ordinance that requires conservation of some portion of forests, specimen trees, or other native vegetation at development sites?
76. Do tree conservation requirements identify or reference methods for delineating and protecting the critical root zone of trees (sometimes referred to as “drip line”)?
77. Do forest/tree conservation requirements specify planting new trees at sites where none exist?
78. Are trees and native plant materials permissible for landscaping in yards, common areas, and other open spaces?
79. Does the community have an urban forestry plan that supports/is referenced by the landscaping ordinance?
80. Do landscaping requirements identify or reference specifications for soil amendments, planting methods, species selection, and maintenance?

A natural resources inventory is not required to identify and map natural areas.

The Zoning Bylaw Section 8.3.8.4 requires that “within the Aquifer and Water Resource Districts (encompassing Zones I and II), not less than forty percent (40%) of the lot shall be landscaped or if wooded, may be left in a natural state.” Some of the Planned Development Districts’ provisions contain additional requirements for Open Space including, in some cases, granting of Conservation Restrictions to the Conservation Commission covering Open Space within the District.

Burlington does not have an urban forestry plan, nor is one thought to be needed. Tree conservation requirements do not identify or reference methods for delineating and protecting the critical root zone of trees, and landscaping requirements do not specify soil amendments or maintenance.

Section 10.12 of the Subdivision Rules and Regulations requires that “All cut and fill slopes subject to erosion and contiguous to the way shall be planted with suitable well rooted, low growing plant materials.” Section 7.4 of the Zoning Bylaws refer to landscape screening being maintained.

The Wetlands Regulations do require replacement plantings in the buffer zone or riverfront area be native and staff can provide a native species list. The Subdivision Rules and Regulations (Section 10.12) requires street trees of a Zone 6 hardiness from licensed nursery stock in the proposed right-of-way, with the species to be approved by the Planning Board, while Section 10.13 requires cul-de-sac plantings.

Recommended Actions: Both root protection and soil specifications will be considered when the Wetland Regulations are reviewed.

The Planning Department and Board will address requiring native tree planting in their planned review of the various Rules and Regulation under their purview.

## Land Conservation Incentives

81. Are there any incentives to developers (e.g., open space design, density bonuses, stormwater credits, or expedited design review) to conserve land above and beyond what is already required (e.g., steep slopes, wetlands)?
82. Is flexibility to meet land conservation requirements (e.g. density compensation, buffer or lot averaging, transferable development rights, off-site mitigation) offered to developers?

There are no incentives to conserve land, however, Section 11.6.7 of the Zoning Bylaws allows for increased density provided traffic or pedestrian improvements is provided or high-value open space is present or “when the applicant agrees to make public improvements or improvements in the public interest on property not under the applicant's control.”

Recommended Action: The Planning Board and Staff will consider changing the minimum acreage for OSRD. It is thought that will be more effective than incentives.

### Stormwater Outfalls

83. Does the stormwater code contain special treatment criteria for discharges to impaired or sensitive waters, such as natural wetlands, lakes, trout streams, nutrient-sensitive estuaries, drinking water supplies, etc.?

84. Does a floodplain management ordinance exist that restricts or prohibits development within the 100-year floodplain?

85. Is there a local wetland protection ordinance?

The performance standards (Section 6.8) of the Stormwater & Erosion Control Bylaw require that applicants will detail how they will b. “Implement structural and non-structural stormwater best management practices (BMPs) for projects that discharge, directly or indirectly, to a water body subject to one or more pollutant-specific Total Maximum Daily Loads (TMDLs). These practices shall be consistent with each such TMDL” and c. “Implement structural and non-structural stormwater BMPs optimized to remove the pollutant(s) responsible for the impairment to the extent the project will discharge, directly or indirectly, to an impaired water body not subject to a TMDL.” This Bylaw complies with “Federal and state statutes and regulations relating to stormwater discharges including total maximum daily load requirements and with the General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts, issued by the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection.” The Wetlands Bylaw and Regulations covers development with the 100-year floodplain, also known as Bordering Land Subject to Flooding.

### Stormwater Codes

86. Do codes define rainwater harvesting and establish acceptable uses for rainwater (e.g., irrigation and toilet flushing) and corresponding treatment requirements?

87. Does the stormwater code include specific standards to reduce post-construction runoff volume (not just peak rate)?

88. Does the code require or have incentives for consideration of runoff reduction concepts early in the site planning process?

89. If the code includes post-construction runoff reduction standards, is there reference to clear, understandable, and local or regionally-based design guidance or stormwater manual?

90. Are drainage and stormwater treatment standards all in one place within the code and internally consistent?

No Town regulations specifically define rainwater harvesting, but collection for irrigation purposes is encouraged. The Uniform State Plumbing Code does not allow for use of rainwater for toilet flushing. According to the current Stormwater & Erosion Control Bylaw, a stormwater management plan is required for all construction projects that disturb more than 20,000 square feet. That plan must meet the Massachusetts Stormwater Management Standards (or as revised) and the Massachusetts

Stormwater Management Handbook Volumes I and II (or as revised). Applicants are encouraged but not required to confer with the administering Department Commission and Department (Conservation) before submitting an application but no incentives are written into the Bylaw.

There are also Regulations for Stormwater and Runoff Management, which are administered by the Board of Health. The primary intent of this Regulation is to provide some protection “from pollutants, flooding, icing, siltation, and other drainage problems.” While these Regulations prevent the use of structures that are designed to and do hold standing water in residential areas, detention basins are allowed anywhere in town except residential areas and raingardens are allowed throughout town.

### Installation and Maintenance of Practices.

91. Do erosion and sediment control standards specify protection of post-construction practice sites during active construction?

92. Does the code mandate performance bonds and periodic inspections to ensure proper installation of stormwater practices based on the approved plans?

93. Does the code include provisions for runoff reduction practice easements, inspector right-of-entry, maintenance agreements, and post-construction inspections?

The Stormwater & Erosion Control Bylaw does not call for protection of post-construction practice sites during active construction, but this requirement is included in permits where applicable. At present, the Stormwater and Erosion Control Bylaw requires a cash bond for projects that disturb more than 20,000 square feet. One proposed change being applied is that cash bonds will be required for all projects requiring a Standard or Abbreviated Stormwater permit, so for any project that disturbs more than 5,000 square feet or results in an increase in impervious area of 5% of the total property area. The Bylaw grants permission to perform inspections. Section 8.12 of the Subdivision Rules and Regulations requires “unencumbered title to all sanitary sewers, storm water drains, water mains and all appurtenances thereto” and “perpetual rights and easements to construct, inspect, repair, renew, replace, operate, and forever maintain” “for subdivisions in which the ways and utilities are proposed to be offered for acceptance as public ways.” The codes are silent on post-construction inspections, however, the Stormwater and Erosion Control Bylaw requires Operations and Maintenance Plans and permits typically require post-construction maintenance of stormwater management systems.

Recommended Action: The Planning Board and Staff will consider requiring easements to access stormwater BMPs on commercial properties that directly connect either to the MS4 or to Waters of the U.S. in the planned review of the Site Plan Rules and Regulations.

### Off-Site Compliance

94. If off-site stormwater compliance is authorized, is some percentage of treatment required on-site?

The Stormwater Bylaw does not allow for off-site mitigation of stormwater.

### Conclusion

The Planning Board and Staff will undertake a thorough review of the Zoning Bylaw, Subdivision Rules and Regulations, Site Plan Rules and Regulations in Year 5 of the Permit, and will apply the changes described within this report.

The Conservation Commission and Staff is in the process of amending the Stormwater (Erosion and Sedimentation Control) Bylaw at the time this report is being prepared. No changes are required in order to comply with the findings herein.

The Conservation Commission and Staff will review the Wetlands Regulations in either year 5 or Year 6 of the Permit and will apply the changes described within this report.

## References

Burlington Stormwater /Erosion & Sedimentation Control Bylaw (Article XIV)

<https://www.burlington.org/DocumentCenter/View/4861/Burlington-Stormwater-Bylaw?bidId=>

Burlington Subdivision Rules & Regulations

<https://www.burlington.org/DocumentCenter/View/646/Subdivision-Rules-and-Regulations-PDF?bidId=>

Burlington Wetlands Bylaw (Article XIV)

<https://www.burlington.org/DocumentCenter/View/219/Wetlands-Bylaw-PDF>

Burlington Wetlands Regulations <https://www.burlington.org/DocumentCenter/View/220/Wetlands-Bylaw-Regulations-PDF>

Burlington Zoning Bylaws <https://www.burlington.org/ArchiveCenter/ViewFile/Item/446>

EPA Region 1, April, 2011. Assessing Street and Parking Design Standards to Reduce Excess Impervious Cover in New Hampshire and Massachusetts. Available online at

[www.epa.gov/region1/npdes/stormwater/assets/pdfs/ImperviousAssessment.pdf](http://www.epa.gov/region1/npdes/stormwater/assets/pdfs/ImperviousAssessment.pdf)

Burlington Street Opening/Utility Connection Rules & Regulations

<https://www.burlington.org/DocumentCenter/View/6425/Utility-Rules-and-Regulations>