

# Impervious Cover Creation Report

TOWN OF BRAINTREE  
STORMWATER DIVISION

## Executive Summary

### Background on NPDES and Permit Requirements

Several sections of the Clean Water Act focus on control of nonpoint source pollution, which is caused when rainfall or snowmelt, also known as stormwater, moving over and through the ground, picks up and carries natural and human-made pollutants, depositing them into lakes, rivers, wetlands, coastal waters and ground waters.

In 1987, the US Environmental Protection Agency (EPA) amended the Clean Water Act to require a two-phased national program to address water pollution from stormwater. Phase I, promulgated in 1990, addressed stormwater discharges in approximately 900 of the nation's largest cities. Phase II regulations, promulgated in 1999, require operators of municipal separate storm sewer systems (MS4s) located in urbanized areas with populations of fewer than 100,000 people to obtain a NPDES permit for their stormwater discharges. In Massachusetts, permits are issued jointly by EPA Region 1 and the Massachusetts Department of Environmental Protection (MassDEP).

On May 1, 2003, EPA Region 1 issued its Final General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (2003 small MS4 permit) consistent with the Phase II rule. The 2003 small MS4 permit covered "traditional" (i.e., cities and towns) and "non-traditional" (i.e., Federal and state agencies) MS4 Operators located in the states of Massachusetts and New Hampshire. This permit expired on May 1, 2008 but remained in effect until operators were authorized under the 2016 MS4 general permit, which became effective on July 1, 2018. As a designated MS4 area, the Town of Braintree is covered under this permit.

This Impervious Cover Creation Report has been developed by the Town of Braintree (the Town) to address the requirements of the United States Environmental Protection Agency Region 1's and Massachusetts Department of Environmental Protection's jointly issued 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "MS4 Permit."

The MS4 Permit requires that Braintree address six Minimum Control Measures. Minimum Control Measure 5 requires the Town to develop a report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover.

The permit requirement is as follows:

*Within four (4) years of the effective date of this permit [by June 30, 2022], the permittee shall 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 [MS4 Annual Report] on the status of this assessment including any planned or completed changes to local regulations and guidelines.*

## What is the purpose of the Impervious Cover Creation Report?

The purpose of this evaluation is to give information to Town boards, commissions, and officials so that they may determine whether changes to design standards for streets and parking lots can be made to reduce excess impervious cover. The report indicates which design standards promote excess impervious cover. The assessment also recommends specific changes to those standards, and proposed schedules to incorporate those changes into relevant documents and procedures.

The evaluation was completed based on EPA Region 1's Technical Support Document, "Assessing Street and Parking Design Standards to Reduce Excess Impervious Cover in New Hampshire and Massachusetts", with supplementary material from the Pioneer Valley Planning Commission. This document reviews each of the types of impervious cover that permittees must evaluate.

Following this evaluation, the Town should work to implement the recommendations and proposed schedules for changes to design standards.

## Why evaluate current standards?

Roads and parking lots are a significant component of the urban landscape, and often constitute the majority of impervious area in a given the watershed. In many communities, the current standards guiding road design and parking lot layout were established decades ago with different considerations about environmental impact. 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 lower-impact practices, such as green infrastructure or pervious pavement. Even where variances and special permitting procedures allow for design alternatives, these additional steps can be time-consuming and unpredictable; and therefore, unattractive to developers (EPA, 2011).

## What is in this report?

We evaluate the following street and parking standards to determine if they are contributing to the unnecessary generation of surplus impervious cover from new construction or redevelopment projects. For each standard, we print questions from the checklist provided in EPA Region 1's Technical Support Document, "Assessing Street and Parking Design Standards to Reduce Excess Impervious Cover in New Hampshire and Massachusetts". We include our answers to the checklist's questions and suggest changes where appropriate.

Each design factor in the list below links to its evaluation.

### Local street design:

- [Residential roadway pavement widths](#)
- [Non-residential and mixed-use roadway pavement widths](#)
- [Road right-of-way \(ROW\) widths and usage](#)
- [Turnarounds for dead end streets](#)
- [Sidewalks](#)
- [Driveways](#)
- [Building frontage and setback requirements](#)

### Parking lot standards:

- [Parking ratios](#)
- [Off-street and on-site parking](#)
- [Credits for shared parking and mass transit](#)
- [Stall and driving aisle dimensions](#)
- [Landscape requirements](#)
- [Pervious parking](#)

Within each section, we note the current standard and where it exists, whether any change is recommended, and a proposed schedule for any changes. In some cases, we suggest a more comprehensive review of the standard from the appropriate Town departments or elected bodies.

In general, our assessment found that many design factors do not explicitly allow or prohibit standards that would allow for the reduction of impervious cover. In these cases, we typically recommend no change to the standard to allow maximum flexibility to Town authorities during the review process.

We identified some standards where questions were raised about whether Town authorities, such as the Highway Division of the Department of Public Works, would accept certain pavement reduction strategies in the course of the street acceptance process. To address these questions, representatives from the Departments of Public Works and Department of Planning and Community Development met to determine which of these strategies would be appropriate and which would not be feasible for public streets. We also discussed these strategies separately with members of the Police and Fire Departments in cases where their approval was also necessary. We note in this report where we have made such determinations.

We also found that some standards that may promote the creation of excess impervious cover are frequently waived. In these cases, we recommend that the appropriate decision-makers (Town departments or elected bodies) review ordinances or regulations for amendment of these standards. The decision of whether amendment of existing standards or continuance of current practices would be preferable is left to those decision-makers.

## Compliance Recommendation: Pre-Application Meeting with Developers

Requiring project applicants to participate in a pre-application meeting with local officials can be one of the most important and cost-effective strategies to limiting impervious cover and ensuring best stormwater management approaches. For this pre-application meeting, an applicant can be asked to take some first steps in thinking about the site through a Low Impact Development lens that involves analysis of site resources, soils, and a sketch plan informed by those considerations. The pre-application meeting then enables a preliminary conversation about the site, stormwater management and erosion control considerations, and concept plan prior to investing in extensive professional design efforts.

The Town often invites applicants for this type of meeting, which can involve staff from Planning, Conservation, Building, Police, Fire, and Public Works, all of whom can work with the applicant to reach satisfactory recommendations that consider the many different factors at hand.

## Challenges to updating design standards

Challenges to updating design standards may include:

- Safety concerns (i.e., fire, school bus) for setbacks, turnarounds, permeable pavers, and road widths;
- Utility installation and maintenance in public ROWs;
- Snow removal requirements for parking lots, landscape islands, and turnarounds; and
- Retail parking demands set by financial institutions for minimum parking requirements

In order to implement changes to design standards, the Town should engage in discussions with representatives of local planning boards, water suppliers and other utilities, transportation, public works, emergency response, school superintendents, and the development community.

## Local Street Design

### Street width (residential, non-residential, and mixed use)

#### **1.1 Is the minimum pavement width for low traffic residential roads (<500 average daily trips) between 18-22 ft?**

No. The minimum pavement width for residential roads is 28ft. This standard is listed in Braintree's Subdivision Rules and Regulations in the typical cross-sections. In some cases this standard can promote excess impervious cover.

The Planning Board often grants waivers under the Subdivision Rules and regulations to allow the pavement width to be reduced to 24 Ft. when it is acceptable to the Fire Department in order to maintain safe and adequate life and fire safety access.

Recommended action: Work with the Fire Department to evaluate life and fire safety in order to amend the Subdivision Rules and Regulations to allow for reductions in minimum pavement width where appropriate by December of 2024.

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#### **1.2 Can parking lanes serve as traffic lanes in higher density areas?**

No standard in Braintree explicitly permits or prohibits the use of parking lanes for traffic.

Recommended action: No change.

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#### **1.3 Are narrower pavement widths allowed on road sections where there are no houses, buildings, intersections, or on-street parking spaces?**

No standard provides for narrower pavement widths under these circumstances, which rarely occur in Braintree. When these circumstances do occur, they are typically on roads owned by the Massachusetts Department of Transportation or the Department of Conservation and Recreation.

Recommended action: No change.

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#### **1.4 Are reductions in frontage distances allowable where appropriate (i.e., open space developments, around cul-de-sacs, and along outside sideline of curved streets) to minimize street length?**

The minimum frontage distance in Braintree is typically 50 feet. Reductions in frontage distances are allowable in some cluster developments. There are no internal frontage

requirements. Reductions are not allowed around cul-de-sacs and along outside sidelines of curved streets.

Recommended action: No change.

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### **1.5 Can permeable paving be used for residential roads, shoulders, and parking lanes?**

No standard exists in Braintree for these uses of permeable paving. Based on discussions between the Departments of Planning and Community Development, the Department of Public Works, and the Police and Fire Departments, the Town has determined that the Department of Public Works would not accept streets or roads with permeable pavement on roads, shoulders, or parking lanes as public streets. This determination is due to factors including difficulty and expense of maintenance and repairs, and recommendations that permeable pavement not be used for high-traffic roadways.

Recommended action: No change.

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## Right-of-Way widths and usage

### **2.1 Are minimum right-of-way widths less than 45 feet for a residential street?**

No. The minimum right-of-way width is 50 feet. The Town commonly grants waivers for narrower layouts as long as standards for sidewalks, utilities, and landscaping are met.

Recommended action: Solicit public feedback on potential amendment to the typical road layout in the Subdivision Rules and Regulations. If feedback is positive, amend typical cross section to allow for a narrower minimum layout.

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### **2.2 Can utilities be placed below the paved section of the right-of-way?**

Yes. It is typical in Braintree for utilities to be placed below the paved section of right-of-way.

Recommended action: No change.

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## Turnarounds for dead end streets

### **3.1 Are landscaped/bioretention islands required in the center of cul-de-sacs?**

No. Braintree does not have any standard requiring or prohibiting islands in the center of cul-de-sacs.

Recommended action: Continue to permit islands in the center of cul-de-sacs when proposed, when acceptable to Town departments, including public safety.

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### **3.2 Is the minimum required radius for cul-de-sacs less than 35 ft?**

No. The minimum required radius is 60 feet.

Recommended action: Amend Subdivision Rules and Regulations to allow for smaller cul-de-sac radius where appropriate by December 2024. Ensure the new standard is acceptable to Town departments, including Public Works and Public Safety.

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### **3.3 Are alternatives to cul-de-sacs such as “hammerheads” allowed for permanent turnarounds?**

Yes, these alternatives are allowed. Development of new dead-end streets is infrequent in Braintree.

Recommended action: No change.

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### **3.4 Are alternative road layouts such as one-way loops encouraged to eliminate dead end streets?**

One-way loops are allowed, but not encouraged. Most subdivision developments in Braintree are not large enough for a one-way loop to be considered. Braintree requires turnaround easements in dead-end streets.

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## Sidewalks

### **4.1 Are sidewalks always required on both sides of residential streets?**

Yes, but this requirement is waived frequently. The Town recognizes that in many cases and circumstances, it is more practical for only one side of a street to have sidewalks, and often permits sidewalks on only one side where appropriate. However, it is

Recommended action: Do not make amendments to Subdivision Rules and Regulations, but continue to evaluate proposed developments to determine whether waivers or variances may be granted to allow for fewer sidewalks.

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### **4.2 Is permeable paving allowed for sidewalks?**

No standard exists that explicitly allows or prohibits permeable paving for sidewalks.

Based on discussions between the Departments of Planning and Community Development, the Department of Public Works, and the Police and Fire Departments, the Town has determined that the Department of Public Works would not accept streets or roads with permeable pavement on sidewalks as public streets. This determination is due to factors including difficulty and expense of maintenance and repairs. The Town would accept use of permeable pavement on private property, with the expectation that the property owner will be responsible for maintenance of the permeable pavement areas.

Recommended action: No change.

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### **4.3 Are alternative pedestrian pathway layouts allowed, rather than placement in road ROW?**

Alternative pedestrian pathway layouts are not prohibited but not expressly allowed. In public ways, the Town generally believes alternative pathways are not applicable, as most sidewalks and walking paths lead to sidewalks and other right-of-way walkways.

Recommended action: No change.

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## Driveways and building frontage requirements

### **5.1 Are reductions in setback distances allowable where appropriate to minimize driveway lengths?**

The minimum residential front setback is 20 feet. The Town believes that this setback distance is as short as possible and promotes minimized driveway lengths.

Recommended action: No change.

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### **5.2 Is the minimum driveway width 9 feet or less (single lane) or 18 feet (two lane)?**

The Town does not regulate a minimum driveway width, but typically recommends 10-12 feet for a single lane or 20-24 feet for a double lane.

Recommended action: Due to the lack of an existing minimum, no change is recommended.

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### **5.3 Are shared driveways allowable?**

Common driveways are allowed for up to two lots, or in cluster/multifamily developments for more than two lots.

Recommended action: No change.

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### **5.4 Are alternative materials and designs (i.e., porous pavers, two-track design) allowed?**

These materials and designs are allowed in driveway applications. The Fire and Police Departments have confirmed that as long as these designs are passable for emergency equipment, they are acceptable. Review of such designs would occur during the application process for building and planning permits.

Recommended action: No change.

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### **5.5 Is residential road length determined by the required frontage distance for individual lots?**

Yes. The minimum frontage distance is 50 feet.

Recommended action: No change.

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## Parking Lot Standards

### Parking ratios, off-street and on-site parking, credits for shared parking and mass transit

#### 6.1 Are parking ratios expressed as both minimum and maximums?

Parking ratios for commercial space is expressed only as a minimum.

Recommended action: See 6.2 below.

§135-806. Schedule of off-street parking requirements.

Use	Parking Required
Single-family	2
Two-family	4
Multifamily	2 per unit
Hotel, motel	1.25 spaces/guest unit plus additional spaces for other commercial uses as required
Club or lodge	1 space/100 gross sq. ft*
Fraternities, sororities, dormitories	1 space/200 gross sq. ft
Hospital	1 space/bed plus 1 space/100 gross sq. ft. devoted to medical uses and/or office space
Sanatorium, nursing, convalescent home, home for the aged	1 space/2 beds plus 1 space/250 gross sq. ft. devoted to adult day care and/or office space
Funeral home, mortuary	1 space/250 gross sq. ft. (entire structure)
Museum, library, community center	1 space/250 gross sq. ft
Commercial post office	1 space/200 gross sq. ft.
Bowling alley	3 spaces/bowling lane
Theater, auditorium	1 space/4 seats
Church	1 space/4 seats
Elementary and middle school	1.5 spaces/employee
High school	1.5 spaces/employee plus 1 space per 5 students of designed capacity
General office, professional, or public building	1 space/250 gross sq. ft.
Heliport	As required by the special permit granting authority
Restaurant	1 space/3.5 seats
Fast-food establishment	1 space/100 gross sq. ft.
Filling station, motor vehicle repair shop	1 space/500 gross sq. ft.
General business, retail and personal service establishments	1 space/200 gross sq. ft.

Commercial and manufacturing establishments	1 space/1,000 gross sq. ft.
Private school	1 space/500 gross sq. ft.
Training school	1 space/500 gross sq. ft. including outside training areas
Institution of historic, philanthropic, charitable character	Board of Appeals (see § 135-806C)
Riding academy or stable	1 space/horse stall
Boathouse, marina	.75 space/boar
Golf course	2 spaces/green plus 50% of requirements for any associated uses
Motor vehicle sales	1 space/250 gross sq. ft. (exclusive of outside sales area)
Amusement/place of assembly	1 space/250 gross sq. ft.
Newspaper or job printing	1 space/250 gross sq. ft.
Open storage, boats	1 space/5 boats
Medical office/clinic	1 space/150 gross sq. ft.
Greenhouse	1.25 spaces/employee
Animal clinic/hospital	1 space/250 gross sq. ft.
Indoor commercial recreation	1 space/250 gross sq. ft.
Outdoor commercial recreation	Board of Appeals (see § 135-806C)
Fair, carnival, similar events	As required by the special permit granting authority
Data center, communications facility	1 space per 1,000 gross square feet together with parking as required for any portion devoted to office space
Municipal public park	As required under site plan review

\* Gross square feet is the sum of the gross horizontal areas of all the floors of a building measured from the exterior face of exterior walls or from the center line of a wall separating two buildings.

## 6.2 Are the minimum required number of parking spaces less than:

- 3 spaces per 1000 square feet for professional office building?

No, the requirement is 1 space/250 square feet, or 4 spaces/1,000 square feet.

- 4.5 spaces per 1000 square feet for shopping centers?

Yes, the minimum is 4.

- 2 spaces per single family home?

No, the minimum is 2.

Braintree's zoning bylaw does provide for decreases in parking requirements (see Section 135-803) as a condition of a special permit, but requires applicants to obtain a parking study and reserve an undeveloped portion of the site to meet the off-street parking space requirements.

Recommended action: Within the Town of Braintree’s upcoming Master Plan (Adoption September 2023), the implementation section will include a requirement to review/reduce several parking requirements in the Zoning Bylaw as the requirements are outdated/over parked.

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**6.3 Are parking requirements reduced for shared parking arrangements, structured parking, areas near mass transit, and special districts?**

§135-615-12 of the Zoning Ordinances describe circumstances in which reductions in off-street parking may be allowable. These circumstances are:

- 1) Shared parking agreements within the Braintree-Weymouth Landing District with other landowners/businesses for peak and non-peak demand hours.
- 2) Shared access between properties.
- 3) Shared or co-location for refuse facilities of multi-businesses.
- 4) Financial commuter incentives for employees to use public transit and bus systems.
- 5) Accommodations for bike parking and users beyond the installation of a simple bike rack.
- 6) Provide parking accommodations for small motorized nonvehicle modes of transportation such as motorcycles, scooters, mopeds, etc.
- 7) Any other transportation demand management (TDM) alternative or option proposed by an applicant and reviewed/recommended by the Planning and Community Development Director.

The Braintree-Weymouth Landing District also has the following permissible parking requirements for specific uses within 1,000 feet of the East Braintree/Weymouth commuter rail station. These requirements create fewer parking spaces compared to the standard requirements in the Zoning Ordinances.

Use	Parking Required
Residential uses above first floor only	0.8 spaces per unit
Retail uses	1 space/500 gross sq. ft.
Professional and business office	1.7 spaces/1,000 gross sq. ft.
Restaurant	1 space/6 seats

Recommended action: In future creation of special districts, ensure parking requirements are reviewed for opportunities to reduce creation of excess parking area, similarly to those in the Braintree-Weymouth Landing District. Inform applicants about these shared parking provisions.

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**6.4 Are model shared parking agreements provided?**

No.

Recommended action: Publicize shared parking agreements that have been approved by the special permit granting authority in the past. Encourage applicants to review this information ahead of filing for a special permit.

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### **6.5 Are there special design standards for urban village centers?**

Yes. The Village Zoning Overlay District is a set of requirements which are superimposed on selected portions of the existing General Business Zoning District centered around the intersections of Pearl Street and Hancock Street and Washington Street in South Braintree Square and Elm Street and Washington Street in Braintree Square. There are also special design standards for the Braintree-Weymouth Landing District. More information can be found in (135-613 and 135-615).

Recommended action: Where possible, continue to allow for reduction of impervious cover creation requirements in the Village Zoning Overlay District and Braintree-Weymouth Landing District.

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## Stall and driving aisle dimensions

### **7.1 Are minimum stall dimensions for standard parking space 9 x 18 feet or less?**

Yes. Minimum stall dimensions are 8.5 feet by 18 feet.

Recommended action: No change.

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### **7.2 Are minimum driving aisle widths for standard two-way traffic 22 feet or less?**

No. The minimum driving aisle width is 24 feet. However, the Zoning Ordinance does provide for reduction in driving aisles based on one-way traffic and reduction in driving aisles based on parking angle.

Recommended action: No change.

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### **7.3 Are smaller compact car stalls required for at least 30% of total parking spaces?**

No. Braintree's minimum stall dimensions are 8.5 by 18 feet. Suggested stall dimensions for compact cars are 8 feet by 16 feet.

Recommended action: No change. The Town's experience has been that in a parking lot spaces smaller than 8.5 by 18 Feet are too tight. These small spaces and the size of most vehicles driven create maneuvering difficulty accessing the spaces. Most drivers in Braintree/suburban MA are driving standard size or larger vehicles.

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## Landscape requirements

### **8.1 Does a portion of impervious parking area require shading with mature tree canopy cover?**

Yes, within commercial or business zoning districts. Otherwise, Braintree's landscaping requirements generally specify that landscaping for parking areas shall use trees as the primary landscaping material, using shrubs and ground cover to complement trees.

**§135-812-I.** Parking facilities located in a commercial or business zoning district shall have peripheral landscaping along any interior (side) property line not along a public right-of-way. Peripheral landscaping shall:

- (1) Have a five-foot-wide landscaped strip located between the parking area and the abutting property line.
- (2) Have a minimum of one tree planted for each 40 linear feet of property line.

Recommended action: No change.

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### **8.2 Is the minimum landscaping requirement at least 20% of the total parking area?**

The minimum landscaping requirement differs based on lot size. For all parking areas, the minimum landscaped area is 5%, not including a minimum 10-foot-wide setback along property lines parallel to any public or private street when parking or circulation areas abut said street.

Lots are also required to maintain a minimum portion of the land as open space, differing based on zoning and use requirements. The table of requirements is below.

Recommended action: Continue to evaluate landscape plans during site plan review to ensure adherence with current standards. Where possible, encourage additional open space/landscaped areas.

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## Pervious parking<sup>1</sup>

### 9.1 Is the use of structural permeable pavement options permitted?

Yes. The Town permits structural permeable pavement options on the general level, and does not specifically encourage or prohibit specific strategies.

Recommended action: No change.

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### 9.2 Is parking above the minimum requirement allowed to be pervious?

Yes.

Recommended action: No change.

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<sup>1</sup> These questions do not appear in the “Assessing Street and Parking Design Standards to Reduce Excess Impervious Cover in New Hampshire and Massachusetts” checklist. We have added them and formatted them similarly to the EPA checklist for clarity and consistency while evaluating all the necessary design factors.