Town of Saugus, Massachusetts

MS 4 Street Design and Parking Lots Report

Assessment of Current Street Design and Parking Lot Guidelines in the Town of Saugus

June 2022

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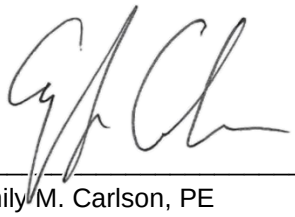

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Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
DPW	Department of Public Works
DCIA	Directly Connected Impervious Areas
EPA	United States Environmental Protection Agency
GI	Green Infrastructure
IA	Impervious Area
IDDE	Illicit Discharge Detection and Elimination
LID	Low Impact Development
MCM	Minimum Control Measures
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
ROW	Rights of Way
SWMP	Stormwater Management Plan

1 Introduction

The Town of Saugus, Massachusetts, with a population of 28,385 (2018), is a suburban community with urban pockets located 10 miles north of the City of Boston. The Town's proximity to Boston, coastal beaches, major regional highways, and well-maintained public facilities makes Saugus a thriving community.

The Town of Saugus is a listed permittee under the 2016 National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit, issued by the United States Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (MassDEP). The permit requires an assessment report of each permittee's rules, regulations, and local bylaws (regulatory documents) which address the addition of impervious surfaces within their jurisdiction. This report, fulfilling the assessment requirement, reviews the various rules, regulations, and local bylaws which influence the scale of impervious surfaces, including street design and parking zones. As required by the permit, recommendations and an implementation schedule are provided.

1.1 MS4 Permit

The Town's stormwater is discharged to surface waterbodies throughout Saugus and those discharges are covered by the MS4 permit, which became effective on July 1, 2018. The Town is currently in Year 4 of the 5-year MS4 permit term. The MS4 Permit includes six (6) minimum control measures (MCMs) that must be addressed by the Stormwater Management Program. These minimum control measures are:

- MCM 1 – Public Education and Outreach
- MCM 2 – Public Involvement and Participation
- MCM 3 – Illicit Discharge Detection and Elimination (IDDE) Program
- MCM 4 – Construction Site Stormwater Runoff Control
- MCM 5 – Stormwater Management in New Development and Redevelopment
- MCM 6 – Good Housekeeping and Pollution Prevention for Permittee Owned Operations

As part of the MCM 5 – Stormwater Management in New Development and Redevelopment requirements, the Town must develop a report which assesses the impact of current street and parking lot design guidelines on the creation of impervious surfaces. This report is due by the end of Year 4 of the NPDES MS4 permit term, on June 30, 2022. The requirements of this report, per the MS4 permit, are:

"Within four (4) years of the effective date of this permit, 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 annual report on the status of this assessment including any planned or completed changes to local regulations and guidelines."

There are several primary goals of evaluating regulatory documents which directly or indirectly effect impervious surfaces resulting from new development, they are:

1. reducing the hydraulic loading on stormwater infrastructure,
2. reducing the potential for flooding,
3. extending the useful life of existing stormwater infrastructure,
4. reducing contaminant loading on stormwater treatment elements, and
5. reducing contaminant loading in natural waterways.

2 Relevant Regulatory Documents in Saugus

A review of relevant local bylaws and regulations was performed, a reproduced list and excerpts of which are provided in Appendix A. Saugus currently has the following detailed regulatory documents:

- ***Rules and Regulations Governing the Subdivision of Land (2010)*** govern subdivision layout, design of roadways, design of sidewalks, curbing, and grass plots are outlined in Sections 2, 4, and 5 of these regulations.
- ***Zoning Bylaws of the Town of Saugus, Massachusetts (May 2021)*** provides requirements for parking, driveways, and sidewalks.
  - Parking Rules and Regulations outline design criteria for roadside parking and private parking areas are provided in Town Zoning Bylaws Articles 17 – Historic Mills Mixed Use Overlay District, Article 18 – Waterfront Mixed Use Overlay District, and Article 21 – Business Highway Sustainable Development Zoning District.
  - Off-Street Parking Rules and Regulations are provided in Town Zoning Bylaws Article 8 – Off Street Parking and Loading Regulations and Article 21 – Business Highway Sustainable Development Zoning District.
  - Driveway Rules and Regulations are provided in Town Zoning Bylaws Article 21 – Business Highway Sustainable Development Zoning District.
- ***Stormwater Bylaw (2018)*** and ***Stormwater Management Rules and Regulations (2018)***, govern stormwater management during construction activities and stormwater management requirements for new development and redevelopment within the Town. Bylaw Section 705.00 Stormwater was adopted in 2018.
- Additional relevant bylaw sections were reviewed, they include: Town Zoning Bylaws Article 12 – Special Permits and Conditions, and Article 21 – Business Highway Sustainable Development Zoning District.

Each regulatory document was reviewed for language which directly impacts the amount of impervious surface area in the Town. Opportunities for adjustment to the regulatory documents are described in detail in Section 4.

3 Local Considerations & Conditions

3.1 Opportunities and Challenges in Saugus

Important safety, accessibility, economic, and maintenance challenges must be taken into consideration when evaluating adjustments to existing regulatory documents regarding the design of streets and parking areas. Acceptable accommodations for emergency vehicle access to homes and businesses in the event of an emergency should not be limited by changes to regulatory documents. The ease and safety of installation and accessibility of buried utilities in public rights-of-way, typically installed below paved surfaces, must be considered as part of any adjustment to rules about development.

Massachusetts experiences extreme weather conditions resulting in management of not only stormwater runoff, but snow removal, snow storage, and accommodations for snow melt during upwards of 6 months out of the year. Any adjustments to roadway and parking areas must consider the impacts on the regular and frequent high volumes of snow management faced by the Town's DPW.

Future development of streets, sidewalks, and parking areas need to be able to meet expected traffic demands, maintain safe transit for motorists, cyclists, and pedestrians, and not limit the economic viability of developable land within the Town.

Figure 1 highlights land-uses which typically result in large swaths of impervious areas. Opportunities to decrease impervious surfaces may be realized through adjustments to regulatory language impacting these land uses. Specific measures that can be taken to reduce impervious surfaces within these land-uses through revisions in the current rules and regulations are provided in Section 4.

Figure 1. Land Uses of Opportunity in Saugus

A map of impervious surface within Saugus is shown in Figure 2; approximately one-quarter of the Town's surface area is covered by impervious surface. Alterations to local rules and regulations may allow for developers to reduce the amount of additional impervious surfaces resulting from new development and redevelopment in the Town and encourage the use of stormwater-friendly infrastructure as part of their projects.

The Department of Public Works relies heavily on consultants and contractors to assist with implementation of stormwater management program components. The DPW would require additional resources (funding and/or staffing) allocated to the department to implement any improvements in the Town's regulatory documents or programs that reduce impervious area.

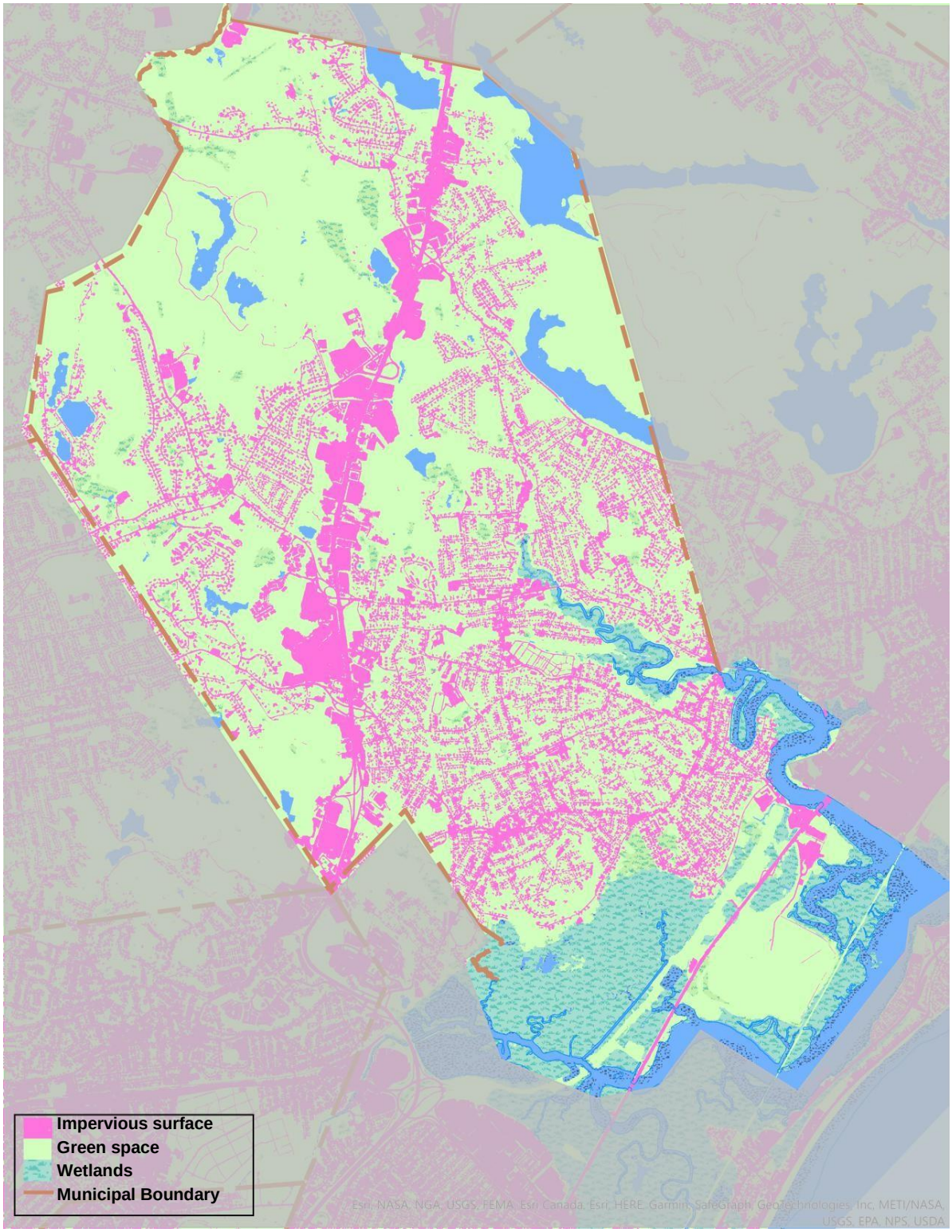

Figure 2. Impervious Surfaces in Saugus, MA

3.2 Guidance for Impervious Area Reduction

The EPA provides guidance for evaluating impervious cover resulting from street and parking area regulating documents in *Assessing Street and Parking Design Standards to Reduce Excess Impervious Cover in New Hampshire and Massachusetts* (**Appendix B**). A summary of this technical support document is provided in Table 1. The document outlines relevant items communities should consider as part of this evaluation. Evaluating these considerations is an important step in the process to identify areas where the Town can modify rules and regulations to reduce impervious surfaces and promote on-site rainwater infiltration.

Table 1. Design Considerations for Improvement to Application of Impervious Surfaces

Area of Development	Considerations
Streets & Roadways	• Width of residential roadways • On-street parking requirements • Pedestrian use of non-residential & mixed-use streets • Location of installation of utilities in public rights of way (ROWs) • Setback requirements for homes & buildings • Optimize design requirements to meet turning radius needs of emergency vehicles on dead-end streets
Parking Areas	• Optimize number of parking spots to avoid an excessive quantity • Off street & onsite parking • Communal parking solutions and use of public transportation • Minimize oversized stalls & driving aisles • Use of permeable surface materials & green space • Residential driveway design requirements
Other Areas/Elements	• Reduce setbacks or create smaller lot sizes that satisfy legal & safety constraints • Set a maximum percentage of impervious cover on individual lots & prohibit exceeding this value • Outreach education on temporary non-damaging ponding of stormwater on residential lots & why that is better than on streets/storm sewers • Redirect stormwater to infiltration zones • Landscaping as a stormwater management requirement

Source: https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ImperviousAssessment.pdf

4 Review of Improvement Alternatives

The following section outlines opportunities for improvement to existing regulatory documents governing land development within Saugus.

4.1 Sub-Division Development & New Roads

The following summary of existing regulating documents in Saugus outperform the recommendations from the EPA which aim to limit required impervious areas resulting from new subdivisions:

- Dead-end roadways are strongly discouraged by the Town's regulatory documents.
- On-street parallel parking and head-in parking on roadways are sized appropriately, adding 9-feet and 18-feet of pavement respectively.
- Limits on property frontage with lower minimums on local roads than on major arterials.
- Regulating language permits and encourages placement of utilities under paved sections of the right-of-way leaving space within right-of-way for vegetated swales and stormwater management infrastructure.

The regulatory documents for new subdivision development, or subsidiary streets, as they are referred to, present ample opportunity to reduce required impervious surfaces. Minimum pavement width is a prominent opportunity for improvement, the current limit of 24-feet can likely be reduced to a minimum of 22 feet for low-density local roads. Design guidance from the AASHTO "Green Book" for lane width is provided in Table 2.

Table 2. Range for Lane Width Based on Roadway Use Type

Type of Roadway	Rural (feet)	Urban (feet)
Freeway	12	12
Ramps (1-lane)	12-30	12-30
Arterial	11-12	10-12
Collector	10-12	10-12
Local	9-12	9-12

(Source: A Policy on Geometric Design of Highways and Streets, AASHTO)

The minimum right-of-way is regulated to be no less than 50 feet, with the only exception being for subsidiary streets and greater right-of-way widths at the discretion of the Board, with a reduced minimum pavement width the right-of-way can likely be decreased as well.

Current design requirements codified by the regulatory documents state all dead-end streets must be equipped with a cul-de-sac with a minimum turning radius of 120-feet and ban the use of islands within the center of the cul-de-sac. This requirement is in direct opposition of limiting unnecessary impervious surfaces as part of new development. If a cul-de-sac must be constructed, the central part of the cul-de-

sac should be utilized for stormwater management, while not limiting the ability of larger emergency vehicles to use the cul-de-sac to turn around.

Table 3 summarizes regulatory barriers to the MS4 permit goal of limiting application of impervious surfaces identified in the existing subdivision design guidelines.

Table 3. Regulatory Barriers to Reduced Impervious Area in Subdivision Rules and Regulations

Existing Codes and Standards	Alternative	Application
Subdivision Rules and Regulations, Section 4 Design Requirements, 4.A. Streets	Reduce minimum paved roadway width requirements	• Subsidiary street minimum lane width minimum can be reduced. • Provide detailed guidance on pavement width dictated by expected traffic volume and travel speeds according to AASHTO "Green Book" guidelines.
Subdivision Rules and Regulations, Section 4 Design Requirements, 4.A. Streets	Dead-End Lane Design	• Permit use of alternative turn-around methods with smaller footprints than cul-de-sacs. • Permit construction of vegetated islands within cul-de-sacs, where required. Any curbing around the cul-de-sac island should be notched to enable runoff to enter the vegetated island.
Subdivision Rules and Regulations, Section 4 Design Requirements, 4.A. Streets	Reduce minimum right-of way requirements	• Reduced right-of-way limits future expansion of publicly owned paved areas.

In addition to the identified barriers to limited impervious surfaces within the Town of Saugus stated in Table 3, Table 4 below lists opportunities to further encourage limited application of impervious surface during development. These recommendations are not defined as barriers as part of the Town's MS4 permit, rather they are provided in this report as informational guidance for future improvements to be pursued at the discretion of the Town, and as funding and staff resources allow.

Table 4. Opportunities to Further Reduce Impervious Area in Subdivision Rules and Regulations

Existing Codes and Standards	Alternative	Application
Subdivision Rules and Regulations, Section 4 Design Requirements, 4.A. Streets	Reduce minimum paved roadway width requirements	• Prioritize parallel parking over head-in parking for on-street parking to limit pavement width. • Limit on-street parking to one side of the roadway.
Subdivision Rules and Regulations, Section 4 Design Requirements, 4.A. Streets	Dead-End Lane Design	• Promote application of pervious ground cover on dead-end lanes where traffic volume is low.
Subdivision Rules and Regulations, Section 4 Design Requirements, 4.A. Streets	Landscaping	• Encourage or require trees to be planted along new roadways and developments. • Permit roadside maintenance to be performed at the minimum level necessary to encourage healthy roadside vegetation.
Subdivision Rules and Regulations, Section 4 Design Requirements, 4.A. Streets	Alternative Neighborhood Designs	• Discourage developments which are likely to increase stormwater management difficulties i.e. steep sloping roads, depressions, etc. • Provide language encouraging exploration of alternative street layouts to increase the number of homes per unit length and minimize the length of the roadway. • Encourage use of pervious pavement on local traffic residential roads, shoulders, and parking lanes.

4.2 Parking Lots & Off-Street Parking

Parking lots account for a significant amount of impervious surface in Saugus, servicing a wide array of buildings such as schools, municipal facilities, playgrounds, offices, and shopping centers. The following summary of existing regulatory language in Saugus outperform the recommendations from the EPA which aim to limit required impervious parking lot size:

- Parking at Shopping Centers: 1 space per 1,000 square feet of building size. Recommendation is less than 4.5 spaces per 1,000 square feet.
- Office Buildings: 1.7 spaces per 1,000 square feet of building size. Recommendation is less than 3 spaces per 1,000 square feet.
- Residential parking requirements per unit has lower parking requirements for small and studio sized residential dwellings.
- Shared parking between multiple businesses and building is permissible in the Town's regulatory documents.

- Specific to the Historic Mills Mixed Use District: "*Large parking areas or areas greater than 20 parking spaces shall be separated by landscaped islands of 8 to 10 feet in width or in the alternative shall devote at least 5% of the interior of the parking lot to landscaping. In addition, a minimum of one shade tree shall be planted for every 6 parking spaces required or built, within appropriate locations on the lot(s). Trees planted within parking areas shall be planted in protected pervious plots of at least 60 square feet of area. In the alternative, if the above parking design standards are not feasible, parking design stands shall utilize low impact design techniques aimed at enhancing parking area by utilizing landscaping features and greenery that will meet the intent of this subsection."*

Reviewing the listed minimum values to determine if there are any areas in Town that do not require as many parking spots as currently listed presents an opportunity to reduce the impervious surface in the Town. It was noted that parking stall size requirements vary among the various regulatory documents and sections, ranging from 8 feet wide to 10 feet wide and from 16 feet long up to 20 feet long. There are three categories of parking stalls listed in the regulatory documents: 1) standard parking stalls, 2) compact car spaces, and 3) handicap accessible spaces. The number of compact car spaces is limited to no more than 35% of spaces for a given parking area. No indication within the rules and regulations was found which apply stricter regulations to handicap parking spaces than what is found in the American with Disabilities Act (ADA).

Re-evaluating peak parking demands at office complexes may be a unique opportunity to reduce impervious surfaces, given the persistent impact work from home has had on the traditional utility of office space. Reduced area reserved for parking can be replaced with pedestrian spaces and/or vegetated islands, improving opportunities for low-impact stormwater management and urban heat island management while increasing property value, air quality, and overall aesthetics.

Table 5 below summarizes regulatory barriers to the MS4 permit goal of limiting application of impervious surfaces identified in the existing parking lot regulatory language.

Table 5. Regulatory Barriers to Reduced Impervious Area in Parking Lots and Off-Street Parking Rules and Regulations

Existing Codes and Standards	Alternative	Application
Zoning Bylaws	Reduced stall dimensions	• Remove maximum limit on compact car spaces. • Enact minimum limit on compact car spaces; a typical goal is a minimum of 30% of spaces. • Establish a consistent, reasonably sized standard parking spot.

In addition to the identified barriers to limited impervious surfaces within the Town of Saugus stated in Table 5, Table 6 below lists opportunities to further encourage limited application of impervious surface during development of parking lots. These recommendations are not defined as barriers as part of the Town's MS4 permit, rather they are provided in this report as informational guidance for future improvements to be pursued at the discretion of the Town, and as funding and staff resources allow.

Table 6. Opportunities for Reduced Impervious Area in Parking Lots and Off-Street Parking Rules and Regulations

Existing Codes and Standards	Alternative	Application
Zoning Bylaws	Reduce minimum parking requirements	• Encourage projects near public transit with reduced parking requirements within fixed distance from public transit depots. • Decrease minimum parking spaces for residential units from 2 spaces to 1 space. • Establish traffic mitigation fee for projects which do not meet minimum parking requirements.

Zoning Bylaws	Material selection	• Encourage use of pervious pavement, where appropriate.
		• Other pervious/porous materials which can replace traditional asphalt parking areas:
		  ○ Gravel
		  ○ Cobblestones
		  ○ Pervious Pavers

Zoning Bylaws	Landscaping	• Expand Historic District landscaping requirements in parking lots to other areas of the Town.
Zoning Bylaws	Maximum limits on parking	• Limit number of parking spaces for new developments. • Encourage time limit-based parking to reduce parking area sizes.
Zoning Bylaws	In-lieu parking fees	• Decrease amount of individual parking lots. • Instead of building parking areas, developers pay fee for district parking area.

4.3 Sidewalks & Curbing Alternatives

Curbs are installed for a variety of purposes, such as drainage control and pedestrian safety. Installation of curbing along roadways and parking areas is a useful and low-cost way to convey excess runoff to established stormwater management infrastructure elements such as catch basins, bioswales, retention basins, etc. However, the use of curbs to convey flow should be limited to areas where they are absolutely needed, and rather prioritize runoff reaching on-site pervious areas for infiltration.

Current regulatory documents require sidewalks with a minimum width of 5 feet to be constructed on both sides of new streets, with exception made at the discretion of the Board for sidewalks on one side of the street. Establishing a maximum width of sidewalks and permitting development or redevelopment with sidewalks on one side will provide opportunity to decrease the impervious surface area. Current regulatory documents require a grassed area separating paved roadways from established sidewalks, this existing area is an opportunity to encourage installation of green infrastructure to promote infiltration of local runoff.

4.4 Driveway Alternatives

The Town of Saugus is a predominantly residential community with most residents residing in single family homes, and as such there is a prominent number of privately owned driveways in the Town. Therefore, encouraging or enforcing application of stormwater-friendly driveway alternative surfaces will have a significant impact on impervious surface area in Saugus.

The following existing regulatory language in Saugus outperform the recommendations from the EPA which aim to limit required impervious driveway area:

- The Town encourage driveway sharing of adjoining properties.
- A maximum of one driveway access point is permitted per property for frontages less than 600 feet.

No barriers were identified which unduly encourage impervious surfaces in the design of driveways.

Table 7 lists opportunities to further encourage limited application of impervious driveways. These recommendations are not defined as barriers as part of the Town's MS4 permit, rather they are provided in this report as informational guidance for future improvements to be pursued at the discretion of the Town, and as funding and staff resources allow. Examples of alternative driveway regulatory approaches are provided in Table 7 and alternative driveway surface materials are provided in Table 8.

Table 7. Opportunities for Reduced Impervious Area in Driveway Rules and Regulations

Existing Codes and Standards	Alternative	Application
Zoning Bylaws	Building Setbacks	• Establish a maximum allowed setback from streets for development to limit the required length of driveways. • Decrease minimum setback for front of properties to allow for shorter driveways.
Zoning Bylaws	Material selection	• Encourage use of pervious cover material, where appropriate. • Pervious/porous materials which can replace traditional asphalt are listed in Table 8.
Zoning Bylaws	Maximum limits on parking	• Set limits on the maximum area of impervious driveway cover. If driveways on private properties exceed the maximum alternative cover with pervious characteristics must be applied to offset the excess impervious area.

Table 8. Stormwater-Friendly Driveway Alternative Cover Material Types

Alternative	Benefits	
Porous Pavement	• Provides infiltration of stormwater at the same capacity as the substrate soil. • Provides same aesthetic appeal as traditional pavement. • Snow removal practices are the same as traditional pavement.	
Pervious Paver Driveways	• Concrete pavers with voids in between to be filled with gravel or sand. • Plastic grids that keep a surface layer of gravel or sand (with or without grass) from compacting, so water drains through.	
Ribbon Driveways	• Two parallel strips of materials such as concrete, stone, turf pavers, or brick for, limiting impervious cover to only where needed. • Lower installation costs and less materials used.	
Shared driveways	• Reduce paving costs. • Minimizes impervious surfaces. • Increases yard space. • Can be paired with pervious cover material options.	

4.5 Stormwater Management

The Stormwater Bylaw and Stormwater Management Rules and Regulations provide robust requirements for stormwater management in new development and redevelopment. The regulatory documents require new and re-development sites to capture and treat stormwater runoff generated during specified precipitation events and/or remove specified percentages of Total Suspended Solids and Total Phosphorus in accordance with the MS4 permit. The regulatory documents also require that non-structural stormwater management strategies be implemented to the maximum extent practicable for new and re-development projects. Non-structural stormwater management strategies include minimizing impervious surfaces, providing low-maintenance landscaping that encourages retention, and other techniques. Low Impact Development (LID) site planning and design strategies must also be used to the maximum extent practicable.

The Town of Saugus has implemented an inter-departmental working group known as the Stormwater Committee which consists of Town department heads/representatives who typically review development projects that meet quarterly to review upcoming development projects to ensure they are meeting the requirements of various relevant permits and regulations within Town. It is recommended that the Stormwater Committee and those charged with reviewing developments continue to review applicants' proposed non-structural stormwater management strategies and ensure developments are meeting the goals of the Stormwater Management regulatory documents.

5 Recommendations & Implementation Schedule

The Town of Saugus has an existing robust approach to stormwater management and many established regulatory documents which promote conservative application of new impervious ground cover which often outperform EPA suggested limitations. There also exists several opportunities to further improve design standards to promote innovative development practices to further improve stormwater runoff quantity and quality.

Table 9 outlines the recommendations of this report with priority grading of each recommendation based on the largest impacts, and a preliminary implementation schedule.

The implementation schedule for changes to the regulatory documents allows for studies to determine exact parameters for inclusion in regulatory language. Priority weighting is assigned based on the following criteria:

- Anticipated impact to stormwater runoff,
- Feasibility, effectiveness, and ease of implementation,
- Impact to community, and
- Desirability.

Table 9. Recommendations and Implementation Schedule to remove Barriers to Excessive Regulated Impervious Surfaces within Saugus, Massachusetts

Recommendation	Priority	Implementation Schedule	Regulation to be Amended
Roadways & Developments			
Evaluate reducing pavement and ROW for low traffic volume and travel speed roadways.	1	2 years	Rules and Regs Governing the Subdivision of Land
Remove requirements of cul-de-sac on all dead-end lanes and permit vegetated islands where cul-de-sacs are built.	3	5-10 years	Rules and Regs Governing the Subdivision of Land
Parking			
Establish standard and consistent minimum parking stall size.	2	5 years	Zoning Bylaws
Replace maximum number of compact vehicle stalls with minimum compact vehicle stalls.	2	5 years	Zoning Bylaws, Section 17.10
Stormwater Management			

Recommendation	Priority	Implementation Schedule	Regulation to be Amended
Specifically include impervious area reduction as a stated purpose of the Regulations.	3	5-10 years	Stormwater Management Rules and Regulation

In addition to the recommendations to remove barriers to excessive impervious surfaces within the Town of Saugus stated in Table 9, Table 10 below lists opportunities to further encourage limited application of impervious surface during development. These recommendations are not required as part of the Town's MS4 permit, rather they are provided as information for future improvements to be pursued at the discretion of the Town, and as funding and staff resources allow.

Table 10. Future Opportunities for Improvements to Regulated Impervious Surfaces within Saugus, Massachusetts

Recommendation	Regulation to be Amended
Parking	
Evaluate feasibility of establishing minimum pervious material cover for parking lots.	Zoning Bylaws
Establish a maximum allowable parking lot size.	Zoning Bylaws
Driveways & Sidewalks	
Incentivize application of pervious driveway cover material.	Zoning Bylaws
Establish maximum driveway area, above which pervious driveway cover material must be used to offset excess area.	Zoning Bylaws
Remove requirement for sidewalks on both sides of roadway, where appropriate.	Rules and Regs Governing the Subdivision of Land

Appendix A

Town of Saugus' Relevant Bylaws and Regulations

Saugus Subdivision Rules & Regulations (excerpts)

2. GENERAL

2. A. Definitions

Adequate Access: Without waiver, and within the legal right of way, the minimum adequate access shall be defined as minimum roadway paved width of thirty (30) feet with a pedestrian sidewalk. The sidewalk shall be a minimum width of five (5) feet and shall be separated from the roadway pavement by a 2 1/2 foot seeded grass plot. A six (6) inch vertical granite curbing shall be used on all access roadways. The access roadway shall provide adequate access from the subdivision to a major street. The right of way shall be of reasonable horizontal alignment, provide for safe visibility and not exceed a nine (9) percent centerline grade.

4. DESIGN REQUIREMENTS

4. A. Streets

4. A. 1. Location

e) Subsidiary Street is a private street that, in the opinion of the Saugus Planning Board may be built to a less exacting standard than otherwise described in the "Rules & Regulations", provided the following are met:

(2) Such subsidiary street shall be no longer than 250 feet. If there is a cul-de-sac, the subsidiary street may be up to 250 feet long from the intersection of a street to the beginning of the cul-de-sac.

(5) The design of the subsidiary street shall be as follows:

(a) Curbs, sidewalks, and street trees are only mandatory in exceptional circumstances.
(b) Pavement will be a minimum of 24 feet wide.
(c) For dead ends, there shall be cul-de-sacs or other turning designs acceptable to the Planning Board. Cul-desacs shall be constructed with a minimum 100-foot diameter right-of-way, and the diameter to the exterior edge of pavement shall be 84 feet minimum.
(d) The subsidiary street shall be posted as a private way at its entrance or entrances.
(e) Pavement design and geometrics shall be the same as for a street except as noted in a through d above.
(f) The use of islands within the Cul-de-sacs is prohibited.

4. A. 3. Width

a) Except for subsidiary streets (4.A.1.e) the minimum width of right-of-way shall be fifty feet (50'). Greater width shall be required by the Board when deemed necessary for present and future vehicular travel.

4. A. 5. Dead-End Streets (Except Subsidiary Streets 4.A.1.e)

b) Dead-end streets shall be discouraged by the Board. However, if they are necessary, dead-end streets and their extensions, if any, shall not be longer than five-hundred feet (500') unless in the opinion of the Board, a greater length is necessitated by topography or other local conditions.

c) Dead-end streets shall be provided at the closed end with a turnaround having an outside roadway diameter of at least one-hundred twenty feet (120').

e) The use of islands within the Cul-de-sacs is prohibited.

4. H. Sidewalks, Grass Plots, Trees

Sidewalks, grass plots, and trees shall be provided on both sides of each street for the full length of the street except where in the opinion of the Planning Board, the proposed housing density and/or expected traffic intensity is such that a sidewalk on one side is sufficient.

5. CONSTRUCTION REQUIREMENTS

5. D. Sidewalks

5. D. 1. Sidewalks shall be constructed within the Subdivision along the full length of each side of each street and around the outside of each turnaround, and at other locations within the subdivision as shown on the approved Definitive Plan, except as provided in Section 4.8 of these Rules and Regulations.

5. D. 2. All sidewalks shall be a minimum width of five feet (5') and shall be separated from the road pavement by a seeded grass plot. All sidewalk construction shall be in accordance with the requirements of the Town of Saugus and as shown on the standard cross-section found in the appendix C.

5. E. Curbing

The Planning Board requires the use of vertical granite curbing throughout subdivisions of more than two homes. At a minimum, sloped granite curbs shall be required at all intersection points of ways. Curved vertical or sloped granite curbing shall be provided for curve radii of fifty feet (50') or less. Vertical granite curb inlets shall be provided at the back of all catch basins when placed between granite curbing.

All curbing shall be installed and prepared in accordance with Massachusetts DPW "Standard Specification for Highways and Bridges, 1988 ed." and as amended.

5. G. Grass Plots

5. G. 1. A grass plot shall be provided on each side of each roadway between the pavement and the sidewalk areas and shall occupy all the remaining area not paved. Grass shall be used unless other ground cover is approved by the Planning Board.

Saugus Zoning Bylaws (excerpts)

Current Parking Space Requirements

SECTION 17.10 – PARKING. For projects submitted under the provisions of the HMMUOD, parking spaces shall be 9 feet wide by 18 feet long, except for required Handicapped Spaces, and designated "small or compact car spaces" shall be 8 feet wide by 16 feet long. No more than 35% of spaces shall be designated for "small cars".

To promote a pedestrian friendly environment, parking in front of buildings is discouraged. Bicycle parking shall be provided as close as possible to the building entrances.

SECTION 17.11 – DESIGN CRITERIA.

Design Criteria promotes quality development that is compatible with the character of the Historic Mills Overlay District and the Saugus Iron Works National Historic Site, and the desire for contextual, pedestrian-scaled projects.

Compatible Design helps to enhance the quality of life for all residents while strengthening the economic viability of the Mills Mixed Use Overlay District.

The Design Criteria seeks to encourage visual harmony and historic integrity and encourage creative design solutions. The Design Criteria encourages a variety of choices for achieving design compatibility within the Mills Mixed Use Overlay District.

The following Design Criteria shall be used to evaluate all projects that require a Special Permit and/or Site Plan Review submitted under the provisions of the Mills Mixed Use Overlay.

15. Landscape plans shall show the type, size and location of all proposed plantings. The plan shall show the location of plantings, including use of plantings to buffer neighboring properties and along the street frontage and pedestrian ways.
16. Large parking areas or areas greater than 20 parking spaces shall be separated by landscaped islands of 8 to 10 feet in width or in the alternative shall devote at least 5% of the interior of the parking lot to landscaping. In addition, a minimum of one shade tree shall be planted for every 6 parking spaces required or built, within appropriate locations on the lot(s). Trees planted within parking areas shall be planted in protected pervious plots of at least 60 square feet of area. In the alternative, if the above parking design standards are not feasible, parking design stands shall utilize low impact design techniques aimed at enhancing parking area by utilizing landscaping features and greenery that will meet the intent of this subsection.

SECTION 21.11: PARKING

Parking spaces shall be 9 feet wide by 18 feet long, except for required Handicapped Spaces; and spaces designated "small or compact car spaces" shall be 8 feet wide by 16 feet long. No more than 35% of spaces shall be designated for "small cars".

A. The following table provides Minimum and Maximum parking requirements for certain uses. All other Parking requirements shall be the same as listed in Article VIII-Off Street Parking and Loading Regulations in the Saugus Zoning By-Law. For all other uses not specifically mentioned, the number of parking spaces shall be determined by the closest similar use, as determined by the Building Inspector.

Table 3. Minimum Parking Requirements by Use

Use	Minimum Parking Spaces:	Maximum Parking Spaces:	Comments
Studio/1 Bedroom All other residential units	1 per unit 1.5 per unit	1 per unit 2 per unit	Reduction for smaller units
Motels, hotels	0.75 space for each guest room or dwelling unit, plus 1 space for each 500 s.f. of meeting, banquet, or restaurant area	1 space for each guest room or dwelling unit, plus 1 space for each 400 s.f. of meeting, banquet, or restaurant area	The maximum is in the current By-Law
Retail business and service establishments	1 space for each 300 s.f. of gross floor area on the first floor of a building, and one space for each 500 s.f. of gross floor area thereafter for all floors used and businesses, excluding basement storage area	1 space for each 250 s.f. of gross floor area on the first floor of a building, and one space for each 400 s.f. of gross floor area thereafter for all floors used and businesses, excluding basement storage area	The current By-Law requires 1/300 s.f. – adjusted the minimum
Theaters	1 space for each five seats or for each 100 s.f. of auditorium area, if there are not fixed seats	1 space for each four seats or for each 50 s.f. of auditorium area, if there are not fixed seats	
Mixed uses in a single building	See Section 8.5 Combined Facilities of the Zoning By-Law	Spaces required will be the sum of the requirements of the various individual uses	If deeded condo parking, may not apply.
Marina	0.50 spaces per boat moored, docked, stored, or tailored		

For all other uses not specifically mentioned, the number of parking spaces shall be determined by the closest similar use, as determined by the Building Inspector.

By grant of a Special Permit by Zoning Board of Appeals, the minimum or maximum number of offstreet parking spaces required may be decreased or increased by taking into consideration the following criteria where appropriate:

a. The purpose and intent of the by-law is achieved.
b. The amount of off-street parking to be provided will be sufficient to serve the use(s) for which it is intended.
c. The decrease in required off-street parking is based on a parking study prepared by a professional engineer or traffic engineer registered in Massachusetts. The parking study will include, at a minimum, the following:
    1. Size and type of existing uses or activities on site
    2. Size and type of proposed uses or activities on site
    3. Rate of parking turnover
    4. Peak traffic and parking loads to be encountered
    5. Hours of usage of the proposed use/structure
    6. Hours of usage of other uses/structures within the Waterfront Zoning Overlay District
    7. Amount of shared parking with other uses
    8. Demand for space can be met upon presentation of an acceptable shared parking agreement.
    9. Availability of public transportation, bicycle and/or pedestrian facilities such as sidewalks.
    10. Other factors identified by the Planning Board.
d. The Zoning Board of Appeals may consult with the Town Building Inspector, public safety officials and/or engineer prior to granting any decrease in parking.
e. If the Zoning Board of Appeals allows a decrease in the amount of required off-street parking spaces required by this bylaw, this reserved area shall not be developed and shall be either landscaped or maintained in a natural state. The reserved area shall not count towards the open space requirements.

Off-Street Parking Requirements

Table 4. Minimum Number of Spaces per Use

Parking Code	Uses	Number of Spaces per Unit (Min.)
A	Single and two-family dwelling	Two for each dwelling unit
B	Multi-family dwelling	Two for each dwelling unit, except for housing for the elderly that shall provide one for each three units
C	Loding house, dormitory, fraternity, sorority, YMCA, YWCA, and similar group quarters	One for each rental or sleeping unit
D	Theater, restaurant, auditorium, church or similar place of public assembly with seating facilities	One for each four seats of total seating capacity
E	Automotive retail and service establishment and other retail and service establishments utilizing extensive display areas, either indoor or outdoor that are unusually extensive in relation to customer traffic	One per 1,000 square feet for gross floor space. In the case of outdoor display areas, one for each 1,000 square feet of lot area in such use

F	Other retail, service, finance, insurance, or real estate establishment	One per 300 square feet of gross floor space except that there shall be required for every laundromat business, a number of spaces each to one-half the number of washing machines for public use
G	Hotel, motel, tourist court	One for each sleeping room plus one for each 400 square feet of public meeting room and restaurant space
H	Medical/Dental office building	Four spaces per each doctor
I	Wholesale establishment, warehouse or storage establishment	One per each 1,000 square feet of gross floor space
J	Manufacturing or industrial establishment	One per each 600 square feet of gross floor space OR 0.75 per each employee of the combined employment of the two largest successive shifts, whichever is larger
K	Hospital	Two per bed at design capacity
L	Nursing home	One for each 3 beds at design capacity
M	Business, trade, or industrial school or college	One for each 200 square feet of gross floor area in classrooms, plus space for gymnasium or auditorium whichever has larger capacity (see Code D)
N	Other school	Two per classroom in an elementary and junior high school; four per classroom in a senior high school plus space for which has the larger capacity (see Code D)
O	Community facility (town building, recreation, etc.)	One per each 400 square feet of gross floor space
P	Public utility	One for each 400 square feet of gross floor area devoted to office use and one for each 88 square feet of gross floor area per other use
Q	Transportation terminal establishment	One for each 600 square feet gross floor area
R	Mixed use	Sum of various uses computed separately
S	Any use permitted by this By-Law not interpreted to be covered by this schedule	Closest similar used as shall be determined by the Building Inspector
T	Mixed residential and home occupation use	The applicable residential requirement plus one for each 600 square feet of gross floor area used for home occupation

By grant of a Special Permit by the Planning Board, the Minimum number of off-street parking spaces required may be decreased provided that the following criteria have been met:

- The purpose and intent of the by-law is achieved
- The amount of off-street parking to be provided will be sufficient to serve the use(s) for which it is intended
- The decrease in required off-street parking is based on a parking study prepared by a registered professional engineer. The parking study will include, at a minimum, the following:
    - Size and type of existing uses or activities on site
    - Size and type of proposed uses or activities on site
    - Rate of parking turnover
    - Peak traffic and parking loads to be encountered
    - Availability of public transportation, or transportation shuttle services
    - Other factors identified by the Planning Board

The Planning Board may consult with the Town Building Inspector, public safety officials and/or engineer prior to granting any decrease in parking.

If the Planning Board allows a decrease in the amount of required off-street parking, the Board may require that a portion of the site be reserved to meet the off-street parking spaces required by this bylaw. This reserved area shall not be developed and shall be either landscaped or maintained in a natural state. The reserved area shall not count towards the open space requirements.

B. Shared Parking

Notwithstanding any other parking requirements set forth in the By-law for individual land uses , when any land or building is used for two or more distinguishable purposes (including Mix Use development), the minimum total number of parking spaces required to serve the combination of all uses shall be determined in the following manner:

11. Multiply the minimum parking requirement for each individual use (See Section above) by the appropriate percentage (as shown in the Shared Parking Chart below) for each of the five designated time periods.
12. Add the resulting sums from each vertical column.
13. The column total having the highest total value is the minimum shared parking space requirement for that combination of land uses.
14. The calculations shall be reviewed and approved as part of the Site Plan and Design Review process.

Table 5. Shared Parking Chart

Use	Weekday Night % (Midnight to 7:00AM)	Weekday Day % (7:00AM to 5:00PM)	Weekday Evening % (5:00PM to Midnight)	Weekend Day % (6:00AM to 6:00PM)	Weekend Evening % (6:00PM to Midnight)
Residential	100	60	90	80	90
Office/Industrial	5	100	10	10	5
Commercial/Retail	5	80	90	100	70
Hotel	70	70	100	70	100
Restaurant	10	50	100	50	100
Restaurant associated with hotel	10	50	60	50	60
Entertainment/recreation (theaters, bowling alleys, cocktail lounges and similar)	10	40	100	80	100
Day-care facilities	5	100	10	20	5
All other (unless documentation is submitted by a registered engineer, etc.)	100	100	100	100	100

SECTION 21.12: DESIGN STANDARDS

D. Parking and Driveway Design Standards

Parking lots shall be landscaped according to the following regulations:

1. The ends of all parking rows shall be divided from drives by planting islands.
2. There shall be no more than 15 contiguous parking stalls in a row without a planting island.
3. Planting islands shall be a minimum of ten (10) feet by twenty (20) feet in area, underlain by soil (not base course material) and shall be protected by curbing, wheel stops, or bollards. Each

planting island shall contain at least one (1) shade tree plus low growing shrubs and/ or groundcover to cover the entire area at maturity.

4. Parking lots shall be divided by planting strips placed at intervals of one (1) for every four (4) or fewer rows of parking. These planting strips shall meet the following requirements:
   a. At least half of the planting strips shall be a minimum of 15 feet in width, and contain a 5 foot paved walkway leading towards the building, with 5 feet provided for plantings on both sides of the walkway.
   b. All other planting strips shall be a minimum of ten feet in width, with all ten feet for plantings.
   c. Strips shall run the length of the parking row, be underlain by soil, and be protected by curbs, wheel stops or bollards.
   d. Planting strips shall contain plantings of one (1) canopy tree every twenty five (25) feet, two (2) shrubs per tree, and groundcover/shrubs to cover the entire remaining unplanted area at maturity

Driveway Requirements

SECTION 21.13: BUSINESS HIGHWAY SUSTAINABLE DEVELOPMENT ACCESS STANDARDS

A. All tracts of land to be developed in the BHSD shall share access with an adjacent BHSD zoned property when available and feasible, consistent with subsection 2 below. If shared access cannot be provided by an existing driveway, the applicant shall provide access in a way that maximizes the potential for shared access in the future, consistent with subsection 3 below. When the requirements of subsections 2 and 3 cannot be satisfied, an independent access may be permitted consistent with subsection 4 below. Multiple access points may be provided when the requirements of subsection 5 are satisfied.

15. **Existing Driveways.** All existing driveways providing access to the property from public roads shall be eliminated unless they meet the requirements in subsection 3 or 4 below.
16. **Shared Access via Existing Driveways on Adjacent Properties**
    a. When the nearest edge of an existing driveway on an adjacent property zoned BHSD having frontage on the same street is within 50 feet of the subject tract, that subject tract shall utilize the driveway on the adjacent tract as a shared access, provided it is feasible and that an easement granting access to the subject tract has been recorded.
    b. The shared access shall be the sole access to the site unless a second driveway is permitted consistent with subsection 5, herein.
    c. Shared access shall not be required when all possible interconnections between the two abutting lots would cross twenty (20) linear feet or more of wetlands, floodplains, and/or slopes of 15% or more.
    d. Shared access may be entirely located on one lot or split along a common lot line.
    e. Each property within the BHSD Zoning District shall provide an access easement guaranteeing internal vehicular access to all abutting lots zoned BHSD
17. **Shared Access via New or Existing Driveway on the Property.**
    a. When shared access cannot be provided via an existing driveway consistent with subsection above, a maximum of one driveway intersection shall be permitted per street frontage.

b. This driveway shall be located on a side lot line bordering a property zoned BHSD. In order to accommodate required sight distances, or preserve environmental features, the driveway may be set back from the side lot line no greater than 50 feet. Shared access shall not be required when all possible interconnections between the two abutting lots would cross twenty (20) linear feet or more of wetlands, floodplains, and/or slopes of 15% or more

c. Each property with a nonresidential use shall provide an access easement for this driveway guaranteeing access to all abutting lots zoned Business Highway Sustainable Development. In addition, the access easement shall provide access from the closest adjacent property line to the driveway. The easement between the driveway and the closest adjacent lot shall have a minimum width of 35 feet and shall be located between 50 and 100 feet from the street ultimate right-of-way line.

d. The location of the driveway intersection and the easement connection to the closest adjacent lot shall be subject to approval by the Planning Board based on its ability to minimize the need for future driveways and/ or maximize the distance from existing street and driveway intersections, including consideration for safe site distances.

18. **Independent Access.**
    a. When future shared access cannot be provided consistent with subsection 2 or 3 above, a maximum of one driveway intersection per street shall be permitted.
    b. The driveway intersection shall be separated from existing driveway intersections by a minimum of 300 feet.
19. **Dual Access.**
    a. A second driveway intersection per street may be permitted when it is located at least 300 feet from the first driveway intersection and at least 300 feet from adjacent property lines.
    b. When a second driveway can be permitted consistent with subsection 5.a. above, a separation from adjacent property lines may be reduced in order to provide future shared access, provided the second driveway is located within 50 feet of an adjacent property line and at least 300 feet from any other driveway intersection. The adjacent property must be zoned BHSD and the potential interconnection shall not cross twenty (20) linear feet or more of wetlands, floodplains, or slopes of 15% or more. Each property zoned BHSD shall, where feasible and practical, provide access easements to all abutting lots zoned BHSD consistent with subsection 3.c.

Additional Relevant Requirements

SECTION 12.6 – SITE PLAN REVIEW

C. **Traffic Impact Standards**:
D. **Recommended**: The proposed site plan shall minimize points of traffic conflict, both pedestrian and vehicular. The following guidelines shall be used to achieve this standard:

1) Entrance and exit driveways shall be so located and designed as to achieve maximum practicable distance from existing and proposed access connections from adjacent properties.
2) Where possible, driveways shall be located opposite similar driveways.
3) Sharing of access driveways by adjoining properties and uses is encouraged.
4) Left-hand turns and other turning movements shall be minimized.
5) Driveways shall be so located and designed as to discourage the routing of vehicular traffic to and through residential streets.
6) Pedestrian and bicycle circulation shall be separated from motor vehicle circulation as far as practicable.

6. (I) Environmental Impact Study:

A. **Purpose**: To describe the impacts of the proposed development with respect to on-site and off-site environmental quality.
B. **Format and Scope**: Identification of Potential Impacts — Description and evaluation of potential impacts on the quality of air, public health, surface water, and ground water adjacent to or directly affected by the proposed development; on-site or off-site flooding, erosion and/or sedimentation resulting from alterations to the project site including grading changes and increases in impervious area; onsite or off-site hazards from radiological emissions or other hazardous materials; and off-site noise or light impacts.
C. **Systems Capacity**: Evaluation of the adequacy of existing or proposed systems and services for water supply and disposal of liquid and solid wastes.
D. **Proposed Mitigation Measures**: Description of proposed measures for mitigation of any potential adverse impacts identified above.

The Planning Board shall consider the following guidelines in evaluating any environmental impact study and may require a plan to provide for the protection of the interests stated herein:

A. The proposed development shall attempt to minimize any significant emission of noise, dust, fumes, noxious gases, radiation, water pollutants, or any other similar significant adverse environmental impact.
B. The proposed development shall not significantly increase the potential for erosion, flooding or sedimentation, either on-site or on neighboring properties; and shall not increase rates of runoff from the site to the satisfaction of the Town Engineer and Department of Public Works. Provision for attenuation of runoff pollutants and for ground water recharge shall be included in the proposal.
C. The design of the proposed development shall minimize the destruction of unique Natural features.
D. Outdoor lighting, including lighting on the exterior of a building or lighting in parking area, shall be arranged to minimize glare and light spill over to neighboring properties.

SECTION 21.1: PURPOSE AND INTENT

The primary purpose of the Business Highway Sustainable Development Zoning District (BHSD) is to realign an aging major arterial commercial strip corridor with the forces of market demand so it is restructured into a form which property owners and developers will reinvest and create attractive mixed use sustainable development centers that ensure the development and redevelopment of a mix of compatible uses including the creation of new housing opportunities. Specifically, the BHSD Zoning District is intended to:

- Embrace smart growth principles to enhance economic development opportunities along Routes 1 and 99.
- Discourage strip-style single story commercial development which requires incongruous architectural styles, excessive paved areas, and numerous curb cuts.
- Encourage consolidation of driveways, parking and curb cuts to provide more efficient and economical access and parking.

Appendix B

Assessing Street and Parking Design Standards to Reduce Excess Impervious Cover in New Hampshire and Massachusetts

Assessing Street and Parking Design Standards to Reduce Excess Impervious Cover in New Hampshire and Massachusetts

Small MS4 Permit Technical Support Document, April 2011

Draft NPDES Permits require evaluation of local street and parking lot design standards

The draft NPDES Small MS4 permits for New Hampshire and North Coastal Massachusetts require permittees to evaluate and report on local street design and parking requirements that affect the **creation of impervious cover**. This assessment will be used to determine if design standards need to be revised to support the application of Low Impact Development (LID) techniques. Recommendations and a schedule for changing any relevant standards and policies need to be incorporated into the Stormwater Management Program (SWMP), with status updated in annual reports. This requirement is detailed in the draft permit Section 2.3.6.6 for New Hampshire and Section 2.4.6.7 for North Coastal Massachusetts, respectively.

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 little consideration of potential impacts to pedestrians or the local environment. Consequently, outdated zoning by-laws, subdivision regulations, and road standards may not only promote excessive impervious cover (Figure 1), but they may effectively prohibit the application of many LID practices (Figure 2). 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.

Figure 1. Unnecessarily wide cul-de-sacs and residential roads generate additional stormwater runoff, create un-friendly pedestrian environments, and increase overall construction costs.

Figure 2. (A) Example of narrow residential road with a bio-swale, utilities, and single-sided sidewalk in Duxbury, MA. (B) Use of pervious pavers and bioretention practices in the landscape islands in spillover parking lot in Wilmington, MA.

What design factors lead to excess imperviousness?

At a minimum, the following street and parking standards should be evaluated to determine if they are contributing to the unnecessary generation of surplus impervious cover from new construction or redevelopment projects:

Local street design:

- **Residential roadway pavement widths**—pavement widths should be set based on the number of homes served, anticipated vehicle usage, and on-street parking requirements. Establish minimum and maximum standards to meet these needs while avoiding excessively wide streets.
- **Non-residential and mixed use roadway pavement widths**—pavement widths should be set based on traffic volumes, types of vehicles, parking, and pedestrian requirements, which often require

more complex analysis. Provide flexibility to accommodate this analysis, particularly in mixed use/and or Traditional Neighborhood Districts.

- **Road right-of-way (ROW) widths and usage**—large ROW's can increase the overall area disturbed during development. Allow for flexibility in widths, where appropriate, and for the placement of utilities below the paved portion of the roadway to allow for the use of roadside swales or other stormwater practices.
- **Building frontage and setback requirements**—residential road length is often determined by the required frontage distance for individual lots.
- **Turnarounds for dead end streets**—road layouts that reduce the number of dead end streets are preferable. Provide options for turnaround designs (cul-de-sacs, loop-de-lanes, T-shaped, etc). To minimize impervious cover, maximum paved diameters for cul-de-sacs should be based on the required turning radius for emergency response vehicles and should also allow for landscaped islands (Figure 3).
- **Sidewalks**—consider pedestrian preferences when designing sidewalks, rather than the blanket application of a requirement for the placement of sidewalks on both sides of the roadway. Allow for sidewalks to be paved with pervious materials.
- **Driveways**—driveway dimensions can be minimized through reduced minimum widths and front yard setbacks. Standards should allow for pervious driveway materials, allow "two-track" designs (i.e., paved tire track with pervious median), and prohibit direct rooftop discharge on to impervious driveway surfaces. Shared driveways should be allowed and sample agreements should be provided by the municipality.

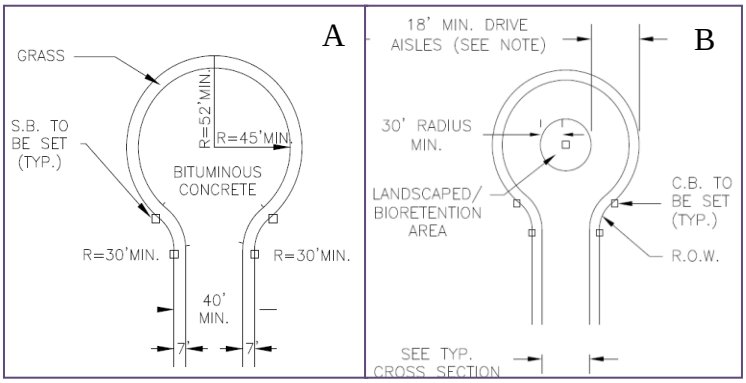

Figure 3. (A) Existing design details may require updating (B) to accompany revised street and parking requirements, such as in this revised cul-de-sac detail for Attleboro, MA that incorporates a reduced paved radius and a central bioretention/landscaped island.

Parking lot standards:

- **Parking ratios**—the number of required parking spaces is often based on parking demand studies that are not locally applicable, expressed only as a minimum standard for the worst case scenario, and often result in an oversupply of parking. In these cases, communities should be comfortable establishing maximum parking requirements at current minimum standards and new minimums set ~ 1/3 below these revised maximums (see Table 1).
- **Off-street and on-site parking**—in urban and village centers, consider dramatic changes to the typical parking demand requirements to provide flexibility in design. Consider revising off-site distance limits, as well as the amount of public parking allowed to help satisfy private parking requirements.
- **Credits for shared parking and mass transit**—allow for reductions in parking requirements for shared parking arrangements, parking garages, and in areas where mass transit is accessible. Provide model shared parking contracts.
- **Stall and driving aisle dimensions**—avoid requiring excessively wide stalls and driving aisles. Standard stall dimensions can be as small as 9 ft x 18 ft. Driving aisle widths should be based on orientation of parking stalls and whether traffic flow is single or two-way.
- **Pervious parking**—allow the use of structural permeable pavement options where appropriate; allow spillover parking (or parking above minimum requirement) to be pervious.
- **Landscape requirements**—landscape islands and borders are often required for traffic flow and screening purposes. The total landscaped area is often a calculated based on the number of parking spaces or amount of total impervious cover. Vegetated stormwater practices should be incorporated into these features; the amount of required landscaping should be sufficient to meet tree canopy/shade requirements and adequate for long-term tree survival.

A more detailed discussion of preferred parking lot design, planning options, and a model parking by-law can be found online at the **MA Smart Growth/Smart Energy Toolkit** www.mass.gov/envir/smart_growth_toolkit/.

Other important site design requirements

In addition, a number of other site design factors can have a significant impact on the amount of impervious cover created at a site and whether it is connected or disconnected to the storm drain system. Examples include:

- Allowing open space residential development (i.e., conservation design or low impact development) that provides for reduced setbacks and smaller lot sizes as "by-right" without additional permitting;
- Restricting the percentages of impervious and turf cover on individual lots;
- Allowing for open-section (i.e., curb-less) roads through flexibility in curbing requirements;
- Allowing for temporary ponding of stormwater on residential lots;
- Requiring the routing of rooftop runoff to pervious areas, dry wells, or other devices to promote infiltration and/or stormwater reuse;
- Requiring integration of landscaping and stormwater management requirements.

Table 1. Example of suggested parking requirements per 1,000 sq ft of Gross Floor Space (excerpt from the Smart Parking By-law, MA Smart Growth/Smart Energy Toolkit)

Land Use	Maximum	Minimum
Bank	3	2
Large Scale Retail	4	2
General Office Building	4	2
Medical Building	8	2
Nursing Home	3	2
Restaurants	10	6
Shopping Centers	4	3
Bed and Breakfast	1.2 spaces/guest room or suite	1 space/guest room or suite
Personal Services	3	2
Churches and Places of Worship	1 space/3 seats in service portion of the building	1 sp/5 seats in service portion of building
Museums and Libraries	2	1
Public and Private Educational Institutions	1 space/3 seats in the classroom	1 sp/5 seats in classroom

Challenges to updating design standards

Consider including representatives of local planning boards, water suppliers and other utilities, transportation, public works, emergency response, school superintendents; and the development community in the review process to help address some of the following concerns related to street design and parking standards:

- 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.

How do I report on our assessment of local regulations?

Within two years of the effective permit, permittees must have developed a report on the assessing current street design, parking lot guidelines, and other local requirements that affect the creation of impervious cover. *This report should clearly indicate which design* ***standards promote excess impervious cover and any*** *recommended changes.*

There are a number of checklists, self-audits, and model bylaws available to assist communities in evaluating street and parking standards including the ***Codes and Ordinance Worksheet*** from the Center for Watershed Protection (www.cwp.org) and the ***LID Local Codes Checklist*** from the Massachusetts Planning Commission (www.mapc.org/LID). **Table 2** provides a simplified checklist that can be used to help satisfy SWMP and annual reporting requirements. A narrative describing any recommended (or completed) changes must also be included.

Within three years, permittees must also have developed a report assessing regulatory barriers to implementing structural LID practices (e.g., green roofs, infiltration practices, and water harvesting devices).
It may be advantageous to conduct and report on both assessments concurrently.

Other References

CWP. 1998. Better Site Design: A handbook for changing development rules in your community www.cwp.org

EPA. 2006. Parking Spaces/Community Places: Finding the balance with smart growth solutions. www.epa.gov/smartgrowth/pdf/EPAParkingSpaces06.pdf

American Planning Association, Massachusetts and Home Builders Association of Massachusetts. October 2010. Sustainable Neighborhood Road Design: A guidebook for Massachusetts cities and towns. www.apa-ma.org/resources/publications/nrb-guidebook

New Hampshire Department of Environmental Services. 2008. Innovative Land Use Planning Techniques: A handbook for sustainable development. http://des.nh.gov/organization/divisions/water/wmb/repp/documents/ilupt_complete_handbook.pdf

Rhode Island Department of Environmental Management. Rhode Island Community LID Site Planning and Design Guidance Document. 2011.

Maryland Governor's Office of Smart Growth. Driving Urban Environments: Smart growth parking best practices.

Table 2. Checklist for evaluating street and parking standards (adapted from CWP *Codes and Ordinances Worksheet* and MAPC *LID Checklist**)

STREETS

1. Street width	**1.1. Is the minimum pavement width for low traffic residential roads (<500 average daily trips) between 18-22 ft?**	*ft*
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
	1.2. Can parking lanes serve as traffic lanes in higher density areas?	
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
	1.3. Are narrower pavement widths allowed on road sections were there are no houses, buildings, intersections, or on-street parking spaces?	
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
	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?	
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
	1.5. Can permeable paving be used for residential roads, shoulders, and parking lanes?	
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
2. Right-of-way (ROW)	**2.1. Are minimum ROW widths less than 45 ft for a residential street?**	*ft*
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
	2.2. Can utilities be placed below the paved section of the ROW?	
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
3. Dead-end streets and turnarounds	**3.1. Are landscaped/bioretention islands required in the center of cul-de-sacs?**	
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
	3.2. Is the minimum required radius for cul-de-sacs less than 35 ft?	*ft*
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
	3.3. Are alternatives to cul-de-sacs such as "hammerheads" allowed for permanent turnarounds?	
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised
	3.4. Are alternative road layouts such as one-way loops encouraged to eliminate dead end streets?	
	☐ Yes ☐ No ☐ No standard ☐ Don't know	*Action*: ☐ Leave as is ☐ To be revised

4. Sidewalks

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

☐ Yes ☐ No ☐ No standard ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

4.2. Is permeable paving allowed for sidewalks?

☐ Yes ☐ No ☐ No standard ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

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

☐ Yes ☐ No ☐ No standard ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

5. Driveways

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

☐ Yes ☐ No ☐ No standard ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

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

☐ Yes ☐ No ☐ No standard ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

5.3. Are shared driveways allowable?

☐ Yes ☐ No ☐ No standard ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

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

☐ Yes ☐ No ☐ No standard ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

PARKING

6. Parking ratios

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

☐ Yes ☐ No, minimum only ☐ No maximum only ☐ No, Expressed as medians *Action*: ☐ Leave as is ☐ To be revised

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

3 spaces per1000 sq ft for professional office building?	☐ Yes	☐ No	☐ No Standard		*Action*:	☐ Leave as is ☐ To be revised
4.5 spaces per sq ft for shopping centers?	☐ Yes	☐ No	☐ No Standard		*Action*:	☐ Leave as is ☐ To be revised
2 spaces per single family home?	☐ Yes	☐ No	☐ No Standard		*Action*:	☐ Leave as is ☐ To be revised

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

☐ Yes, all ☐ Not all ☐ Not for any ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

6.4. Are model shared parking agreements provided?

☐ Yes ☐ No ☐ Shared parking not allowed ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

6.5 Are there special design standards for urban village centers?

☐ Yes ☐ No ☐ No standard ☐ Don't know *Action*: ☐ Leave as is ☐ To be revised

7. Stall and aisle dimensions	**7.1. Are minimum stall dimensions for standard parking space 9 x 18 feet or less?**	*ft*
	□ Yes □ No □ No standard □ Don't know *Action*: □ Leave as is □ To be revised	
	7.2. Are minimum driving aisle widths for standard two-way traffic 22 feet or less?	*ft*
	□ Yes □ No □ No standard □ Don't know *Action*: □ Leave as is □ To be revised	
	7.3. Are smaller compact car stalls required for at least 30% of total parking spaces?	*%*
	□ Yes □ No □ No standard □ Don't know *Action*: □ Leave as is □ To be revised	
8. Landscape requirements	**8.1. Does a portion of impervious parking area require shading with mature tree canopy cover?**	
	□ Yes □ No □ No standard □ Don't know *Action*: □ Leave as is □ To be revised	
	8.2. Is the minimum landscaping requirement at least 20% of the total parking area?	*%*
	□ Yes □ No □ No standard □ Don't know *Action*: □ Leave as is □ To be revised	

**See these checklists for a more extensive set of evaluation questions that include additional site design factors.*

SUMMARY OF STANDARDS TO REVISE

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