

BRUNSWICK TOWN COUNCIL

Agenda

February 3, 2020

Executive Session - 6:15 P.M.

Regular Meeting - 6:30 P.M.

Council Chambers

Town Hall

85 Union Street

Roll Call of Members/Acknowledgement Notice

EXECUTIVE SESSION:

Executive session to discuss acquisition of real property per 1 M.R.S.A. §405(6)(C)

Pledge of Allegiance

Adjustments to Agenda

Public Comments/Announcements

MANAGER'S REPORT

- a) Budget schedule
- b) Mere Creek Golf Course
- c) Asylum Seekers – Transportation
- d) Downtown Streetscape Project
- e) Village Review Guidelines

NEW BUSINESS

- 13. The Town Council will consider the relocation of the Farmer's Market, possible changes to fees, and setting a public hearing for the proposed parking ordinance changes, and will take any appropriate action. (Town Manager Eldridge)

ACTION

- 14. The Town Council will consider appointing a representative to the Metro Board, and will take any appropriate action. (Town Manager Eldridge)

ACTION

- 15. The Town Council will consider setting a public hearing for March 2, 2020 regarding proposed text amendments relative to street standards to Chapters 14 and 15 of the Municipal Ordinance, and will take any appropriate action. (Town Manager Eldridge)

ACTION

16. The Town Council will consider setting a public hearing for February 18, 2020 regarding proposed zoning ordinance text amendments to define and allow Environmental Resource Center as a conditional use in the Growth Outdoor (GO) Zoning District, and will take any appropriate action. (Planning Board)

ACTION

17. The Town Council will receive a report from the Planning Board detailing proposed text amendments to the Zoning Ordinance regarding outdoor lighting, and will take any appropriate action. (Planning Board)

DISCUSSION

18. The Town Council will consider appointments to the Town's Boards and Committees, and will take any appropriate action. (Appointments Committee)

ACTION

CORRESPONDENCE/COMMITTEE REPORTS

CONSENT AGENDA

- a) Approval of the minutes of January 21, 2019
- b) Appointment of Fran Smith as Warden and Susan Karnes, Sara King and Joe Zrioka as Deputy Wardens for the March 3, 2020 Election

**INDIVIDUALS NEEDING AUXILIARY AIDS FOR EFFECTIVE
COMMUNICATION SHOULD CONTACT
THE TOWN MANAGER'S OFFICE AT 725-6659 (TDD 725-5521)**

Emails to Town Council - towncouncil@brunswickme.org

**Brunswick Town
Council Agenda
February 3, 2020
Council Notes and Suggested Motions**

EXECUTIVE SESSION:

Executive session to discuss acquisition of real property per 1 M.R.S.A. §405(6)(C)

Suggested Motion:

Motion to go into executive session to discuss the acquisition of real property per 1 M.R.S.A. §405(6)(C)

MANAGER’S REPORT

A memo from the Manager addressing items in the manager’s report is included in your packet.

- a) Budget schedule
- b) Mere Creek Golf Course
- c) Asylum Seekers – Transportation
- d) Downtown Streetscape Project
- e) Village Review Guidelines

NEW BUSINESS

13. **Notes:** The public hearing for this item was held January 21, 2020. Following that meeting, the Farmers Market Committee held two meetings to discuss locating the Market along the existing sidewalks bisecting the mall. Ultimately, the attached plan was deemed to be the best option given the direction received from the Council and the public. If acceptable to the Council, this approach will require a public hearing on February 18, 2020 for a parking ordinance change to allow extended parking, conceivably by permit only, but would not make Park Row one-way, which was a concern of many people. This layout also includes an extension of the existing sidewalk on Park Row up to Fitch Place. The estimated cost is approximately \$35,000, but this sidewalk also provides additional safety benefits year-round. Staff has also developed a cost estimate to repair a portion of the mall the Market has been operating on, and the Market has indicated that they would be willing to pay an increased fee up to \$5,000 to offset future turf management expenses based on the most recent proposed layout. The layout includes three (3) vehicles on the mall. There were options discussed which could eliminate vehicles from the mall completely, but resulted in greater impacts overall. A copy of a memo from Assistant Manager Ryan Leighton, the proposed layout of the Market, a copy of a memo from Commander Mark Waltz regarding parking changes, and the proposed parking ordinance revisions are included in the packet.

Suggested Motions:

- 1. Motion to relocate the Farmer’s Market along existing sidewalks bisecting the Mall as proposed.

2. Motion to set a public hearing for February 18, 2020 for amendments to portions of the Municipal Code of Ordinances, Chapter 15 – Traffic and Vehicles, to add vendor permits and restricted on-street parking areas on Park Row as proposed.
 3. Motion to increase the fee for the Farmers’ Market in the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B, from \$3,500.00 to _____.
14. **Notes:** The Town Council voted last November to join the Greater Portland Transit District (METRO) contingent upon a statutory change that would make Brunswick eligible for membership. The Legislature’s Committee on Transportation voted “out to pass” on LD 2009, and this bill is expected to be enacted. As a member of METRO, Brunswick can appoint one member to the Board of Directors. A copy of a memo from Town Manager Eldridge is included in the packet.

Suggested Motion:

The Town Council appoints (Council member or Town Manager/designee) to be Brunswick’s representative on the Greater Portland Transit District Board.

15. **Notes:** The Town Engineer is requesting the Council set a public hearing for March 2, 2020 regarding proposed Municipal Ordinance text amendments that include changes to Chapter 14 – Article IV – Excavation, Chapter 14 – Article VI – Street Acceptance and Standards, and Chapter 15 – Traffic and Vehicles. A copy of a memo from Town Engineer Ryan Barnes, as well as new language to Chapters 14 and 15 are included in the packet.

Suggested Motion:

Motion to set a public hearing for March 2, 2020 regarding proposed Municipal Ordinance text ordinances pertaining to Chapters 14 and 15.

16. **Notes:** The Planning Board is requesting that the Town Council set a public hearing for February 18, 2020 regarding proposed zoning ordinance text amendments to allow for a new conditional use in the Growth Outdoor (GO) Zoning District. The use would allow for a broad scope of activities related to agriculture, aquaculture, environmental studies, land and water conservation and wildlife organizations. The Planning Board deemed the use to be appropriate for the entire GO District, and confirmed that the amendments were consistent with the Town’s 2008 Comprehensive Plan and the BNAS Reuse Master Plan. A copy of a memo from Matt Panfil, Director of Planning and Development, as well as the proposed Zoning Ordinance Text Amendment, staff memos to the Planning Board from November 2019 through January 2020, and correspondence concerning this amendment are included in the packet.

Suggested Motion:

Motion to set a public hearing for February 18, 2020 regarding proposed zoning ordinance text amendments allowing for a new conditional use in the Growth Outdoor (GO) district.

17. **Notes:** The Planning Board has been working on zoning ordinance text amendments related to outdoor lighting standards. Following a January 24th public hearing the Board voted to send two proposed ordinance amendments to the Town Council. The first is a change to require all outdoor lighting comply with standards. The second is a requirement for full cutoff light shielding for all lighting exceeding 1800 lumens (approximately a 100-watt bulb), rather than the current 2600 lumen standard. The third requires the color temperature maximum to 3,000 Kelvin, and the fourth establishes maximum light trespass levels at shared private property lines (0.1 footcandles at residential lines and 0.5 footcandles at commercial lines). The Board is requesting that the Town Council consider holding a public hearing and adopting these changes.

The Planning Board is also contemplating a larger lighting standards project. Since these might result in significant policy changes, the Council may want to consider providing direction to the Board before a significant project is authorized.

A copy of a memo from Matt Panfil, Director of Planning and Development, the Zoning Ordinance Improvement Program (ZIP) Matrix, Staff memos to the Planning Board from November 2019 to January 2020, a List of Other Outdoor Lighting Topics the Planning Board Would Like to Consider, Regional Communities' Lighting Standards Spreadsheet and Supplemental Outdoor Lighting Information from various sources are included in the packet.

Suggested Motion:

There is no suggested motion, as this is a discussion item.

18. **Notes:** The Town Council will consider appointments to the Town's Boards and Committees, and will take any appropriate action. Copies of the Committee's report and applications are included in the packet.

Suggested Motion:

Nominations will be made, with no seconds required, and the Council will then vote on the nominations.

CONSENT AGENDA

- a) **Approval of the minutes of January 21, 2020:** A copy of the minutes is included in your packet.
- b) **Appointment of Fran Smith as Warden and Susan Karnes, Sara King and Joe Zrioka as Deputy Wardens for the March 3, 2020 Election:** These are appointments for the March election.

Suggested motion:

Motion to approve the Consent Agenda

Suggested motion:

Motion to adjourn the meeting.

MANAGER'S REPORT MEMO

Town of Brunswick, Maine

OFFICE OF THE TOWN MANAGER

MEMORANDUM

TO: Town Council

FROM: John Eldridge
Town Manager

DATE: January 28, 2020

SUBJECT: Town Manager's Report
February 3, 2020 - Town Council Meeting

Budget Schedule (a)

Attached is the proposed schedule for reviewing and adopting the 2020-21 municipal budget. As usual, the schedule may be adjusted as the process unfolds. The charter requires that the budget be adopted by June 15th, however, because the school portion of the budget is subject to a validation referendum, we typically schedule the budget adoption in time to meet the notice requirement for the June state election date so that the validation referendum can be held on the same day.

Mere Creek Golf Course (b)

Last Friday, January 24th, Ryan Leighton and I met with Jeff Harris of Harris Golf, the operator of the Mere Creek Golf Course on Brunswick Landing. I would characterize the meeting as very positive. Mr. Harris is willing to consider allowing public use of the course for x-c skiing. He expressed legitimate concerns including protection of property and insurance. He also wants the Town to present a design for fencing and screening that would separate the Town's easement to the Furbish Preserve from the cart path and woods line along the first hole of the golf course. As more people use the course and the trails there are safety concerns, primarily protecting trail users from errant golf shots. At this point, Mr. Harris wants to see a plan that could be constructed later this year. Ryan Leighton, Assistant Manager, is working with the Parks and Recreation Department to develop and cost such a plan.

Asylum Seekers - Transportation (c)

We are told that there are now five children attending Head Start at the Gurnet Road location. Ryan Leighton met with the Superintendent of Schools and Director of Transportation to see if the School Department could transport these five children. We are optimistic that we can work out the details to allow that to happen. Absent an ability to arrange transportation with the School Department, we believe that we can enroll the children in the Recreation Department's pre-school program.

Downtown Streetscape Project (d)

The committee tasked to work with the consultant, Milone & MacBroom, met again today to discuss the Downtown Streetscape project. Part of the design phase of the project includes an outreach for public input. The Town will be hosting the first public meeting for the project in the Town Council

Chambers on Thursday, February 13, 2020 from 6:00 to 7:30 PM. The meeting is intended to be an informational meeting with abutters and the public. A brief presentation will be followed by the opportunity to provide input and ask questions. The Town hopes that shortly after the public meeting an online survey will be made available to gather additional input.

As a reminder to the Town Council, only the design phase of the project is currently funded, and the Council will need to authorize funding for the project to proceed to the construction phase.

Village Review Guidelines (e)

Last fall, the Village Review Board submitted a complete re-write of the Village Review Zone Guidelines for the Council's consideration. The re-write was the culmination of a year-long effort to clarify and give more specificity to the guidelines. A frequent criticism of the current guidelines has been that they resulted in inconsistent application. The Village Review Board is requesting a workshop to discuss the revised guidelines. February 10th and 24th are suggested dates. As the Council moves into March and April, most workshop time is likely to be focused on the budget.

MANAGER'S REPORT - A BACK UP MATERIALS

JANUARY 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30	31	1 New Year's Day	2	3	4
5	6 Council Meeting School Board Mtg	7	8	9	10	11
12	13	14	15	16 Joint Finance Committee Meeting (audit)	17	18
19	20 M L King Day	21 Council Meeting	22	23	24	25
26	27	28	29	30	31 Municipal Depts - Personnel Budgets due	1

FEBRUARY 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	1
2	3 Council Meeting	4	5	6	7	8
9	10	11	12 School Board Mtg	13	14 Municipal Depts - Budgets due to Town Manager	15
16	17 Presidents' Day	18 Council Meeting	19	20	21	22
23	24	25	26	27	28	29

MARCH 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 Council Meeting Proposed CIP	3	4	5 Council Workshop Budget/CIP (Dept presentations)	6	7
8	9	10	11 School Board Mtg	12 Council Workshop Budget/CIP (Dept presentations)	13	14
15	16 Council Meeting	17	18	19 Council Workshop Budget/CIP (Dept presentations)	20	21
22	23	24	25	26 Council Workshop Budget/CIP (Dept presentations)	27	28
29	30	31	1	2	3	4

APRIL 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30	31	1	2 Council Workshop Budget/CIP Manager's Full Budget	3	4
5	6 Council Meeting Set Budget/CIP Public Hearing	7	8 School Board Mtg	9 Council Workshop Budget/CIP	10	11
12 Easter Sunday	13	14	15	16 Council Workshop Budget/CIP	17	18
19	20 Patriots Day	21 Council Meeting	22	23 Council Workshop Budget/CIP	24	25
26	27 Town Council Budget/CIP Public Hearing	28	29	30 Council Workshop Budget/CIP	1	2

MAY 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	1	2
3	4 Council Meeting	5	6 School Board Mtg	7 Council Workshop Budget/CIP	8	9
10	11 Council Workshop Budget/CIP	12	13	14 Town Council Budget/CIP Adoption	15	16
17	18 Council Meeting	19	20	21	22	23
24	25 Memorial Day	26	27	28	29	30
31	1	2	3	4	5	6

JUNE 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1 Council Meeting	2	3	4	5	6
7	8	9 School Budget Referendum	10 School Board Mtg	11	12	13
14	15 Council Meeting	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4

MANAGER'S REPORT
NO BACKUP
FOR B,C, D and E

ITEM 13
BACKUP

Town of Brunswick, Maine

OFFICE OF THE TOWN MANAGER

MEMORANDUM

TO: Town Council

FROM: E. Ryan Leighton
Assistant Town Manager

DATE: January 28, 2020

SUBJECT: Brunswick Farmers' Market Proposed Layout

Following the January 21, 2020 Town Council meeting, members of the Brunswick Farmers' Market (Market) and the Committee researching location and layout alternatives for the Market met on two occasions to discuss the logistics and impacts of locating the Market along the existing sidewalks bisecting the mall.

With the goal of providing enough space for the Market to continue to operate successfully, as well as minimizing the overall detrimental impact to the mall, staff developed a plan identifying where displays could be set up. This was reviewed with several members of the Market and ultimately resulted in the attached plan which was deemed to be the best option given the direction received by the Town Council and the overall feedback from the public at the January 21st meeting.

This solution results in two box trucks and one van being located on the mall adjacent to their displays. This was necessitated to limit the total number of tents, provide a quicker set up and take down each day, and decrease the total number of on-street parking spaces to be occupied by the Market. Three other box trucks and approximately ten passenger vehicles would still need to be located near their displays, and we have identified specific parking spots on Park Row where these would be located during the Market's hours. If acceptable to the Council, this approach will require a parking ordinance change to allow extended parking, conceivably by permit only. Based on feedback from Park Row property owners at the January 21st Council meeting, the group tried to minimize the overall parking impact by shrinking the area to the spaces designated in the sketch. The group is optimistic the reduction in overall parking impacts and maintaining two-way traffic on Park Row would be acceptable.

This layout includes an extension of the existing sidewalk on Park Row up to Fitch Place. The estimated cost of the sidewalk is approximately \$35,000, utilizing a bituminous sidewalk surface to be installed this spring. Not only does this stretch of sidewalk provide additional set up space for the Market, but also provides additional safety benefits year round.

Staff has also developed a cost estimate to repair a portion of the mall the Market has been operating on for the past seven years. We limited the repair to an area not expected to be impacted by the construction of the Veteran's Plaza, and the overall anticipated cost to restore this section of the mall is approximately \$13,000.

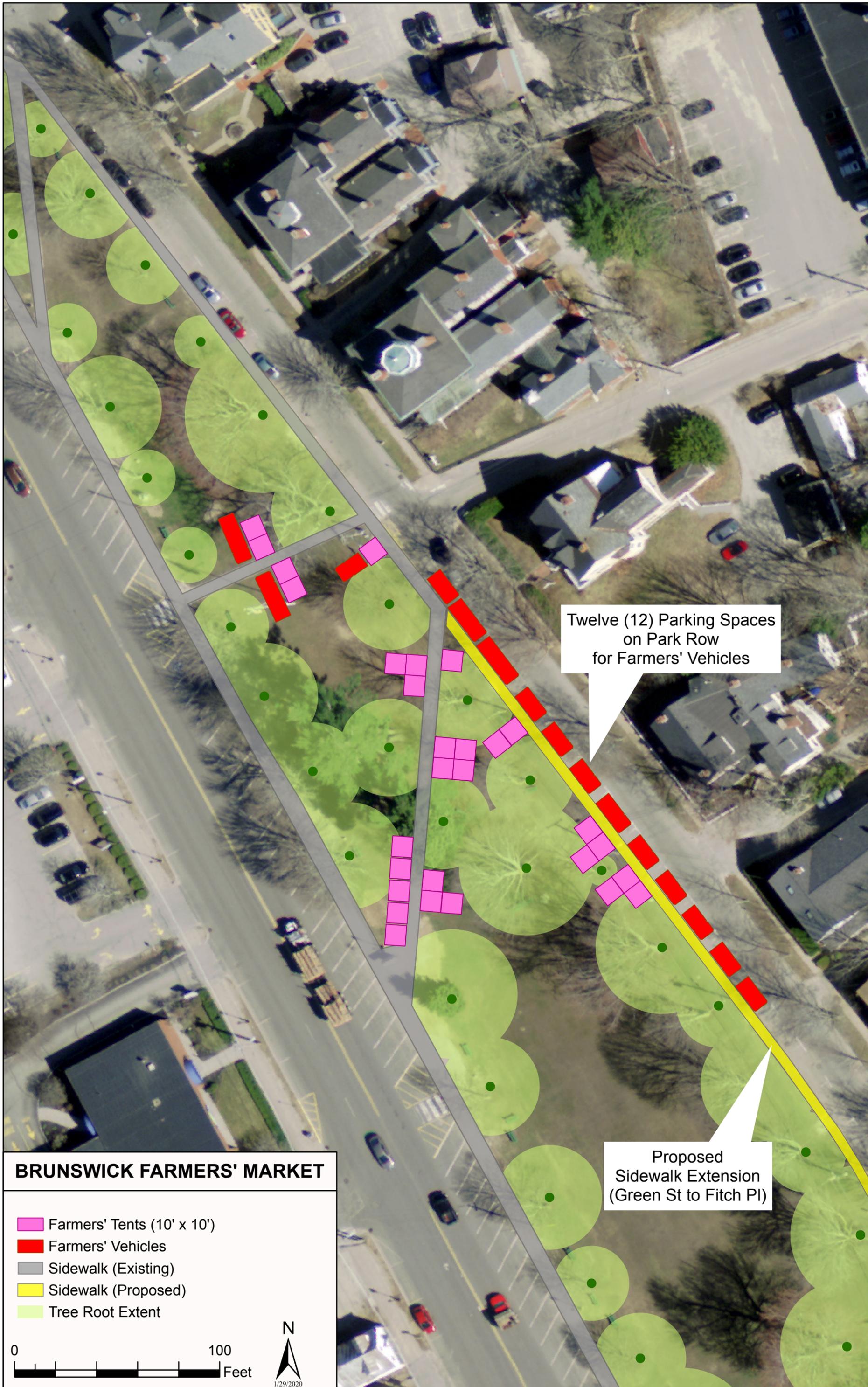
Throughout this process Market members, Committee members, staff, and the general public have all expressed the importance of having the Market located near the mall. There is also consensus the current setup is not sustainable. All parties further agree it will be a cooperative effort if all

uses are to co-exist in such a small, sensitive area. To that end, the Market has indicated they would be willing to pay an increased fee, up to \$5,000, to help offset future turf management expenses based on the most recent proposed layout. They have also indicated they will actively work to secure potential private donations to aid in the rehabilitation of the portion of the mall being vacated this season.

This group has attempted to meet the direction provided by the Town Council on January 21st. Based on all input received, we do feel this solution provides for a majority of the needs of all involved while minimizing vehicular traffic on the mall. There were options discussed which could conceivably eliminate vehicles from the mall completely, but resulted in greater impacts overall.

This approach is supported by the Farmers' Market layout committee as well as the Committee tasked with studying this issue over the past year and we respectfully request the Town Council approve this solution for the upcoming season.

Please contact me if you have any questions.



BRUNSWICK FARMERS' MARKET

- Farmers' Tents (10' x 10')
- Farmers' Vehicles
- Sidewalk (Existing)
- Sidewalk (Proposed)
- Tree Root Extent



1/29/2020

Twelve (12) Parking Spaces
on Park Row
for Farmers' Vehicles

Proposed
Sidewalk Extension
(Green St to Fitch Pl)

Town of Brunswick, Maine

POLICE DEPARTMENT

MEMORANDUM

TO: John Eldridge, Town Manager

FROM: Mark Waltz, Commander

DATE: January 29, 2020

SUBJECT: Parking Ordinance Amendments
Farmers Market

Attached please find a number of proposed parking ordinance changes to implement farmers market vendor parking within the parking spaces on Park Row adjacent to the lower Mall that are subject to a 2 hour limit. We propose to accommodate the farmers market vendors by:

- Creating a new permit – the Farmers Market Vendor Permit. The proposed permit fee is \$25.00. This is the same as the fee for a resident parking permit for streets that utilize resident parking.
- A vendor can obtain a permit that allows the vendor to park one vehicle in a legal parking space (as opposed to the yellow painted “no parking zone” that abuts a portion of the Mall) for the duration of the farmer’s market, notwithstanding the 2 hour limit.

Attachments

Chapter 15 - TRAFFIC AND VEHICLES^[1]

Footnotes:

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Cross reference— Animals, Ch. 4; dogs, § 4-26 et seq.; fire prevention and protection, Ch. 7; housing, Ch. 8; vehicles for hire, § 10-96 et seq.; solid waste, Ch. 13; streets, sidewalks and other public places, Ch. 14; zoning and subdivision of land, App. A; traffic impact analysis required in certain circumstances, App. A, § 409.3, L; subdivision regulations, App. A, § 501 et seq.

ARTICLE I. - IN GENERAL

...

ARTICLE IV. - STOPPING, STANDING, PARKING^[3]

...

Sec. 15-71. - Rules governing stopping and parking.

The following rules govern the stopping and parking of vehicles:

(15) *Farmers Market Vendor Permits.* A vendor who participates in the farmer's market on the lower Mall may obtain a permit which entitles one (1) vehicle to park on Park Row, in a legal parking space, for so long as the farmers market is open. In order to receive a parking permit, the vendor shall certify to the Chief of Police that he/she is a lower Mall farmers market vendor and that the vehicle on which the permit will be displayed is used to transport his/her goods and/or products to the farmers market. The permit shall be for the calendar year and the fee for it is the amount set forth in the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances.

Sec. 15-73. - Overnight parking restricted.

(a) A person shall not park a vehicle on either side of the easterly portion of Maine Street, known as Park Row, running from School Street southerly to the Maine Central Railroad tracks, between the hours of 11:00 p.m. and ~~5:00 a.m.~~ 7:00 a. m.

Sec. 15-76. - Restricted on-street parking areas.

(a) A person shall not park a vehicle for more than two (2) consecutive hours in any parking space adjacent to a curb, nor in any other parking space adjacent to a curb on the same block, between the hours of 8:00 a.m. and 6:00 p.m. on any day except Sunday, and a public holiday in the following areas:

...

Park Row, west side commencing at School Street and extending southerly to the "No Name Street.", unless the vehicle has a farmers market vendor permit and the farmers market is open;

...

APPENDIX B MASTER SCHEDULE OF REVENUES, CHARGES, FEES AND FINES

Sec. 15-71 (14) & (15)	2/__/20	Parking Permit Fee	\$25.00
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...

APPENDIX B MASTER SCHEDULE OF REVENUES, CHARGES, FEES AND FINES

Sec. 10-26(3)	5/15/2017	Peddler's license: Weekly	\$30.00
		Up to 3 months	\$60.00
		Up to 6 months	\$90.00
		Up to 12 months	\$125.00
Sec. 10-26(4)	5/15/2017	Pawnbroker's license	\$150.00
Sec. 10-26(5)	5/15/2017	Pinball machines and other amusement devices	\$40.00 each
Sec. 10-26(6)	5/15/2017	License fee for sellers of prepared food on a public way	\$150.00
	12/19/2016	License fee for sellers of prepared food at the mall	\$2,000.00
	12/19/2016 Proposed 12/16/19	License fee for sellers of prepared food at the farmer's market	\$3,500.00 <u>\$13,500.00</u>
	5/15/2017	FSE temporary 1 to 3 days	\$30.00
Sec. 10-26(7)	5/15/2017	License for indoor or drive-in theater as follows: per screen	\$175.00 Not to exceed \$1,575.00 per business location
Sec. 10-26(8)	5/15/2017	Food service establishment with malt, vinous, and spirituous liquor	\$300.00
		FSE with malt and vinous	\$250.00
		FSE with malt or vinous	\$210.00
		FSE with no alcohol—Sit-down	\$125.00
		FSE with mobile carts, take-out coffee, popcorn, deli, pizza, etc.	\$90.00

ITEM 14
BACKUP

Town of Brunswick, Maine

OFFICE OF THE TOWN MANAGER

MEMORANDUM

TO: Town Council

FROM: John Eldridge
Town Manager

DATE: January 28, 2020

SUBJECT: Greater Portland Transit District (METRO)
Board Membership - Appointment

Last November, the Town Council voted to join the Greater Portland Transit District (METRO). You may recall that vote was contingent on a statutory change that would make Brunswick eligible for membership.

Last week, the Legislature's Committee on Transportation voted "out to pass" LD 2009, an emergency bill that would make Brunswick eligible for METRO membership. The bill is expected to be enacted. As a member of METRO, Brunswick can appoint one member of the Board of Directors. Absent a desire from a Council member to be appointed, we would recommend that the Council appoint the Town Manager or his designee as Brunswick's representative on the Board.

ITEM 15
BACKUP

Town of Brunswick, Maine

OFFICE OF THE TOWN ENGINEER

MEMORANDUM

TO: Brunswick Town Council
FROM: Ryan Barnes, PE, CPESC, Town Engineer
DATE: January 29, 2020
SUBJECT: Proposed Ordinance Changes

I. BACKGROUND

June 2018: The position of Town Engineer/Public Works Director was split to be separate positions. At that time the ordinance was not revised to reflect this change.

June 2019: Text revisions were made to the Zoning Ordinance requiring that new private roads meet the National Fire Protection Association Fire Code.

II. STAFF SUMMARY OF PROPOSED MUNICIPAL ORDINANCE TEXT AMENDMENTS

1. The proposed text amendments change references from the Town Engineering/Public Works Director and Public Works Director to Town Engineer.
2. Adds minimum temporary paving requirements between November 1 and March 15.
3. Provides additional clarification on the trench restoration requirements and warranty periods.
4. Prohibits driveways from the ends of Town roads and turnarounds.
5. Adds standards for private roads to the street standards to comply with the requirements of the National Fire Protection Association Fire Code.
6. Provides a third option for turnaround configurations to allow additional flexibility in roadway design.
7. Includes references to Federal and State standards and policies.

III. RECOMMENDED ACTION

It is recommended that the Town Council move to set a public hearing March 2, 2020 for the final adoption of the proposed municipal ordinance text amendments.

IV. ATTACHMENTS

- A. Municipal Ordinance text amendments as recommended by staff in the following chapters of the ordinance:
 - a. Chapter 14 – Article IV – Excavation
 - b. Chapter 14 – Article VI – Street Acceptance and Standards
 - c. Chapter 15 – Traffic and Vehicles

ARTICLE IV. - EXCAVATION^[2]

Footnotes:

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Cross reference— Buildings and building regulations, Ch. 5; utilities, Ch. 16.

State Law reference— Excavations, 23 M.R.S.A. § 3351 et seq.

Sec. 14-71. - Permit required.

Any person desiring to make an excavation in any public way shall first obtain an excavation permit from the public works directortown engineer. All such excavations are governed by 23 M.R.S.A. § 3351 et seq. and this article.

(Ord. of 8-5-85, § 1)

Sec. 14-72. - Time of issue restricted.

Except in an emergency as determined by the public works directortown engineer, no street or sidewalk opening shall be permitted between November 1 and March 15 of the following year. If approved the applicant will be required to place a temporary course of Hot Mix Pavement within the trench. The temporary pavement will be removed and replaced as required by this section by July 1. The applicant will be responsible for any maintenance related to the trench.

(Ord. of 8-5-85, § 2; Ord. of 5-18-15(2))

Sec. 14-73. - Fee schedule.

An application fee shall be paid for the issuance of an excavation permit in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances. If the excavation work is approved by the public works directortown engineer to take place between November 1 and March 15 of the following year, or the excavation work is approved to take place within the five-year moratorium period from when the street was most recently resurfaced, the application fee will be charged in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances. A separate application is required for each utility excavation. Where the excavation work obstructs the public way a separate Obstruction Permit as detailed in this chapter, section 14-82, is required before the start of any work relating to this excavation permit. In addition to the application fee, an inspection fee per application is required in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances. Where the excavation permit involves a utility line replacement or installation in excess of fifty (50) feet then the inspection fee is computed per foot for open cut trench work or for directional drilling, times the estimated utility line length as determined by the public works directortown engineer. Charges in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances, are established as being not in excess of the reasonable cost of replacement of the openings in the public way by the public works engineering department, and must be paid by the permittee if the public works directortown engineer determines the restoration of the excavation is to be done by public works crews.

(Ord. of 8-5-85, § 3; Ord. of 5-18-15(2); Ord. of 11-16-2015(3))

Sec. 14-74. - Minimum charge.

There is a minimum charge equivalent to three (3) square yards for any opening, to be assessed at the appropriate unit rate above. For curbing, the charge is assessed for what is actually destroyed or damaged.

(Ord. of 8-5-85, § 4)

Sec. 14-75. - Measurement of openings.

Where two (2) or more street openings are made in sequence, and adjacent openings are fifteen (15) feet or less from center to center, the responsible party shall be charged for one (1) opening measured from the leading edge of the first opening to the trailing edge of the last opening.

(Ord. of 8-5-85, § 5)

Sec. 14-76. - Private contractor.

The excavator may request the town's permission to contract privately for the repairs to the public way. The town manager may require him to post a performance bond for any work to be completed within the public way. All work must be performed in a good, workmanlike manner according to town specifications which reflect proper construction methods and materials. It is subject to inspection and approval by the public works director/town engineer.

(Ord. of 8-5-85, § 6)

Sec. 14-77. - Removal of bituminous concrete.

When bituminous concrete overlaying portland cement is removed, it must be replaced to grade upon completion of the work unless previously approved by the town engineer.

(Ord. of 8-5-85, § 7)

Sec. 14-78. - Excavation of cement surface.

When an opening is made in a street where the surface is portland cement concrete, the concrete must be cut back at least twelve (12) inches beyond the edges of the trench before the new concrete patch is replaced. Sufficient reinforcing must be furnished to provide the equivalent of half-inch reinforcing steel rods on twelve-inch centers both ways, top and bottom, in the new concrete patch. The concrete in the new patch must be at least four (4) inches thicker than the existing concrete, and the top surface must be finished to conform with the surface of the old concrete. In all cases where there is a hot asphalt pavement or premixed bituminous pavement, the edges of the existing pavement must be cut back an additional eight (8) inches beyond the edges of the patch before the new, permanent surface is replaced.

(Ord. of 8-5-85, § 8)

Sec. 14-79. - Compacting time required.

On all ways where permanent pavement has been built, a period of two (2) months must elapse after a trench has been backfilled before the permanent surface is replaced, and during this period, a temporary surface of premixed bituminous material must be applied. On all other streets the trench must

be patched with premixed bituminous material as soon as the backfilling has been completed. the trench will be sawcut clean and perpendicular to the roadway, be fully backfilled and paved with binder pavement (Hot Mix Asphalt 19.0mm) to the full depth of required pavement. Following the two-month compaction time the contractor will mill 1.5 inches of pavement and place a surface course of Hot Mix Asphalt 9.5mm or Hot Mix Asphalt 12.5mm as directed by the town engineer. The milling shall be perpendicular to the roadway and extend a minimum of 12" beyond the furthest limits of the trench resulting in a rectangular patch. Those trenches paved after October 1 will be milled and paved the following spring.

Any settlement that occurs within one year of the surface paving of the trench shall be corrected by the applicant as directed by the town engineer.

(Ord. of 8-5-85, § 9)

Sec. 14-80. - Violation and penalty.

A person or organization which violates this article shall be punished for each offense by a fine in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances, plus the cost of any applicable fees and charges for the work done which remains unpaid. No further permits shall be issued to, and no further excavation work which requires a permit shall be done by any person which violates this article until any amounts due have been paid. If a private party fails to complete within a reasonable time any work for which an excavation permit is required, the town may complete the work and charge the owner of the property for the cost of doing so.

(Ord. of 8-5-85, § 10; Ord. of 11-16-2015(3))

Sec. 14-81. - Entrances to public right-of-ways.

- (a) *Purpose* . This section provides for the review of any entrance onto a public way for compliance with sound construction and design practices, to ensure that traffic safety, drainage and public improvements are not adversely affected. A permit is not required for paving, culvert replacements, sealing or repairs to any existing access provided the access is not expanded. No access shall be granted from the end of an existing roadway or from the end of a hammerhead or "T" turnaround.
- (b) *Permit required*.
- (1) No driveway, entrance or approach or other improvement within the limits of the right-of-way for any public road may be constructed, altered or relocated except in accordance with an Entrance Permit issued by the town upon application. For the purposes of this permit no distinction is made between temporary, seasonal, or permanent entrances.
 - (2) No entrance, approach or other improvement constructed on the right-of-way shall be relocated or its dimensions altered without a permit from the town.
 - (3) The application fee for each permit is fifty dollars (\$50.00) for a driveway serving a single-family dwelling. For entrances serving other uses the permit fee is seventy-five dollars (\$75.00). For lots with multiple entrances if approved by the town engineer, a separate permit is required for each entrance.
 - (4) The entrance permit shall be valid for a period of twelve (12) months from the date of original issue.
 - (5) The owner served by the entrance is responsible for future maintenance of the entrance within the limits of the right-of-way and shall maintain the entrance in accordance with the approved permit.

- (6) *Applicant* . The applicant for a permit shall be the owner of the property or authorized representative being served. Any driveway or approach constructed by the owner shall be for the bona fide purpose of securing access to the owner's property and not for the purpose of parking or servicing vehicles on the right-of-way.
- (7) The applicant shall hold harmless the town and its duly authorized agents and employees against any action for personal injury or property damage sustained by reason of the exercise of an entrance permit.

(c) *Design criteria.*

- (1) Entrances should shall be designed and constructed to provide safe access to the public way. Applicants are encouraged to shall comply with the *Access Management Rules for Driveways and Entrances* as developed by the Maine Department of Transportation, latest edition unless approved by the town engineer.
- (2) *Sight distance criteria.*
 - a. All entrances shall be so located such that vehicles approaching or using the entrance will be able to obtain adequate sight distance in both directions along the public way or to maneuver safely and without interference with traffic.
 - b. Measurements to determine sight distance shall be made in the proposed entrance at a point ten (10) feet from the edge of pavement with the height of eye three and one-half (3½) feet above the pavement. The sight distance shall be computed from this point measuring along the roadway to a point where an approaching height of object four and one-quarter (4¼) feet is first seen.
 - c. Driveway placement shall be such that an existing vehicle has an unobstructed sight distance according to the following schedule:

Highway Speed (MPH)	Minimum Sight Distance (in feet)
25	200
30	250
35	305
40	360
45	425
50	495
55	570

(3) *Geometry* .

- a. The entrance shall be designed such that the grade within the right-of-way does not exceed ten (10) percent.

- b. For uncurbed public ways the entrance shall in general slope away from the road surface at a rate of not less than one-quarter ($\frac{1}{4}$) inch per foot, nor more than one (1) inch per foot for a distance of not less than the prevailing width of the existing shoulder, but in no case less than four (4) feet from the edge of pavement.
- c. The entrance should intersect the traveled way at a horizontal angle of ninety (90) degrees but in no case shall the horizontal angle be less than seventy-five (75) degrees.
- d. No part of the entrance shall extend beyond the property lot frontage for the lot being served.
- e. The entrance shall not be located close to an intersection and should be back at least fifty seveny-five (5075) feet from an unsignalized intersection, and 125 feet from a signalized intersection. On low volume dead end residential streets the town engineer may allow a reduction to fifty (50) feet from an intersection if a seventy (75) foot setback is not feasible.
- f. The width of a residential driveway shall be between 12 and 22 feet. The width of commercial driveways shall be in accordance with the MaineDOT Standard Details.

(4) *Drainage* .

- a. Existing roadside drainage in gutter or ditch lines shall not be altered or impeded by the applicant. The applicant must provide at his/her expense suitable and approved drainage structures at all entrances.
- b. Surface drainage shall be provided so that all surface water on the areas adjacent to the road shall be carried away from the roadway.
- c. Where a drainage culvert is required to maintain roadside drainage the Town must approve the pipe diameter/length and type pipe material prior to installation. In any case, the pipe size shall be at least twelve (12) inches in diameter.

(5) *Construction* .

- a. The owner is responsible for all construction and restoration of disturbed areas for the entrance within the limits of the right-of-way.
- b. The entire portion of any entrance within the limits of the right-of-way shall be constructed with a minimum fifteen-inch well-graded gravel base course (Maine Department of Transportation Type C).
- c. If the entrance grade within the right-of-way exceeds five (5) percent slope then the entrance shall have a paved surface within the limits of the right-of-way. , if the entrance is less than five (5) percent slope only a five (5) foot paved apron will be required.

(6) *Curb and sidewalk*.

- a. When sidewalk or curb exists at the proposed entrance the applicant shall remove and replace such materials at the applicant's expense. Any granite curb to be removed by the applicant will remain the property of the town and shall be delivered to the Department of Public Works.
- b. Where curb exists, curb tip-downs shall be provided at each side of a new entrance. The tipdowns shall be four (4) feet in areas without sidewalk and seven (7) in areas with sidewalk.
- c. Where sidewalk is removed to accommodate a new entrance a new walk surface of equal type construction is to be provided. The sidewalk area at all entrances is to meet accessibility requirements and conform to the American with Disabilities Act guidelines. In general, sidewalks shall meet the following:
 - 1. The maximum sidewalk longitudinal transition slope is not to exceed one (1) vertical to twelve (12) horizontal.

2. The maximum sidewalk cross-slope is not to exceed two (2) percent.
3. No abrupt changes in grade are permitted and the maximum curb reveal crossing a walkway is one-half ($\frac{1}{2}$) inch or less.

(Ord. of 5-18-15(2))

Sec. 14-82. - Obstruction permit.

- (a) *Permit required.* No person shall obstruct any street or sidewalk by erecting any staging for building, or place or deposit any construction equipment or building materials thereon, or otherwise occupy, obstruct or encumber the public way for the purpose of facilitating construction or maintenance activities, without first obtaining an "obstruction permit" from the public works directortown engineer or designee for that purpose. A permit is not required for normal commercial delivery vehicles providing inventory and goods sold or consumed at the site or for special event activities as approved by the town. A permit is not required for any public utility vehicle performing emergency or normal service operations.
- (b) *Application required.* Applications for permits should be submitted in complete form at least five (5) business days before the desired obstruction date.
- (c) *Restriction or revocation of permit.* The town reserves the right to reject any obstruction permit or restrict the duration and timing of any obstruction permits where it deems necessary or appropriate to protect public health and safety. The town may revoke a permit when it deems appropriate due to any site issues that may develop that adversely impact or create a hardship to the public.
- (d) *Fee schedule.* The base application fee is ten dollars (\$10.00) plus the following as applicable:
 - (1) Occupying any parking stalls located within a time restricted area is fifteen dollars (\$15.00) per day per stall.
 - (2) Occupying any area where unrestricted parking is permitted is ten dollars (\$10.00) per day.
 - (3) Occupying a travel lane is fifteen dollars (\$15.00) per day.
 - (4) Occupying part of a sidewalk where sufficient sidewalk area remains to accommodate pedestrians (forty-eight (48) inches) or a temporary sidewalk area is provided to safely re-route pedestrians around the obstruction is ten dollars (\$10.00) per day.
 - (5) Occupying all of a sidewalk requiring pedestrians to detour and use an alternate route: twenty-five (\$25.00) per day.
 - (6) Occupying a street requiring the closure of the street to traffic is one hundred dollars (\$100.00) for up to four (4) hours or two hundred dollars (\$200.00) per day.
 - (7) Failure to obtain in advance an obstruction permit shall result in the following charges: twenty-five dollars (\$25.00) for the first occurrence and one hundred dollars (\$100.00) for the second occurrence and two hundred fifty dollars (\$250.00) for the third and each subsequent occurrence.
 - (8) Should the actual duration of the obstruction area increase from what the applicant originally indicated and paid then the applicant will promptly pay for such overage upon notification by the town. The maximum fee for an obstruction will be capped at two hundred dollars (\$200.00) per month for items 1 through 5 above.
- (e) *Application .* The applicant shall provide on proscribed forms the following information:
 - (1) Exact location of work;
 - (2) Proposed limits of obstructed area (submit a site plan to scale if deemed necessary by public works directortown engineer);
 - (3) Duration of closure;

- (4) Anticipated working hours;
 - (5) Responsible names with contact information for emergency site representatives, if needed, during non-work hours;
 - (6) *Provisions for maintaining traffic flow.* In most cases, the applicant will be required to submit a maintenance and protection of traffic plan (MPT)Traffic Control Plan (TCP). The MPT TCP should shall address advance warning signs, barricades around work area, and proposed detours. Plans should consider pedestrian needs in addition to vehicular traffic;
 - (7) *Proof of liability insurance.*
 - a. Commercial general liability insurance, including contractual liability insurance with a limit of at least one million dollars (\$1,000,000.00) per occurrence and a least two million dollars (\$2,000,000.00) general annual aggregate limit; and
 - b. Automobile liability insurance with a limit of at least one million dollars (\$1,000,000.00) for each occurrence.
- (f) *Obstruction permit criteria.*
- (1) All work is to be carried out during normal weekday only construction hours. No work is to start before 7:00 a.m. and all work is to end by 7:00 p.m. unless otherwise approved in advance.
 - (2) The applicant shall insure that the location of the obstruction is maintained in a neat and orderly fashion.
 - (3) It shall be the responsibility of the applicant to secure the perimeter of the obstructed area as may be necessary for pedestrian and vehicular safety. Applicant shall be responsible for installing and maintaining signage, jersey barriers, fencing, barricades and the like as deemed necessary by the applicant or the public works directortown engineer. Temporary or relocated pedestrian access shall meet the requirements of the Americans with Disabilities Act.
 - (4) All excavation within the Town right of way shall be backfilled flush with existing grade at the end of each work day unless previously approved by the town engineer.

(Ord. of 5-18-15(2))

Secs. 14-83—14-95. - Reserved.

ARTICLE VI. - STREET ACCEPTANCE STANDARDS AND STANDARDS ACCEPTANCE
ORDINANCE

Sec. 14-181. - Title.

The ordinance from which this article was derived shall be known and may be cited as the "Street Acceptance and Standards Ordinance Street Standards and Acceptance Ordinance" of the Town of Brunswick, Maine.

(Ord. of 3-1-10(2); Ord. of 10-17-11(2))

Sec. 14-182. - Statement of purpose.

The purpose of this article is to promote the health, safety, and public welfare of the residents of the Town of Brunswick by the means of establishing minimum standards for streets which may be accepted as town ways. Nothing in this article shall be interpreted to mandate road acceptance by the town council.

(Ord. of 3-1-10(2))

Sec. 14-183. - Authority, administration and effective date.

- (a) This article is enacted pursuant to Title 30-A, M.R.S.A., Section 3001 Ordinance Power. Limited and Section 2151, Police Power Ordinances.
- (b) This article shall be administered by the town council who shall consult with the planning board and the town engineer.
- (c) The effective date of the ordinance from which this article is derived is March 31, 2010 January 1, 2020.

(Ord. of 3-1-10(2))

Sec. 14-184. - Definitions.

Easement: The right to use or restrict the use of land of another for or to specified purposes.

Private Street: A street privately owned and maintained that is used as the principal means of access to two (2) or more abutting lots.

Public Street: A publicly dedicated way accepted or proposed to be accepted by the Town Council.

Street classifications: The size and design needs of new streets shall be based upon the projected number of vehicles they are to carry. All streets proposed for public dedication shall be classified by the town engineer according to the following criteria that include a consideration of residential or mixed use development potential of any future street extensions.

- (1) *Collector.* Street that serves over one hundred fifty (150) residential units.
- (2) *Local.* Street that serves twenty-six (26) to one hundred fifty (150) residential units.
- (3) *Minor.* Street that serves twenty-five (25) residential units or less.

Note: For non-residential or mixed used developments the town engineer will determine the classification based on equivalent peak hour vehicle trips for the development as compared to the peak hour trips generated for the above residential unit developments.

(Ord. of 3-1-10(2))

Sec. 14-185. - Applicability.

- (a) This article shall apply to all streets within the town proposed to be accepted as town ways constructed after thenot currently under review or previously approved by the planning board as of the effective date of this article.
- (b) Nothing in this article shall be construed to prevent the design and construction of streets which meet higher standards, use improved methods or use higher quality materials. The determination of the acceptability of other standards, methods or materials shall be made by the town council with advice of the planning board and the town engineer.
- (c) Any work completed on a State Roadway will be required to meet current federal and state standards in addition to any local standards that may apply.
- (c) The following planning board previously approved projects are exempt from this article and are subject to the standard practices of the public works department and the town council in effect on December 31, 2009:
 - (1) Jones Farm, Lisbon Rd., thirty-six (36) lots;
 - (2) Wood Pond, Ledgewood Road Phase, nine (9) lots;
 - (3) Botany Place, Condominiums, Section B and C to Baribeau Drive, sixty-two (62) lots;
 - (4) Perreault Subdivision, Durham Rd., twelve (12) lots;
 - (5) Brunswick Commerce Center Subdivision, Old Portland Rd., fifteen (15) lots;
 - (6) Sandelin Subdivision 1, Moody Road, eight (8) lots.

(Ord. of 3-1-10(2); Ord. of 10-17-11(2))

Sec. 14-186. - Acceptance and application requirements.

- (a) No street shall be laid out and accepted as a public street by the Town of Brunswick except in accordance with the provisions of this article. This article shall prevail over all other ordinances, or parts thereof, in conflict or inconsistent with the provisions of this article.
- (b) Streets can be offered for town acceptance only if they meet the requirements of a Public Street as detailed in section 14-187 of this article. Where a street section is offered for acceptance that is part of a phased development the street section offered shall be complete and function in full compliance with this article independent of the future phases of construction.
- (c) An application shall be submitted to the town council for acceptance of a new or extended town way upon a form prescribed by the town engineer after satisfactory completion of all public improvements. The application shall contain the following information and certifications:
 - (1) A copy of a boundary survey plan that has been recorded in the Cumberland County Registry of Deeds prior to the time of acceptance and the plan book and page reference shall be provided in the application.
 - (2) The project surveyor shall provide a certificate that all monuments have been set and any monuments disturbed during construction have been replaced, and that all monuments exist and are in good condition as of the acceptance date. Disturbed or high monuments along the street and public easements must be re-set flush with grade prior to any offer for acceptance.
 - (3) The project surveyor shall certify that the roadway and its appurtenances as-built lie within the bounds of the roadway being conveyed, and that any drainage structures or other improvements as-built lie within their respective easements. An as-built plan shall be submitted detailing the street features as built.

- (4) A letter from the landowner's attorney certifying that the landowner has clear title to the property and that there are no encumbrances on the property. Executed "lien waivers" shall be provided from all contractors, subcontractors and material suppliers involved with the street improvements with the request for street acceptance.
- (5) A letter from each public utility in the roadway, including the Brunswick Sewer District and the Brunswick and Topsham Water District, indicating that all work has been completed in a satisfactory manner for their acceptance and operation of the respective utility.
- (6) A letter from the town engineer certifying he/she has made a final inspection of the street and found all work has been satisfactorily completed in accordance with the approved subdivision plans and the requirements of this article.
 - a. If, in the opinion of the town engineer, the street has faults or is not performing properly the town engineer may recommend against acceptance until such issues have been corrected by the applicant to the satisfaction of the town engineer. The applicant can request the town engineer submit a letter to the town council detailing any such deficiencies for review and consideration by the town council where the applicant has a difference of opinion regarding such findings of the town engineer.
- (7) The project surveyor shall provide a metes and bounds legal description of the bounds encompassing the proposed town way and any associated public easements for review and approval by the town engineer.
- (8) Once the proposed legal description has been reviewed and approved by the town engineer, the applicant's attorney shall prepare a warranty deed conveying the parcel of land encompassing the roadway in "fee simple" suitable for recording at the registry of deeds. The deed shall include a signature block for town council acceptance listing each of the current town councilors.
- (9) The landowner conveying the street parcel with improvements shall warrant all such public improvements to be free of defects in workmanship or materials for a period of two (2) years from the date of acceptance.

(Ord. of 3-1-10(2))

Sec. 14-187. Design standards.

All streets offered for town acceptance shall meet the design standards detailed herein.

- (1) For any streets to be offered that have not been reviewed and approved by the planning board as part of a subdivision development, the applicant must submit full engineering plans for review and approval detailing the road construction including centerline profile, drainage facilities with elevations and pipe sizes, boundary lines and related information as required by the town engineer to indicate compliance with these requirements. The applicant must also submit field test information as required by the town engineer to indicate compliance with these standards. Street pavements over two (2) years old shall be evaluated by a professional engineer as to condition and distress. Streets to be offered for town acceptance must have a Performance Condition Rating (PCR) of "very good" (3.61 to 5.00).
- (2) Permanent survey monumentation (four-inch by four-inch by four-foot granite monument or approved equal) is to be provided and set by a State of Maine Professional Land Surveyor along the street at all changes in direction (including point of curvature and point of tangency for curved) on both sides of the street parcel. Monument location and type at all other points must conform to standard State of Maine survey practices.
- (3) The street developer shall provide and install street name signs of the type, size and location as approved by the town engineer. Proposed street names shall first be reviewed and approved by the town assessor for compliance with E911 naming criteria.

- (4) A digitized electronic drawing file of the complete final planning board approved plans, in an approved format, must be furnished to the town engineer.
 - a. An "as-built" or set of record drawings shall be submitted in a form acceptable to the town engineer upon completion of each phase of the project prior to any acceptance offer.
- (5) The following street standards shall be met for town acceptance. All workmanship, methods of construction and materials for the public street improvements shall have been completed in compliance with the Maine Department of Transportation, Standard Specifications, latest edition unless otherwise specifically approved by the town engineer.
 - a. For all streets to be constructed for town acceptance the town engineer shall be notified of all such construction work in advance. The town shall have the right to inspect and test all materials and workmanship. All materials to be used for the street construction shall first be submitted with appropriate design information or laboratory test data to indicate compliance with the standards contained herein.
 - b. In addition to the below standards, all roads offered for town acceptance shall meet current state and local requirements for stormwater management. The owner shall provide engineering certification by a licensed professional engineer that the road and associated drainage structures meet these requirements and protect water quality.
 - c. For all streets not to be constructed for town acceptance the roadway will be constructed to meet the private road standard in the below table as a minimum.

Street Standards for Town Dedication

Item	Public			Private
	Collector	Local	Minor	
1a. Minimum Right of Way Width, Curbed	66 feet	50 feet	50 feet	50 feet
1b. Minimum Right of Way Width, Uncurbed	66 feet	60 feet	50 feet	50 feet
2a. Minimum Pavement Width, Curbed	34 feet ¹	28 feet ¹	24 feet ¹	24 feet
2b. Minimum Pavement Width, Uncurbed	30 feet ¹	24 feet ¹	20 feet ¹	20 feet
3. Maximum Grade	8%	8%	12.8%	12% ²
4. Minimum Centerline Radius	200 feet	175 feet	125 feet	125 feet
5. Minimum Tangent Between	100 feet	75 feet	50 feet	50 feet

Reverse Curves				
6. Minimum Shoulder Width	4 feet	4 feet	4 feet	0 feet
7. Maximum Length of Dead End Street	1,500 feet and serving up to 25 units whichever comes first	1,500 feet and serving up to 25 units whichever comes first	1,500 feet and serving up to 25 units whichever comes first	1,500 feet and serving up to 25 units whichever comes first
8. Minimum Braking Sight Distance for Vertical and Horizontal Curves	150 feet	150 feet	n/a	n/a
9. Road Base (Total, minimum)	24 inches	18 inches	18 inches	18 inches
Sub-Base (MDOT Grade D)	18 inches	15 inches	15 inches	15 inches
Base (MDOT Grade A)	6 inches	3 inches	3 inches	3 inches
10. Pavement Courses (Total)	4.0 inches	3.5 inches	3.00 inches	Not Required ³
Binder Course (MDOT Item 403.207, 19.0 mm HMA)	2.5 inches	2.0 inches	1.75 inches	Not Required ³
Top Course (MDOT Item 403.209 9.5 mm HMA)	1.5 inches	1.5 inches	1.25 inches	Not Required ³
11. Sidewalk Construction (where sidewalks are req'd ⁴)				
Width (minimum)	5 feet	5 feet	5 feet	n/a
Gravel Base (MDOT Grade A)	12 inches	12 inches	12 inches	n/a
Surface Material	Asphalt	Asphalt	Asphalt	n/a
Pavement Thickness: (2 passes, MDOT D Mix)	3.0 inches	2.5 inches	2.5 inches	n/a
Comply w/28 CFR Part 36 (ADA)	Yes	Yes	Yes	n/a

Design Standards)				
12. Curbing Material (if curbs are provided)	Bit. ConcreteSlipform Concrete or Granite	Bit. Concrete Slipform Concrete or Granite	Bit. Concrete Slipform Concrete or Granite	n/a
Straight Sections	Type 3, Mold 5 Mold 1 (s/w) Mold 2(No s/w)	Type 3, Mold 5 Mold 1 (s/w) Mold 2(No s/w)	Type 3, Mold 5 Mold 1 (s/w) Mold 2(No s/w)	n/a
Radius Sections (< 50' R)	Granite, Type 5 Slipform Concrete or Granite	Granite, Type 5 Slipform Concrete or Granite	Granite, Type 5 Slipform Concrete or Granite	n/a
13. Storm Drainage				
Road Culverts (minimum size)	18 inches	18 inches	18 inches	18 inches
Driveway culverts (min. size)	15 inches	15 inches	12 inches	12 inches
Storm Drain Piping	ADS N-12 or equal	ADS N-12 or equal	ADS N-12 or equal	ADS N-12 or equal
14. Street Lighting (if required) CMP Acceptable Rentals:				
GE M-250R2 Cutoff or equivalent fixture approved by the Town on a 35' Wooden Pole	Yes	Yes	Yes	Not Required ⁵
GE Town & Country Series or equivalent fixture approved by the Town on a 15' Fiberglass Pole w/concrete base	Yes	Yes	Yes	Not Required ⁵
All Wiring Runs in Conduit for underground installations	Yes	Yes	Yes	Not Required ⁵

¹ The minimum travelway width on town roads shall be shall be eleven (11) feet.

²Any roadway section with a grade in excess of 8% shall be paved for a minimum of fifty feet beyond the limits of the grade in excess of 8% in each direction.

³Paving of Private Roads is not required except as noted in ² above, however, the road must be designed to support the loads of fire apparatus and maintained with an all-weather driving surface. The entire roadway surface must be maintained at 20 feet wide year round. If the Private Road is paved it will be paved to match the paving standards of a Public Minor Roadway.

⁴Required sidewalk locations are as determined by the planning board during subdivision review or for existing private streets offered for dedication, sidewalks (one side or both sides) are to be provided if determined necessary by the town engineer after consultation with the Brunswick Bicycle and Pedestrian Committee.

⁵If Street Lighting is installed it shall meet the standards of a Public Road.

Intersection Standards for Streets Proposed for Dedication

Item	Public			Private
	Collector	Local	Minor	
1. Minimum/ Maximum Angle	90 degree	90 degree	90 degree	90 degree
2. Maximum Grade within 100 feet of Centerline Intersection	3%	3%	3%	3%
3. Minimum Curb Radius	30 feet	30 feet	25 feet	25 feet
4. Minimum Property Line Radius	20 feet	20 feet	20 feet	20 feet
5. Minimum Centerline Distance Between Intersections, Same Side of Street	300 feet	250 feet	250 feet	250 feet
6. Minimum Centerline Distance Between Intersections, Opposite Side of Street	150 feet	150 feet	150 feet	150 feet
7. Minimum Tangent Length from Intersection Centerlines	50 feet	50 feet	50 feet	50 feet

Standards for Turnarounds on Dead-End Streets.

A suitable means for reversing direction shall be provided at the end of a dead-end street in the form of a center-island cul-de-sac, or a hammerhead, or a "T" turnaround. No lot may be accessed from any part of a hammerhead or "T" turnaround or within 50 feet from the end of the roadway. Turnarounds shall meet the minimum design dimensions as shown below in Figure 1 unless otherwise approved by the town engineer. The town engineer may require larger dimensions for turnarounds in commercial lot subdivisions.

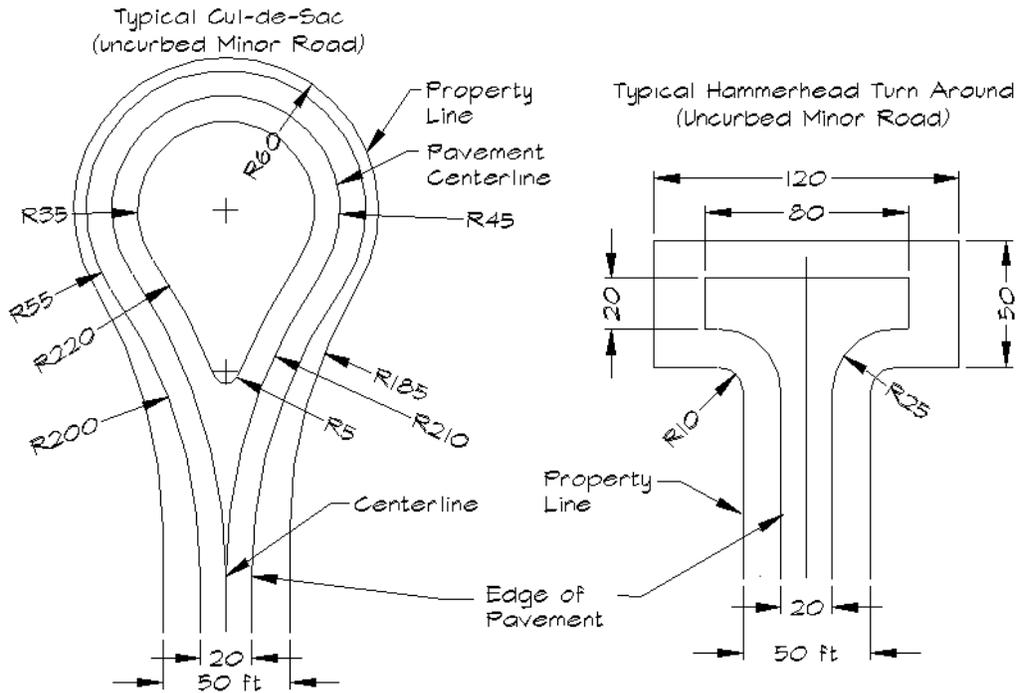


Figure 1

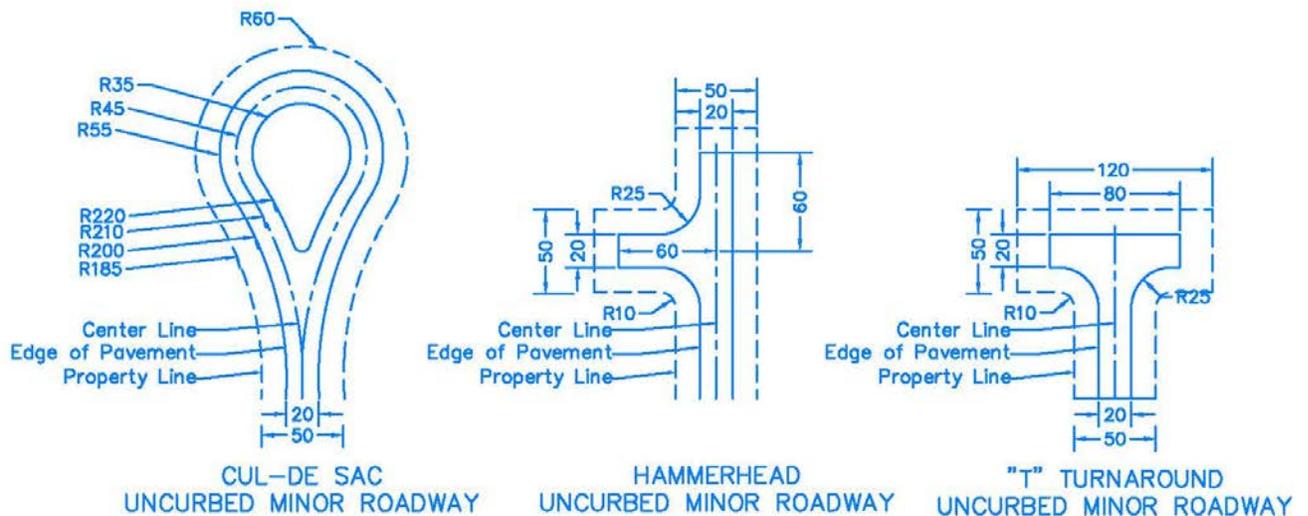


FIGURE 1

(Ord. of 3-1-10(2))

Sec. 14-188. - Acceptance of street required by the public interest.

Notwithstanding the provisions of any other section thereof, the town may at any time accept any street whenever the general public interest so requires. The cost of said street may be borne by said town.

(Ord. of 3-1-10(2))

Sec. 14-189. - No street to be accepted until after report by the town engineer.

No street shall be laid out and accepted by the town council until the town engineer or his/her designee shall have made a careful investigation thereof, and shall have reported to the town council their recommendations with respect thereto.

(Ord. of 3-1-10(2))

Secs. 14-190—14-200. - Reserved.

Chapter 15 - TRAFFIC AND VEHICLES^[1]

Footnotes:

--- (1) ---

Cross reference— Animals, Ch. 4; dogs, § 4-26 et seq.; fire prevention and protection, Ch. 7; housing, Ch. 8; vehicles for hire, § 10-96 et seq.; solid waste, Ch. 13; streets, sidewalks and other public places, Ch. 14; zoning and subdivision of land, App. A; traffic impact analysis required in certain circumstances, App. A, § 409.3, L; subdivision regulations, App. A, § 501 et seq.

ARTICLE I. - IN GENERAL

Sec. 15-1. - Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

All-day parking means the occupancy of a parking stall by a vehicle between the hours of 8:00 a.m. and 5:00 p.m.

Bicycle means every device propelled by human power upon which any person may ride, having two (2) tandem wheels either of which is more than twenty (20) inches in diameter.

Emergency vehicle means vehicles of the fire department, police department, ambulance and other vehicles of municipal departments or public service corporations which are designated by the commissioner of public safety as emergency vehicles.

Loading zone means an area designated for the loading or unloading of passengers or freight.

Long term lot means a parking lot or portion thereof designated for use for periods of eight (8) hours or longer.

Motorcycle means an open vehicle with one (1) front wheel and one (1) or two (2) rear wheels.

Motor vehicle means any vehicle which is self-propelled.

Parking enforcement officer is an individual authorized by the chief of police to issue parking tickets.

Police officer includes the chief of police and any member of the police department authorized to make arrests.

Restricted parking areas means those areas in which no parking or limited parking is allowed.

Skateboard means a device propelled by human power consisting of a deck, two (2) trucks (a device used for mounting wheels to the deck), and four (4) wheels.

Vehicle means any device in or on which a person or thing may be conveyed from one (1) place to another along a way.

(Ord. of 5-2-88, § 2; Ord. of 1-17-12; Ord. of 8-7-17)

Cross reference— Definitions and rules of construction generally, § 1-2.

Sec. 15-2. - Enforcement.

The chief of police, through the police officers in his department, shall enforce this chapter and shall regulate the flow of traffic on all public ways. In addition to police officers, parking enforcement officers may enforce the parking regulations set forth in this chapter. When necessary to meet an emergency situation in the interest of the health, safety or general welfare of the residents of the town, the chief may

temporarily suspend any provision of this chapter. He may restrict and divert vehicular and pedestrian traffic, and he may restrict or regulate parking.

(Ord. of 5-2-88, § 3; Ord. of 1-17-12)

Sec. 15-3. - Obedience to police officers.

All persons shall comply with any order of a police officer authorized by this chapter.

(Ord. of 5-2-88, § 4)

Sec. 15-4. - Obedience to chapter.

The operator of any vehicle shall obey this chapter unless otherwise directed by a police officer.

(Ord. of 5-2-88, § 5)

Sec. 15-5. - Push carts and animals subject to regulations.

Any person propelling a push cart, riding an animal, or driving an animal-drawn vehicle on a public way is subject to the provisions of this chapter which are applicable to the driver of any vehicle, except those which by their nature cannot apply.

(Ord. of 5-2-88, § 6)

Sec. 15-6. - Public vehicles subject to regulations.

This chapter also applies to all public vehicles and their drivers.

(Ord. of 5-2-88, § 7)

Sec. 15-7. - Authority to remove vehicles.

- (a) When a vehicle is left unattended or disabled on a public way in such a manner as to obstruct traffic, and the owner or operator fails to remove it immediately, the chief of police may move it to the nearest garage or other safe place at the expense of the owner.
- (b) Declaration of emergency parking ban:
 - (1) The town manager, or his or her designee, may declare an emergency parking ban. The declaration of an emergency parking ban may be made applicable to all town streets and municipal parking lots or only to certain lots, streets or streets within a defined perimeter. Such a declaration of emergency shall be for the purpose of plowing or removing snow or ice which has accumulated, or for other good cause stated in the declaration of the parking ban. Any such declaration shall be reduced to writing as soon as practicable thereafter stating the reasons therefore. The declaration shall be made no less than six (6) hours prior to the starting time of the ban. Such declaration shall be communicated to such representatives of the communications media as the town manager may direct.
 - (2) Violation of emergency parking ban. It shall be unlawful for any vehicle to be or remain parked on any street, including any unaccepted street subject to a declaration of emergency no parking under the above section 15-7 during the effective time of such declared emergency. Any vehicle in violation will also be subject to removal as outlined under section 15-71(9).

- (c) When a vehicle is parked in the long term parking lot located on the west side of Union Street opposite town hall for a purpose other than permitted by section 15-86, or without paying the entire fee required by section 15-86, the chief of police may move it to the nearest garage or other safe place at the expense of the owner.

(Ord. of 5-2-88, § 34; Ord. of 12-4-07; Ord. of 8-7-17)

Sec. 15-8. - Parking penalty.

A person who parks a motor vehicle in violation of article IV, sections 15-71, 15-73 and 15-86 will be subject to a penalty fine in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances, with the exception of a resident permit holder failing to properly display their valid permit, in which case the penalty fine shall be reduced in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances.

Any person who parks a motor vehicle in violation of article IV, section 15-78 will be subject to a penalty fine as set forth in 30A M.R.S.A. § 3009, subsection 1, paragraph D. With the exception of improper or failure to display a disability parking placard which will be subject to a penalty fine in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances.

Any person who parks a motor vehicle in violation of article IV, sections 15-76 and 15-77 will be subject to a penalty fine of in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances.

Payments for all violations must be made at the tax collector's office. The violator shall be given a receipt for each payment. If payment is not made at the office of the chief of police within fourteen (14) days after the notice of violation, an additional penalty shall be imposed in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances.

(Ord. of 5-2-88, § 35; Mo. of 1-7-91; Ord. of 9-16-96; Emergency/Regular Ord. of 7-21-97; Ord. of 5-1-00; Ord. of 5-31-06(2); Ord. of 1-12-13; Ord. of 12-1-14(2); Ord. of 11-16-2015(3); Ord. of 11-16-15(4); Ord. of 8-7-17)

Sec. 15-9. - General penalty.

Except as provided in sections 15-8 and 15-10, a person who violates this chapter shall be punished by a fine in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances.

(Ord. of 5-2-88, § 36; Ord. of 11-16-2015(3))

Sec. 15-10. - Impoundment of skateboards.

- (a) Whenever the chief of police or his designee is satisfied that a person under the age of eighteen (18) has violated section 15-144, the chief of police or his designee may impound the skateboard from such person.
- (b) In order to retrieve the skateboard, the person whose skateboard has been impounded under this section shall appear with his parent or guardian and meet with the chief of police or his designee to discuss the nature of the violation and skateboard responsibility.

(Ord. of 5-2-88, § 35A)

Cross reference— Skateboards prohibited in certain areas, § 15-144.

Sec. 15-11. - Impoundment of bicycles.

- (a) Whenever the chief of police or his designee is satisfied that a person under the age of eighteen (18) has violated section 15-143, the chief of police or his designee may impound the bicycle from such person.
- (b) In order to retrieve the bicycle, the person whose bicycle has been impounded under this action shall appear with his/her parent or guardian and meet with the chief of police or his designee to discuss the nature of the violation and bicycle safety.

(Emergency Ord. of 8-4-97)

Cross reference— Method of riding on sidewalks, § 15-143.

Secs. 15-12—15-25. - Reserved.

ARTICLE II. - TRAFFIC-CONTROL DEVICES

Sec. 15-26. - Installation and maintenance of traffic signs.

The chief of police and town engineer, with the aid of the public works department, shall place and maintain all traffic signs authorized by the town council and this chapter. Signs placed in the Town right of way shall meet the standards of the Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration (FHWA), and MaineDOT guidelines and recommendations.

All speed limits in the Town are established by the MaineDOT, the Town will maintain speed limits signs based on those speeds established.

Signs that are no longer required or recommended by the MUTCD, FHWA, and MaineDOT will not be replaced at the end of their useful life and may be removed as directed by the town engineer.

(Ord. of 5-2-88, § 9)

Sec. 15-27. - Official traffic signs required.

Any provision of this chapter for which signs are required may not be enforced if at the time and place of the alleged violation an official traffic sign is not properly positioned and sufficiently legible to be seen and read by an ordinarily observant person.

(Ord. of 5-2-88, § 10)

Secs. 15-28—15-45. - Reserved.

ARTICLE III. - SPECIFIC STREET REGULATIONS^[2]

Footnotes:

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Cross reference— Streets, sidewalks and other public places, Ch. 14.

Sec. 15-46. - One-way streets.

The following public ways are one-way streets, and vehicles may move only in the indicated directions:

Bath Road, easterly from junction of Maine Street to C.M.P. Co. Pole No. 2.

Center Street, easterly from Maine Street to Federal Street.

Cleveland Street, westerly from Federal Street to Maine Street.

Cumberland Street, westerly from Maine Street to Union Street.

Dunlap Street, easterly from Maine Street to Federal Street.

Elm Street, westerly from a point three hundred seventy (370) feet westerly from Maine Street to Union Street.

Gilman Avenue, westerly from Maine Street to Union Street.

Green Street, easterly from Park Row to Federal Street.

Harriet Beecher Stowe School Access Road, westerly from one hundred and ten (110) feet west of Spring Street to Armory Street.

Lincoln Street, easterly from Union Street to Maine Street.

Mill Street, northerly from a point east of the traffic island Pleasant Street to C.M.P. Pole No. 28.

Noble Street, westerly from Maine Street to Union Street.

Park Row, from "No Name Street," north bound to Fitch Place.

Park Row, northerly from College Street to Maine Street.

Park Row, southerly from Bath Road to College Street.

Pleasant Street, easterly from the junction of Mill Street to Maine Street.

Ramp A. on Route 1, relocation as shown on State Highway Commission Plan relating to Federal Aid Project #U-01-1(18), westerly from Maine Street to end of Ramp A.

Ramp B. on Route 1, relocation as shown on State Highway Commission Plan relating to Federal Aid Project #U-01-1(18), easterly from the westerly end of Ramp B. to Maine Street.

Ramp C. on Route 1, relocation as shown on State Highway Commission Plan relating to Federal Aid Project #U-01-1(18), westerly from U.S. Route 1 to Maine Street.

Ramp D. on Route 1, relocation as shown on State Highway Commission Plan relating to Federal Aid Project #U-01-1(18), easterly from Progress Road to U.S. Route 1.

School Street, westerly from Federal Street to Maine Street.

South Street, commencing one hundred fifty-five (155) feet east of Park Row to Coffin Street.

Unnamed public way, from the First Parish Church on Bath Road to Maine Street, northerly on this way.

Unnamed public way, from Sills Drive to U.S. Route #24, the easterly portion of the triangle, northerly on this way.

(Ord. of 5-2-88, § 11; Ord. of 8-7-95; Emergency/Regular Ord. of 6-16-97; Ord. of 1-18-00(3); Ord. of 2-7-00; Ord. of 2-22-00(2); Ord. of 12-21-05(1); Ord. of 1-17-12; Ord. of 5-6-13; Ord. of 2-16-16)

Sec. 15-47. - Through streets.

The following public ways are designed as through streets:

Antietam Street, beginning at State Route #24, the Gurnet Road and continuing to the westerly terminus of Antietam Street.

Baribeau Drive, beginning at Pleasant Hill Road and continuing to McKeen Street.

Bath Road, beginning at Maine Street and continuing to the Brunswick-West Bath town line.

College Street, beginning at Maine Street and continuing to Harpswell Road.

Columbia Avenue, beginning at Spring Street and continuing westerly to East Emmanuel Drive.

Cumberland Street, beginning at Maine Street and continuing to Cushing Street.

Cushing Street, beginning at Mill Street and continuing to Pleasant Street.

Federal Street, beginning at Mason Street and continuing to Bath Road.

Forrestal Drive, beginning at State Route #24, the Gurnet Road, and continuing to the westerly terminus of Forrestal Drive.

Greenwood Road, beginning at Old Portland Road (Rt. #1) and extending southeasterly to Church Road, and beginning at Church Road and extending southeasterly to its end.

Guadalcanal Drive, beginning at Coral Sea Street and continuing to Bunker Hill Street.

Harpswell Road, beginning at Sills Drive and continuing to Brunswick-Harpswell town line.

Longfellow Avenue, beginning at Maine Street and continuing to Harpswell Road.

Maine Street, beginning at the Brunswick-Topsham line and continuing to Maquoit Road.

Maquoit Road, beginning at its junction with Maine Street and extending southerly to its end.

McKeen Street, beginning at Spring Street and continuing to Church Rd.

Melden Drive, beginning at Mere Point Road and extending to its end.

Middle Street, beginning at Pleasant Street and continuing to land of the Maine Central Railroad Co.

Mill Street, beginning at Maine Street and continuing to Pleasant Street.

Mere Point Road, beginning at Maine Street and continuing southerly to end.

Pleasant Street, beginning at Mill Street and continuing westerly to the divided highway known as Interstate Route 95.

Riverview Drive, beginning at Jordan Avenue and continuing westerly to Minat Avenue.

Sparwell Lane, beginning at Meadowbrook Road and extending easterly to its end.

Spring Street, beginning at Pleasant Street and continuing to McKeen Street, and beginning at McKeen Street and continuing to Thompson Street.

Station Avenue, beginning at Maine Street and continuing to Union Street.

Union Street, beginning at Mill Street and continuing to McKeen Street except at the intersection of such street with Cumberland Street and Pleasant Street, which have been designated as through streets.

Water Street, beginning at Mason Street and continuing to its northerly terminus.

(Ord. of 5-2-88, § 12; Emergency/Regular Ord. of 6-16-97; Ord. of 9-14-05; Ord. of 7-19-06; Ord. of 10-5-09)

Sec. 15-48. - Yield streets.

Stop signs shall be placed near the intersection on the right-hand side of each street which intersects a through street, except yield signs shall be placed instead of stop signs near the intersection on the right-hand side of the following streets which intersect through streets:

College Street/Maine Street, access road to south on Maine Street.

College Street/Upper Park Row access road, to College Street east bound.

College Street/Sills Drive access road, to Sills Drive northbound off College Street.

Coombs Road, as it intersects with second Coombs Rd. entrance, northeast corner.

Maine Street, for northbound traffic at its junction with Bath Road.

Sills Drive/Bath Road access road, from Sills Drive to Bath Road eastbound.

Simpson's Point Road, at Mere Point Road.

(Ord. of 5-2-88, § 13; Ord. of 10-16-95; Emergency/Regular Ord. of 6-16-97; Ord. of 6-7-04(1); Ord. of 9-14-05)

Sec. 15-49. - Four-way stop signs.

Stop signs must be placed near the intersection on the right-hand side of the street at all four (4) corners of the following intersections:

Columbia Avenue and Baribeau Drive.

Columbia Avenue and Barrows Street.

Elm and Middle Streets.

Hemlock Road and Sparwell Lane.

Pleasant Hill, Church and Casco Roads.

Spring Street and Columbia Avenue.

Spring and McKeen Streets.

Union Street and Cumberland Street.

(Ord. of 5-2-88, § 14; Ord. of 11-7-94; Ord. of 7-19-06)

Sec. 15-50. - Right turn only.

A right turn only movement is required at the following locations and intersections:

- (1) At the junction of Maine Street and the exit from Railroad Ave. so called, such exit being ninety-five (95) feet northerly from the tracks on the Maine Central Railroad.
- (2) At the junction of Maine Street and the exit from the bank office adjacent to the exit from Railroad Ave. so called, such bank exit being thirty-five (35) feet northerly from the tracks of the Maine Central Railroad.
- (3) Station Avenue where it intersects Maine Street.
- (4) At the junction of Pleasant Street (Route 1) and the most easterly exit from the Texaco Quick Mart/Express Lube located at No. 162 Pleasant Street.

- (5) At the intersection of Park Row and the Unnamed Public Way, which runs from the First Parish Church on the Bath Road to Maine Street.
- (6) On Fitch Place at the intersection of Maine Street.
- (7) At the northern end of the section of Park Row which is between College Street and the Joshua Chamberlain statue plaza, at its intersection with Maine Street.

(Ord. of 5-2-88, § 14.1; Ord. of 10-3-88, § 2; Emergency/Regular Ord. of 6-16-97; Ord. of 4-21-98; Ord. of 10-5-06(2); Ord. of 10-5-09; Ord. of 5-6-13)

Sec. 15-51. - No U-Turn.

A U-turn movement is prohibited on Maine Street between Bath Road and Cabot Street.

(Ord. of 5-2-88, § 14.2; Emergency/Regular Ord. of 6-16-97)

Sec. 15-52. - Designation of crosswalks.

Crosswalks are established at the approximate locations as designated by the chief of police and town engineer and are on file in town clerk's office. Crosswalks shall be installed in accordance with MaineDOT current policies.

(Ord. of 5-2-88, § 15)

Sec. 15-53. - Crosswalk signs.

Crosswalk signs must be placed on all crosswalks situated on Maine Street between Elm Street and Mill Street, except where pedestrian traffic is governed by illuminated "walk" signs.

(Ord. of 5-2-88, § 17)

Sec. 15-54. - Reserved.

Editor's note— Ord. of April 25, 2011 repealed § 12-54, which pertained to reverse angle parking and derived from Ord. of 10-5-09.

Secs. 15-55—15-70. - Reserved.

ARTICLE IV. - STOPPING, STANDING, PARKING³¹

Footnotes:

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Cross reference— Streets, sidewalks and other public places, Ch. 14.

Sec. 15-71. - Rules governing stopping and parking.

The following rules govern the stopping and parking of vehicles:

- (1) *Prohibited in certain places.* Except in compliance with a statute or with this chapter, a person shall not stop or park a vehicle on any public way in any of the following places:
 - a. On a sidewalk.
 - b. In front of a public or private driveway.
 - c. Within an intersection.
 - d. Within seven (7) feet of a fire hydrant, except as otherwise designated by the chief of police.
 - e. On a crosswalk.
 - f. Alongside or opposite any excavation or obstruction when stopping or parking would obstruct traffic.
 - g. On the roadway side of any vehicle stopped or parked at the edge or curb of a public way.
 - h. On any bridge or other elevated structure or in a tunnel.
 - i. At any place where official signs or yellow striped areas or yellow curbing indicates a restricted, no-stopping or no-parking area. Except however, on Maine Street, a moped as defined by 29-A M.R.S.A. Sec. 101(36) may park in a yellow striped restricted area which is not adjacent to a disabled parking stall. No more than one (1) moped may park in a single restricted area and any restricted time limit applicable to the section of street still applies.
 - j. Within twenty (20) feet of a marked crosswalk.
 - k. Within twenty (20) feet of the near corner of the curbs at an intersection unless otherwise designated.
- (2) *Public ways.* A person shall not stop or park a vehicle on any public way except on the right-hand side of the way, in the proper direction of travel and with the curbside wheels of the vehicle within twelve (12) inches of the edge of the roadway, except upon those streets which have been marked or signed for angle parking upon which vehicles shall be parked at the angle to the curb indicated by such marks or signs, except that motorcycles will have one (1) wheel within twelve (12) inches of the curb. On one-way streets, stopping and parking is permitted on both sides of the street where not otherwise prohibited by this chapter.
- (3) *Not to obstruct traffic.* A person shall not park any vehicle on a public way so as to leave available less than ten (10) feet of the width of the roadway for free movement of vehicular traffic.
- (4) *Parking within lines.* Where parking places are marked by painted lines, a person must park a vehicle within the lines.
- (5) *Oversize vehicles.* A driver of a vehicle having an overall length of twenty (20) feet or more shall not stop or park diagonally on any public way, but may park parallel with the curb, where parallel parking is permitted, for not more than thirty (30) minutes.
- (6) *Parking for certain purposes prohibited.* A person shall not park a vehicle on any public way for the principal purpose of washing, lubricating or displaying it for sale, or repairing it, except for changing tires or making other emergency repairs.
- (7) *Owner liable.* A person shall not allow any vehicle registered in his name to be parked on any public way in violation of this chapter.
- (8) *Temporary parking restrictions.* When he believes circumstances require it, the chief of police may temporarily prohibit the parking of vehicles at the entrance to any place of public assembly and install signs so indicating. This restriction remains effective until the need for it no longer exists. A person shall not park a vehicle in an area in which parking is temporarily prohibited.

- (9) *Interfering with snow removal and/or plowing.* A person shall not park a vehicle at any time on any public way so as to interfere with plowing or the removal of snow from it by the town. The chief of police may remove any such vehicle and place it in a suitable parking space, at the expense of the owner. For the purpose of facilitating snow removal, the chief of police may place temporary signs along any public way from which the snow is about to be removed, indicating that parking a vehicle is prohibited. A person shall not park a vehicle within the area indicated by the signs.
- (10) *Abandoned vehicle.*
- a. For the purposes of this section, a vehicle parked or stopped on any public way, private way or public property, in a time restricted parking zone or designated restricted zone as described by sections 15-71(5), 15-73, 15-76, 15-77, 15-81 and 15-84 and which the police have determined has not been moved within a twenty-four-hour period, may be ordered removed by the police chief or his/her designee, and placed in a suitable location at the expense of the owner, after reasonable attempts have been made by the police to contact the owner or operator.
 - b. For the purposes of this section, a vehicle parked or stopped on any public way, private way or public property, other than a time restricted parking zone or designated restricted zone as described by sections 15-71(5), 15-73, 15-76, 15-77, 15-81 and 15-84 and which the police have determined has not been moved within a seventy-two-hour period, may be ordered removed by the police chief or his/her designee, and placed in a suitable location at the expense of the owner, after reasonable attempts have been made by the police to contact the owner or operator.
- (11) *Obstructing certain ways.* A person shall not park a vehicle on any public way, private way, alley, fire lane, bridge, private drive or private road, in such a way as to obstruct any other public way, private way, alley, fire lane, bridge, private drive or private road, unless in the case of a private drive or private road the person has permission of the owner of the private drive or private road. The chief of police or his designee, at the vehicle owner's expense, may order the immediate removal of said vehicle.
- (12) *Diagonal parking.* A person shall not stop or park a vehicle, excluding motorcycles, on any public way in an area designated for diagonal parking with the vehicle facing any direction other than with the front of the vehicle facing away from the traveled portion of the public way consistent with the diagonal parking markings.
- (13) *Permit parking for town-owned lots.* A person shall not stop or park a vehicle in any town-owned or leased parking area designated as "parking by permit only" without a proper or valid permit displayed. Any vehicle parked in violation will be subject to a fine as defined under section 15-8. The chief of police or his designee, at the vehicle owner's expense, may order the immediate removal of said vehicle.
- (14) *Parking limited to residents with permits.* A person shall not stop or park a vehicle on a street upon which parking for a particular purpose or time period is limited to particular residents with permits unless an unexpired resident permit issued by the Town of Brunswick is hanging from the vehicle's rear view mirror. For the purpose of this section, a resident is defined an owner of a property on a designated street, as set forth on the assessing records of the Town of Brunswick. A property owner may obtain up to two (2) resident parking permits per tax lot, which permits may be displayed in the vehicle of the property owner, a tenant of the property owner, a family member of the property owner or tenant, or a guest/invitee of the property owner or tenant. The permits are issued to the property owner and are not vehicle specific. Each permit shall cost twenty-five dollars (\$25.00) per year and the expiration date shall be displayed prominently on the permit. Resident parking permits do not entitle to the permit holder to disregard a snow emergency parking ban. Resident parking permits for a particular street shall only be issued to residents of that street. Report to town council: The police department will report to the town council on the effectiveness of the permit system by the second meeting of January 2016.

(Ord. of 5-2-88, § 28(1)—(9); Ord. of 8-21-95; Ord. of 5-19-97; Ord. of 9-2-97; Emergency and Regular Ord. of 3-1-04; Ord. of 12-4-07; Ord. of 1-17-12; Ord. of 12-1-14(2); Ord. of 2-9-15)

Sec. 15-72. - Restricted parking area legend.

Restricted parking areas of any type must be indicated by yellow curbing, yellow striped areas or by appropriate signs.

(Ord. of 5-2-88, § 29; Ord. of 1-17-12)

Sec. 15-73. - Overnight parking restricted.

- (a) A person shall not park a vehicle on either side of the easterly portion of Maine Street, known as Park Row, running from School Street southerly to the Maine Central Railroad tracks, between the hours of 11:00 p.m. and 5:00 a.m.
- (b) No person shall park a vehicle in the Mill Street parking lot between the hours of 9:00 p.m. to 5:00 a.m.
- (c) No person shall park a vehicle on Maine Street in the parking area which is located north of the mall for a distance of one hundred twenty (120) feet, more or less, between the hours of 11:00 p.m. and 5:00 a.m.
- (d) A person shall not park a vehicle on Maine Street, commencing at Fitch Place and extending northerly to School Street, between the hours of 11:00 p.m. and 5:00 a.m.
- (e) A person shall not park a vehicle on Park Row, east side, commencing at Bath Road and extending southerly to College Street between the hours of 1:00 a.m. and 6:00 a.m.
- (f) A person shall not park a vehicle on South Street, north side, commencing at Coffin Street and extending westerly to Maine Street between the hours of 1:00 a.m. and 6:00 a.m.
- (g) A person shall not park a vehicle on Longfellow Avenue, both sides, commencing at Harpswell Road and extending westerly to Maine Street between the hours of 1:00 a.m. and 6:00 a.m. unless the vehicle displays an unexpired Longfellow Avenue resident parking permit issued in accordance with section 15-71(14).
- (h) A person shall not park a vehicle on Maine Street, west side, commencing at Noble Street and extending southerly to Boody Street between the hours of 1:00 a.m. and 6:00 a.m.
- (i) A person shall not park a vehicle on Park Row, east side, commencing at Longfellow and extending northerly to College Street between the hours of 1:00 a.m. and 6:00 a.m.
- (j) A person shall not park a vehicle on Potter Street, south side, commencing at Maine Street and extending westerly to Union Street between the hours of 1:00 a.m. and 6:00 a.m.
- (k) A person shall not park a vehicle on Page Street, north side, commencing at Maine Street and extending westerly to Union Street between the hours of 1:00 a.m. and 6:00 a.m. unless the vehicle displays an unexpired Page Street resident parking permit issued in accordance with section 15-71(14).
- (l) A person shall not park a vehicle in the long term parking lot located at 86 Union Street between the hours of 1:00 a.m. and 6:00 a.m. unless the vehicle has been parked in connection with the operator's utilization of train or bus service. The vehicle may only park in the long term parking for the duration of the operator's out-of-town trip on the train or bus. Proof of train or bus service utilization may be documented in a manner proscribed by the chief of police.
- (m) A person shall not park a vehicle in the Town Hall parking lot located at 85 Union Street, between the hours of 1:00 a.m. and 6:00 a.m. This prohibition shall not apply to the leased portion of the parking lot.

(Ord. of 5-2-88, §§ 19, 19B, 28(10); Ord. of 3-21-94, Regular and Emergency Ord. of 11-21-94; Ord. of 10-18-99(2); Ord. of 9-18-00(1); Ord. of 12-4-07; Ord. of 10-20-08(2); Ord. of 7-21-14; Ord. of 12-1-14(2); Ord. of 2-9-15; Ord. of 7-20-15(2))

Sec. 15-74. - No-parking areas.

The following areas are designated as no-parking areas:

Armory Street, west side, commencing at Weymouth Street and extending southerly to end.

Bank Street, both sides.

Baribeau Drive, westerly side, commencing twenty (20) feet north of the entrance of Mallard Pond, to twenty (20) feet south of the exit to Mallard Pond.

Barrows Drive, west side, commencing at Columbia Avenue and extending south six hundred and ninety-six (696) feet, 8:00 a.m. to 5:00 p.m., Monday through Friday.

Basswood Road, east side, commencing two hundred and forty (240) feet south of the intersection of Wildwood Drive and extending southerly for sixty (60) feet.

Basswood Road, west side, commencing at Wildwood Drive and extending southerly to Aspen Drive.

Bath Road, both sides, commencing from the Brunswick/West Bath Boundary westerly to a point one thousand (1,000) feet past Sawyer Road.

Bath Road, both sides, commencing at Cook's Corner and extending easterly three hundred (300) feet.

Bath Road (Route 24), both sides, commencing at Cook's Corner and extending westerly three hundred (300) feet.

Bath Road, north side reverse direction loop located across from the main entrance to Brunswick Naval Air Station, both sides, commencing at the east side entrance to the turn around and extending to the west side exit.

Bath Road, north side, commencing at Federal Street and extending westerly five hundred eighty (580) feet.

Bath Road, south side, commencing at Bowdoin College Campus Drive so-called and extending westerly one hundred forty (140) feet.

Bath Road, south side, commencing at Sills Drive and extending westerly forty (40) feet.

Bath Road, south side, commencing at Sills Drive and extending easterly one hundred fifty (150) feet.

Boody Street, both sides, commencing at Maine Street and extending westerly four hundred ten (410) feet Monday a.m. through Friday p.m. except holidays.

Bowker Street, south side.

Cedar Street, south side.

Center Street, both sides.

Church Road, east side, commencing at Pleasant Street and extending southerly to Paul Street, and on the westerly side of Church Road commencing at Pleasant Street and extending southerly three hundred forty (340) feet.

Cleaveland Street, south side.

Coffin Street, both sides.

College Street, both sides.

Columbus Drive, both sides.

Columbus Drive, east side, commencing at the intersection of Cressey Road and extending southerly one hundred twenty (120) feet.

Cressey Road, both sides.

Cumberland Street, north side, commencing at Cushing Street and extending easterly one hundred twenty (120) feet.

Cumberland Street, north side, commencing at Cushing Street and extending westerly one hundred thirty (130) feet.

Cumberland Street, north side, commencing at Maine Street and extending two hundred twenty (220) feet in a westerly direction.

Cumberland Street, north side, commencing at Union Street in an easterly direction sixty-five (65) feet.

Cumberland Street, north side commencing at a point of three hundred twenty-five (325) feet from Maine Street and extending westerly one hundred forty (140) feet.

Cumberland Street, southerly side, from Maine Street to Cushing Street.

Cushing Street, west side, commencing at Pleasant Street and extending northerly one hundred twenty (120) feet.

Dunlap Street, south side.

Dunlap Street, north side commencing one hundred forty-six (146) feet east of Maine Street for a distance of twenty (20) feet in an easterly direction.

Dunning Street, south side.

Elm Street, south side, commencing at Maine Street and extending westerly three hundred seventy (370) feet; and on the north side commencing one hundred eighteen (118) feet westerly of Maine Street and extending westerly to Union Street.

Everett Street, south side.

Federal Street, east side, commencing 735 feet north of the intersection with Bath Road and extending north for four hundred and forty (440) feet.

Federal Street, west side, commencing at Bath Road and extending northerly to Green Street.

Federal Street, west side, commencing at Mason Street and extending southerly to Center Street.

Federal Street, west side, commencing at Center Street to a point three hundred eighty (380) feet extending southerly sixteen (16) feet.

Federal Street, west side, commencing at Center Street extending southerly thirty (30) feet.

Federal Street, west side, commencing at School Street extending southerly three hundred seventeen (317) feet.

Federal Street, east side, commencing at Bath Road and extending northerly three hundred sixty-five (365) feet.

Federal Street, east side, commencing at Jordan Avenue extending northerly to a point four hundred (400) feet north of Franklin Street.

Federal Street, east side, commencing at Mason Street and extending southerly one hundred thirteen (113) feet.

Fitch Place, both sides.

Franklin Street, both sides.

Gilman Avenue, north side.

Green Street, both sides.

Grover Lane, north side.

Gurnet Road, (Route 24), both sides, commencing at Cook's Corner and extending southerly nine hundred (900) feet.

Gurnet Road (Route 24), east side, within ten (10) feet from the edge of pavement, commencing at Princes Point Road and extending southerly to the Gurnet Bridge.

Harding Road, both sides, commencing at Bath Road and extending southerly five hundred (500) feet.

Harpswell Road, east side, commencing at College Street and extending southerly to Bowker Street.

Harpswell Road, west side, commencing at Bath Road and extending southerly forty (40) feet.

Harpswell Road, westerly side, commencing at College Street and extending southerly to Hambleton Avenue.

Harriet Beecher Stowe School Access Road, north side, commencing at Spring Street extending westerly one hundred (100) feet west of the intersection with Armory Street.

Harriet Beecher Stowe School Access Road Loop, north side, commencing at the western intersection with the Harriet Beecher Stowe School Access Road easterly to the eastern intersection with the Harriet Beecher Stowe School Access Road.

Harriet Beecher Stowe School Access Road Loop, south side, commencing at the western intersection with the Harriet Beecher Stowe School Access Road easterly forty-eight (48) feet.

High Street, south side, commencing at Union Street and extending westerly one hundred eighty (180) feet.

High Street, north side, commencing at Union Street and extending westerly to Cushing Street.

Jordan Avenue, north and south sides, commencing at Federal Street and extending easterly under the railroad overpass to Wadsworth Road.

Jordan Avenue, south side, commencing at the intersection with the driveway to Edwards Field and extending easterly to the intersection with Wheeler Park.

Lincoln Street, north side commencing one hundred (100) feet west of Maine Street and extending in a westerly direction to Union Street.

Lincoln Street, south side commencing at Maine Street and extending westerly for a distance of forty-three (43) feet.

Longfellow Avenue, south side, commencing at Maine Street and extending easterly three hundred (300) feet.

Longfellow Avenue, south side, commencing at Coffin Street Extension and extending westerly sixty (60) feet.

Longfellow Avenue, north side, commencing at Maine Street and extending easterly one hundred seventy-two (172) feet.

Magean Street, north side, commencing at Maine Street and extending westerly one hundred twenty-five (125) feet.

Maine Street, east side, commencing at Bath Road and extending southerly to Longfellow Avenue.

Maine Street, east side, commencing at its intersection with Bath Road and continuing north twenty-five (25) feet.

Maine Street , east side, commencing one hundred eighty-five (185) feet north of the intersection with Bath Road and continuing north to the intersection with No Name Street.

Maine Street , east side, commencing one hundred (100) feet south of the intersection with the Maine Eastern Railroad tracks and continuing north one hundred (100) feet to the Maine Eastern Railroad tracks.

Maine Street, east side, commencing at a point ninety (90) feet northerly from School Street and extending northerly sixty (60) feet.

Maine Street, east side, commencing at School Street extending southerly ninety-seven (97) feet.

Maine Street, north side, commencing at Pleasant Street and extending southerly one hundred fifty (150) feet.

Maine Street, west side, commencing at Potter Street and extending southerly forty-six (46) feet.

Maine Street, west side, commencing eighty-seven (87) feet southerly of the intersection of Potter Street, and extending southerly forty-eight (48) feet.

Maine Street, west side, commencing two hundred twenty-two (222) feet southerly of the intersection of Potter Street, and extending southerly one hundred eighty (180) feet.

Maine Street, west side, commencing one hundred eighty (180) feet southerly of the intersection of Page Street, and extending southerly one hundred eighty (180) feet.

Maine Street, west side, commencing at Pleasant Street and extending northerly thirty-five (35) feet.

Maine Street, west side, commencing at McKeen Street and extending southerly one hundred ten (110) feet.

Maine Street, west side commencing at the Maine Eastern Railroad tracks and extending southerly to Potter Street.

Maine Street, west side commencing at Noble Street and extending northerly sixty (60) feet.

Maine Street, westerly side, commencing at Boody Street and extending northerly for a distance of three hundred twenty (320) feet.

Maine Street, east side, commencing at the intersection of Whittier Street and extending south to the intersection of Atwood Lane.

Maquoit Road, easterly side, commencing at a point 0.13 miles southerly of the Maquoit Road, Mere Point Road, and Maine Street intersection and extending southerly 0.15 miles.

Maquoit Road, both sides commencing at the entrance to the Brunswick High School and extending southerly three hundred forty-five (345) feet.

Maquoit Road, both sides commencing at the entrance to the Brunswick High School and extending northerly three hundred thirty (330) feet.

Mason Street, both sides.

Market Lane, south side.

Marriner Road, both sides.

Merryman Lane , west side, commencing on the west side of Merryman Lane twenty (20) feet south of the turnaround, thence northerly to the end of Merryman Lane, thence easterly across the end of Merryman Lane.

McKeen Street, north side, commencing at Maine Street and extending westerly to a point opposite 21 McKeen Street.

McKeen Street, north side, commencing at Spring Street and extending westerly five hundred fifty (550) feet.

McKeen Street, north side, commencing at Spring Street and extending westerly to Stanwood Street.

McKeen Street, south side, commencing at Spring Street and extending westerly to 63 McKeen Street.

McKeen Street, south side, commencing at Maine Street and extending westerly five hundred twenty-two (522) feet.

McLellan Street, south side, commencing at the intersection with Harpswell Road and extending east one hundred and forty-five (145) feet.

Middle Street, east side.

Middle Street, west side, commencing at Pleasant Street and extending southerly forty (40) feet, commencing at Elm Street and extending southerly to the southerly terminus of Middle Street, and commencing at Elm Street and extending northerly three hundred twenty-five (325) feet.

Mill Street, northerly side, between a point opposite Cumberland Street and a point opposite Swett Street.

No Name Street, east side, commencing at Bath Road and continuing northwesterly to Maine Street.

No Name Street, west side, commencing at Bath Road and continuing northwesterly thirty (30) feet.

No Name Street, west side, commencing one hundred fifteen (115) feet northwesterly of Bath Road and continuing north to Maine Street.

Noble Street, north side, commencing at Maine Street and extending westerly fifty (50) feet, and north side, commencing at the west side of the curb cut for the driveway to the Inn at Maine Street Station and extending in a westerly direction twenty-eight (28) feet.

Noble Street, south side.

Oak Street, north side, commencing at Union Street and extending westerly one hundred ninety (190) feet.

Oak Street, south side.

Old Bath Road, both sides, commencing from Bridge Road easterly to the Brunswick/Bath boundary.

Old Bath Road, both sides, commencing at New England Telephone Co., utility pole #148 and extending westerly for a distance of six hundred (600) feet to utility pole #152, such starting point being five hundred (500) feet, more or less, westerly from the junction of Old Bath Road and Baybridge Road.

Page Street, north side commencing at Maine Street and extending westerly thirty-six (36) feet.

Page Street, north side commencing one hundred and eighty-seven (187) feet west of Maine Street and extending westerly twenty-four (24) feet.

Page Street, north side, commencing at Spring Street, and extending easterly forty (40) feet.

Page Street, south side, commencing at Maine Street and extending westerly to Union Street.

Page Street, south side commencing at Union Street, westerly to Spring Street, 8:00 a.m. to 4:00 p.m., Monday through Friday.

Park Row, east side, commencing at School Street extending southerly to a point one hundred fifty (150) feet north of the Cleaveland Street intersection.

Park Row, east side, commencing at Longfellow Avenue and extending southerly to the end of Park Row.

Park Row, east side, commencing at Maine Street and extending southerly ninety (90) feet.

Park Row, east side, commencing one hundred fifty-four (154) feet south of the intersection of Maine Street and extending southerly to one hundred twenty-eight (128) feet.

Park Row, west side, commencing at Fitch Place southerly to Longfellow Avenue.

Park Row, west side, commencing at School Street extending southerly forty (40) feet.

Park Row, west side, commencing one hundred fifty (150) feet south of School Street extending to a point two hundred (200) feet in a southerly direction.

Pine Street, south side, commencing at Bath Road and extending easterly to Bowker Street, except parking is permitted adjacent to Whittier Field between April fifteenth and November fifteenth if the entire vehicle is parked off of the pavement.

Pleasant Street, north side, commencing at the west side of the curb cut for the driveway to 76 Pleasant Street, continuing westerly for forty (40) feet;

Pleasant Street, north side, commencing at Cushing Street and extending easterly one hundred ten (110) feet.

Pleasant Street, commencing at Cushing Street extending westerly for a distance of forty-five (45) feet.

Pleasant Street, south side, commencing at I-95 extending easterly to Spring Street.

Pleasant Street, south side, commencing at Maine Street and extending westerly one hundred twenty (120) feet.

Potter Street, north side, commencing at Maine Street and extending westerly one hundred eighty (180) feet.

Potter Street, north side commencing at Union Street and extending easterly thirty-six (36) feet.

Potter Street, south side.

River Road, north side, commencing at Pleasant Street and extending westerly four hundred seventy (470) feet.

School Street, north side, commencing at Federal Street and extending easterly forty (40) feet.

School Street, south side, commencing at Federal Street and extending easterly to Stetson Street.

School Street, south side, commencing at Maine Street and extending easterly to a point sixty (60) feet easterly of Federal Street.

Sills Drive, easterly side, commencing at Bath Road and extending southerly to College Street.

Simpson's Point Road, west side, commencing at mean high water and extending northerly to Pennell Way; and the east side, commencing at mean high water and extending northerly one hundred forty (140) feet.

South Street, south side.

South Street, north side from Maine Street extending easterly two hundred twenty-four (224) feet.

Spring Street, east side, commencing at McKen Street extending northerly to forty (40) feet south of Page Street, 8:00 a.m. to 4:00 p.m., Monday through Friday, and east side commencing forty (40) feet south of Page Street and extending to forty (40) feet north of Page Street.

Spring Street, west side, commencing at McKen Street extending northerly to Weymouth Street.

Stanwood Street, east side, commencing at Pleasant Street and extending southerly to Hennessey Avenue; on the west side, commencing at Pleasant Street and extending southerly to a point seventy-five (75) feet northerly of the tracks of the Maine Central Railroad and extending southerly to Hennessey Avenue.

Station Avenue, north side, commencing at Maine Street and extending westerly one hundred sixty-four (164) feet.

Station Avenue , south side, commencing at Maine Street and extending westerly two hundred fifteen (215) feet.

Station Avenue , north side, commencing two hundred thirty-nine (239) feet west of the intersection of Maine Street and extending westerly one hundred and eighty-two (182) feet.

Station Avenue , south side, commencing at Union Street and extending easterly forty-five (45) feet.

Station Avenue , south side, commencing one hundred five (105) feet east of Union Street and extending easterly one hundred seventy (170) feet.

Station Avenue , north side, commencing at Union Street and extending easterly sixty (60) feet.

Station Avenue , north side, commencing one hundred thirty (130) feet east of the intersection of Union Street and extending easterly eighty (80) feet.

Stetson Street, west side.

Storer Road, both sides, commencing at Old Bath Road and extending northerly four hundred and twenty (420) feet.

Swett Street, east side.

Town Hall Place, both sides.

Turner Street, north side, commencing at Webster Street and extending westerly to the end of Turner Street.

Union Street, east side, commencing at McKeen Street and extending northerly to Noble Street.

Union Street, west side, commencing at McKeen Street and extending northerly to Weymouth Street.

Union Street , east side, commencing at Station Avenue and extending northerly one hundred twenty-five (125) feet.

Union Street , east side, commencing at Station Avenue and extending to Noble Street.

Water Street, both sides.

Webster Street, east side.

Webster Street, west side.

Weymouth Street, south side, commencing at its intersection with Union Street and extending west one hundred (100) feet.

Weymouth Street, north side, commencing at its intersection with Union Street and extending west for seventy-five (75) feet.

Connecting ramp, both sides, from U.S. Route 1 to Bath Road, commencing at Cook's Corner and extending northerly three hundred (300) feet.

An extension to the Lower Mall, west side, commencing at a point opposite the southerly sideline of School Street and extending northerly one hundred (100) feet.

(Ord. of 5-2-88, § 18; Ord. of 10-3-88, § 1; Ord. of 6-5-89; Ord. of 10-21-91; Ord. of 10-19-92; Ord. of 3-21-94; Emergency/Regular Ord. of 6-20-94; Ord. of 8-7-95; Ord. of 9-18-95; Emergency/Regular Ord. of 11-20-95; Ord. of 12-4-95; Ord. of 11-18-96; Ord. of 4-22-97; Emergency/Regular Ord. of 6-16-97; Ord. of 10-6-97; Emergency/Regular Ord. of 11-17-97; Ord. of 2-2-98; Ord. of 12-7-98; Ord. of 10-18-99(2); Ord. of 1-18-00(4); Ord. of 3-6-00; Ord. of 5-1-00(3); Ord. of 6-5-00(2); Ord. of 9-18-00(2); Ord. of 11-20-00; Emergency/Regular Ord. of 2-6-01(2); Ord. of 4-2-01(1); Ord. of 4-2-01(2); Ord. of 4-17-01; Emergency/Regular Ord. of 7-16-01; Emergency/Regular Ord. of 12-3-01; Emergency/Regular Ord. of 12-17-01(1); Emergency/Regular Ord. of 12-17-01(2); Ord. of 2-19-02(1); Emergency/Regular Ord. of 2-19-

02(2); Emergency/Regular Ord. of 2-18-03(2); Emergency/Regular Ord. of 6-7-04(2); Ord. of 3-21-05; Ord. of 12-20-05; Ord. of 1-17-07; Ord. of 7-21-08(2); Ord. of 9-2-08(2); Ord. of 12-1-08(2); Ord. of 3-23-09(2); Ord. of 10-5-09; Ord. of 7-26-10(2); Ord. of 1-24-11; Ord. of 6-20-11(2); Ord. of 1-17-12; Ord. of 1-12-13; Ord. of 4-27-15; Ord. of 7-20-15(2); Ord. of 2-1-16(3); Ord. of 2-16-16; Ord. of 11-6-17; Ord. of 11-6-17)

Sec. 15-75. - No-parking signs.

No-parking signs must be placed in no-parking areas in such a manner as to be seen and understood by an ordinarily observant person.

(Ord. of 5-2-88, § 19)

Sec. 15-76. - Restricted on-street parking areas.

- (a) A person shall not park a vehicle for more than two (2) consecutive hours in any parking space adjacent to a curb, nor in any other parking space adjacent to a curb on the same block, between the hours of 8:00 a.m. and 6:00 p.m. on any day except Sunday, and a public holiday in the following areas:

Bow Street, north side, at 18-26 Bow Street.

Cleveland Street, north side, from Federal Street to Maine Street.

Cumberland Street, north side, at Maine Street and extending westerly to Union Street.

Cumberland Street, south side commencing thirty (30) feet west of Maine Street, and extending one hundred ten (110) feet.

Dunlap Street, north side commencing one hundred ninety (190) feet easterly of Maine Street and extending to Federal Street.

Elm Street, north side commencing at Maine Street, and extending westerly one hundred eighteen (118) feet.

Federal Street, east side, commencing three hundred sixty-five (365) feet north of Bath Road and extending northerly three hundred seventy (370) feet.

Federal Street, east side, commencing at Mason Street and extending southerly to a point opposite Center Street.

Federal Street, west side, commencing at School Street and extending northerly to Center Street.

Gilman Avenue, south side, commencing at Maine Street and extending westerly one hundred (100) feet.

Lincoln Street, south side commencing one hundred fifty (150) feet west of Maine Street and extending west eighty-five (85) feet.

Lincoln Street, south side commencing two hundred eighty (280) feet west of Maine Street and extending to Union Street.

Lincoln Street, north side commencing forty (40) feet west of Maine Street and extending for a distance of forty-five (45) feet.

Lincoln Street, north side commencing one hundred ninety (190) feet west of Maine Street and extending for a distance of three hundred sixty-seven (367) feet from April 15 to November 15.

Maine Street, east side, commencing at Route #1 overpass and extending southerly to Bath Road.

Maine Street, west side, commencing at Mill Street and extending southerly to Potter Street.

Middle Street, west side commencing at Pleasant Street and extending southerly two hundred fifty (250) feet.

Mill Street, south side, commencing twenty (20) feet west of Maine Street and extending westerly two hundred eighty (280) feet.

No Name Street, west side, commencing thirty (30) feet northwest of Bath Road and continuing northwesterly forty-five (45) feet.

Park Row, commencing at the driveway/footpath on the south side of the Walker Art Museum and continuing north to the driveway/footpath on the north side of the Walker Art Museum.

Park Row, east side, commencing at Cleaveland Street and extending northerly one hundred fifty (150) feet.

Park Row, east side, commencing at a point one hundred thirty-five (135) feet north of South Street and continuing north to College Street.

Park Row, west side commencing at School Street and extending southerly to the "No Name Street."

Pine Street, north side, commencing at Bath Road and extending easterly to Bowker Street.

Pleasant Street, north side, commencing at Union Street and extending easterly to Maine Street.

Pleasant Street, south side, commencing at Union Street and extending easterly to Maine Street.

Spring Street, east side, between Page Street and McKeen Street.

Station Avenue, all marked on-street parking spaces, both sides commencing at Maine Street and extending westerly to Union Street (excluding the seven (7) parking spaces located in front of the Midcoast Federal Credit Union).

Union Street, west side, commencing one hundred fifteen (115) feet southerly of Mill Street and extending southerly forty-five (45) feet.

(b) A person shall not park a vehicle for more than fifteen (15) consecutive minutes in designated zones as signed.

Federal Street, east side, commencing four hundred (400) feet north of Franklin Street and extending northerly forty (40) feet (two (2) parking spaces).

(c) A person shall not park a vehicle for more than three (3) consecutive hours in any parking space adjacent to a curb between the hours of 8:00 a.m. and 6:00 p.m. on any day except Friday, Sunday, and a public holiday and between the hours of 8:00 a.m. and 9:00 p.m. on Friday in the following areas:

School Street, north side, commencing at Maine Street and extending easterly to Federal Street.

(d) Notwithstanding any other provisions of this chapter, a person shall not park a vehicle for more than five (5) consecutive minutes in the following signed designated zone:

Middle Street, west side, the three (3) northernmost spaces between Elm Street and Pleasant Street.

(e) Notwithstanding any other provisions of this chapter, a person shall not park a vehicle for more than thirty (30) consecutive minutes in the following signed designated zones:

Maine Street, west side, the two (2) northernmost parking spaces (excluding any spaces which designated as disability parking spaces) on each block between Gilman Avenue and Town Hall Place;

Maine Street, east side, the two (2) southernmost parking spaces (excluding any spaces which designated as disability parking spaces) on each block between School Street and Mason Street;

Union Street, Town Hall parking lot located at 85 Union Street, the three westernmost spaces in each of the two northernmost rows, 8:00 a.m. to 5:00 p.m., Monday through Friday.

(Ord. of 5-2-88, § 28; Mo. of 12-4-89; Ord. of 3-21-94; Emergency/Regular Ord. of 6-20-94; Ord. of 8-7-95; Ord. of 1-18-00(5); Emergency/Regular Ord. of 12-3-01; Ord. of 8-4-03); Ord. of 12-20-05; Ord. of 12-21-05(2); Ord. of 5-31-06; Ord. of 10-5-09; Ord. of 1-17-12; Ord. of 1-12-13; Ord. of 9-17-13; Ord. of 7-21-14; Ord. of 7-20-15(2))

Sec. 15-77. - Restricted off-street parking areas.

A person shall not park a vehicle for more than two (2) consecutive hours in any town-owned or town-leased off-street parking area between the hours of 8:00 a.m. and 6:00 p.m. on any day except Friday, Sunday, and a public holiday, and between the hours of 8:00 a.m. and 9:00 p.m. on Friday. This two-hour limitation does not apply to:

- (1) Forty-two (42) parking spaces in the Cumberland Street parking lot which are established as all-day parking spaces.
- (2) Thirty-seven (37) parking spaces in the easterly side of the Bank Street parking lot which are established as all-day parking spaces.
- (3) The long term parking lot located on the west side of Union Street opposite town hall.

(Ord. of 5-2-88, § 28(14); Mo. of 5-20-91; Emergency/Regular Ord. of 6-20-94; Emergency/Regular Ord. of 10-16-95; Ord. of 8-7-17)

Sec. 15-78. - Disability parking.

A person shall not park a vehicle in a parking stall specifically designated and clearly marked for persons with physical disabilities unless the vehicle is equipped with a special designating plate or displays placard issued by the secretary of state under the provisions of and in compliance with 29A M.R.S.A. § 521. A person shall not park in an access aisle adjacent to a disability parking space regardless of whether the person has been issued a disability registration plate or removable placard by the State of Maine. Disability access aisles shall be marked by painting on the pavement a rectangular box with white or yellow diagonal stripes.

(Ord. of 5-2-88, § 19B; Emergency/Regular Ord. of 7-21-97; Ord. of 5-1-00(4); Ord. of 5-31-06(2); Ord. of 1-12-13)

Sec. 15-79. - Loading zones designated.

Loading zones are established at the following locations:

Bath Road, south side, commencing one hundred forty (140) feet east of Maine Street and continuing east for eighty (80) feet.

Center Street, north side commencing thirty-five (35) feet west of Federal Street and extending thirty-six (36) feet in a westerly direction.

Church Road, west side commencing one hundred fifty (150) feet south of the intersection of Pleasant Street and extending southerly for a distance of fifty (50) feet.

Lincoln Street, south side commencing at a point of forty-three (43) feet west of Maine Street and extending in a westerly direction for a distance of ninety (90) feet.

Lincoln Street, south side, commencing at a point two hundred thirty-five (235) feet west of Maine Street and continuing in a westerly direction for forty-five (45) feet.

No Name Street, west side, commencing seventy-five (75) feet northwesterly of Bath Road and continuing northwesterly for forty-five (45) feet.

South Street, south side commencing one hundred ninety (190) feet east of the intersection of Park Row and extending easterly for a distance of one hundred and forty-five (145) feet, for a maximum of fifteen (15) minutes between the hours of 7:30 a.m. and 6:30 p.m. Monday through Friday.

Station Avenue, south side commencing five hundred thirty-five (535) feet west of the intersection of Maine Street and extending westerly sixty (60) feet.

Station Avenue, north side commencing five hundred twenty-six (526) feet west of the intersection of Maine Street and extending westerly sixty (60) feet.

Town Hall Place, south side, a space fifty (50) feet long, at 9 Town Hall Place.

(Ord. of 5-2-88, § 20; Ord. of 3-21-94; Emergency/Regular Ord. of 6-20-94; Ord. of 10-3-94; Emergency/Regular Ord. of 6-3-02; Ord. of 8-5-02; Ord. of 9-6-06; Ord. of 10-5-09; Ord. of 1-12-13)

Sec. 15-80. - Loading zone signs.

Loading zones shall be indicated by appropriate signs or by parallel lines with diagonal lines running between them. All lines shall be six (6) inches wide and shall be painted yellow.

(Ord. of 5-2-88, § 21)

Sec. 15-81. - Restricted use of taxicab stands and bus stops.

A person shall not stop or park a vehicle other than a taxicab in a taxicab stand, nor other than a bus in a bus stop. The operator of a passenger vehicle may temporarily stop there while actually engaged in loading or unloading passengers as long as it does not interfere with any taxicab or bus entitled to occupy the stand.

(Ord. of 5-2-88, § 28(12))

Sec. 15-82. - Parking of taxicabs and buses.

A person shall not park a taxicab or a bus on any public way, except at a stand or stop assigned to its owner by the town council. A taxicab driver may temporarily stop the taxicab while actually engaged in loading or unloading passengers.

(Ord. of 5-2-88, § 28(11))

Sec. 15-83. - Reserved.

Editor's note— An ordinance adopted Sept. 6, 2006 repealed § 15-83 in its entirety. Formerly said section pertained to taxi stand designation as enacted by §§ 22 and 23 of an ordinance adopted May 2, 1988; as subsequently amended by an ordinance adopted Oct. 3, 1994.

Sec. 15-84. - Bus stops designated.¹⁴

(a) Bus stops are established at the following locations:

Reserved.

(b) Bus stops must be indicated by appropriate signs.

(Ord. of 5-2-88, §§ 24, 25; Ord. of 4-2-01(3); Emergency/Regular Ord. of 6-21-04; Ord. of 5-31-06; Ord. of 10-5-09; Ord. of 1-17-12)

Footnotes:

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Editor's note— Ord. of 1-17-2012, removed §§ 15-84(a)(2) and 15-84(a)(3) in their entirety. Formerly those sections pertained to designated bus stops.

Sec. 15-85. - Parking violations—Towing.

- (a) *Purpose* . The purpose of these sections is to improve the enforcement of the Brunswick parking ordinances and to discourage habitual violators.
- (b) *Definitions* . The following words and terms as used in these sections shall have the meanings ascribed thereto, unless the context otherwise indicates:
 - (1) *Towing list* means a list maintained by the police department containing the names of those wreckers approved by the town to respond to requests for the towing of vehicles made by the police department.
 - (2) *Wrecker* means a person engaged in the business of, or offering the services of, a vehicle wrecker or towing service, whereby motor vehicles are or may be towed or otherwise moved from one (1) place to another by the use of a motor vehicle adapted to and designated for that purpose.
 - (3) *Outstanding parking ticket* means any notice of violation of any parking ordinance of the Town of Brunswick where:
 - a. The owner of the offending vehicle has been finally determined to be in violation by reason of default or otherwise; and
 - b. The resultant fine or waiver charge established pursuant to 30-A M.R.S.A. §§ 3001 and 3009 has not been paid.
 - (4) *Waiver charges or charges* means the fees a violator may pay to waive court action plus all expenses the Town of Brunswick incurs specifically enumerated in this chapter or state law to collect fees or fines, including but not limited to certified mail fees.
- (c) *Towing* . The Brunswick Police Department is authorized, subject to the requirements of these sections, to remove by use of a wrecker, and impound any vehicle found on any public or private way or public property, which has outstanding parking tickets with accumulated fines totalling seventy-five dollars (\$75.00) or more, and is authorized to take whatever action is reasonably necessary to carry out the provisions of these sections.
- (d) *Notice to owner before towing*. After a vehicle has received outstanding tickets with accumulated fines totalling seventy-five dollars (\$75.00) or more, a letter will be sent by certified mail to the vehicle's registered owner. This letter alerts the owner of the outstanding parking tickets and shall allow fourteen (14) days for payment of accumulated fines or waiver charges. After this time period has transpired without either payment in full or an arrangement acceptable to the chief of police having been made to pay the fines or waiver charges, the vehicle will be subject to tow.
- (e) *Procedure for towing and impoundment*. Any police officer ordering towing and impoundment of a vehicle under these sections shall, at the time of such towing and impounding, or within a reasonable time thereafter, notify the dispatcher of the storage location of the vehicle. Such information shall be recorded by the dispatcher for use by the chief of police, or his/her authorized representative. The chief of police, or his/her authorized representative shall notify the owner or operator by certified mail, return receipt requested, of the towing and impoundment of the vehicle within five (5) business days of the towing and impoundment thereof, the storage location of such vehicle, and the

requirements of release as set forth in subsection (f) of this section. This section shall not apply where an impounded vehicle has been released within the five-day period.

- (f) *Release of vehicles.* The vehicle shall not be released until:
 - (1) The individual requesting the release presents satisfactory evidence of his/her right to possession and signs a receipt therefor; and
 - (2) The chief of police, or his/her authorized representative, certifies that all fines or waiver fees described in this chapter, including the fees for towing and impoundment have been paid; or
 - (3) Upon the certification by the chief of police, or his/her authorized representative, that the owner or operator is unable to pay accumulated fines or waiver charges by reason of poverty, having provided satisfactory proof of such status, and that such owner or operator has accepted a summons initiating a court proceeding to determine his/her liability for the alleged violations.
- (g) *Towing conditions.* Once a police officer has ordered towing, one (1) of three (3) following possibilities exist:
 - (1) If the towing truck is enroute to the scene but has not yet arrived, and the owner or operator has arrived, or if they arrive approximately the same time, then the owner or operator must pay the wrecker, on arrival, in the amount of one-half of the towing charge and must pay to the chief of police, or his/her authorized representative, all fines or waiver charges to effect the on-the-scene release of the vehicle.
 - (2) If the wrecker has secured the vehicle before the owner or operator arrives, the owner or operator must pay the wrecker, on arrival, all the towing charges and must pay the chief of police, or his/her authorized representative, all fines or waiver charges to effect the on-the-scene release of the vehicle.
 - (3) If the vehicle is actually towed away for impoundment, the vehicle owner or operator must pay the wrecker all towing and storage charges and must pay the chief of police, or his/her authorized representative, all fines and waiver charges, in order to gain release of the vehicle.
- (h) *Interference with enforcement .* It shall be a violation of these sections for any person to obstruct or attempt to prevent the removal of a vehicle as provided in these sections. The penalty for such violation shall be charged in accordance with the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances.
- (i) *Hearings .* The owner or operator of a towed and impounded vehicle may request a hearing on the applicability of these sections to the towing and impoundment. Such hearing shall be scheduled at the earliest possible date and be conducted by the captain of operations. Decisions of the captain of operations shall be appealable to the chief of police.

(Ord. of 8-21-95; Ord. of 1-12-13; Ord. of 11-16-15(3))

Sec. 15-86. - Parking for a fee.

Parking in the long term parking lot located on the west side of Union Street opposite town hall is limited to users who (1) pay the sum set forth in the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances per twenty-four-hour period to park in the lot and (2) are parking in the lot so that the operator can utilize public transportation originating from or terminating at Brunswick Station. Cars parked for any other purposes, or parked in the lot without paying the fee (whether because the fee was not paid at all or an insufficient amount was paid) are subject to fine in the amount set forth in the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B to this Municipal Code of Ordinances and additionally are subject to being towed without further notice.

(Ord. of 8-7-17)

Secs. 15-87—15-100. - Reserved.

ARTICLE V. - RULES FOR OPERATION OF VEHICLES

Sec. 15-101. - Funeral processions.

A person shall not drive a vehicle between the vehicles or pedestrians in, or attempt to cut across the line of a funeral procession.

(Ord. of 5-2-88, § 27(3))

Sec. 15-102. - Sidewalks.

A person shall not drive a vehicle within any sidewalk area except at a driveway.

(Ord. of 5-2-88, § 27(4))

Sec. 15-103. - Limitations on backing.

A person shall not back a vehicle on a public way unless it can be done with reasonable safety and without interfering with other traffic.

(Ord. of 5-2-88, § 27(5))

Sec. 15-104. - Method of operation.

A person shall not operate a vehicle on any public way except in a prudent manner having proper regard for existing conditions.

(Ord. of 5-2-88, § 27(8))

Sec. 15-105. - Loud or unnecessary noise.

A person shall not operate a motor vehicle so as to make any loud, unusual, or unnecessary noise against the peace, quiet or good order of the town.

(Ord. of 5-2-88, § 27(9))

Sec. 15-106. - Commercial vehicles excluded.

(a) A person shall not operate a commercial vehicle on the following streets, except to provide service or access to properties on or adjacent to those streets:

- (1) Peary Drive
- (2) MacMillan Drive
- (3) Federal Street
- (4) Union Street from Weymouth Street to McKeen Street

(b) A commercial vehicle under this ordinance is any commercially registered vehicle which requires the operator to hold a State of Maine Commercial Driver's License, Class A or B.

- (c) Municipal vehicles are exempt from the provisions of this section.
- (d) Appropriate signs shall be erected at the beginning and end of the above streets to indicate the exclusion of commercial vehicles.

(Ord. of 5-2-88, § 27(10); Ord. of 1-19-93; Ord. of 9-2-08(3))

Secs. 15-107—15-120. - Reserved.

ARTICLE VI. - PEDESTRIANS^[5]

Footnotes:

--- (5) ---

Cross reference— Streets, sidewalks and other public places, Ch. 14.

State Law reference— Pedestrians, 29 M.R.S.A. §§ 904-A, 904-B.

Sec. 15-121. - Right-of-way at crosswalks.

Where traffic-control signals are not in place or in operation, the operator of a vehicle shall yield the right-of-way to a pedestrian crossing a public way within any marked crosswalk or at any intersection protected by a stop sign. When any vehicle is stopped at a crosswalk or intersection to permit a pedestrian to cross, the driver of any other vehicle approaching from the rear shall not overtake and pass the stopped vehicle.

(Ord. of 5-2-88, § 30)

Sec. 15-122. - Crossing at other than crosswalks.

Every pedestrian crossing a public way at any point other than within a crosswalk or protected intersection shall yield the right-of-way to all vehicles on the way.

(Ord. of 5-2-88, § 31)

Sec. 15-123. - Walk on left side of roadway.

Pedestrians shall walk on a sidewalk when there is one, otherwise, they shall walk on the left side of a public way, and shall yield to oncoming traffic by stepping off the paved portion of the way when traffic approaches.

(Ord. of 5-2-88, § 32)

Secs. 15-124—15-140. - Reserved.

ARTICLE VII. - BICYCLES AND SKATEBOARDS^[6]

Footnotes:

--- (6) ---

Cross reference— Streets, sidewalks and other public places, Ch. 14.

Sec. 15-141. - License required.

A resident of the town shall not operate a bicycle on any public way unless it has been licensed by the chief of police. The license must be evidenced by a tag furnished by the chief and affixed to the bicycle.

(Ord. of 5-2-88, § 33)

Sec. 15-142. - License record.

The chief of police shall keep a record of the name and address of the licensee, the number of the tag and a description of the bicycle so licensed.

(Ord. of 5-2-88, § 33; Ord. of 10-21-91)

Sec. 15-143. - Method of riding on sidewalks.

No person shall ride a bicycle on a sidewalk except in a prudent and reasonable manner having proper regard for public safety. In all cases, bicyclists on a sidewalk shall yield the right-of-way to pedestrians.

(Ord. of 5-2-88, § 33A; Emergency/Regular Ord. of 6-16-97; Emergency Ord. of 8-4-97)

Cross reference— Impoundment of bicycles, § 15-11.

Sec. 15-144. - Skateboards prohibited in certain places.

No person shall ride a skateboard on the sidewalks or in the street between the hours of 7:00 a.m. and 7:00 p.m. Monday through Saturday in the following areas:

- (1) *Maine Street*, between Mill St. and Bath Road.
- (2) *Pleasant Street*, between Union and Maine Streets.

(Ord. of 5-2-88, § 33B)

Cross reference— Impoundment of skateboard, § 15-10.

ITEM 16
BACKUP

Town of Brunswick, Maine

DEPARTMENT OF PLANNING AND DEVELOPMENT

MEMORANDUM

TO: Brunswick Town Council

FROM: Brunswick Planning Board
Matt Panfil, AICP CUD, Director of Planning & Development

DATE: February 3, 2020

SUBJECT: Zoning Ordinance Update – New Definition, “Environmental Resource Center” and Amendment to Table 3.2: Permitted Use Table for Growth Area Zoning Districts to Allow Environmental Resource Centers as Conditional Use in the Growth Outdoor (GO) Zoning District

I. INTRODUCTION

At their November 12, 2019 meeting, the Planning Board briefly discussed a suggestion by a property owner to allow for a new use in the Growth Outdoor (GO) Zoning District. The use would allow for a broad scope of activities related to agriculture, aquaculture, environmental studies and improvement, land and water conservation, and wildlife organization. Such activities could include office and meeting space, exhibit space, greenhouse, grounds for passive recreation, a commercial kitchen for public events or tenant use, etc.

At their November 26, 2019, December 10, 2019, and January 14, 2020 meetings, the Planning Board discussed multiple options to allow for such a use. Although the proposed use, defined as an *environmental resource center*, was first suggested by a property owner with their specific existing structure in mind, the Planning Board deemed the use to be appropriate for the entire GO District, thus allowing all properties within the GO District the ability to host such a use. The Planning Board considered allowing environmental resource centers in other zoning districts, but decided the GO District was sufficient and, if necessary, they could reevaluate its potential as an allowed use in other districts at a later date.

The Planning Board also discussed with staff that the proposed amendments were consistent with the Town’s 2008 Comprehensive Plan (Planning Area A.1.6, Brunswick Naval Air Station Reuse) and the BNAS Reuse Master Plan. It was confirmed that the amendments were consistent with the above referenced documents.

The draft of proposed zoning ordinance text amendments (Attachment A), as recommended by the Planning Board at their meeting on January 14, 2020 (Staff Memos included as Attachment B) is attached.

II. ACTION REQUESTED

It is recommended that the Town Council move to set a public hearing for the final adoption of the proposed zoning ordinance text amendments.

III. AMENDMENTS

- A. Proposed Zoning Ordinance Text Amendment
- B. Staff Memos to the Planning Board from November 26, 2019, December 10, 2019, and January 14, 2020
- C. Correspondence

ATTACHMENT A - PROPOSED ZONING ORDINANCE TEXT AMENDMENTS

New Text in Bold Underline ~~Deleted Text in Strikethrough~~

Chapter 1 - General Provisions
Section 1.7 - Definitions and Rules of Construction

1.7.2. Definitions

Environmental Resource Center: A structure or group of structures that provide various uses supporting activities related to agriculture, aquaculture, environmental studies and improvement, land and water conservation, and wildlife organizations. Provided that they are associated with the above referred uses, such uses may include, but are not limited to: office and meeting space for supporting such activities; commercial kitchen for public events or tenant use; exhibit space; greenhouse; grounds for passive recreation; picnic areas; non-motorized trails; incubator space; space for storage for conservation / trail maintenance equipment; bicycle and/or ski rental facilities; cooperative storage space for shared equipment, gear, and tools; and public lockers, restrooms, and showers.

DRAFT

ATTACHMENT A – PROPOSED ZONING ORDINANCE TEXT AMENDMENTS

New Text in Bold Underline Deleted Text in Strikethrough

3.2 Growth Area Permitted Use Table

Table 3.2: Permitted Use Table for Growth Area Zoning Districts																														
P = Permitted C = Allowed Only with a Conditional Use Permit X = Prohibited A = Allowed Only as an Accessory Use																														
Land Use	CURRENT ZONE	RR	RT & 8	R2	R3, 4, 5, 6	R7	TR1	TR2	TR3 & 4	TR5	MU2	MU3 & 6	MU4, 11, 14	MU1, CC	HC1 & 2	IC1, 2, 3	RCMU	MUOZ	CU1 & 3	CU5 & 6	CU4 & 7	CU/TC	CU2	GC5	GA	GI	GO	GN	Supplementary Use Standards	
	1997 ZONING DISTRICT																													
Principal Uses																														
Other Uses																														
<u>Environmental resource center</u>		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	C	X	



Town of Brunswick, Maine

DEPARTMENT OF PLANNING AND DEVELOPMENT

MEMORANDUM

TO: Planning Board

FROM: Matt Panfil, AICP CUD, Director of Planning & Development

DATE: November 26, 2019

SUBJECT: Workshop – Zoning Ordinance Amendment – Table 3.2: Permitted Use Table for Growth Area Zoning Districts, Growth Outdoor (GO) District

I. INTRODUCTION:

At their November 12, 2019 meeting, the Planning Board briefly discussed a potential zoning ordinance amendment to add a new use to the Growth Outdoor (GO) District in Table 3.2: Permitted Use Table for Growth Area Zoning Districts of the Town of Brunswick Zoning Ordinance (Attachment A).

The property owner expressed a desire to be able to reuse the existing structure to accommodate uses that would essentially be part of an environmental resource incubator and non-Park District affiliated recreation support uses. As outlined in a letter from the property owner (Attachment B), the proposed facility would allow for a broad scope of uses that is not anticipated by the Zoning Ordinance.

II. TOPICS FOR WORKSHOP DISCUSSION

- Is an amendment to Table 3.2 Permitted Use Table for Growth Area Zoning Districts preferable to any other alternative such as a map amendment to rezone the property to an adjacent zoning district: Growth Industrial (GI) District or Growth Mixed-Use 7 (GM7)?
- Staff's working draft term for the proposed use is "environmental resource center, event space, outdoor recreation, and environmentally-associated facilities." Please provide comments and suggestions.
- Should an "environmental resource center, event space, outdoor recreation, and environmentally-associated facilities" be allowed in other zoning districts aside from the Growth Outdoor (GO) District?

III. ATTACHMENTS:

- A. Table 3.2: Permitted Use Table for Growth Area Zoning Districts of the Town of Brunswick Zoning Ordinance.
- B. Letter from Thomas Wright, dated November 14, 2019

Town of Brunswick, Maine

DEPARTMENT OF PLANNING AND DEVELOPMENT

MEMORANDUM

TO: Planning Board

FROM: Matt Panfil, AICP CUD, Director of Planning & Development

DATE: December 10, 2019

SUBJECT: Workshop – Zoning Ordinance Amendment – Table 3.2: Permitted Use Table for Growth Area Zoning Districts, Growth Outdoor (GO) District

I. INTRODUCTION:

At their November 12 and November 26, 2019 meetings, the Planning Board briefly discussed a potential zoning ordinance amendment to add a new use to the Growth Outdoor (GO) District in Table 3.2: Permitted Use Table for Growth Area Zoning Districts of the Town of Brunswick Zoning Ordinance (Attachment A).

The property owner expressed a desire to be able to reuse an existing structure to accommodate uses that would essentially be part of an environmental resource incubator and non-Park District affiliated recreation support uses. The proposed facility would allow for a broad scope of uses that is not anticipated by the Zoning Ordinance. Therefore, staff has proposed a new definition, *environmental resource center*, that would be a new use listed in Table 3.2: Permitted Use Table for Growth Area Zoning Districts as a conditional use in only the Growth Outdoor (GO) District.

II. PROPOSED AMENDMENTS

Chapter 1 - General Provisions
Section 1.7 - Definitions and Rules of Construction

Environmental Resource Center: A structure, or group of structures, that provides various amenities, including, but not limited to: education; office; and meeting space, for supporting agriculture, aquaculture, environment, conservation, and wildlife organizations. Additional permissible uses include, but are not limited to: commercial kitchen for public events or tenant use; exhibit space; greenhouse; grounds for passive recreation, picnic areas, and non-motorized trails; incubator space; and storage for conservation / trail maintenance equipment. Other permissible uses, provided they are associated with an above referenced use include, but are not limited to: bicycle and/or ski rental facilities; cooperative storage space for shared equipment, gear, and tools; and public lockers, restrooms, and showers.

3.2 Growth Area Permitted Use Table

Table 3.2: Permitted Use Table for Growth Area Zoning Districts																												
P = Permitted C = Allowed Only with a Conditional Use Permit X = Prohibited A = Allowed Only as an Accessory Use																												
Land Use	CURRENT ZONE	GR1	GR2 & 10	GR3	GR4	GR5	GR6	GR7	GR8	GR9	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GC1	GC2	GC3	GC4	GC5	GA	GI	GO	GN	Supplementary Use Standards
	1997 ZONING DISTRICT	RR	R1 & 8	R2	R3, 4, 5, 6	R7	TR1	TR2	TR3 & 4	TR5	MU2	MU3 & 6	MU4, 11, 14	MU1, CC	HC1 & 2	IC1, 2, 3	RCMU	MUOZ	CU1 & 3	CU5 & 6	CU4 & 7	CU/TC	CU2	R-AR	I2, I3, RBTI	R-R&OS	BCN	
Principal Uses																												
Other																												
Environmental resource center		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	C	X

III. ATTACHMENTS:

- A. Table 3.2: Permitted Use Table for Growth Area Zoning Districts of the Town of Brunswick Zoning Ordinance
- B. Letter from Thomas Wright, dated November 14, 2019
- C. Email from Thomas Wright, dated December 3, 2019

Town of Brunswick, Maine

DEPARTMENT OF PLANNING AND DEVELOPMENT

MEMORANDUM

TO: Planning Board

FROM: Matt Panfil, AICP CUD, Director of Planning & Development

DATE: January 14, 2020

SUBJECT: Public Hearing – Zoning Ordinance Amendment – Table 3.2: Permitted Use Table for Growth Area Zoning Districts, Growth Outdoor (GO) District

I. INTRODUCTION:

At their November 12, November 26, and December 10, 2019 meetings, the Planning Board discussed a potential zoning ordinance amendment to add a new use to the Growth Outdoor (GO) District in Table 3.2: Permitted Use Table for Growth Area Zoning Districts of the Town of Brunswick Zoning Ordinance (Attachment A).

A property owner within the GO District has expressed a desire to be able to reuse an existing structure to accommodate uses that would essentially be part of multi-tenant space for environmental-, recreational-, and natural resource-associated uses including office space, an environmental resource incubator, meeting and exhibit space, and non-Park District affiliated recreation support uses. The proposed facility would allow for a broad scope of uses that is not anticipated by the Zoning Ordinance. Therefore, the Planning Board has proposed a new definition, *environmental resource center*, that would be a new use listed in Table 3.2: Permitted Use Table for Growth Area Zoning Districts as a conditional use in only the Growth Outdoor (GO) District.

II. PROPOSED AMENDMENTS

New Text in Bold Underline

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Chapter 1 - General Provisions
Section 1.7 - Definitions and Rules of Construction

Environmental Resource Center: A structure or group of structures that provide various uses supporting activities related to agriculture, aquaculture, environmental studies and improvement, land and water conservation, and wildlife organizations. Provided that they are associated with the above referred uses, such uses may include, but are not limited to: office and meeting space for supporting such activities; commercial kitchen for public events or tenant use; exhibit space; greenhouse; grounds for passive recreation; picnic areas; non-motorized trails; incubator space; space for storage for conservation / trail maintenance equipment; bicycle and/or ski rental facilities; cooperative storage space for shared equipment, gear, and tools; and public lockers, restrooms, and showers.

3.2 Growth Area Permitted Use Table

Table 3.2: Permitted Use Table for Growth Area Zoning Districts																												
P = Permitted C = Allowed Only with a Conditional Use Permit X = Prohibited A = Allowed Only as an Accessory Use																												
Land Use	CURRENT ZONE	GR1	GR2 & 10	GR3	GR4	GR5	GR6	GR7	GR8	GR9	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GC1	GC2	GC3	GC4	GC5	GA	GI	GO	GN	Supplementary Use Standards
	1997 ZONING DISTRICT	RR	R1&8	R2	R3, 4, 5, 6	R7	TR1	TR2	TR3 & 4	TR5	MU2	MU3 & 6	MU4, 11, 14	MU1, CC	HC1 & 2	TC1, 2, 3	RCMU	MUOZ	CU1&3	CU5 & 6	CU4 & 7	CU/TC	CU7	R-AR	I2, 13, RBTI	R-R&OS	BCN	
Principal Uses																												
Other																												
Environmental resource center		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	C	X

III. ATTACHMENTS:

- A. Table 3.2: Permitted Use Table for Growth Area Zoning Districts of the Town of Brunswick Zoning Ordinance
- B. Letter from Thomas Wright, dated November 14, 2019
- C. Email from Thomas Wright, dated December 3, 2019

14 November 2019

Matt and Jared, thank you for suggesting the workshop meeting as a way to move forward. I think the positive response of the committee was indicative of the interest in having a conservation/education, trailhead and recreation support center for Brunswick.

Many years ago I built the Outdoor Recreation Center for Bowdoin and see no reason why the Town couldn't have as nice a facility.

The purpose of my note is to give you a list of the various agencies and uses that have shown interest in being part of the space so you can consider how those might fit into the "option" designation.

Brunswick Topsham Land Trust, meeting, conference, cubicle space.

Pine Island: meeting and Storage

CREA: meeting and office

Teens to Trails: meeting and cubicle space

Maine Coast Fisherman's Assn. : office and meeting

NEMBA

Public Restrooms

Event Space for programs and conservation education

Cooperative Storage: Stewardship tool library, shared gear hub, Outdoor Recreation equipment storage, The Real School, Harpswell Coastal Academy, YMCA, Seeds of Independence.

Maintenance Equipment Storage for trail maintenance.

Public Service Office: Police, First Aid etc. (ATV storage for patrols)

Incubator space

Commercial Kitchen for public events or COOP use

Ski and Bike Rental

Showers and lockers.

Indoor Golf.

Aquaculture, mushroom farm

Fireplace

Greenhouse on the South Side of the Building

Picnic area

From: [Thomas Wright](#)
To: [Matt Panfil](#)
Subject: 179 Neptune, GO Zone
Date: Tuesday, December 3, 2019 11:24:23 AM

Matt, here is my condensed version after several more attempts.

Regards, Tom

Community based organizations supporting activities and practices consistent with the GO zone intention of conservation, education, recreation, health, nutrition, safety, agriculture and community engagement.

This email has been scanned for spam and viruses by Proofpoint Essentials. Click [here](#) to report this email as spam.

From: [Catherine Ferdinand](#)
To: [Matt Panfil](#); [Julie Erdman](#)
Cc: [Matthew Orlando](#)
Subject: Comments regarding Case #19-052 - Zoning Ordinance Amendment, Use Table
Date: Monday, January 13, 2020 3:53:36 PM

Dear Matt and Julie,

I'd be very grateful if you would forward these comments regarding tomorrow night's meeting agenda item #3 to members of the Planning Board.

Thanks so much,

Catherine

To: Members of the Brunswick Planning Board

January 13, 2020

Re: Case #19-052 Zoning Ordinance Amendment, Use Table – adding definition of Environmental Resource Center to Use Table for Growth Area Zoning Districts

Bowdoin College has no objection to the proposed definition of the use, **Environmental Resource Center** or to its addition to **Table 3.2: Permitted Use Table for Growth Area Zoning Districts**.

We do ask that should the Planning Board include this new use in the table, that the use, as defined, be allowed in the Growth College (GC) Use Districts. Since the ordinance rewrite in 2017, College buildings or structures developed in support of academic studies fall under the ordinance definition of "College". While we could argue that any development of structures in support of academics be defined as College and allowed per Table 3.2, having an alternate specific definition in the ordinance that includes the same or similar activities, prohibited in these same zoning districts creates confusion.

Components of the Environmental Resource Center definition such as (urban) agriculture, aquaculture, and offices are allowed uses in all the Growth College districts. Recreational facilities as an accessory use are also allowed in all GC districts. Having these activities prohibited in the College Use districts if they are associated with what could be defined as an Environmental Resource Center, seems to go against the intent of the ordinance.

Thank you for your attention to our concern. I plan to attend the public hearing and would be happy to answer any questions and work with board to avoid unintended consequences of this proposed change.

Catherine

Catherine Ferdinand | *Government Relations and Land Use Specialist*

Bowdoin College

Office of the Treasurer

5600 College Station

Brunswick, ME 04011-8447

P: 207.725.3093 | C: 207.841.8367 | F: 207.751.5161

cferdina@bowdoin.edu

ITEM 17
BACKUP

Town of Brunswick, Maine

DEPARTMENT OF PLANNING AND DEVELOPMENT

MEMORANDUM

TO: Brunswick Town Council

FROM: Brunswick Planning Board
Matt Panfil, AICP CUD, Director of Planning & Development

DATE: February 3, 2020

SUBJECT: Zoning Ordinance Update – Outdoor Lighting

I. INTRODUCTION

Since the adoption of the Brunswick Zoning Ordinance on August 7, 2017, the Department of Planning and Development has been notified of several areas in need of improvements or minor alterations. Staff maintains a list of requested improvements (Attachment A) and is in the process of making the desired changes. The attached draft of proposed zoning ordinance text amendments, as recommended by the Planning Board at their meeting on January 14, 2020 (Planning Board Staff Memo included as Attachment C), pertain to the following sections of the Brunswick Zoning Ordinance (the complete text is included as Attachment B):

- Section 1.7.2 – Definitions

New definitions proposed include:

- *Correlated Color Temperature;*
- *Disability Glare;*
- *Foot-Candle;*
- *Kelvin;*
- *Light Trespass.*

All new definitions were included in the Planning Board Staff Memo for the January 14, 2020 Public Hearing with the exception of “disability glare,” which was altered at the Public Hearing.

- Section 4.10.1 – Outdoor Lighting
 - Deleted Subsection 4.10.1.B.(1).a that exempted, “lighting emitting brightness less than 2600 lumens.” The result of this amendment is that all lighting is now required to comply with Section 4.10.1, Outdoor Lighting. This standard was added to the proposed amendments at the January 14, 2020 Public Hearing and was not included in the Planning Board Staff Memo (Attachment C). Due to the last minute change, staff is unable to advise on the potential creation of nonconformities and other unintended consequences.
 - Amended Subsection 4.10.1.B.(3).a to require full cutoff light shielding for all lighting emitting brightness exceeding 1800 lumens rather than the existing 2600 lumen standard. This standard was added to the proposed amendments at the January 14,

2020 Public Hearing and was not included in the Planning Board Staff Memo (Attachment C). Due to the last minute change, staff is unable to advise on the potential creation of nonconformities and other unintended consequences.

- Added a new standard (Subsection 4.10.1.B.(5) for light color temperature. Although there has not been an existing standard, the Planning Board has been asking for applicants to limit lighting temperature to 3,000 Kelvin. This amendment seeks to formalize an ongoing Planning Board practice. This amendment was included in the Planning Board Staff Memo.
- Added a quantitative standard by which to measure light trespass at private property lines. Subsection 4.10.1.B.(3).a.iv currently requires lighting, “be directed away from adjacent properties and streets,” but does not identify a method in which to measure the level of light trespass. New Subsection 4.10.1.B.(6) establishes a maximum 0.1 foot-candles of light allowed at adjacent residentially-zoned property lines and 0.5 foot-candles at adjacent mixed-use-zoned property lines. This new standard allows for light to trespass when adjacent to the public right-of-way. This amendment was included in the Planning Board Staff Memo.

II. ACTION REQUESTED

It is recommended that the Town Council move to set a public hearing for the final adoption of the proposed zoning ordinance text amendments.

III. ATTACHMENTS:

- A. Zoning Ordinance Improvement Program (ZIP) Matrix
- B. Proposed Zoning Ordinance Text Amendment
- C. Staff Memos to the Planning Board from November 26, 2019, December 10, 2019, and January 14, 2020
- D. List of Other Outdoor Lighting Topics the Planning Board Would Like to Consider
- E. Regional Communities’ Lighting Standards Spreadsheet
- F. Supplemental Outdoor Lighting Information (various sources, for additional information please download the November 26, 2019 Planning Board packet from the Town website)

Post Zoning Ordinance Rewrite Committee (ZORC) Zoning Ordinance Revisions				
Section	Page #	Title	Comment	Recommendation
1.6.3	1-8	Nonconforming Uses	Allow for reconstruction within 3 years in WPO	Staff recommends removing WPO from 1.6.3.D and effectively changing the time limit on reconstruction within the WPO from 1 year (like SPO, APO and FPO) to 3 years.
1.7.2	1-16	Definitions	Add language for interpretation of undefined words	Staff recommends adding language, "Words contained in this ordinance and not defined hereinafter shall assume definitions as prescribed in the most recently published edition of Merriam-Webster's Collegiate Dictionary."
1.7.2	1-16	Definitions	Add language to "Accessory Structure" definition	Staff recommends adding the word "detached"; "a detached structure subordinate to the principal structure..."
1.7.2	1-17	Definitions	Define "Block"	Staff recommends adding definition.
1.7.2	1-18	Definitions	Define "Canopy, Accessory Use"	Staff recommends adding definition.
1.7.2	1-24	Definitions	Define "Hospital"	Staff recommends adding definition.
1.7.2	1-27	Definitions	Add language to "Motor Vehicle Fueling Station" definition	Staff recommends adding "except electric fueling stations accessory to a permitted use".
1.7.2	1-28	Definitions	Define "Permanent Dwelling"	Staff recommends adding definition.
1.7.2	1-28	Definitions	Define "Parking Facility, Accessory Use"	Staff recommends adding definition. Parking Facility as a Principal Use is defined.
1.7.2	1-29	Definitions	Delete "salt meadow" definition since not used in zoning ordinance. Don't need multiple terms for a "Salt Marsh," also defined.	Staff recommends keeping both definitions pending the post adoption SPO review. Both terms are presently used in ordinance.
1.7.2	1-36	Definitions	Consider lowering the percentage of floor area permitted for "use, accessory."	
2.3.4	2-38	Flood Protection Overlay		Review Flood Protection Standards
2.3.8.D.(11)	2-53	Telecommunication Overlay (TCO) District - Lighting	Design lighting to minimize bird impacts.	Recommendation: Include comment as part of post adoption lighting revision (Section 4.10).
Tables 3.2 and 3.3	3-2, 3-3, 3-6	Permitted Uses in Growth and Rural Districts	Allow water-based aquaculture within zoning districts along Androscoggin River.	Recommendation: No change in draft ordinance as additional neighborhood-level input and discussions with appropriate Town Committees will be required. Consider inclusion after ordinance adoption.

Post Zoning Ordinance Rewrite Committee (ZORC) Zoning Ordinance Revisions				
Section	Page #	Title	Comment	Recommendation
4.2.5.B(4)e	4-7	Supplementary Dimensional and Density Standards	Review impact of rural steep slope language.	
4.5.1.C.(5)	4-25	Sewage Disposal	HAT = "Highest Annual Tide" not highest average tide. Also, any system within 1 foot elevation above HAT will have problems. Given projections of 3 foot rise in 50 years (conservative) this should be bumped up to at least 1 meter. Complete	Recommendation: Delete "average" and replacing with "annual". Agree with planning for 50-100 year sea level rise predications and suggest adopting the proposed 1-foot language as written since the lowest predicted sea level rise is 0.7 feet and the highest predicted rise is 6.6 feet (re: Global Sea Level Rise Scenarios for the United States National Climate Assessment [12/6/2012]). Staff recommends engaging in a public stakeholder process after ordinance adoption to consider predicted sea level rise including: maximum warming, thermal expansion, predicted ice sheet loss, and storm surge.
4.10	4-45	Lighting	Consider more specific "dark sky" lighting standards / overlay district.	Having reviewed materials provided by commenter, as well as from other municipalities, such as Bar Harbor and other Mt. Desert Island communities, ZORC recommends further consideration is postponed until after ordinance adoption. Inclusion will require additional public participation and vetting of any proposed standards over and above finalizing the draft ordinance. Recommendation: No change at this time.
4.10.1.B.(1).c	4-45	Lighting	Consider regulating lighting at approved sports facilities	Agreed to delete proposed exemption (also contained in current zoning ordinance) and develop appropriate standards with public input after ordinance adoption as part of "dark sky" lighting revisions noted above. Recommendation: No change at this time.
5.2.3/5.2.9	5-9, 5-10/5-50, 5-51	Special Permits	Conflicting expirations on Special Permits	Staff recommends the Board discuss whether permits should expire in 2 years or 3 years. Currently, as stated in section 1.5, when two parts of the ordinance conflict the more restrictive provision applies.
5.3	N/A	Violations, Enforcement, and Penalties	Add a clear enforcement mechanism for buildings and sites not built according to plan and do not meet the allowable administrative adjustment criteria.	

Post Zoning Ordinance Rewrite Committee (ZORC) Zoning Ordinance Revisions				
Section	Page #	Title	Comment	Recommendation
Appendix B, B.2	B-1	Private Street Standards	The established private street standards are inconsistent with other sections of municipal code (NFPA).	A.) Delete private street standards in their entirety; or B.) Amend private street standards to be consistent with all other sections of municipal code. If "Option B," consider moving private street standards to Chapter 14 – Streets, Sidewalks and Other Public Places of the municipal code. If necessary rephrase the title of Chapter 14 to make clear that "Streets" includes both public and private street standards.
N/A	N/A	Short-Term Rentals	Develop provisions for Short-Term Rentals.	ZORC discussed the addition of short-term rentals as a use and appropriate standards late in the process. Recommendation: No change in draft ordinance. Consider inclusion as an amendment after ordinance adoption.
N/A		Amateur Radio Towers		Pending legal counsel recommendations.

ATTACHMENT B – PROPOSED ZONING ORDINANCE TEXT AMENDMENTS

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Chapter 1 - General Provisions
Section 1.7 - Definitions and Rules of Construction

1.7.2. Definitions

Correlated Color Temperature (CCT): Specification of the color appearance of the light emitted by a lamp, relating its color to the color of light from a reference source when heated to a particular temperature, measured in degrees Kelvin (K).

Disability Glare: Visual disturbance produced by the introduction of stray light into the eye that reduces the ability to resolve spatial detail.

Foot-Candle: A unit of measure of the amount of light (illumination) falling on a surface, equal to one lumen per square foot.

Kelvin: The base unit of thermodynamic temperature in the International System of Units (SI) that is equal to 1/273.16 of the Kelvin scale temperature of the triple point of water. Kelvin is used to describe the hue of a specific light source. The higher the Kelvin value, the cooler (blue to white) the hue of the light and the lower the Kelvin value, the warmer (yellow) the hue of the light.

Light Trespass: Lighting that falls beyond the boundaries of the property it is intended to illuminate.

ATTACHMENT B – PROPOSED ZONING ORDINANCE TEXT AMENDMENTS

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Chapter 5 - Administration
Section 4.10 - Lighting

4.10 Lighting

4.10.1. Outdoor Lighting

A. General Standard

Outdoor lighting shall not adversely impact road safety or adjacent properties and uses.

B. Specific Standards

(1) Exemptions

The following types of lighting are exempt from the standards in this Subsection 4.9.1.(B):

- a. ~~Lighting emitting brightness less than 2600 lumens;~~
- b. White string mini-lights used in window displays or in trees, bushes, and shrubs as part of the landscaping;
- c. Lighting of approved sports facilities;
- d. Short-term use of lighting for public festivals, celebrations, and the observance of holidays; and
- e. Lighting required and regulated by the Federal Aviation Administration (FAA).

(2) Lighting Height

The maximum height of regulated freestanding lights shall be the height of the principal building or 25 feet, whichever is less.

(3) Light Shielding

- a. All lighting emitting brightness exceeding ~~2600~~ **1800** lumens shall:
 - i. Conform to the Illumination Engineering Society (IES) Specification for Full Cutoff;
 - ii. Be shielded to direct all light towards the ground so that the lighting elements are not exposed to normal view;
 - iii. Avoid disability glare (i.e., avoid being a hazard or nuisance to motorists, pedestrians, or neighboring residents);
 - iv. Be directed away from adjacent properties and streets, including properties separated from the development site by a street, road, or right-of-way, so that the lighting elements are not exposed to normal view by motorists or sidewalk pedestrians, or from adjacent properties.
- b. Compliance with this Subsection shall be achieved with fixture shielding, directional control designed into the fixture, fixture location, fixture height, fixture aim, or a combination of these measures.

(4) Lighting Maintenance

All outdoor lighting shall be maintained pursuant to Section 4.15 (Maintenance)

(5) **Light Color Temperature**

The correlated color temperature of any outdoor light source shall not exceed 3,000 Kelvin unless introduced as part of a building or landscape lighting scheme used exclusively for the decorative illumination through color of certain building façade or landscape features. All outdoor lighting shall be maintained pursuant to Section 4.15 (Maintenance)

ATTACHMENT B – PROPOSED ZONING ORDINANCE TEXT AMENDMENTS

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(6) **Light Trespass**

Except for public street lighting, light emitted from any outdoor light source(s) shall not cause the light level along any adjacent residentially-zoned property line to exceed 0.1 foot-candles or any adjacent mixed-use-zoned property line to exceed 0.5 foot-candles. Light emitted from any outdoor light source(s) may trespass into the public right-of-way.

DRAFT

Town of Brunswick, Maine

DEPARTMENT OF PLANNING AND DEVELOPMENT

MEMORANDUM

TO: Planning Board
FROM: Matt Panfil, AICP CUD, Director of Planning & Development
DATE: November 26, 2019
SUBJECT: Workshop – Zoning Ordinance Update – Outdoor Lighting

****** PLANNING BOARD MEMBERS PLEASE NOTE THAT YOU DO NOT NEED TO READ ALL OF THE ATTACHMENTS FOR THE MEETING. THE ATTACHMENTS ARE FOR YOUR REFERENCE AND FUTURE WORKSHOPS ******

I. INTRODUCTION:

Since the adoption of the Brunswick Zoning Ordinance on August 7, 2017, the Planning and Development Department has been notified of several areas in need of improvement. Staff maintains a list of requested improvements (Attachment A). This workshop will focus on updating the existing outdoor lighting standards located in Sections 4.9.3, 4.10.1, and 4.15.5 of the Zoning Ordinance.

II. EXSITING OUTDOOR LIGHTING STANDARDS:

4.9 Parking and Loading

4.9.3. Design, Construction and Maintenance of Parking Areas

A. Surfacing, Drainage, Lighting

- (1) Parking areas shall be lighted in a manner that does not result in direct lighting to or glare to abutting residential properties or cause a traffic hazard due to glare.

4.10 Lighting

4.10.1 Outdoor Lighting

A. General Standard

Outdoor lighting shall not adversely impact road safety or adjacent properties and uses.

B. Specific Standards

- (1) Exemptions

The following types of lighting are exempt from the standards in this Subsection 4.9.1.(B):

- a. Lighting emitting brightness less than 2600 lumens;
- b. White string mini-lights used in window displays or in trees, bushes, and shrubs as part of the landscaping;
- c. Lighting of approved sports facilities;
- d. Short-term use of lighting for public festivals, celebrations, and the observance of holidays; and
- e. Lighting required and regulated by the Federal Aviation Administration (FAA).

(2) Lighting Height

The maximum height of regulated freestanding lights shall be the height of the principal building or 25 feet, whichever is less.

(3) Light Shielding

- a. All lighting emitting brightness exceeding 2600 lumens shall:
 - i. Conform to the Illumination Engineering Society (IES) Specification for Full Cutoff;
 - ii. Be shielded to direct all light towards the ground so that the lighting elements are not exposed to normal view;
 - iii. Avoid disability glare (i.e., avoid being a hazard or nuisance to motorists, pedestrians, or neighboring residents);
 - iv. Be directed away from adjacent properties and streets, including properties separated from the development site by a street, road, or right-of-way, so that the lighting elements are not exposed to normal view by motorists or sidewalk pedestrians, or from adjacent properties.
- b. Compliance with this Subsection shall be achieved with fixture shielding, directional control designed into the fixture, fixture location, fixture height, fixture aim, or a combination of these measures.

(4) Lighting Maintenance

All outdoor lighting shall be maintained pursuant to Section 4.15 (Maintenance).

4.15 Site Feature Maintenance

4.15.5. Specific Standards: Outdoor Lighting Maintenance

- A. All outdoor lighting installed on all property shall be maintained in compliance with the standards in Section 4.10 (Outdoor Lighting) and with any conditions attached to a development approval.
- B. Any lighting required to be installed pursuant to this Ordinance that becomes non-functional shall be promptly repaired or replaced so that it complies with the standards in Section 4.10 (Outdoor Lighting) and with any conditions attached to a development approval.

III. DEFINING THE ISSUE

At their first outdoor lighting workshop on November 12, the Planning Board expressed concerns regarding color temperature, excessive glare, and light trespass. A review of the Town's existing outdoor lighting standards (above) demonstrates that although the standards do not address color temperature and only minimally address excessive glare and light trespass. Noticeably absent are quantitative standards by which to regulate these issues.

According to the American Planning Association (APA):

Poorly oriented or shielded light fixtures can cause glare (excessive brightness that makes it difficult to see) and light trespass (illumination spilling over into areas where it is not needed or wanted). Both glare and light trespass contribute to artificial nighttime sky glow, or light pollution, which negatively affects wildlife, ecosystems, and human health. Glare can be a safety hazard to drivers or pedestrians at night, and light trespass across property lines can be a nuisance to neighbors. Excessive nighttime lighting also wastes energy.

Staff has assembled an informational packet (see Attachments B-E) that includes introductory information regarding outdoor lighting and regulations, articles, model guidelines and ordinances, and examples from municipalities as recommended for review by the APA.

IV. TOPICS FOR WORKSHOP DISCUSSION

As the topic of outdoor lighting can be complex, staff recommends that this workshop focus on some basic issues before moving forward with specific recommendations. Issues meriting consideration include:

- To what extent do the existing outdoor lighting standards need revision? Should they just address the previously identified issues of color temperature, glare, and light trespass? Or are additional standards, such as those found in Attachment E, necessary?
- Should the outdoor lighting amendments differentiate between residential and non-residential uses?
- Should the outdoor lighting amendments differentiate between the Rural Area and the Growth Area?
- Should there be additional outdoor lighting standards for uses with a high light intensity,

such as gas stations?

- Should specific types of outdoor lighting be required, for example LED lighting fixtures?
- Should the existing method of addressing nonconforming outdoor lighting be continued? Or adjusted?
- Are there definitions that need to be added to the Zoning Ordinance?
- What are the best and easiest quantitative measures that can be used to address color temperature, glare, and light trespass?
- Should outdoor lighting be regulated by type, including security lighting, building-mounted lighting, pedestrian lighting, and landscape lighting?
- Do hours of operation need to be established?

V. ATTACHMENTS:

- A. Zoning Improvement Program (ZIP) Matrix
- B. Outdoor Lighting Basics
- C. Articles
- D. Outdoor Lighting Guidelines
- E. Municipal Outdoor Lighting Regulations Recommended for Review by APA

Town of Brunswick, Maine

DEPARTMENT OF PLANNING AND DEVELOPMENT

MEMORANDUM

TO: Planning Board

FROM: Matt Panfil, AICP CUD, Director of Planning & Development

DATE: December 10, 2019

SUBJECT: Workshop – Zoning Ordinance Update – Outdoor Lighting

I. INTRODUCTION:

At the previous lighting workshop on November 26, 2019 the Planning Board discussed a broad arrange of topics relating to outdoor lighting. It became apparent that there are many possible potential outdoor lighting regulations to implement. Some regulations and model ordinances that the Board reviewed may represent a policy change and it was determined that it may be best to discuss such changes with Town Council before crafting language for a Zoning Ordinance amendment. Other regulations are rather straightforward and can immediately address the previously identified issues of color temperature, glare, and light trespass. The Planning Board directed staff to prepare draft Zoning Ordinance amendment language for such regulations.

II. PROPOSED ZONING ORDINANCE AMENDMENTS:

The following proposed zoning ordinance amendments address the issues of color temperature and light trespass. Although the Illumination Engineering Society (IES) adopted a new classification system, referred to as BUG (backlight-uplight-glare), that replaces the former cutoff classification system with a numeric rating system for glare, the existing light shielding requirements found in Section 4.10.1.B.(3) below are still a reliable standard to minimize glare. An in-depth review of the appropriateness of adopting a complete, or elements of, BUG rating system can be conducted by the Planning Board at a later date.

The following amendments have been prepared to provide definitions and quantitative standards for color temperature and light trespass:

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Chapter 1 - General Provisions
Section 1.7 - Definitions and Rules of Construction

Correlated Color Temperature (CCT): Specification of the color appearance of the light emitted by a lamp, relating its color to the color of light from a reference source when heated to a particular temperature, measured in degrees Kelvin (K).

Foot-Candle: A unit of measure of the amount of light (illumination) falling on a surface, equal to one lumen per square foot.

Glare: A visual disturbance produced by a distinct light source directly, or indirectly from reflective surfaces, that causes visual discomfort or reduced visibility because it is sufficiently brighter than the level to which the eyes are adapted.

Kelvin: The base unit of thermodynamic temperature in the International System of Units (SI) that is equal to 1/273.16 of the Kelvin scale temperature of the triple point of water. Kelvin is used to describe the hue of a specific light source. The higher the Kelvin value, the cooler (blue to white) the hue of the light and the lower the Kelvin Value, the warmer (yellow) the hue of the light.

Light Trespass: Lighting that falls beyond the boundaries of the property it is intended to illuminate.

Chapter 4 - Property Development Standards
Section 4.10 - Lighting

4.10 Lighting

4.10.1 Outdoor Lighting

A. General Standard

Outdoor lighting shall not adversely impact road safety or adjacent properties and uses.

B. Specific Standards

(1) Exemptions

The following types of lighting are exempt from the standards in this Subsection 4.9.1.(B):

- a. Lighting emitting brightness less than 2600 lumens;
- b. White string mini-lights used in window displays or in trees, bushes, and shrubs as part of the landscaping;
- c. Lighting of approved sports facilities;
- d. Short-term use of lighting for public festivals, celebrations, and the observance of holidays; and
- e. Lighting required and regulated by the Federal Aviation Administration (FAA).

(2) Lighting Height

The maximum height of regulated freestanding lights shall be the height of the principal building or 25 feet, whichever is less.

(3) Light Shielding

- a. All lighting emitting brightness exceeding 2600 lumens shall:
 - i. Conform to the Illumination Engineering Society (IES) Specification for Full Cutoff;
 - ii. Be shielded to direct all light towards the ground so that the lighting elements are not exposed to normal view;
 - iii. Avoid disability glare (i.e., avoid being a hazard or nuisance to motorists, pedestrians, or neighboring residents);
 - iv. Be directed away from adjacent properties and streets, including properties separated from the development site by a street, road, or right-of-way, so that the lighting elements are not exposed to normal view by motorists or sidewalk pedestrians, or from adjacent properties.
- b. Compliance with this Subsection shall be achieved with fixture shielding, directional control designed into the fixture, fixture location, fixture height, fixture aim, or a combination of these measures.

(4) Lighting Maintenance

All outdoor lighting shall be maintained pursuant to Section 4.15 (Maintenance).

(5) Light Color Temperature

The correlated color temperature of any outdoor light source shall not exceed 3,000 Kelvin unless introduced as part of a building or landscape lighting scheme used exclusively for the decorative illumination through color of certain building façade or landscape features.

(6) Light Trespass

Except for street lighting, light emitted from any outdoor light source shall not cause the light level along any adjacent residentially-zoned property line to exceed 0.1 foot-candles or any adjacent mixed-use-zoned property line to exceed 0.5 foot-candles.

III. TOPICS FOR FURTHER DISCUSSION

Although the proposed amendment should help reduce the issues of color temperature and light trespass, outdoor lighting regulations can be complex and may represent a shift in established policy. Staff recommends that the Planning Board move forward with the above proposed Zoning Ordinance Amendments, but further discussion on the following issues may merit discussion:

- Should there be different outdoor lighting standards for residential and non-residential uses? Rural Area and the Growth Area?
- Should there be additional outdoor lighting standards for uses with a high light intensity, such as gas stations?

- Should specific types of outdoor lighting be required, for example LED lighting fixtures?
- Should the existing method of addressing nonconforming outdoor lighting be continued? Or adjusted?
- Should outdoor lighting be regulated by type, including security lighting, building-mounted lighting, pedestrian lighting, and landscape lighting?
 - Do hours of operation need to be established?

Town of Brunswick, Maine

DEPARTMENT OF PLANNING AND DEVELOPMENT

MEMORANDUM

TO: Planning Board

FROM: Matt Panfil, AICP CUD, Director of Planning & Development

DATE: January 14, 2020

SUBJECT: Public Hearing – Zoning Ordinance Update – Outdoor Lighting

I. INTRODUCTION:

At the previous lighting workshops on November 26 and December 10, 2019 the Planning Board discussed a broad arrange of topics relating to outdoor lighting. Through the workshops, it became apparent that there are many possible potential outdoor lighting regulations to implement. Some regulations and model ordinances that the Board reviewed would represent a policy change and should be discussed with Town Council prior to drafting a Zoning Ordinance amendment. Other potential regulations discussed at the workshops are rather straightforward and the Planning Board indicated their willingness to immediately address the previously identified lighting issues of color temperature, glare, and light trespass. The Planning Board directed staff to prepare draft Zoning Ordinance amendment language for such regulations.

II. PROPOSED ZONING ORDINANCE AMENDMENTS:

The following proposed zoning ordinance amendments address the issues of color temperature and light trespass. Although the Illumination Engineering Society (IES) adopted a new classification system, referred to as BUG (backlight-uplight-glare), that replaces the former cutoff classification system (currently used by the Town) with a numeric rating system for glare, the existing light shielding requirements found in Section 4.10.1.B.(3) below are still a reliable standard to minimize glare. An in-depth review of the appropriateness of adopting a complete, or elements of, BUG rating system can be conducted by the Planning Board at a later date.

The following amendments have been prepared to provide definitions and quantitative standards for color temperature and light trespass:

New Text in Bold Underline

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Chapter 1 - General Provisions
Section 1.7 - Definitions and Rules of Construction

Correlated Color Temperature (CCT): Specification of the color appearance of the light emitted by a lamp, relating its color to the color of light from a reference source when heated to a particular temperature, measured in degrees Kelvin (K).

Foot-Candle: A unit of measure of the amount of light (illumination) falling on a surface, equal to one

lumen per square foot.

Glare: A visual disturbance produced by a distinct light source directly, or indirectly from reflective surfaces, that causes visual discomfort or reduced visibility because it is sufficiently brighter than the level to which the eyes are adapted.

Kelvin: The base unit of thermodynamic temperature in the International System of Units (SI) that is equal to 1/273.16 of the Kelvin scale temperature of the triple point of water. Kelvin is used to describe the hue of a specific light source. The higher the Kelvin value, the cooler (blue to white) the hue of the light and the lower the Kelvin Value, the warmer (yellow) the hue of the light.

Light Trespass: Lighting that falls beyond the boundaries of the property it is intended to illuminate.

Chapter 4 - Property Development Standards
Section 4.10 - Lighting

4.10 Lighting

4.10.1 Outdoor Lighting

A. General Standard

Outdoor lighting shall not adversely impact road safety or adjacent properties and uses.

B. Specific Standards

(1) Exemptions

The following types of lighting are exempt from the standards in this Subsection 4.9.1.(B):

- a. Lighting emitting brightness less than 2600 lumens;
- b. White string mini-lights used in window displays or in trees, bushes, and shrubs as part of the landscaping;
- c. Lighting of approved sports facilities;
- d. Short-term use of lighting for public festivals, celebrations, and the observance of holidays; and
- e. Lighting required and regulated by the Federal Aviation Administration (FAA).

(2) Lighting Height

The maximum height of regulated freestanding lights shall be the height of the principal building or 25 feet, whichever is less.

(3) Light Shielding

- a. All lighting emitting brightness exceeding 2600 lumens shall:
 - i. Conform to the Illumination Engineering Society (IES) Specification for Full Cutoff;
 - ii. Be shielded to direct all light towards the ground so that the lighting elements are not exposed to normal view;
 - iii. Avoid disability glare (i.e., avoid being a hazard or nuisance to motorists, pedestrians, or neighboring residents);
 - iv. Be directed away from adjacent properties and streets, including properties separated from the development site by a street, road, or right-of-way, so that the lighting elements are not exposed to normal view by motorists or sidewalk pedestrians, or from adjacent properties.
- b. Compliance with this Subsection shall be achieved with fixture shielding, directional control designed into the fixture, fixture location, fixture height, fixture aim, or a combination of these measures.

(4) Lighting Maintenance

All outdoor lighting shall be maintained pursuant to Section 4.15 (Maintenance).

(5) Light Color Temperature

The correlated color temperature of any outdoor light source shall not exceed 3,000 Kelvin unless introduced as part of a building or landscape lighting scheme used exclusively for the decorative illumination through color of certain building façade or landscape features.

(6) Light Trespass

Except for street lighting, light emitted from any outdoor light source shall not cause the light level along any adjacent residentially-zoned property line to exceed 0.1 foot-candles or any adjacent mixed-use-zoned property line to exceed 0.5 foot-candles.

III. ATTACHMENTS:

Attachment A: Lighting Basics, published by the International Dark-Sky Association

ATTACHMENT D

List of Other Outdoor Lighting Topics the Planning Board Would Like to Consider

At the outdoor lighting workshops on November 26 and December 10, 2019 the Planning Board discussed a broad arrange of topics relating to outdoor lighting. Through the workshops, it became apparent that there are many possible potential outdoor lighting regulations to implement. Some regulations and model ordinances that the Board reviewed would represent a policy change and should be discussed with Town Council prior to drafting a Zoning Ordinance amendment. Such topics include:

- How can outdoor lighting standards account for the cumulative effect of lighting? For example, multiple 1800 lumen lighting fixtures grouped together.
- Should there be different outdoor lighting standards for residential and non-residential uses? Rural Area and the Growth Area?
- Should there be additional outdoor lighting standards for uses with a high light intensity, such as gas stations?
- Should specific types of outdoor lighting be required, for example LED lighting fixtures?
- Should the existing method of addressing nonconforming outdoor lighting be continued? Or adjusted?
- Should outdoor lighting be regulated by type, including security lighting, building-mounted lighting, pedestrian lighting, and landscape lighting?
- Do hours of operation need to be established?
- Should the Town of Brunswick pursue International Dark-Sky Association accreditation?

Surrounding Community Lighting Regulation Comparison

	Town of Brunswick	Bath	Freeport	Topsham	Yarmouth
Lighting Regulations Apply To:	All (single-family homes are generally not reviewed for lighting).	New or expanded non-residential and multi-family uses.	All (there is nothing in the Zoning Ordinance limiting lighting regulations by district or use).	All (there is nothing in the Zoning Ordinance limiting lighting regulations by district or use).	Village Districts (I and II)
External Standards:	Illumination Engineering Society (IES) Specification for Full Cutoff (for lights emitting more than 2,600 lumens).	---	Consistent with the guidelines and recommendations of the Illuminating Engineering Society of North America (IESNA) for the given location.	Must meet the minimum standards established by the Illuminating Engineering Society of North America (IESNA) for each particular land use.	
Location of Freestanding Lighting:	---	---	* Lighting shall be located along streets, parking areas, at intersections and crosswalks and where various types of circulation systems merge, intersect, or split.	* Light poles and fixtures should be on the same side of the street as the sidewalk, wherever practicable. * In parking lots, light poles shall be placed in locations to avoid damage from vehicles.	Illumination source must be 10' (measured horizontally) from any lot line or abutting property. Structures, such as poles, to support the illumination source may be closer than 10' to a lot line. When there is less than 10' from the front lot line to the paved surface of the public right-of-way, the illumination source may be located less than 10' from the abutting front lot line.
Maximum Height:	25' unless the property is subject to Neighborhood Protection Standards that limit the height to 20' if the fixture is within 50' of lot lines shared with a Growth Residential Zoning District lot with a single- or two-family dwelling on it.	---	The same as the principal building, but no greater than 20'.	Shall not exceed the height of the principal building.	* Village Commercial: 14' * * Village Residential: 12' * Building attached lighting shall not exceed the heights or the eaves/gable roof edge, whichever is lower.
Shielding Requirements:	All lighting emitting brightness exceeding 2600 lumens shall: * Conform to the Illumination Society (IES) Specification for Full Cutoff. * Direct all light towards the ground so that the lighting elements are not exposed to normal view. * Avoid disability glare (being a hazard or nuisance to motorists, pedestrians, or neighboring residents). * Direct away from adjacent properties and streets, including properties separated from the development site by a street, road, or right-of-way, so that the lighting elements are not exposed to normal view.	Lighting fixtures must be shielded or hooded so that the lighting elements are not exposed to normal view by motorists, pedestrians, or adjacent dwellings, and so that they do not unnecessarily light the night sky.	* All lights should have shielding to provide a beam cut-off at no more than 75 degrees above nadir. * Where lights along property lines will be visible to adjacent residences, the lights shall be appropriately shielded.	* All light fixtures shall be shielded to a maximum of 90 degrees above horizontal. 75 degrees above horizontal is recommended. * Lighting fixtures shall be shielded or hooded so that lighting elements are not exposed to normal view by motorists.	The illumination source of all outdoor lighting except spotlights/floodlights shall be permanently covered on the top and sides by the lighting fixture which shall completely block the passage of light. The side covering, or shade, shall extend downward vertically below the lowest point of illumination.

Surrounding Community Lighting Regulation Comparison

	Town of Brunswick	Bath	Freeport	Topsham	Yarmouth
Illumination (footcandles):	---	Maximum 0.2 at the lot line.	* Parking Lots: Avg. = 1.5 / Max. = 6 / Max.-to-Min. Uniformity Ratio = 20:1 * Intersections: Avg. = 3 / Max. = 6 / Max.-to-Min. Uniformity Ratio = 20:1 * * Property Lines: 0.1	* General: 0.5 upon abutting residential properties. * Parking Lots: 0.2-2.0 / Uniformity Ratio = 4:1 * Walkways: Avg. = 0.6 * Stairs & Accessible Ramps: Avg. = 10 * Entrance Areas: 5-10 * Building/Landscape: Maximum 5	* Parking Lots: Avg. = 1.5 * Property Lines: Avg. = 0.5 * Site: Avg. = 0.5
Style Guidelines:	---	---	The style of the light standard shall be consistent with the architectural style of the principal building.	The style of the light fixtures and standards shall be consistent with the architectural style of the principal building and/or streetscape.	---
Prohibited Lighting:	---	---	Rotating or flashing lights or signals, except safety signalling devices as required by law, are permitted.	Rotating or flashing lights or signals, except safety signalling devices as required by law, are permitted.	Moving, flashing, message, or roof-mounted lighting
Review Exemptions:	* Lighting emitting brightness less than 2,600 lumens. * White string mini-lights used in window displays or landscaping. * Lighting of approved sports facilities. * Short-term use of lighting for public festivals, celebrations, and the observance of holidays. * Lighting required and regulated by the FAA	---	---	---	Traffic lighting and pedestrian control lighting in the public right-of-way
Energy Conservation:	---	---	---	Timers, photosensors, dimmers and other energy-saving devices should be utilized to conserve energy and limit negative impacts of lighting.	---
Building & Landscaping Lighting:			* Stairways and sloping or rising paths, building entrances and exits require illumination. * Lighting shall be provided where buildings are set back or offset from the street.	Façade lighting that is aimed downwards is preferred. Any lighting aimed up to illuminate a façade or landscaping shall be properly shielded to avoid sky glow and glare on adjacent walkways.	Soffit lighting shall be encouraged and may be required by the Planning Board. Building attached lighting shall not exceed the maximum heights or the eaves/gable roof edge, whichever is lower.
Pedestrian Lighting:			Pathways, sidewalks, and trails shall be lighted with low or mushroom-type standards.	The use of bollard lights and decorative pole-mounted fixtures is encouraged. The height of the fixtures shall be less than parking lot lighting to create more human-scaled spaces.	Pedestrian walkway lighting fixtures less than 3' above the ground may not be placed closer than 10' from a lot line.
Off-Hours:	---	All exterior lighting, except security lighting, must be turned off between 11 PM and 6 AM unless located on the site of a non-residential use that is open for business during that time frame.	When the activity is not in use, lighting shall be turned down to security level or turned off.	---	---

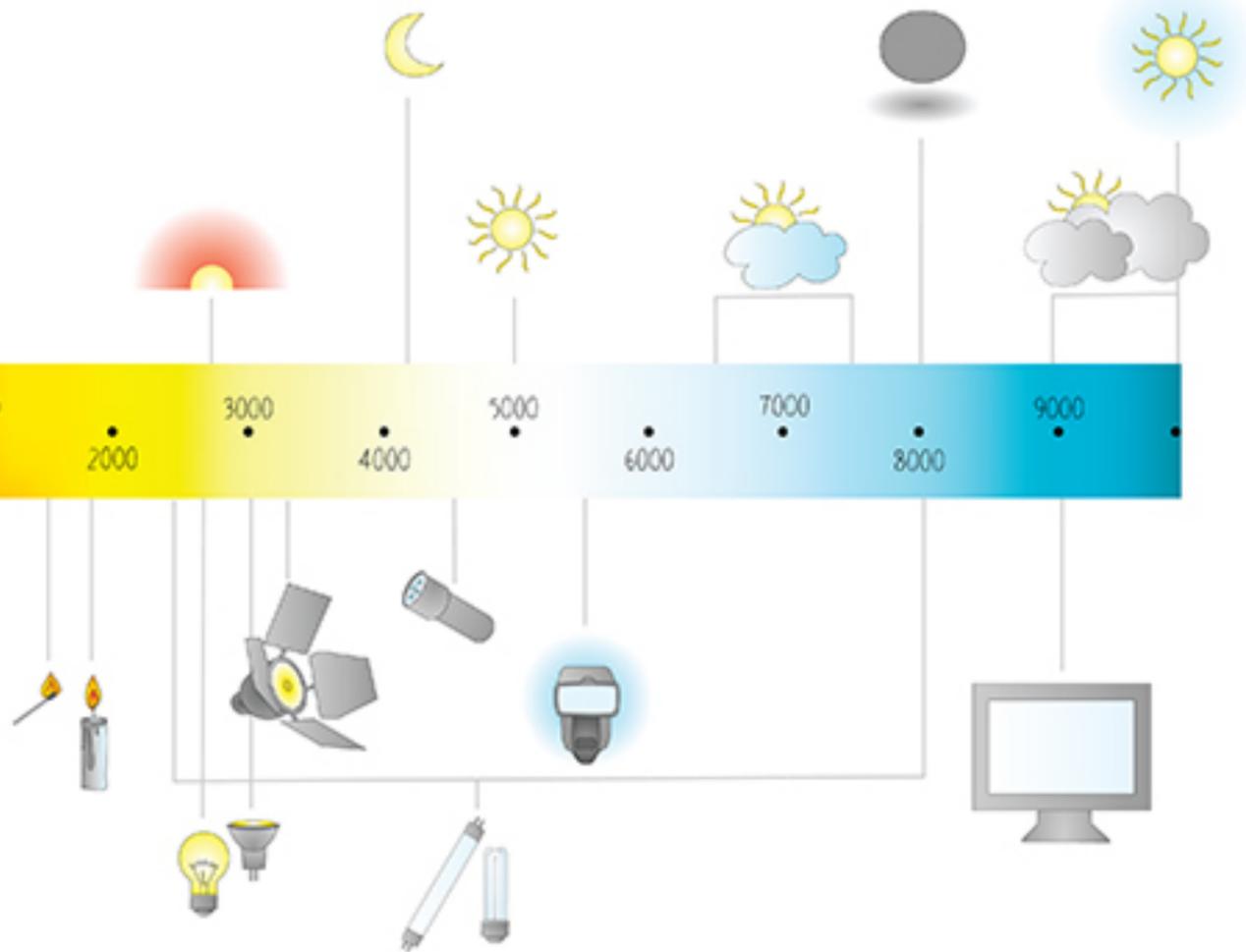
Surrounding Community Lighting Regulation Comparison

	Town of Brunswick	Bath	Freeport	Topsham	Yarmouth
Wiring:	---	Wiring to light poles must be underground unless site conditions make it impractical.	---	---	---
Other:	---	---	<p>* May require neatural landscape or artificial screening to prevent unnecessary or undesirable light from being directed beyond lot lines onto adjacent properties.</p> <p>* Extensive standards for athletic field lighting.</p>	<p>* Lighting with a lumen output equal to or greater than a 200 watt mercury light shall not be directed towards the sky or adjacent properties. *</p> <p>Specific standards for gas stations.</p>	<p>* Nonconforming provision requires lights to meet maximum height and shielding standards upon their replacement.</p> <p>* Spotlights/Floodlights allowed provided they meet specific criteria. * Codes Official allowed to waive setback standards in built-up areas which historically, or by zoning, have buildings or lot lines less than 10' from the public right-of-way. * Temporary outdoor lighting allowed November 15 to January 15. * String lights are allowed in rear yards and in café seating patios or sidewalk cafés.</p>

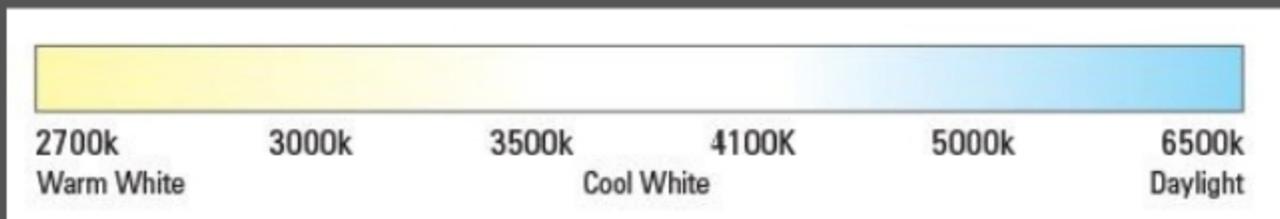
outdoor



indoor



Kelvin Color Temperature Scale



THE LANGUAGE OF LIGHTING

KELVIN

A SCALE FOR
COLOR OF LIGHT



+

-

A higher number
means a cooler light.

LUMENS

MEASURE THE LIGHT'S
BRIGHTNESS



1,500-3,000 lumens are needed
to light your living room.

WATTAGE

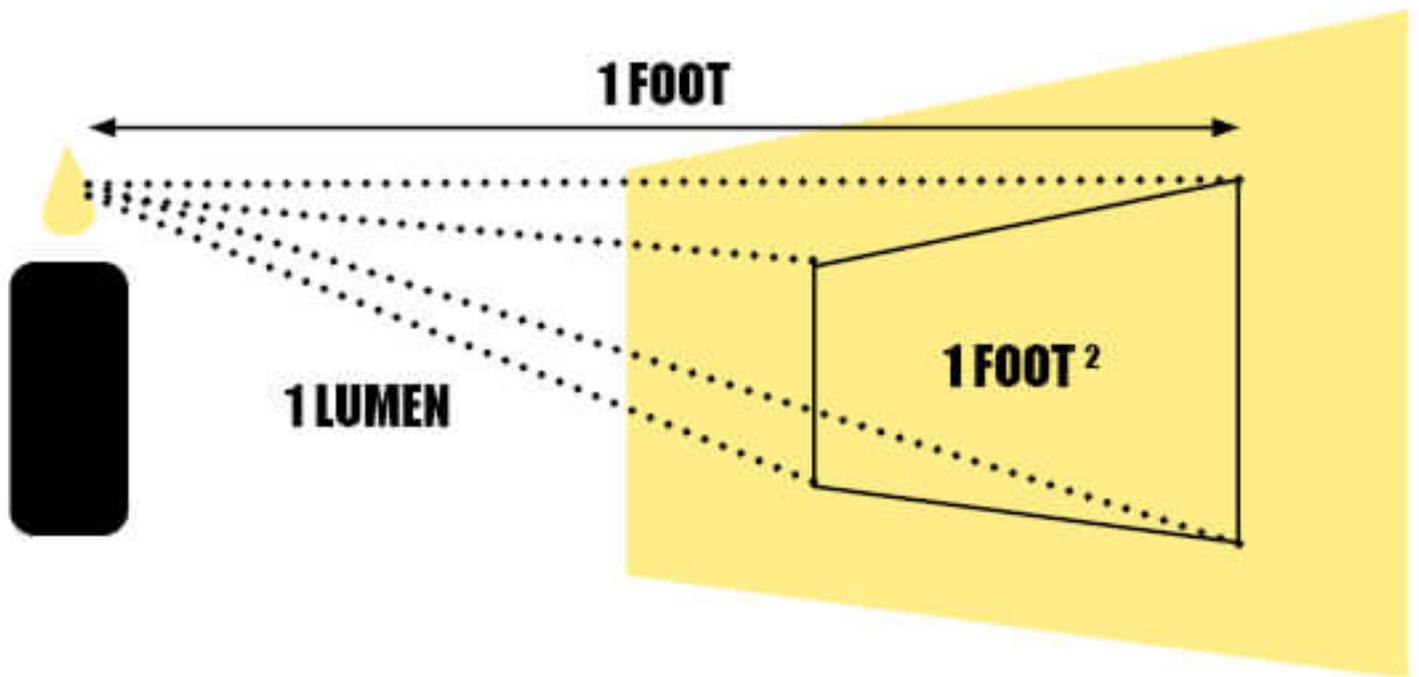
THE LIGHT'S ENERGY
CONSUMPTION



Lower wattage bulbs
use less electricity.

EFFICIENCY	Least		Most	
BULB TYPE				
LUMENS	<i>STANDARD</i>	<i>HALOGEN</i>	<i>CFL</i>	<i>LED</i>
450	40 W	29 W	9 W	8 W
800	60 W	43 W	14 W	13 W
1100	75 W	53 W	19 W	17 W
1600	100 W	72 W	23 W	20 W
RATED LIFE	1 year	1–3 years	6–10 years	15–25 years
SAVINGS	×	up to 30%	up to 75%	up to 80%

FOOTCANDLE



$$1 \text{ LUMEN} / \text{SQFT} = 1 \text{ FOOTCANDLE}$$



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Outdoor Lighting Basics

Modern society requires outdoor lighting for a variety of needs, including safety and commerce. IDA recognizes this but advocates that any required lighting be used wisely. To minimize the harmful effects of light pollution, lighting should

- Only be on when needed
- Only light the area that needs it
- Be no brighter than necessary
- Minimize blue light emissions
- Be fully shielded (pointing downward)

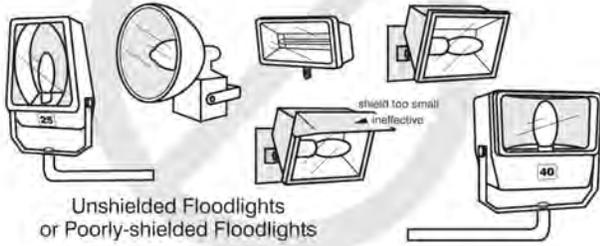
The illustration below provides an easy visual guide to understand the differences between unacceptable, unshielded light fixtures and those fully shielded fixtures that minimize skyglow, glare and light trespass.

[Glossary of Lighting Terms](#)

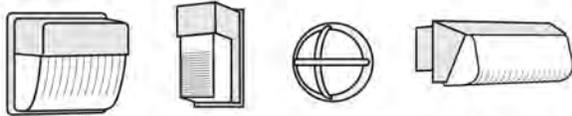
ATTACHMENT F.1 - SUPPLEMENTAL OUTDOOR LIGHTING INFORMATION
Examples of Acceptable / Unacceptable Lighting Fixtures

Unacceptable / Discouraged

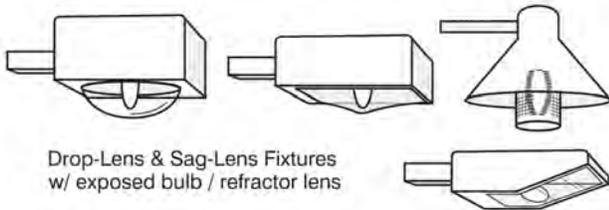
Fixtures that produce glare and light trespass



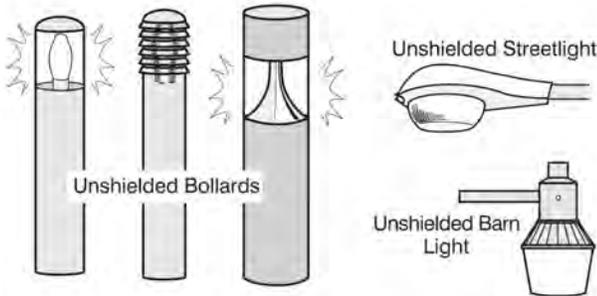
Unshielded Floodlights or Poorly-shielded Floodlights



Unshielded Wallpacks & Unshielded or Poorly-shielded Wall Mount Fixtures



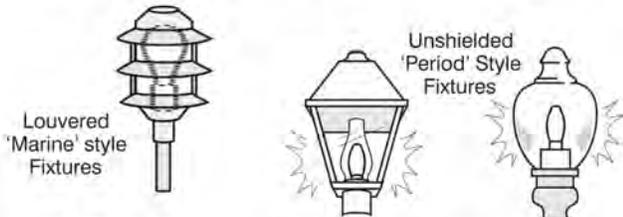
Drop-Lens & Sag-Lens Fixtures w/ exposed bulb / refractor lens



Unshielded Streetlight

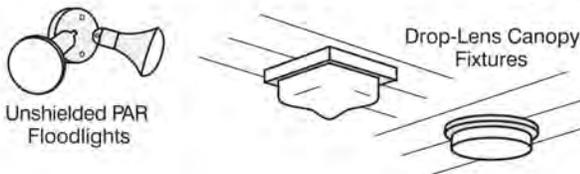
Unshielded Bollards

Unshielded Barn Light



Louvered 'Marine' style Fixtures

Unshielded 'Period' Style Fixtures

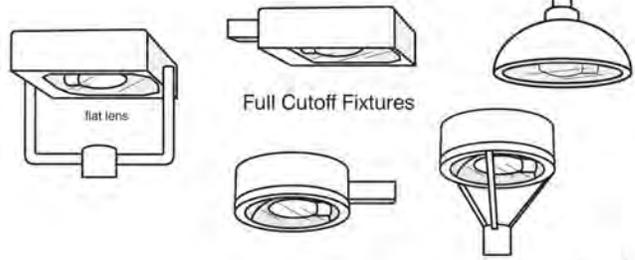


Unshielded PAR Floodlights

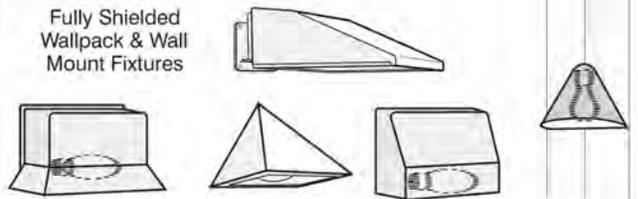
Drop-Lens Canopy Fixtures

Acceptable

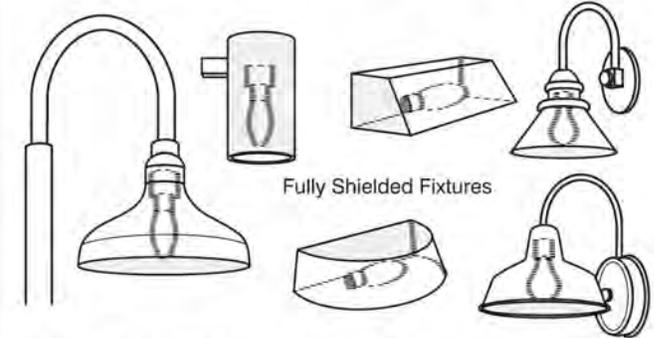
Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



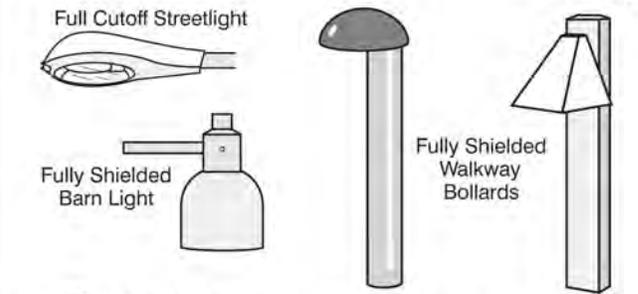
Full Cutoff Fixtures



Fully Shielded Wallpack & Wall Mount Fixtures



Fully Shielded Fixtures



Full Cutoff Streetlight

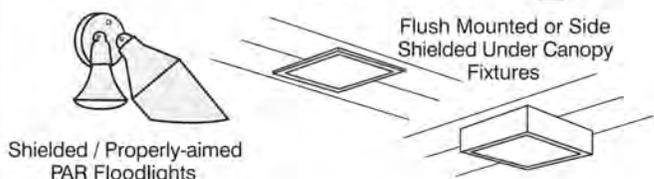
Fully Shielded Barn Light

Fully Shielded Walkway Bollards



Fully Shielded Decorative Fixtures

Fully Shielded 'Period' Style Fixtures



Shielded / Properly-aimed PAR Floodlights

Flush Mounted or Side Shielded Under Canopy Fixtures

Illustrations by Bob Crelin © 2005. Rendered for the Town of Southampton, NY. Used with permission.

[Are you looking for dark sky friendly lighting fixtures? Search our Fixture Seal of Approval](#)

Types of Light

Most people are familiar with incandescent or compact fluorescent bulbs for indoor lighting, but outdoor lighting usually makes use of different, more industrial, sources of light. Common light sources include low-pressure sodium (“LPS”), high-pressure sodium (“HPS”), metal halide and light emitting diodes (“LEDs”).

LPS is very energy efficient but emits only a narrow spectrum of pumpkin-colored light that some find to be undesirable. Yet, LPS is an excellent choice for lighting near astronomical observatories and in some environmentally sensitive areas.

HPS is commonly used for street lighting in many cities. Although it still emits an orange-colored light, its coloring is more “true to life” than that of LPS.

In areas where it’s necessary to use white light, two common choices are metal halide and LEDs. One of the advantages of LED lighting is that it can be dimmed. Thus, instead of always lighting an empty street or parking lot at full brightness, LEDs can be turned down, or even off, when they aren’t needed and then brought back to full brightness as necessary. This feature both saves on energy and reduces light pollution during the night.

Because of their reported long life and energy efficiency, LEDs are rapidly coming into widespread use, replacing the existing lighting in many cities. However, there are important issues to consider when making such a conversion. See our [LED Practical Guide](#) for more information.

Color Matters

As the illustration above, it is crucial to have fully shielded lighting, but we now know that the color of light is also very important. Both LED and metal halide fixtures contain large amounts of blue light in their spectrum. Because blue light brightens the night sky more than any other color of light, it’s important to minimize the amount emitted. Exposure to blue light at night has also been shown to harm [human health](#) and [endanger wildlife](#). [IDA recommends](#) using lighting that has a color temperature of no more than 3000 Kelvins.

Lighting with lower color temperatures has less blue in its spectrum and is referred to as being “warm.” Higher color temperature sources of light are rich in blue light. IDA recommends that only warm light sources be used for outdoor lighting. This includes LPS, HPS and low-color-temperature LEDs. In some areas, the white light of even a low-color-temperature LED can be a threat to the local nighttime environment. In those cases, LPS or narrow-spectrum LEDs are

preferred choices.

Finding What You Need

IDA doesn't sell dark sky friendly lighting, but our [Fixture Seal of Approval program](#) makes it easy for you to find the right products. The FSA program certifies dark sky friendly outdoor lighting – these are fixtures that are fully shielded and have low color temperature. [Search our database](#) and then check with your local retailer.

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Glossary

We include in this glossary definitions for a number of the basic terms and words used in the lighting community. For further information and formal definitions please see discussions in standard dictionaries, encyclopedias, the IES Lighting Handbook, and other lighting industry books.

Note that some of these definitions are quite subjective, and are offered here as guidance only.

A

Accent lighting: Lighting used to emphasize or draw attention to a special object or building.

Adaptive Controls: Devices such as motion sensors, timers and dimmers used in concert with outdoor lighting equipment to vary the intensity or duration of operation of lighting.

Ambient light: The general overall level of lighting in an area.

Angstrom: A unit of wavelength often used in astronomy, equal to 10^{-10} meter or 0.1 nanometer.

B

Baffle: An opaque or translucent element to shield a light source from direct view.

Ballast: A device used with a discharge lamp to obtain the necessary voltage, current, and/or wave form for starting and operating the lamp.

Beam spread: The angle between the two directions in the plane in which the intensity is equal to a given percentage (usually 10 percent) of the maximum beam intensity.

Brightness: Strength of the sensation that results from viewing surfaces from which the light comes to the eye.

Bulb or lamp: The source of electric light. To be distinguished from the whole assembly (see luminaire). Lamp often is used to denote the bulb and its housing.

C

Candela (cd): Unit of luminous intensity. One candela is one lumen per steradian. Formerly called the candle.

Candlepower distribution curve: A plot of the variation in luminous intensity of a lamp or luminaire.

Candlepower: Luminous intensity expressed in candelas.

CIE: Commission Internationale de l'Eclairage. The international light commission. Sets most lighting standards.

Coefficient of Utilization (CU): Ratio of luminous flux (lumens) from a luminaire received on the "work plane" [the area where the light is needed] to the lumens emitted by the luminaire.

Color rendering: Effect of a light source on the color appearance of objects in comparison with their color appearance under normal daylighting.

Color Rendering Index (CRI) A measure of the accuracy with which a light source of a particular CCT renders different colors in comparison to a reference light source with the same CCT. A high CRI provides better illumination with the same or lower lighting levels. It is important not to mix lamps with different CCTs and CRIs. Specify both the CCT and CRI when purchasing lamps.

Cones and rods: Groups of light-sensitive cells in the retinas of animal eyes. Cones dominate the response when the luminance level is high, and provide color perception. Rods dominate at low luminance levels, but give no significant color perception.

Conspicuity: The capacity of a signal to stand out in relation to its background so as to be readily discovered by the eye (as in lettering on a sign, for example).

Correlated Color Temperature (CCT): A measure in degrees Kelvin (°K) of light's warmness or coolness. Lamps with a CCT of less than 3,200 °K are pinkish and considered warm. Lamps with a CCT greater than 4,000 °K are bluish–white and considered cool.

Cosine law: Illuminance on a surface varies as the cosine of the angle of incidence of the light. The inverse square law and the cosine law can be combined.

Cut off angle, of a luminaire: The angle, measured up from the nadir (i.e. straight down), between the vertical axis and the first line of sight at which the bare source (the bulb or lamp) is not visible.

Cutoff fixture: An IES definition “Intensity at or above 90° (horizontal) no more than 2.5% of lamp lumens, and no more than 10% of lamp lumens at or above 80°”.

D

Dark adaptation: The process by which the eye becomes adapted to a luminance less than about 0.03 candela per square meter (0.01 footlambert).

Diffuser: A device used to distribute light from a source.

Dimmer: Dimmers can reduce the input power requirements and the rated lumen output levels

ATTACHMENT F.1 - SUPPLEMENTAL OUTDOOR LIGHTING INFORMATION

of incandescent and fluorescent lights. Fluorescent lights need special dimming ballasts. Dimming incandescent lights reduces their efficiency.

Disability glare: Glare resulting in reduced visual performance and visibility. It is often accompanied by discomfort.

Discomfort glare: Glare that produces discomfort, but does not necessarily diminish visual performance.

E

Efficacy The ratio of light output to its consumption of power, measured in lumens per watt (lm/W), or the ability of a lighting system to produce the desired result.

Efficiency: A measure of the effective or useful output of a system compared to the input of the system.

Electromagnetic (EM) spectrum: The distribution of energy emitted by a radiant source, arranged in order of wavelength or frequency. Includes gamma-ray, X-ray, ultraviolet, visual, infrared, and radio regions.

Energy (radiant energy): Unit is erg, or joule, or kWh.

F

Façade lighting: The illumination of the exterior of a building

Fixture: The assembly that holds the lamp in a lighting system. It includes the elements designed to give light output control, such as a reflector (mirror) or refractor (lens), the ballast, housing, and the attachment parts.

ATTACHMENT F.1 - SUPPLEMENTAL OUTDOOR LIGHTING INFORMATION

Fixture Lumens A light fixture's light output after processing of emitted light by optics in that fixture.

Fixture Watts: The total power consumed by a fixture. This includes the power consumed by the lamp(s) and ballast(s).

Floodlight: A fixture designed to "flood" a well defined area with light.

Flux (radiant flux): Unit is erg/sec or watts.

Footcandle: Illuminance produced on a surface one foot from a uniform point source of one candela.

Footlambert: The average luminance of a surface emitting or reflecting light at a rate of one lumen per square foot.

Full-cutoff fixture: An IES definition; "Zero intensity at or above horizontal (90° above nadir) and limited to a value not exceeding 10% of lamp lumens at or above 80°".

Fully Shielded fixture: A fixture that allows no emission above a horizontal plane through the fixture.

G

Glare: Intense and blinding light that reduces visibility. A light within the field of vision that is brighter than the brightness to which the eyes are adapted.

H

HID lamp: In a discharge lamp, the emitted energy (light) is produced by the passage of an electric current through a gas. High-intensity discharge (HID) include mercury, metal halide, and high pressure sodium lamps. Other discharge lamps are LPS and fluorescent. Some such lamps have internal coatings to convert some of the ultraviolet energy emitted by the gas discharge into visual output.

High-Pressure Sodium (HPS) lamp: HID lamp where radiation is produced from sodium vapor at relatively high partial pressures (100 torr). HPS is essentially a "point source".

House-side Shield: Opaque material applied to a fixture to block the light from illuminating a residence or other structure being protected from light trespass.

I

Illuminance: Density of luminous flux incident on a surface. Unit is footcandle or lux.

Illuminating Engineering Society of North America (IES or IESNA): The professional society of lighting engineers, including those from manufacturing companies, and others professionally involved in lighting.

Incandescent lamp: Light is produced by a filament heated to a high temperature by electric current.

Infrared radiation: Electromagnetic radiation with longer wavelengths than those of visible light, extending from the nominal red edge of the visible spectrum at 700 nanometers to 1 mm.

Intensity: The degree or amount of energy or light.

International Dark-Sky Association (IDA, Inc.): A non-profit organization whose goals are to build awareness of the value of dark skies, and of the need for quality outdoor lighting.

Inverse-square law: Illuminance at a point varies directly with the intensity, I , of a point source and inversely as the square of the distance, d , to the source. $E = I / d^2$

J

K

kWh: Kilowatt-hour: A unit of energy equal to the work done by one kilowatt (1000 watts) of power acting for one hour.

L

Lamp Life: The average life span for a specific type of lamp. Half of lamps will perform longer than the average; the others will fail before the average.

LED: Light emitting diode.

ATTACHMENT F.1 - SUPPLEMENTAL OUTDOOR LIGHTING INFORMATION

Light Pollution: Any adverse effect of artificial light.

Light Quality: A measurement of a person's comfort and perception based on the lighting.

Light Spill: Unwanted spillage of light onto adjacent areas and may affect sensitive receptors particularly residential properties and ecological sites.

Light Trespass: Light falling where it is not wanted or needed. Spill light. Obtrusive light.

Lighting Controls: Devices used for either turning lights on and off or for dimming. Photocells Sensors that turn lights on and off in response to natural light levels. Some advanced mode can slowly dim or increase the lighting. See also: Adaptive Controls.

Low-Pressure Sodium (LPS) lamp: A discharge lamp where the light is produced by radiation from sodium vapor at a relatively low partial pressure (about 0.001 torr). LPS is a "tube source". It is monochromatic light.

Lumen: Unit of luminous flux; the flux emitted within a unit solid angle by a point source with a uniform luminous intensity of one candela.

Lumen depreciation factor: Light loss of a luminaire with time due to the lamp decreasing in efficiency, dirt accumulation, and any other factors that lower the effective output with time.

Luminaire: A complete lighting unit that usually includes the fixture, ballasts, and lamps.

Luminaire Efficiency: The ratio of the light emitted by the luminaire compared to the light emitted by the enclosed lamps.

Luminance: At a point and in a given direction, the luminous intensity in the given direction produced by an element of the surface surrounding the point divided by the area of the projection of the element on a plane perpendicular to the given direction. Units: candelas per unit area.

Lux: One lumen per square meter. Unit of illuminance.

M

Mercury lamp: An HID lamp where the light is produced by radiation from mercury vapor.

Metal-halide lamp: An HID lamp where the light is produced by radiation from metal-halide vapors.

Mounting height: The height of the fixture or lamp above the ground.

N

Nadir: A point on the celestial sphere directly below the observer, diametrically opposite the zenith.

Nanometer (nm): 10^{-9} meter. Often used as the unit for wavelength in the EM spectrum.

O

Occupancy Sensors

- **Passive Infrared:** A lighting control system that uses infrared beams to sense motion. When beams of infrared light are interrupted by movement, the sensor turns on the lighting system. If no movement is sensed after a predetermined period, the system turns the lights off.
- **Ultrasonic:** A lighting control system using high-frequency sound waves pulsed through a space to detect movement by depth perception. When the frequency of the sound waves change, the sensor turns on the lighting system. After a predetermined time with no movement, the system turns the lights off.

Optic: The components of a luminaire such as reflectors, refractors, protectors which make up the light emitting section.

P

Photometry: The quantitative measurement of light level and distribution.

Photocell: An electronic device that changes the light output of a luminaire dynamically in response to the ambient light level around the luminaire.

Q

Quality of light: A subjective ratio of the pluses to the minuses of any lighting installation.

R

Reflector: An optic that achieves control of light by means of reflection (using mirrors).

Refractor: An optic that achieves control of light by means of refraction (using lenses).

S

Semi-cutoff fixture: An IES definition; “Intensity at or above 90° (horizontal) no more than 5% of lamp lumens and no more than 20% at or above 80°”.

Shielding: An opaque material that blocks the transmission of light.

Skyglow: Diffuse, scattered sky light attributable to scattered light from sources on the ground.

Source Intensity: This applies to each source in the potentially obtrusive direction, outside of the area being lit.

Spotlight: A fixture designed to light only a small, well-defined area.

Stray light: Emitted light that falls away from the area where it is needed or wanted. Light trespass.

T

Task Lighting: Task lighting is used to provide direct light for specific activities without illuminating the entire area.

U

Ultraviolet light: Electromagnetic radiation with wavelengths from 400 nm to 100 nm, shorter than that of visible light but longer than X-rays.

V

Veiling luminance: A luminance produced by bright sources in the field-of-view superimposed

ATTACHMENT F.1 - SUPPLEMENTAL OUTDOOR LIGHTING INFORMATION

on the image in the eye reducing contrast and hence visibility.

Visibility: Being perceived by the eye. Seeing effectively. The goal of night lighting.

W

Wallpack: A luminaire, typically affixed to the side of a structure, used for area lighting.

X

Y

Z

Zenith: An imaginary point directly “above” a particular location, on the imaginary [celestial sphere](#).

[IMPACT](#)

11/13/2019 05:45 am ET Updated Nov 13, 2019

Light Pollution Is Taking Away Our Night Skies. Here's Why That Matters.

Some cities and states are trying to protect our night sky “for the health and wellbeing for all living things.”

By [Kyla Mandel](#)

When the power went out during the blackout of Aug. 14, 2003, 50 million people across the Northeast, from New York City to Toronto, were left in the dark. And in a rare moment that night, looking up to the sky, people could see the Milky Way.

Roughly [one-third](#) of the world, including 80% of North Americans, are unable to see this bright band of stars that makes up the outer rim of our galaxy. Without light pollution, about [2,500 stars](#) should be visible to us at night, but in most suburbs only a few hundred can be spotted with the naked eye.

The artificial light we live with — beaming down on our sidewalks, flooding the roads and rising up in a glowing dome over the land — affects everything from our sleeping habits (and with that our physical and mental health) to the nocturnal eating, mating, migrating and pollinating habits of many bats, birds and bugs.

Some places, however, are taking action to protect the night sky. In the United States, [at least 18 states](#), as well as the District of Columbia and Puerto Rico, have laws to reduce light pollution. Communities are increasingly taking steps, such as consulting with ecologists on lighting design and designating remote areas as dark sky preserves, to protect this vital, yet overlooked, natural resource.

Four years ago, Fort Collins, Colorado, set a simple goal: a darker night sky as part of a broader effort to connect residents to nature.

Currently, the local government is working on establishing important baselines: How bright is the city now, and how much darker should it be? It's also rethinking building codes, establishing connections with developers and educating the public about the importance of dark skies so that it can turn its simple goal into clear, achievable targets — all while maintaining public safety.

“I think people are still very much learning,” says Ginny Sawyer, project and policy manager for the city of Fort Collins, of public awareness around protecting the night sky. “[They’re] learning about the idea of why it’s even important or why it might be important or be of value. I think we’re still in our infancy there.”

ATTACHMENT F.2 - LIGHTING ARTICLES

The majority of Europe (88%) and nearly half of the United States (47%) lives with light pollution each night where the sky is [8% brighter](#) than it naturally would be. From 2012 to 2016, the amount of artificially lighted areas around the world grew 2.2% each year, according to [satellite data](#) — that’s 11% over five years.

Some [research suggests](#) the pace of growth in light pollution matches the rates of urbanization. Experts also point to our rapid switch to LED lighting, a well-intentioned push for energy efficiency that is now leading to unexpected effects on humans and wildlife.

Our dark skies — and the many benefits they bring — are at risk. “It’s not just the night sky, but it’s the entire nighttime environment,” says Amanda Gormley, director of communications and public outreach at the International Dark-Sky Association. “It’s a whole system that’s really necessary for the health and wellbeing for all living things.”

Starry Nights

The night sky has long been a source of wonder and exploration.

In 129 B.C., the Greek astronomer Hipparchus compiled the [earliest known catalog of the night sky](#). His compendium of the stars plotted their location and brightness, and his coordinate calculations are still used by astronomers today.

Ancient Puebloan civilizations living in what is now the southern United States aligned their architecture to the celestial bodies above. Explorers relied on the North Star to navigate foreign waters. And, in 1889, Vincent Van Gogh painted his “Starry Night” in Saint Rémy, France, a location where it’s [no longer possible to properly see the Milky Way](#).

Today, nursery rhymes teach us about the twinkling, twinkling little stars and that we should wish upon them. As we grow up, we are taught how to spot the Big Dipper and that the ocean’s tide is pulled by the moon’s force. Even the Harry Potter novels are littered with astrological references.

But as our access to a truly dark sky dwindles, it’s not just this historical and cultural connection that’s at stake.

Circadian Disruption

In 2017, a group of three scientists [won a Nobel Prize](#) for discoveries showing exactly how the human body’s biological clock relies on, and adapts to shifts in, the rise and setting of the sun.

This circadian rhythm — a combination of the Latin words *circa*, meaning “around,” and *dies* for “day” — affects not just how we sleep but also hormone levels, blood pressure, body temperature and metabolism. A misalignment between our lifestyle and our natural rhythm (felt most dramatically during jet lag) has even been associated with an [increased risk](#) for depression, headaches, ulcers and diabetes.

ATTACHMENT F.2 - LIGHTING ARTICLES

Exposure to light leads to the suppression of melatonin, a hormone critical to producing antioxidants that boost our immune system, lower cholesterol, keep our thyroid, pancreas, ovaries, testes and adrenal glands healthy, and, of course, induce sleep. While all light affects melatonin levels, blue light (as produced by most LEDs and electronics) has been found to be the most harmful to humans.

In 2007, the World Health Organization's International Agency for Research on Cancer [added overnight shift work to its list of probable carcinogens](#). And in 2012, the American Medical Association also [recognized light pollution as a health risk](#).

Studies have now shown that light pollution disrupts our sleep cycle, including [a report](#) connecting outdoor light at night with insomnia.

Our bodies are being bombarded with photons. From football stadium floodlights or traffic lights blinking through your curtains at 2 a.m. to the constant blue glare from our laptop and phone screen, every aspect of our lives is now disrupted by artificial light.

Nocturnal Wildlife

But after the sun goes down, and our final scroll through Instagram is complete, we close our eyes for some much-needed sleep. Meanwhile, the nocturnal creatures are only just waking up.

Nighttime is a busy time for nature. But people may not think about it, says Gormley, "because they're usually in bed asleep, and they don't see the impact that our lights can have on these creatures."

One way this can be seen, though, she says, is when people wake up in the morning to dead birds near the side of their homes. This usually happens because "they left their lights on and the birds have collided into windows," Gormley explains.

According to the Canadian nonprofit [Fatal Light Awareness Program](#) (FLAP), more than a billion birds die each year in North America due to collisions with buildings.

Much like the feeling when you're driving at night and a car speeds toward you with its high beams on, this is what it can be like for nocturnal animals encountering bright city lights.

The phrase "blind as a bat" isn't really true, explains Stephanie West, biodiversity training manager at the U.K. Natural History Museum. In fact, bats are adapted to fly in low-light conditions and are able to see better than humans can when it's dark. "But it means that bright floodlights and things like that are very blinding to them. Hit with a bright street light shining straight in their faces, it's going to disorientate them, it's going to completely blur their vision."

Beyond bats, about 30% of vertebrates around the world, such as owls, deer mice, raccoons and foxes, and more than 60% of invertebrates, like moths and fireflies, are nocturnal.

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There are a [number of reasons](#) why animals prefer to venture out at night. It could be that there's less competition for food — or a better chance of avoiding becoming someone else's food — or that the lower temperature is better for exhausting migratory journeys.

Some insects use the night sky to get their navigational bearings. On moonless nights, for instance, the yellow underwing moth orients itself to the North Star. And [dung beetles use the Milky Way](#) to help them efficiently roll their poop piles toward a safe spot for eating.

But our drive for bigger and brighter lights is disrupting the system. We're all used to seeing flies bump repeatedly into a street lamp or a moth sit transfixed against the glare, but, according to [one estimate](#), 30% to 40% of insects that swarm our street lights die shortly afterward — from collision, overheating, dehydration or predation.

And among most North American species of firefly, a gentle burst of light is used to attract a mate. This bioluminescent courtship signal, however, is obscured by street lights, and some studies suggest this is making it more difficult for males and females to find each other. Increasingly, scientists [suspect](#) light pollution is contributing to the observed loss of firefly species.

The effect of this disruption isn't contained to the nocturnal world. Agriculture, for example, relies on these critical ecosystem services, from natural pest control to maintaining soil quality. For those of us who like tequila, for example, [bats are integral to pollinating the spiky desert agave plant](#) from which the spirit is derived.

Taking Action

Developers and housing planners are becoming more aware of these considerations, says West. In the past five years, “this has hit the forefront of people's minds, in terms of bat conservation,” she says. The U.K. now has guidance from the Bat Conservation Trust as well as the Institution of Lighting Professionals for [best practices](#) on lighting installations to protect wildlife.

Arizona, a longtime hub of astronomy, has had light pollution laws since 1986. Texas is the only state with laws targeting light pollution from military installations.

And in Puerto Rico, before Hurricane Maria (which led to the largest and longest blackout in U.S. history), there was a growing concern about the effect of light pollution — from harming people's ability to see the island's famous bioluminescence in its lagoons and bays to disorienting nesting sea turtles who may then stay away from the beaches. This concern prompted Puerto Rico's government to introduce a [new law](#) in 2008 to control and prevent light pollution, including building code provisions for exterior lighting.

From the shape of the light itself to the types of lightbulbs, “there are loads of different things that can be done,” says West. Having lamps that direct light downward toward the pavement, for instance, is an easy switch to ensure that what needs to be lighted is lighted, rather than “producing huge globes of light” projecting into the sky, she explains.

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In 2017, a community of 102 homes in Fort Collins swapped out 172 porch lamps for fixtures directing light down. Virtually everyone in the neighborhood participated. The following year, they swapped out 65 street lamps for downward-pointing ones. The local government helped the residents measure their energy savings and find new dark sky-compliant fixtures to help cut down on light pollution.

“We’ve seen some traction and interest in a few different pockets,” says Sawyer. Building on this, the city recently launched a rebate program for individuals who want to trade in inefficient outdoor fixtures for night sky-friendly ones.

Light pollution is pretty wasteful. At least [30% of all outdoor light is just excess](#), ending up in the sky rather than on its target. According to one estimate, this unshielded outdoor light represents \$2 billion to \$3 billion in additional energy costs each year in the United States — that’s [equal to 8.2 million tons of coal burned](#) and represents [21 million tons](#) of carbon dioxide emissions annually.

But the focus on efficiency has been almost exclusively on LED bulbs. This drive for energy-efficient lighting, says Gormley, is an emerging culprit in driving light pollution: “What’s happening is, because lights are becoming cheaper with recent technology, decision-makers are thinking, ‘Oh, wow, lighting is cheaper, and I can give more of it to my community.’”

Instead, she argues, “we need to be thinking really smart about the way that we light.”

“Because it is possible to have light that helps us find our way, that helps us feel safe, that makes it so that we can live and work in communities,” Gormley adds, “but also protects the night sky for the public good, for wildlife, for energy efficiency and also just so we can have that experience of connecting with the universe.”

Colorado is among the [top 10 fastest-growing states](#) in the country. So, for places like Fort Collins, whose population of 175,000 is [expected to double](#) over the next 20 to 30 years, development is constantly on peoples’ minds. “A big topic here is growth,” says Sawyer. “Growth is coming, we’re not stopping it, we can’t build a wall around our community and shut it down. So, we know it’s coming, so how do we do it in a way that’s least impactful?”

As one [recent study](#) put it: “A critical question for sustainable development is whether the use of outdoor light will continue to grow exponentially or whether developed countries are nearing saturation in demand.”

One of the biggest challenges is developers and businesses who are used to more traditional lighting and levels of light, Sawyer explains. It’s really difficult, she says, to properly grasp best practice codes by simply reading them on paper.

To help overcome this barrier and allow developers to visualize what the changes would look like in practice, Fort Collins is working on a case study to compare the lighting installed for recent projects — such as a new convenience store or a hotel — with what it would look like if these same projects used night sky-friendly lighting standards.

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Ultimately, says Sawyer, the question is how can we make this change in a “very conscious, positive way?”

Thirty years ago, light pollution used to really only be a concern to astronomers — because they were typically the only ones up at night studying the sky. But now, with the popularity of night sky photography, in particular, Gormley says, interest has taken off. People are now starting to actively seek out the experience of seeing the stars.

Gormley often asks people why the night sky matters or how they feel under the night sky. And the answer is usually something along the lines of “I feel small and insignificant but in a really powerful way,” or “It reminds me how small our differences are from each other, and how connected I am to the world.”

“And I just think that in this moment in our culture, that’s such a deep need that we all have to be connected to each other and to recognize how small our differences are when during the day we feel they’re really big,” she reflects, “and then at night the sun goes down, the stars come out, this dome of sparkling stars come up over our head, and we’re just reminded how tiny we are in comparison to the universe.”

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Composite image of North America at night assembled from data acquired by the Suomi NPP satellite in 2012 using the Visible Infrared Imaging Radiometer Suite, which detects light in a range of wavelengths and uses filters to observe dim signals such as city lights. Source: NASA.

By Allen Best

Back in January, I returned home one night to the disconcerting spectacle of my front yard bathed in harsh light, as if something had gone wrong. Living in metro Denver, I never expect to see a truly dark sky. Polaris and the dippers, big and little, can still be seen, but it's usually like looking through a dirty window.

This was different, though. The owner of the parking lot across the street had installed energy-efficient light-emitting diodes, or LEDs, with brighter light to ensure safety for patrons. But the light that spilled into my yard was bright enough for reading a newspaper. Instead of secure, I felt accosted, as if a stranger had begun loitering on my porch.

Light trespass has been a problem since the arrival of electricity allowed us to banish the night. Many jurisdictions have codes that seek to limit it. Some are better than others, but all succeed only to the extent that they're enforced. Other regulations seek to tackle the broader problem of man-made light blotting out the stars, what many call light pollution.

Some places, including Flagstaff, Arizona, home to two astronomical observatories, have proven that you can have it all: stars in the sky and safety and commerce. Regulations adopted there nearly 60 years ago enjoy broad support. Mass retailers,

accustomed to few restaurants, soon learn that things are different in Flagstaff.

The two observatories make darker skies part of the local economy — 102 people work there, and dark skies are a nuanced component of the tourism business. The U.S. Naval Observatory, which has a mission of delivering information useful to U.S. defense, makes dark skies patriotic. "It really does a lot for our quality of life," says Dan Folke, aicp, the planning director in Flagstaff.

LED growing pains

Technological development of lighting has had a growth spurt lately. But after Edison patented the first incandescent bulb in 1879, the next big thing was fluorescent bulbs, unveiled at the New York World's Fair in 1939. Later came mercury, high-pressure vapor bulbs, and so on. But now technology is moving fast, especially since LEDs began arriving in the market in the early 2000s.

LEDs can deliver robust cost savings and reduce energy use, an important element in ambitious climate- action plans. Edison's incandescent bulbs delivered 10 lumens for every watt of power; LEDs can deliver more than 100 lumens per watt. Lumens measure the level of brightness. Although they cost more than incandescents, manufacturers have promised LEDs can last as much as 25 times longer than some of the older lighting technologies.

But communities have also stumbled as they rushed to curb costs and realize energy savings. California's college town of Davis is something of a living laboratory, says Mitch Sears, the city's sustainability program manager. "You learn by mistakes as much as you learn by success," he says.

Davis, at the cutting edge, tested LED lights in street fixtures in 2011. Getting no pushback, the city set out to replace all of its streetlights with LEDs. That's when emails and phone calls flooded city offices. After the city council halted the retrofit, the city staff consulted with the California Lighting Technology Center at the University of California-Davis and engaged with several manufacturers.

Davis officials had missed something at the outset. Many others have, too. The LEDs delivered a different kind of light than the older high-pressure sodium fixtures they replaced. Some have likened it to being under the torch of an arc welder. Its intensity enhances blues and whites, whereas older lights enhance reds and

yellow. To understand it, you have to understand color temperatures, which are described on the Kelvin scale.

For some of us non-physicists, it's bizarre. The scale's range is based on what a piece of metal would look like if heated. At 2,000 to 3,000 Kelvin, you get light that is white but warm, such as you might want for your bedroom. At higher Kelvins, the light "cools" and brightens. At 4,600 to 6,000 K, it's whitish to blue, more like daylight — or, as in my front yard in January, like a police lineup.

In Davis, after the first stumble, city officials surveyed residents, the majority of whom preferred the warmest LED lights in the spectrum, says Sears. That gave Davis officials enough confidence to replace the 650 LEDs originally installed, at a cost of \$350,000, and begin the methodical replacement of other streetlights. They don't save quite as much energy, but they're easier on the eye.

Then came another phase: lights for the parks and paths connecting neighborhoods. On shorter poles, the upward globes that imitate the gas lamps of old, sending light skyward, were replaced by a cobra-headed fixture to more efficiently direct light downward. And these LEDs were dimmer, too — much dimmer than the 2011 test lights.

Residents soon adjusted to lower levels of light. Sears says energy savings have exceeded 90 percent. "It's part science, part how-does-it-feel?" he says. "That's what lighting is all about."

Overexposure

A large body of research conducted in recent decades points to adverse effects in the natural world from extravagantly lit human ecosystems. Newly hatched turtles in coastal areas, for example, will get drawn inland to lights instead of plodding out to the sea. In doing so, they risk becoming prey.

Humans can also suffer from too much light and the wrong light. The American Medical Association last year issued a report warning that blue-rich LED streetlights operate at wavelengths that adversely suppress melatonin at night. Too-bright residential lighting is associated with reduced sleep times, dissatisfaction with sleep quality, excessive sleepiness, impaired daytime function, and obesity. The AMA-recommended street lighting should have a color temperature of no greater than 3,000 K. For reference, an incandescent bulb has 2,400 K, meaning it contains far less blue and far more yellow and red wavelengths.



Blue wavelengths from the sun are beneficial during the day, but blue light at night may cause health problems. Photo courtesy darksky.org (CC0 1.0).

Peter Strasser, technical director at the International Dark-Sky Association, describes it as still a fledging technology. Most existing lighting regulations never anticipated LEDs. He describes development and adoption of regulations as moving "at the speed of government" while the adoption of the new technology is proceeding "blazingly fast."

Manufacturers overemphasized the cost and energy benefits of LEDs, Strasser charges. "They were really dangling carrots in front of communities, saying the chips (in LEDs) lasted 100,000 hours. That's 20 years of not having to service the products," he says. LEDs can last a long time, but not nearly so long: evidence is coming in at six to eight years, he says. Further, the effectiveness of the lights depends on their cleanliness. LEDs must be wiped occasionally to remove grime. LEDs still deliver a big bang, but not quite so much as advertised.

Tucson, where the Dark-Sky Association is based, has had lighting ordinances since 1972. The amount of illumination is limited, and importantly, lights must also be directed downward, to where the light can be used. It's foolish, says Strasser, to point lights upward to illuminate the bellies of passing airplanes. The upshot of these regulations in Tucson, says Strasser, is that he can still see the Milky Way from the driveway of his home eight miles from a city center of one million people.

Stars and planets aside, says John Barentine, the Dark-Sky

Association's program manager, the bottom line for planners and elected officials is what's good for dark skies also saves money, by making sure light is used most efficiently — including the most effective ways to improve public safety. More lighting is not always the answer. In fact, additional public lighting often has an inverse relationship with public safety, say dark-sky advocates.

Bob Parks, the director of a Virginia-based nonprofit called the Smart Outdoor Lighting Alliance, says the fallacy of increased lighting is demonstrated by metropolitan Washington D.C., where he lives. The city has straight edges, dating to the original founding in the late 18th century. Those borders are well defined by the night lights photographed from 249 miles in space by the International Space Station commander Scott Kelly early this year.

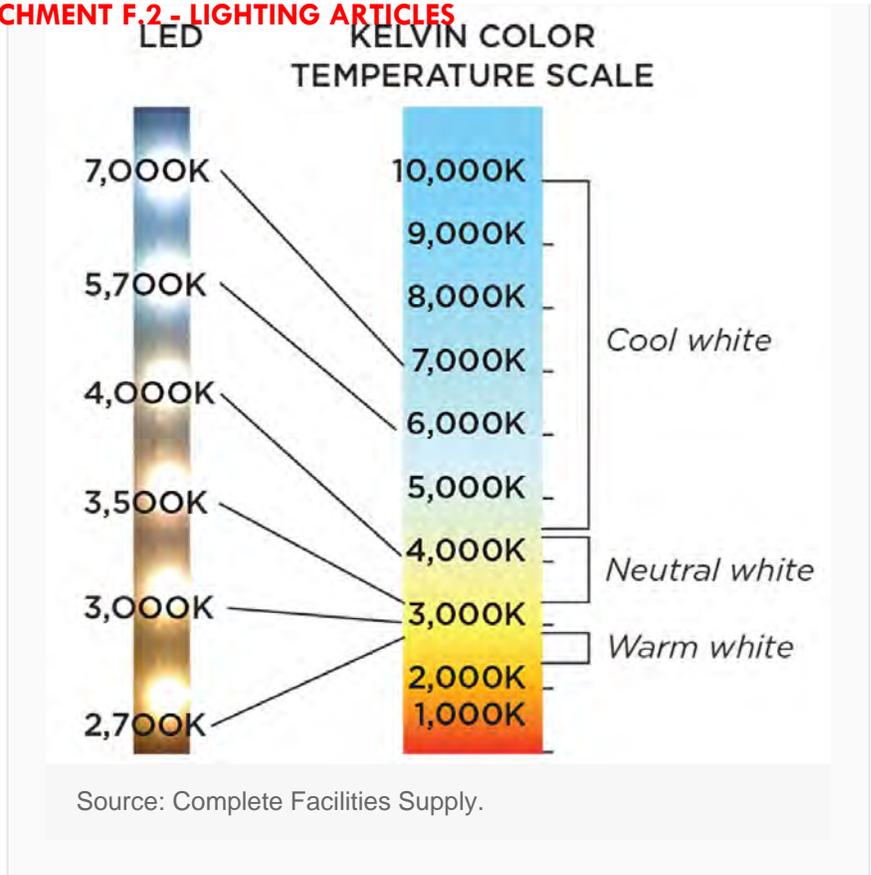
Washington is lit more brightly, as satellite images show. One reason, says Parks, is because many policy makers believe that lighting deters crime. A study he commissioned several years ago, when he was still with the International Dark-Sky Association, found no correlation.

"We found that with few exceptions the DC side had similar or higher overall crime than Maryland or Virginia and two to three times the average lighting levels," he says. The study was abandoned before being published because funding was withdrawn, says Parks, so he can point to no numbers for examination.

Evidence about the value of lighting in deterring crime is surprisingly thin. A 2007 review of studies prepared for the Swedish Council for Crime Prevention found mixed results in eight American studies. Four of the studies found that improved street lighting was effective in reducing crime, while the other four found no effect, according to the report, "Improved Street Lighting and Crime Prevention." Five studies from the United Kingdom, however, were clear that improved lighting led to decreases in crime. What may matter most, however, is the perception that improved lighting reduces crime.

Colors by Number

The Kelvin temperature scale assigns a numerical value to the color of a light source.



A different kind of preservation

In Flagstaff (pop. 68,000), four hours north of Tucson, dimmed lights are part of the culture, even on the old Route 66. Recent images comparing cities of about the same size show that Cheyenne, Wyoming, is nearly 14 times brighter than Flagstaff. Flagstaff is divided into zones, with maximum lumens per acre in each zone. Some areas must have fully shielded fixtures, and others just partially shielded fixtures. There are also classes of light. An informed citizenry, including astronomers, is on board.

"Once you start pushing the envelope, people start getting it," says Brian Kulina, AICP, zoning code manager for Flagstaff. "It's my experience that our lighting standards are pretty well set in stone. None of our planners here negotiate. Either you hit it [the standard] or you don't."

Businesses will arrive, informing the city that they have certain standards, such as for canopies on chain gas stations. Flagstaff tells them to comply with the regulations. A developer arrived recently with a proposal for 1,300 houses — and agreed to create more restrictive standards than the city's standards for that area, near the Naval Observatory.

In Massachusetts, Cambridge has other concerns. It's a city of just

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over 100,000 people, and officials want to balance needs of the many users in mixed use developments: ground-floor merchants, upper-floor residents, maybe a life sciences company next door. An outdoor lighting task force met 18 times over two years to forge regulations. The goal, says Lisa Hemmerle, director of economic development, was to create requirements that developers can pass to the electricians they contract with.



Camping under the stars in Utah's Canyonlands National Park, an International Dark Sky Park, is a rare experience. The park's goal is to make visitors and neighbors aware of its fragile night sky. Photo courtesy NPS/Emily Ogden via Flickr (CC By 2.0).

If you examine a satellite photograph of the U. S. taken at night, the coasts and the more densely populated East are heavily lighted. Lights dim at the Great Plains. "The East will only get lighter over time, but that just underscores the need to preserve the few places with dark skies," says Barentine. "And they are vanishing rapidly."

Greater hope remains in the more thinly settled West, and there are already many dark-sky designations associated with national parks.

In Idaho, there's ambition for something more: the first dark-sky reserve in the U.S. and the 12th in the world recognized by the International Dark-Sky Association. The Idaho Conservation League is pushing for the designation in the Sun Valley-Ketchum area, which has wilderness on three sides. The towns adopted lighting regulations in the late 1990s but do not necessarily enforce them.

In Utah, Janet Muir retired to the mountain town of Eden after a

career in New York City. Eden is on the shadowy side of the Wasatch Range, away from the lights of Ogden. She works to protect the dark sky of her mountain valley. "Your nightscape is a very big part of placemaking," she says.

Muir is cofounder of the University of Utah's recently formed Consortium for Dark Sky Studies. It is described as the first academic center in the world dedicated to discovering, developing, communicating, and applying knowledge pertaining to the quality of night skies.

Stephen Goldsmith, who was the director of planning in Salt Lake City when the Olympics were held there in 2002, is now associate professor of city and metropolitan planning at the university. He grew up in Salt Lake City just a few blocks away from the university, and it was a different place then. As a boy, he could see the Milky Way from his backyard.

"I would just fall asleep staring at the sky and I remember seeing the Milky Way and thinking, 'What is that?'" he says. That sense of wonder gave him a grounding that he says is lost when the night sky is obscured. Restoring the night sky — harnessing our energy flows that have hidden the stars — is a vital task in making cities more livable, he thinks. To see the stars, he says, is to feel like a speck of dust on earth, itself a speck of dust in the cosmos. He finds that comforting. It keeps a lot of other stressful questions in perspective.

Allen Best writes about energy and other topics from his home base in the Denver area. He is a frequent contributor to Planning.

RESOURCES

Model Lighting Ordinance: The International Dark-Sky Association and the Illuminating Engineering Society of North America offer a model ordinance and standards communities can use to reduce glare, light trespass, and skyglow. darksky.org/our-work/public-policy/mlo

Living Under Skyglow: [A recent study](#) finds that 80 percent of the world's population lives under a light-polluted sky. It's even worse in the U.S. and Europe, where 99 percent of residents experience nighttime skyglow. To see how bad light pollution is in your area, download the New World Atlas of Artificial Sky Brightness from the Cooperative Institute for Research in Environmental Sciences. cires.colorado.edu/artificial-sky



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PAS MEMO

The Future of Outdoor Lighting

By Bob Parks

For centuries outdoor lighting has helped mankind shape the environment. By pushing back the night, lighting has allowed us to extend the day, enhance commerce, and feel safer. But over the last few decades, the world has seen an explosion of poorly designed outdoor lighting that has degraded the nighttime environment, wasted resources, fueled climate change, and impacted the health of both humans and wildlife.

Recent technological advances are causing seismic shifts in the outdoor lighting industry. With the advent of light-emitting diode (LED) technology, the industry has introduced a host of new lighting fixtures, as well as new devices such as computerized controls that maximize efficiency and reduce maintenance costs. For decades energy efficiency has been slow to improve, but current improvements dwarf those of the past, with continued improvement expected for decades to come. City officials everywhere are asking, "What should we do about LED lighting?"

During the next decade cities will retrofit much of their existing outdoor lighting. These changes have already begun. Los Angeles installed 140,000 LED streetlights over a period of four years, ending in 2013. New York City has announced plans to replace 250,000 fixtures with LED. Millions of dollars will be spent in this decade to improve outdoor lighting, and the new technologies now emerging offer an important opportunity to do it well.

Planning professionals can have a profound impact on the future of public lighting. From a planning perspective, there has never been a better time to develop standards that will guide this transition. However, outdoor lighting standards have been somewhat of an outlier in the planning community. Lighting design is not in most planners' skill sets, and the topic is easy to ignore — until citizen complaints about excessive lighting demand action.

The new outdoor lighting technology can save 50 percent or more on current energy use, reducing energy bills and carbon footprints. However, with this new technology we need to develop new standards that eliminate glare and light trespass, improve visibility and safety, and protect the night sky and the environment. This *PAS Memo* provides planners with guidance in navigating this brave new world of outdoor lighting technology. It provides a brief history of outdoor lighting and delves into the technical aspects of traditional and new technologies. It then makes the case for revamping local outdoor lighting standards as well as lighting beliefs, and concludes with information on important resources and next steps planners can take to address outdoor lighting standards in their communities.

A Brief History of Outdoor Lighting

To understand the future, it is important to understand the history of outdoor lighting. Few technologies have been so inextricably linked to our development from prehistoric times to today. Fire not only helped us to cook, its light helped us combat our primal fear of darkness, and we became less likely to become a predator's dinner.

Street lighting has been documented as far back as the 4th century, but it didn't really take off until the invention of the gas light in 1792. By the early 19th century cities across the globe embraced the new technology to extend the day. The world at night changed in 1880 when Wabash, Indiana, became the first city to install streetlights using Thomas Edison's electric incandescent light bulb. Cities everywhere began to light their streets in order to attract customers to businesses. As roads were built to accommodate the new automobile, street lighting was installed to improve safety and mobility.

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Outdoor lighting is a ubiquitous part of the nighttime urban landscape. Photo Jim Richardson.

Incandescent lighting technology ruled outdoor lighting until the 1950s when new high-intensity discharge (HID) lighting became commonplace. Mercury vapor (MV) HID streetlights were twice as efficient as incandescent streetlights and the lamps lasted 10 to 20 times longer. High-pressure sodium (HPS) HID lighting was introduced in the 1970s and doubled the efficiency of MV. While there have been other lighting technologies over the last century, these have dominated streetlighting.

Not until the turn of the 21st century did another technology challenge HID. Solid-state lighting (SSL) using light-emitting diode (LED) technology has been in the labs since the 1960s, but its efficiency was no match for HID until about five years ago. LED streetlights began to be installed in cities around 2005. While the efficiency of LED now exceeds HID, it's LED's long life that now makes it a compelling replacement for other technologies. LED manufacturers claim fixture lives of more 100,000 hours or more, which means less maintenance. By comparison, HPS lamps are rated at around 20,000 hours and need to be replaced every five to six years. The continued improvement of efficiency and life expectancy and reduced operating costs and maintenance will propel a tsunami of LED retrofits over the next decade.

Why is efficiency such an important consideration in outdoor lighting? There are approximately 160 million outdoor commercial and public exterior lighting fixtures in U.S., illuminating roads, streets, parking lots, and buildings. These fixtures use two percent of the total energy used in the U.S. Eighty percent of that energy is used for commercial and public exterior lighting. The approximate amount of energy wasted annually by our outdoor lights through unnecessary lighting, over-lighting, light trespass, glare, and uplight is 1.1 petawatt hours (PWH), the equivalent annual output of approximately 500 power plants. This wasted energy could power approximately 7.75 million homes, produces 750 million tons of CO₂, and costs local governments and citizens approximately \$110 billion annually (IDA 2013).

The promise of dramatic efficiency improvement has encouraged the federal government to promote SSL as part of the U.S. Department of Energy (DOE) energy conservation goals. DOE has allocated funds to support the research and development of new technologies and processes to improve the energy efficiency of SSL. It has also established a program to actively promote the accelerated adoption of SSL in the U.S.

While not completely unprecedented, the involvement of DOE has had the effect of expediting the commercial development of SSL technology. Although the federal government's support of this immature technology is a boon to the industry, it has created new problems as well. The most apparent

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side effect is that manufacturers have created and promoted lighting that potentially increases glare and is potentially harmful to human health and wildlife.

A Primer on LED

What we call "white" light comes in a wide range of colors. These are usually described on a scale of "warm" to "cool." Warm white light is on the red/yellow side of the spectrum, while cool white is on the blue side. Technically, this scale is also described as Correlated color temperature (CCT) and measured in Kelvin (K). Most consumers prefer warm white light, which is produced by incandescent lamps. A typical incandescent lamp is around 2700 K CCT. Commercial interior lighting is often cooler, with a typical range of 3500 K to 5000 K. High-pressure sodium (HPS) lighting, which currently accounts for 70-80 percent of all exterior lighting, is approximately 2000 K CCT.

What makes LED different is that it has a large portion of its spectral energy concentrated in the blue side of the visible light spectrum, thus making it a "cool" white light. With early LED technology, only cool white light could compete with the energy efficiency of the HID lighting it was replacing. Cool white light greater than 5000 K CCT was seldom used in interior or exterior lighting prior to LED. While the differences between high CCT (>5000K) LED white light and HPS lighting is often considered purely an aesthetic issue, it has profound impacts on both visibility and ecology.



New light-emitting diode (LED) technology creates a "cool" white light. Photo Bob Parks.

Higher CCT LEDs are perceived by the human eye as more glaring than other light sources, reducing visibility and thus safety unless the fixture is fully shielded so that the source isn't easily visible. A growing body of scientific evidence also indicates that exposure to light at night, particularly blue-rich white light, disrupts our circadian rhythm — the sleep-wake pattern governed by Earth's 24-hour cycle of light and dark. All species have evolved under a cycle of roughly 12 hours of day and 12 hours of night. When this period is disrupted, the negative impacts can be significant on a wide range of activities and biological functions, and can lead to increased risk of obesity, depression, sleep disorders, diabetes, breast cancer, and other health issues. Studies also have shown numerous negative repercussions for wildlife as well.

Blue-rich white light also contributes to light pollution. In 2009, a research study showed that this type of light source scatters light into the atmosphere at a rate two to five times greater than that of currently-used HPS lamps (IDA 2010). The scatter results in increased sky glow, which is the most easily recognized component of light pollution. An important consequence of this is that if current HPS fixtures are replaced with high-CCT white LED fixtures at the same illumination levels, the result will be a substantial increase in light pollution.

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Additional research indicates that humans perceive the "brightness" of white light at the same illumination level to be greater than that of the HPS that it is often replacing. Although conclusions have varied somewhat, high-CCT white light may appear to be 25 to 50 percent brighter than HPS. This happens because the human eye sees better in broad-spectrum white light, so much so that reductions in illumination levels of up to 75 percent may still result in equivalent visibility compared to HPS. This means that using recommended illumination levels from current Illumination Engineering Society (IES) standards for outdoor lighting results in retrofits that appear far brighter than the lighting that was replaced. Unless the fixtures are well designed, a proportional increase in glare may result.

These results of the new LED technology — greater light scatter and glare potential — are often met with complaints from residents. Because of these different characteristics of LED lighting, new illumination standards are required to account for these differences and prevent overlighting with cool white LEDs.

Lighting Standards

In most cases, communities rely on national standards to inform their outdoor lighting regulations. The Illumination Engineering Society produces recommended practices (RPs) for almost every type of lighting application that provides illumination guidelines. The RPs specify the amount of illumination for various tasks and other qualities like uniformity. Many cities use the RP as their standards for lighting practices for outdoor and indoor lighting. The IES RP is designed to help design lighting that will improve visibility.

Based on recent research, however, a new understanding of visibility has emerged. Most current lighting standards tend to focus only on illumination levels and uniformity with little concern for the actual impact on visibility. The results of the new research show that the future of lighting standards should be based on visual contrast: both luminance and color. This new metric for visibility will allow for dramatically reduced light levels using broad spectrum light sources like SSL.

Until national standards are updated to reflect new research on visibility, many communities will not consider reducing illumination levels. Though results from studies clearly show a consumer preference for warmer CCT and lower illumination levels, cost considerations lead cities to install higher-CCT LED sources based on the 10–15 percent increase in energy efficiency over warmer LED options. This creates the situation described above: lighting that provides 25–75 percent more illumination than necessary because communities are following long-established standards. Most communities lack the expertise to translate new research into reduced lighting levels. Cities will be reluctant to use lower illumination levels until the IES revises the appropriate RP documents. Unfortunately it takes time for new research to become incorporated in RPs, and revisions can lag years behind the science.

New standards could allow communities to dramatically reduce illumination levels and carbon footprints while saving large amounts of energy and money at the same time. Effective lighting standards need to control the quality and quantity of lighting. Fully shielding light fixtures eliminates uplight, controls glare, and improves visibility. To control the quantity of light used it is important to limit the illumination levels. Communities need to reassess the amount of lighting required to appropriately illuminate communities. One major component of this is rethinking the connections between outdoor lighting and crime.

Lighting and Crime

Crime and lighting have an interesting history. Thomas Edison and other early proponents of electric light played the safety "card" as a principal sales tool. It has been used for over a hundred years as the primary reason to install lights. However, there has been little independent research on the effects of outdoor lighting on crime levels.



Illuminating the nighttime environment makes people feel safer. Photo Bob Parks.

One reason for the assumed correlation between outdoor lighting and a decrease in crime is that the introduction of outdoor lighting satisfies the "feeling of safety." When there is no outdoor lighting, pedestrians may genuinely feel fear. Simply being able to see makes us feel safer. However, feeling safe and actually being safe are not the same. Adding light to the environment may not reduce the incidence of robbery or injury, but might make pedestrians feel safe right up until the moment they become a crime statistic.

The most surprising study that shows the futility of using lighting to deter criminal behavior comes from Chicago. In 1998, after the city experienced very high levels of violent crime, it decided to increase street lighting illumination levels and add lighting to alleys. Not only did the city install lighting where previously there was none, it did so at illumination levels three to five times higher than normal. The conventional wisdom was that increased lighting would deter crime.

Feedback from residents was mostly positive and the perception that the city had taken proactive steps to reduce crime was politically popular as well. The only problem was that the program did not reduce crime. To the contrary, in the areas where "enhanced lighting" was installed, incidence of crime increased. In similar communities where no additional lighting was installed, crime actually decreased during the same period (Morrow and Hutton 2000). Studies in the United Kingdom comparing communities with similar demographics in which the only difference was the introduction of street lighting have found no significant variation in the rates of crime.

Most studies indicate that reducing crime requires multiple strategies. Community policing, coupled with employment and educational opportunity, seem to work very well, but implementing those tactics requires far more resources than installing lighting. Lighting has become a quick and easy action creating the perception that elected officials are responsive to the needs of the community. Often, that is more than enough justification. Whether allocating these limited resources to the policies that have proved more effective in reducing crime will never be known. Using an economics term, it can be said that the true cost of some outdoor lighting policies may bear the "opportunity cost" of *not* reducing crime.

Better Outdoor Lighting Standards

So what is the solution to the problem of overlighting? The intelligent use of outdoor lighting. Smart lighting policy can be summed up in one sentence: Light only what is needed, when needed, and only at

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illumination levels necessary to get the job done. This policy will eliminate the three main components of light pollution: skyglow, glare, and light trespass.

Skyglow is the brightness of the night sky in a built-up area as a result of outdoor lighting. Glare is the uncomfortable or disabling visual sensation caused by excessive and uncontrolled brightness. Light trespass occurs when light from fixtures illuminates more area than intended, falling where it is not needed — or where it can cause a nuisance. For example, light trespass is occurring if the careless installation of "security" lights end up shining light into a neighbor's bedroom window. This is the most common complaint a planning authority is likely to receive. This type of social irritation can result in ill feelings, legal action, and even violence. The desire for the "feeling of safety" can often clash with the wish for "peaceful enjoyment" and it becomes an issue that planners are forced to manage.



Skyglow (left), glare (center), and light trespass (right) are the three main components of light pollution. Photos Bob Parks.

The best way to make sure that cities are using outdoor lighting intelligently is to adopt community outdoor lighting standards. This is a complex issue, however, and few planning departments have the in-house expertise to draft lighting guidelines. The technical details associated with outdoor lighting can be intimidating, and incorrect or inaccurate terminology can reduce the effectiveness or enforceability of a lighting ordinance. Even when the resources are available, developing a comprehensive outdoor lighting ordinance can take months or years and hundreds of staff hours. For these reasons, communities may want to use guidance to help them draft their lighting ordinances.

The International Dark-Sky Association (IDA), a nonprofit organization founded to raise awareness of light pollution and promote solutions to it, has been working with planners for 25 years to develop effective outdoor lighting ordinances. In 2005, the IDA joined with the IES to develop a [Model Lighting Ordinance \(MLO\) template](#) (IDA IES 2011). The MLO uses IES recommendations to create a template that can save planners most of the time needed to create ordinances customized to the needs of their communities. The primary value of the MLO, a framework developed and endorsed by the leading outdoor lighting standards groups, is that it includes all the information needed to create a successful ordinance.

The IDA/IES Model Lighting Ordinance (MLO)

The MLO takes an approach to regulation that encourages energy savings while reducing light pollution. It provides a lumen allowance for outdoor lighting based on the area of developed "hardscape" for the parcel. Developers are free to use the allowance where it is needed. In addition, fixtures must meet the requirements of the Backlight/Uplight/Glare (BUG) classification system, which replaced the previous IES "cutoff" classification in 2011. It rates each component of a fixture — backlight (the light directed in back of the mounting pole, which creates light trespass), uplight (the light directed above the horizontal plane of the fixture which contributes to skyglow), and glare — on a scale ranging from 0 to 4 (IDA 2009). A "0" indicates the least amount and "4" the most; therefore, a "B0-U0-G0" rating has the least amount of backlight, uplight, and glare.



Good lighting fixtures are designed to reduce or eliminate backlight, uplight, and glare. Photo Bob Parks.

The MLO acknowledges that more light may be needed in highly developed urban areas than in pristine natural parks. To quantify this, it incorporates an environmental zone system of five zones. For example, EVO would indicate a natural park area and EV4 would mean Times Square or the Las Vegas Strip. EV1 is a rural area, EV2 is a suburban area, and EV3 is an urban area. These are the three zones used by most cities. The BUG classification system requirements limit the types of fixtures used to those appropriate in each zone. For example, in the EVO zone, fixtures rated "B0-U0-G0" must be used.

Using the MLO replaces after-the-fact lighting enforcement in the field at night to up-front compliance at the planning office. Developers submit lighting plans to the authority for review and approval. The planning staff must verify the calculations for allowable lumens, the choice of BUG ratings for the fixtures, and their locations. Once approved, the developer must have a professional engineer certify that the installation was installed as approved.

When adopted, the MLO ensures that property owners can use the appropriate amount of illumination to meet industry standards while reducing light pollution, carbon footprint, and energy waste. Enforcement is usually limited to a review of plans, but staff may need additional training to do this effectively.

IDA and IES are currently revising and improving the original MLO. The new MLO will be joined by an "MLO Lite" designed for smaller communities that may not need the full MLO. In addition, the updated MLO will include new sections for situations that typically need a special permit. These include sports lighting, lighted and electronic signs, and protected areas like optical astronomy observatories and ecologically sensitive areas. Each of these sections can be included in the full or lite version of the MLO as required.

Action Steps for Planners

Developing a comprehensive lighting ordinance can be daunting unless there is a staff member that has some experience with outdoor lighting. This doesn't mean that the planner has to be a lighting engineer, but without a basic understanding of the concepts and terminology it may be hard to properly assess what will be needed to complete the process. In most cases it will be helpful to contact a lighting consultant that has had experience writing a lighting ordinance.

Before getting started, however, planners should determine that there is sufficient support of the planning commission or other elected officials that will ultimately need to approve the ordinance. Lighting ordinances are more complex than most other standards that these officials deal with regularly. It is essential to have someone on staff or as a consultant that can present the proposed regulation in layman's terms and can explain the details in an easily understandable manner.

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Be prepared for opposition from some citizens, developers, and businesses. In many cases lighting standards will be considered as unnecessary regulation. It is important to include public education and meetings in the process to explain the value of the regulation. Focus on the reductions in glare, light trespass, and improved visibility. Emphasize that the ordinance will meet national lighting standards and will not impact safety. This public education program should continue after the ordinance is approved to educate developers and the general public.

Allocate enough staff time and budget to implement the ordinance, train staff, and enforce the ordinance after it is approved. Too often this is the area that is most neglected. Without adequate training of the staff that will approve lighting plans and field inspectors that will verify compliance, lighting ordinances will seldom be effective.

Finally, be prepared to revise the ordinance within three to five years to incorporate lessons learned and new lighting standards and technology. Often after an ordinance has been in place for several years and concerns over it have abated, it is possible to include elements that may have been omitted during the original development.

The Future of Outdoor Lighting

From the discussion above, it should be clear to planners that outdoor lighting has a multitude of often detrimental effects on the built and natural environments as well as on our health. New lighting technologies offer exciting advances in energy efficiency and cost savings, but also come with potential costs. If existing standards are not adjusted to account for the spectral characteristics of the LED lighting being created and promoted by the lighting industry today, we could, ironically, be faced with higher levels of light pollution, glare, and overlighting.

Outdoor lighting should be installed to minimize its effect on the environment. Good, ecologically responsible outdoor lighting will employ color temperatures that are as "warm" as feasible, while also eliminating glare and light trespass. While consumer preference may favor "white" light over HPS and low pressure sodium (LPS) light sources, evidence also clearly shows that the public dislikes blue-rich white light. Fortunately, LED technology is capable of providing all of these requirements efficiently.



Good LED lighting design illuminates the nighttime environment while reducing light pollution and energy waste. Photo Bob Parks.

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LED technology allows us to dynamically "tune" the spectrum of the fixture to minimize its impact on the environment, including human health.

Therefore, a reasonable balance between maximum energy efficiency and adverse ecological impact can be achieved. Being "green" is not just a question of energy savings. New ecologically responsible developments in LED include amber LED and filtered LED that removes blue light by eliminating wavelengths below 500 nanometers. These technologies, along with the use of fully shielded LPS, should be used in and around ecologically sensitive areas, optical astronomy facilities, and in communities with a high degree of awareness and concern for the environment.

The choice is clear: we can use responsible standards to guide lighting design, or we can continue to allow uncontrolled lighting to degrade our quality of life and negatively impact human health and ecology. Planners have important roles to play in making the former scenario a reality in their communities.

About the Author

Bob Parks is the owner of Smart Lighting Associates. He is a Lighting Certified (LC) lighting designer and consultant specializing in ecologically responsible outdoor lighting. He is the former executive director of the International Dark-Sky Association and is a member of the IES. He worked on the original IDA/IES Model Lighting Ordinance Task Force that developed the MLO and is part of the current IDA MLO committee that is currently revising it.

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Focus

Missing the Dark: Health Effects of Light Pollution

[Ron Chepesiuk](#)

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In 1879, Thomas Edison’s incandescent light bulbs first illuminated a New York street, and the modern era of electric lighting began. Since then, the world has become awash in electric light. Powerful lamps light up streets, yards, parking lots, and billboards. Sports facilities blaze with light that is visible for tens of miles. Business and office building windows glow throughout the night. According to the Tucson, Arizona–based International Dark-Sky Association (IDA), the sky glow of Los Angeles is visible from an airplane 200 miles away. In most of the world’s large urban centers, stargazing is something that happens at a planetarium. Indeed, when a 1994 earthquake knocked out the power in Los Angeles, many anxious residents called local emergency centers to report seeing a strange “giant, silvery cloud” in the dark sky. What they were really seeing—for the first time—was the Milky Way, long obliterated by the urban sky glow.

None of this is to say that electric lights are inherently bad. Artificial light has benefited society by, for instance, extending the length of the productive day, offering more time not just for

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working but also for recreational activities that require light. But when artificial outdoor lighting becomes inefficient, annoying, and unnecessary, it is known as light pollution. Many environmentalists, naturalists, and medical researchers consider light pollution to be one of the fastest growing and most pervasive forms of environmental pollution. And a growing body of scientific research suggests that light pollution can have lasting adverse effects on both human and wildlife health.

When does nuisance light become a health hazard? Richard Stevens, a professor and cancer epidemiologist at the University of Connecticut Health Center in Farmington, Connecticut, says light photons must hit the retina for biologic effects to occur. “However, in an environment where there is much artificial light at night—such as Manhattan or Las Vegas—there is much more opportunity for exposure of the retina to photons that might disrupt circadian rhythm,” he says. “So I think it is not only ‘night owls’ who get those photons. Almost all of us awaken during the night for periods of time, and unless we have blackout shades there is some electric lighting coming in our windows. It is not clear how much is too much; that is an important part of the research now.”

According to “The First World Atlas of the Artificial Night Sky Brightness,” a report on global light pollution published in volume 328, issue 3 (2001) of the *Monthly Notices of the Royal Astronomical Society*, two-thirds of the U.S. population and more than one-half of the European population have already lost the ability to see the Milky Way with the naked eye. Moreover, 63% of the world population and 99% of the population of the European Union and the United States (excluding Alaska and Hawaii) live in areas where the night sky is brighter than the threshold for light-polluted status set by the International Astronomical Union—that is, the artificial sky brightness is greater than 10% of the natural sky brightness above 45° of elevation.

Light pollution comes in many forms, including sky glow, light trespass, glare, and over illumination. Sky glow is the bright halo that appears over urban areas at night, a product of light being scattered by water droplets or particles in the air. Light trespass occurs when unwanted artificial light from, for instance, a floodlight or streetlight spills onto an adjacent property, lighting an area that would otherwise be dark. Glare is created by light that shines horizontally. Overillumination refers to the use of artificial light well beyond what is required for a specific activity, such as keeping the lights on all night in an empty office building.

The ecologic effects of artificial light have been well documented. Light pollution has been shown to affect both flora and fauna. For instance, prolonged exposure to artificial light prevents many trees from adjusting to seasonal variations, according to Winslow Briggs's chapter on plant responses in the 2006 book *Ecological Consequences of Artificial Night Lighting*. This, in turn, has implications for the wildlife that depend on trees for their natural habitat. Research on insects, turtles, birds, fish, reptiles, and other wildlife species shows that light pollution can alter behaviors, foraging areas, and breeding cycles, and not just in urban centers but in rural areas as well.

Sea turtles provide one dramatic example of how artificial light on beaches can disrupt behavior. Many species of sea turtles lay their eggs on beaches, with females returning for decades to the beaches where they were born to nest. When these beaches are brightly lit at night, females may be discouraged from nesting in them; they can also be disoriented by lights and wander onto nearby roadways, where they risk being struck by vehicles.

Moreover, sea turtle hatchlings normally navigate toward the sea by orienting away from the elevated, dark silhouette of the landward horizon, according to a study published by Michael Salmon of Florida Atlantic University and colleagues in volume 122, number 1–2 (1992) of *Behaviour*. When there are artificial bright lights on the beach, newly hatched turtles become disoriented and navigate toward the artificial light source, never finding the sea.

Jean Higgins, an environmental specialist with the Florida Wildlife Conservation Commission Imperiled Species Management Section, says disorientation also contributes to dehydration and exhaustion in hatchlings. "It's hard to say if the ones that have made it into the water aren't more susceptible to predation at this later point," she says.

Bright electric lights can also disrupt the behavior of birds. About 200 species of birds fly their migration patterns at night over North America, and especially during inclement weather with low cloud cover, they routinely are confused during passage by brightly lit buildings, communication towers, and other structures. "Light attracts birds and disorients them," explains Michael Mesure, executive director of the Toronto-based Fatal Light Awareness Program (FLAP), which works to safeguard migratory birds in the urban environment. "It is a serious situation because many species

that collide frequently are known to be in long-term decline and some are already designated officially as threatened.”

Each year in New York City alone, about 10,000 migratory birds are injured or killed crashing into skyscrapers and high-rise buildings, says Glenn Phillips, executive director of the New York City Audubon Society. The estimates as to the number of birds dying from collisions across North America annually range from 98 million to close to a billion. The U.S. Fish and Wildlife Service estimates 5–50 million birds die each year from collisions with communication towers.

Turtles and birds are not the only wildlife affected by artificial nighttime lighting. Frogs have been found to inhibit their mating calls when they are exposed to excessive light at night, reducing their reproductive capacity. The feeding behavior of bats also is altered by artificial light. Researchers have blamed light pollution for declines in populations of North American moths, according to *Ecological Consequences of Artificial Night Lighting*. Almost all small rodents and carnivores, 80% of marsupials, and 20% of primates are nocturnal. “We are just now understanding the nocturnality of many creatures,” says Chad Moore, Night Sky Program manager with the National Park Service. “Not protecting the night will destroy the habitat of many animals.”

Resetting the Circadian Clock

Go to:

The health effects of light pollution have not been as well defined for humans as for wildlife, although a compelling amount of epidemiologic evidence points to a consistent association between exposure to indoor artificial nighttime light and health problems such as breast cancer, says George Brainard, a professor of neurology at Jefferson Medical College, Thomas Jefferson University in Philadelphia. “That association does not prove that artificial light causes the problem. On the other hand, controlled laboratory studies do show that exposure to light during the night can disrupt circadian and neuroendocrine physiology, thereby accelerating tumor growth.”

The 24-hour day/night cycle, known as the circadian clock, affects physiologic processes in almost all organisms. These processes include brain wave patterns, hormone production, cell regulation, and other biologic activities. Disruption of the circadian clock is linked to several medical disorders in humans, including depression, insomnia, cardiovascular disease, and cancer, says Paolo Sassone-Corsi, chairman of the Pharmacology Department at the University of California, Irvine, who has done extensive

research on the circadian clock. “Studies show that the circadian cycle controls from ten to fifteen percent of our genes,” he explains. “So the disruption of the circadian cycle can cause a lot of health problems.”

On 14–15 September 2006 the National Institute of Environmental Health Sciences (NIEHS) sponsored a meeting that focused on how best to conduct research on possible connections between artificial lighting and human health. A report of that meeting in the September 2007 issue of *EHP* stated, “One of the defining characteristics of life in the modern world is the altered patterns of light and dark in the built environment made possible by use of electric power.” The meeting report authors noted it may not be entirely coincidental that dramatic increases in the risk of breast and prostate cancers, obesity, and early-onset diabetes have mirrored the dramatic changes in the amount and pattern of artificial light generated during the night and day in modern societies over recent decades. “The science underlying these hypotheses has a solid base,” they wrote, “and is currently moving forward rapidly.”

The connection between artificial light and sleep disorders is a fairly intuitive one. Difficulties with adjusting the circadian clock can lead to a number of sleep disorders, including shift-work sleep disorder, which affects people who rotate shifts or work at night, and delayed sleep–phase syndrome, in which people tend to fall asleep very late at night and have difficulty waking up in time for work, school, or social engagements.

The sleep pattern that was the norm before the invention of electric lights is no longer the norm in countries where artificial light extends the day. In the 2005 book *At Day’s Close: Night in Times Past*, historian Roger Ekirch of Virginia Polytechnic Institute described how before the Industrial Age people slept in two 4-hour shifts (“first sleep” and “second sleep”) separated by a late-night period of quiet wakefulness.

Thomas A. Wehr, a psychiatrist at the National Institute of Mental Health, has studied whether humans would revert back to the two-shift sleep pattern if they were not exposed to the longer photoperiod afforded by artificial lighting. In the June 1992 *Journal of Sleep Research*, Wehr reported his findings on eight healthy men, whose light/dark schedule was shifted from their customary 16 hours of light and 8 hours of dark to a schedule in which they were exposed to natural and electric light for 10 hours, then darkness for 14 hours to simulate natural durations of day and night in winter. The subjects did indeed revert to the two-shift

pattern, sleeping in two sessions of about 4 hours each separated by 1–3 hours of quiet wakefulness.

Beyond Sleep Disorders

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Alteration of the circadian clock can branch into other effects besides sleep disorders. A team of Vanderbilt University researchers considered the possibility that constant artificial light exposure in neonatal intensive care units could impair the developing circadian rhythm of premature babies. In a study published in the August 2006 issue of *Pediatric Research*, they exposed newborn mice (comparable in development to 13-week-old human fetuses) to constant artificial light for several weeks. The exposed mice were unable to maintain a coherent circadian cycle at age 3 weeks (comparable to a full-term human neonate). Mice exposed for an additional 4 weeks were unable to establish a regular activity cycle. The researchers concluded that excessive artificial light exposure early in life might contribute to an increased risk of depression and other mood disorders in humans. Lead researcher Douglas McMahon notes, “All this is speculative at this time, but certainly the data would indicate that human infants benefit from the synchronizing effect of a normal light/dark cycle.”

Since 1995, studies in such journals as *Epidemiology*, *Cancer Causes and Control*, the *Journal of the National Cancer Institute*, and *Aviation Space Environmental Medicine*, among others, have examined female employees working a rotating night shift and found that an elevated breast cancer risk is associated with occupational exposure to artificial light at night. Mariana Figueiro, program director at the Lighting Research Center of Rensselaer Polytechnic Institute in Troy, New York, notes that permanent shift workers may be less likely to be disrupted by night work because their circadian rhythm can readjust to the night work as long as light/dark patterns are controlled.

In a study published in the 17 October 2001 *Journal of the National Cancer Institute*, Harvard University epidemiologist Eva S. Schernhammer and colleagues from Brigham and Women’s Hospital in Boston used data from the 1988 Nurses’ Health Study (NHS), which surveyed 121,701 registered female nurses on a range of health issues. Schernhammer and her colleagues found an association between breast cancer and shift work that was restricted to women who had worked 30 or more years on rotating night shifts (0.5% of the study population).

In another study of the NHS cohort, Schernhammer and colleagues also found elevated breast cancer risk associated with rotating night shift work. Discussing this finding in the January 2006 issue of *Epidemiology*, they wrote that shift work was associated with only a modest increased breast cancer risk among the women studied. The researchers further wrote, however, that their study's findings "in combination with the results of earlier work, reduce the likelihood that this association is due solely to chance."

Schernhammer and her colleagues have also used their NHS cohort to investigate the connection between artificial light, night work, and colorectal cancer. In the 4 June 2003 issue of the *Journal of the National Cancer Institute*, they reported that nurses who worked night shifts at least 3 times a month for 15 years or more had a 35% increased risk of colorectal cancer. This is the first significant evidence so far linking night work and colorectal cancer, so it's too early to draw conclusions about a causal association. "There is even less evidence about colorectal cancer and the larger subject of light pollution," explains Stevens. "That does not mean there is no effect, but rather, there is not enough evidence to render a verdict at this time."

The research on the shift work/cancer relationship is not conclusive, but it was enough for the International Agency for Research on Cancer (IARC) to classify shift work as a probable human carcinogen in 2007. "The IARC didn't definitely call night shift work a carcinogen," Brainard says. "It's still too soon to go there, but there is enough evidence to raise the flag. That's why more research is still needed."

The Role of Melatonin

Go to:

Brainard and a growing number of researchers believe that melatonin may be the key to understanding the shift work/breast cancer risk association. Melatonin, a hormone produced by the pineal gland, is secreted at night and is known for helping to regulate the body's biologic clock. Melatonin triggers a host of biologic activities, possibly including a nocturnal reduction in the body's production of estrogen. The body produces melatonin at night, and melatonin levels drop precipitously in the presence of artificial or natural light. Numerous studies suggest that decreasing nocturnal melatonin production levels increases an individual's risk of developing cancer. [For more information on melatonin, see "Benefits of Sunlight: A Bright Spot for Human Health," *EHP* 116:A160–A167 (2008).]

One groundbreaking study published in the 1 December 2005 issue

of *Cancer Research* implicated melatonin deficiency in what the report authors called a rational biologic explanation for the increased breast cancer risk in female night shift workers. The study involved female volunteers whose blood was collected under three different conditions: during daylight hours, during the night after 2 hours of complete darkness, and during the night after exposure to 90 minutes of artificial light. The blood was injected into human breast tumors that were transplanted into rats. The tumors infused with melatonin-deficient blood collected after exposure to light during the night were found to grow at the same speed as those infused with daytime blood. The blood collected after exposure to darkness slowed tumor growth.

“We now know that light suppresses melatonin, but we are not saying it is the only risk factor,” says first author David Blask, a research scientist at the Bassett Healthcare Research Institute in Cooperstown, New York. “But light is a risk factor that may explain [previously unexplainable phenomena]. So we need to seriously consider it.”

The National Cancer Institute estimates that 1 in 8 women will be diagnosed with breast cancer at some time during her life. We can attribute only about half of all breast cancer cases to known risk factors, says Brainard. Meanwhile, he says, the breast cancer rate keeps climbing—incidence increased by more than 40% between 1973 and 1998, according to the Breast Cancer Fund—and “we need to understand what’s going on as soon as possible.”

Linking Light Pollution to Human Health

Go to:

The evidence that indoor artificial light at night influences human health is fairly strong, but how does this relate to light pollution? The work in this area has just begun, but two studies in Israel have yielded some intriguing findings. Stevens was part of a study team that used satellite photos to gauge the level of nighttime artificial light in 147 communities in Israel, then overlaid the photos with a map detailing the distribution of breast cancer cases. The results showed a statistically significant correlation between outdoor artificial light at night and breast cancer, even when controlling for population density, affluence, and air pollution. Women living in neighborhoods where it was bright enough to read a book outside at midnight had a 73% higher risk of developing breast cancer than those residing in areas with the least outdoor artificial lighting. However, lung cancer risk was not affected. The findings appeared in the January 2008 issue of *Chronobiology International*.

“It may turn out that artificial light exposure at night increases risk,

but not entirely by the melatonin mechanism, so we need to do more studies of ‘clock’ genes—nine have so far been identified—and light exposure in rodent models and humans,” Stevens says. Clock genes carry the genetic instructions to produce protein products that control circadian rhythm. Research needs to be done not just on the light pollution–cancer connection but also on several other diseases that may be influenced by light and dark.

Travis Longcore, co-editor of *Ecological Consequences of Artificial Night Lighting* and a research associate professor at the University of Southern California Center for Sustainable Cities, suggests two ways outdoor light pollution may contribute to artificial light–associated health effects in humans. “From a human health perspective, it seems that we are concerned with whatever increases artificial light exposure indoors at night,” he says. “The effect of outdoor lighting on indoor exposure could be either direct or indirect. In the direct impact scenario, the artificial light from outside reaches people inside at night at levels that affect production of hormones. In an indirect impact it would disturb people inside, who then turn on lights and expose themselves to more light.”

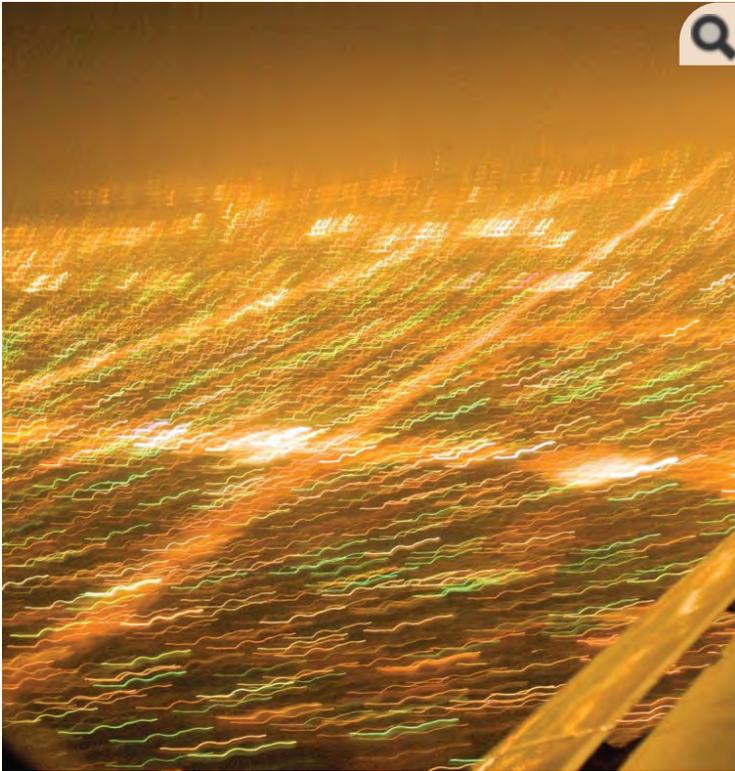
“The public needs to know about the factors causing [light pollution], but research is not going at the pace it should,” Blask says. Susan Golden, distinguished professor at the Center for Research on Biological Clocks of Texas A&M University in College Station, Texas, agrees. She says, “Light pollution is still way down the list of important environmental issues needing study. That’s why it’s so hard to get funds to research the issue.”

“The policy implications of unnecessary light at night are enormous,” says Stevens in reference to the health and energy ramifications [for more on the energy impact of light pollution, see “Switch On the Night: Policies for Smarter Lighting,” p. A28 this issue]. “It is fully as important an issue as global warming.” Moreover, he says, artificial light is a ubiquitous environmental agent. “Almost everyone in modern society uses electric light to reduce the natural daily dark period by extending light into the evening or before sunrise in the morning,” he says. “On that basis, we are all exposed to electric light at night, whereas before electricity, and still in much of the developing world, people get twelve hours of dark whether they are asleep or not.”

Sources believe that the meeting at the NIEHS in September 2006 was a promising beginning for moving forward on the light pollution issue. “Ten years ago, scientists thought something was

there, but couldn't put a finger on it," says Leslie Reimold, a program director at the NIEHS who helped organize the meeting. "Now we are really just at the tip of the iceberg, but we do have something that's scientific and can be measured."

The 23 participants at the NIEHS-sponsored meeting identified a research agenda for further study that included the functioning of the circadian clock, epidemiologic studies to define the artificial light exposure/disease relationship, the role of melatonin in artificial light-induced disease, and development of interventions and treatments to reduce the impact of light pollution on disease. "It was a very significant meeting," Brainard says. "It's the first time the National Institutes of Health sponsored a broad multidisciplinary look at the light-environmental question with the intent of moving to the next step."





Glare, overillumination, and sky glow (which makes the sky over a city look orange, yellow, or pink) are all forms of light pollution. These photos were taken in Goodwood, Ontario, a small town about 45 minutes northeast of Toronto during and the night after the regionwide 14 August 2003 blackout. The lights inside the house in the blackout picture were created by candles and flashlights.

1
50% Wasted Light
10% Glare
40% Productive Light

According to the National Park Service, 50% of the light from a typical unshielded light fixture is wasted, shining upward where it is not needed (figure 1). About 40% of the light shines downward to illuminate the intended target. Light emitted horizontally tends to create glare.

Globe lights typically distribute light poorly and contribute to glare (figure 2). Floodlights can fill a space with light, but they may be too bright for their intended task, and much of the light is wasted (figure 3).

Good lighting is shielded in a manner that directs all the light where it is needed and wanted. The International Dark-Sky Association (IDA) recommends that all lighting be installed such that no light is emitted above a horizontal plane running through the lowest part of the fixture (figure 4).

IDA further recommends the use of low-pressure sodium (LPS) lights wherever possible. LPS lights are the most energy-efficient lights currently available. They emit a yellow light at the wavelength where the human eye is most sensitive, but the monochromatic light makes it difficult to distinguish the colors of objects below. For outdoor lighting where color perception is important (to enhance security, for instance), IDA recommends high-pressure sodium lights.

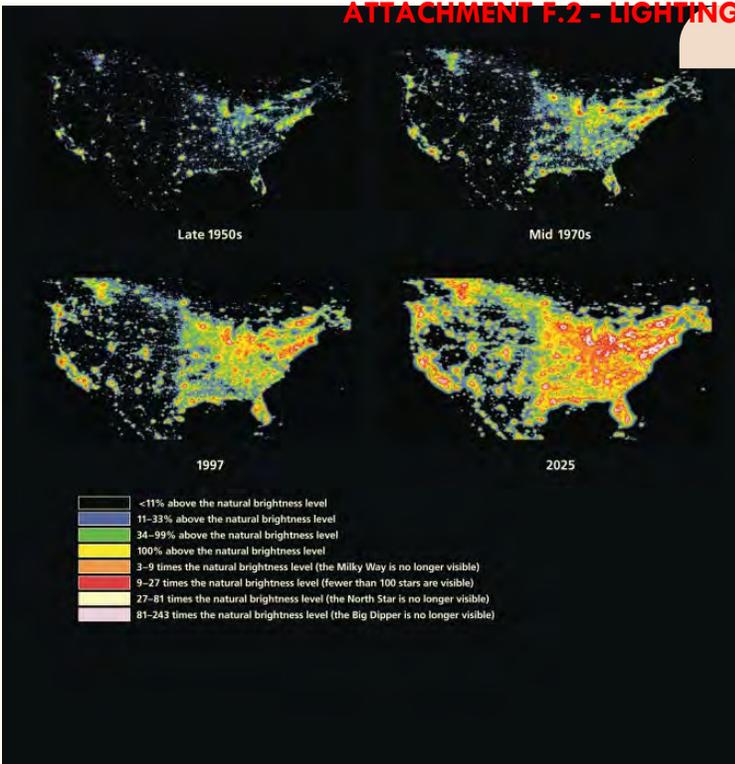
ATTACHMENT F.2 - LIGHTING ARTICLES

How Outdoor Lighting Translates into Light Pollution



Turtle hatchlings instinctively orient away from the dark silhouette of the nighttime shore. Here hatchlings have been temporarily distracted by a bright lamp. Hatchlings and mother turtles distracted by shorefront lights can wander onto nearby roadways.





Increase in Artificial Night Sky Brightness in North America



The International Agency for Research on Cancer has classified shift

ATTACHMENT F.2 - LIGHTING ARTICLES

work as a probable human carcinogen. A study in the December 2008 issue of Sleep found that use of light exposure therapy, sunglasses, and a strict sleep schedule may help night-shift workers achieve a better-balanced circadian rhythm.

Articles from Environmental Health Perspectives are provided here courtesy of **National Institute of Environmental Health Sciences**

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THE PROMISE AND CHALLENGE OF LED LIGHTING: A PRACTICAL GUIDE

A PUBLICATION OF THE
INTERNATIONAL DARK-SKY ASSOCIATION

The light-emitting diode (LED) is transforming the way we light our cities and towns, offering a once-in-a-lifetime chance to radically improve how we use energy and our outdoor spaces at night. With this opportunity comes an obligation to manage these changes responsibly and sustainably. The stakes are high and the potential rewards great, but outcomes depend critically on policymakers and the public having access to reliable information. IDA developed this document to provide planners, lighting designers and public officials an overview of the most important aspects of LED lighting and the choices and challenges involved in its municipal implementation.

What is LED?

LEDs use solid-state technology to convert electricity into light. Put simply, LEDs are very small light bulbs that fit into an electrical circuit. Unlike traditional incandescent bulbs, they don't have a filament that burns out and they don't get very warm. Initially, LEDs only emitted red, yellow, or green light, but now white LEDs are widely available. Early LEDs were also energy-inefficient and emitted little light, but due to technological advances LED efficiency and light output have doubled about every three years. Because of their improved quality and falling prices, LEDs are now replacing conventional high-intensity discharge (HID) lamp types for outdoor lighting in communities around the world.

Why Adopt This Technology?

The improved energy efficiency of LEDs means that, coupled with modern luminaire design, these lights allow for reduced illuminance without compromising safety. LEDs help lower carbon emissions by reducing the demand for electricity, which is still largely generated by burning fossil fuels. Another LED benefit is better control over the color content of light. Manufacturers now produce LEDs with "warm" color qualities at high energy efficiency, rendering old arguments about the perceived inefficiency of warm white LEDs moot. These same LED options also provide accurate color rendition without emitting excessive amounts of potentially harmful blue light (see below).

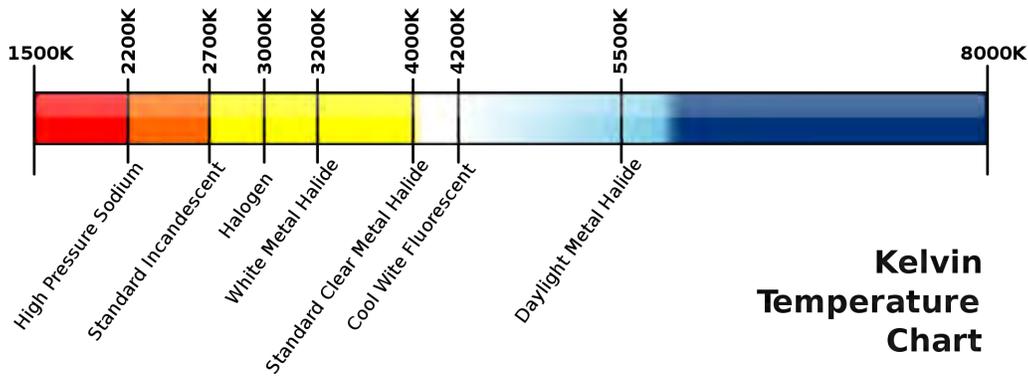
Relative to other outdoor lamps, LEDs are thought to be extremely long-lived. When switched on, LEDs are instantly at full brightness, unlike HID lamps that have a significant time delay to begin emitting light. LEDs also have very low minimum electricity thresholds to produce light, meaning they can be dimmed to much lower illumination levels when less light is needed and resulting in further energy savings.

Blue Light Is Bad

New technical capabilities often come with unanticipated challenges. Most white LED lighting has significant levels of potentially hazardous blue light. IDA published a report¹ in 2010 detailing the hazards of blue-rich white light sources. In the years since, scientific evidence has solidified around its conclusions. In June 2016, the American Medical Association (AMA) publicly concluded² that “white LED street lighting patterns [may] contribute to the risk of chronic disease in the populations of cities in which they have been installed.” The AMA recommends “minimizing and controlling blue-rich environmental lighting by using the lowest emission of blue light possible” in order to reduce potential negative effects on human health.

Concerns about blue light reach far beyond our health. Outdoor lighting with strong blue content is likely to worsen skyglow because it has a significantly larger geographic reach than lighting consisting of less blue. According to the 2016 “World Atlas of Artificial Night Sky Brightness” street lighting and outdoor lighting retrofits using 4000K lamps could result in a factor of 2.5 increase in light pollution.³ Given that the rate of increase of lighting as seen from Earth orbit is about 2 percent per year⁴, and much of the increase is attributable to white LED, it is all the more important to address this problem.

Blue-rich white light sources are also known to increase glare and compromise human vision, especially in the aging eye^{5,6}. These lights create potential road safety problems for motorists and pedestrians alike. In natural settings, blue light at night has been shown to adversely affect wildlife behavior and reproduction^{7,8}. This particularly true in cities, which are often stopover points for migratory species.



¹ <http://bit.ly/2gKiEfN>

² American Medical Association Council on Science and Public Health Report 2-A-16: “Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting”, 2016 (PDF: <http://bit.ly/1UzSqVQ>)

³ Falchi et al., *Science Advances* (10 Jun 2016) Vol. 2, no. 6, e1600377. [10.1126/sciadv.1600377](https://doi.org/10.1126/sciadv.1600377)

⁴ Kyba et al., Artificially lit surface of Earth at night increasing in radiance and extent. *Science Advances* (22 Nov 2017) Vol. 3, no. 11, e1701528. [10.1126/sciadv.1701528](https://doi.org/10.1126/sciadv.1701528)

⁵ Lin et al. Model predicting discomfort glare caused by LED road lights. *Optics Express* (2014) Vol. 22, no. 15, 18056-71. [10.1364/OE.22.018056](https://doi.org/10.1364/OE.22.018056)

⁶ Sweater-Hickcox et al. Effect of different coloured luminous surrounds on LED discomfort glare perception. *Lighting Research Technology* (2013) Vol. 45, no. 4, 464-75. <http://lrt.sagepub.com/content/45/4/464>

⁷ Bennie et al. Ecological effects of artificial light at night on wild plants. *Journal of Ecology* (2016) Vol. 104, issue 3, 611-620. [10.1111/1365-2745.12551](https://doi.org/10.1111/1365-2745.12551)

⁸ Hori and Suzuki. Lethal effect of blue light on strawberry leaf beetle, *Galerucella griseascens* (Coleoptera: Chrysomelidae). *Scientific Reports* (2017) Article 2694. <https://www.nature.com/articles/s41598-017-03017-z>

The promise of cheaper outdoor lighting based on electricity and maintenance savings from LED conversion should be weighed against other factors, such as the blue light content of white LEDs. Blue-rich sources are the most efficient LEDs in terms of the conversion of electricity to light, and therefore have the lowest electricity cost to produce a given amount of light compared to “warmer,” less efficient white LED lamps. Every effort should be made to diminish or eliminate blue light exposure after dark.

Product Selection Considerations

Choosing LED products for outdoor lighting applications involves a series of considerations and tradeoffs. These include:

- **Luminous Efficiency** (Watts-to-lumens): How many lumens of light are produced per input Watt of electricity? More importantly, how many lumens from the light source are meeting the task (“Fixture Lumens” vs. “Lamp Lumens”)
- **Lumen Output**: How much light is produced relative to the amount required for a particular task? When replacing existing fixtures, it is important to use the only level of illumination needed, and not to adopt unneeded increases in brightness.
- **Correlated Color Temperature** (CCT): Does the light have a “warm” or “cool” quality?
- **Color Rendering Index** (CRI): How accurately does the light render colors to the human eye? A high CRI is not needed for all situations. The need for good color rendition should be considered relative to the lighting application in question.
- **Adaptive Control Integration**: Does the lighting make use of adaptive controls such as dimmers, timers, and/or motion sensors? These controls are the wave of the future in outdoor lighting and achieve additional energy savings, improve light source efficacy and increase visual task performance. It is important to build in the ability to make use of adaptive controls during the adoption of designs for new lighting installations, even if they will not immediately be implemented.
- **Heat Mitigation**: Is the lamp housing designed to adequately dissipate heat? Because LED efficiency decreases with rising operating temperature, controlling heat emitted by LED lamps is critical in warm climates.
- **Lumen Depreciation**: How robust is the lamp against efficiency loss over time? Manufacturers typically quote “L70,” the expected use time until a bulb reaches 70% of its initial light output.

Closely related to all these factors is expense: How much will LED replacement solutions cost? The price of commercial LED lighting products continues to drop, and capital cost recovery times for new LED street light installations, once 10 years or more, are now typically less than five years and continue to decline. As barriers to implementation fall, LED is gaining momentum as the lighting technology of choice in both new outdoor installations and existing replace-on-failure installations.

IDA Recommends

Already many white LED options are available on the outdoor lighting market and that number will only rise in the future. IDA has developed a set of recommendations for those choosing lighting systems. These suggestions will aid in the selection of lighting that is

ATTACHMENT F.2 - LIGHTING ARTICLES

energy and cost efficient, yet ensures safety and security, protects wildlife, and promotes the goal of dark night skies. These include:

- **Always choose fully shielded fixtures** that emit no light upward
- **Use “warm-white” or filtered LEDs** (CCT < 3000 K; S/P ratio < 1.2) to minimize blue emission
- **Look for products with adaptive controls** like dimmers, timers, and motion sensors
- **Consider dimming or turning off the lights during overnight hours**
- **Avoid the temptation to over-light** because of the higher luminous efficiency of LEDs.
- **Only light the exact space and in the amount required for particular tasks**

Learn more about outdoor lighting, blue light at night, and dark skies on the IDA website at www.darksky.org.

[The Switch to Outdoor LED Lighting Has Completely Backfired](#) (Published on [gizmodo.com](#))

[George Dvorsky](#)
[11/22/17 2:00PM](#)

[Filed to:light pollution](#)

To reduce energy consumption, many jurisdictions around the world are transitioning to outdoor LED lighting. But as new research shows, this solid-state solution hasn't yielded the expected energy savings, and potentially worse, it's resulted in more light pollution than ever before.

Using satellite-based sensors, an international team of scientists sought to understand if our planet's surface is getting brighter or darker at night, and to determine if LEDs are saving energy at the global scale. With the introduction of solid-state lighting—such as LEDs, OLEDs, and PLEDs—it was thought (and hoped) that the transition to it from conventional lighting—like electrical filaments, gas, and plasma—would result in big energy savings. According to the latest research, however, the use of LEDs has resulted in a “rebound” effect whereby many jurisdictions have opted to use even *more* light owing to the associated energy savings.

Indeed, as the new results show, the amount of outdoor lighting around the world has increased during the past several years. “As a result, the world has experienced widespread ‘loss of the night,’ with half of Europe and a quarter of North America experiencing substantially modified light-dark cycles,” write the researchers in the [new study](#), which was published today in *Scientific Advances*.

This conclusion was reached after analyzing high-resolution images collected by the Day-Night-Band (DNB) instrument that's onboard the Suomi NPP weather satellite. This sensor features a spatial resolution of 2,460 feet (750 meters), and can “see” light in the range of 500-900 nm (humans see in the range 400-700 nm). Traditional lamps emit some infrared that the DNB can detect, and LEDs produce a lot of blue light that the sensor cannot see. So as cities transition their outdoor lights to LED, scientists often see decreases in the light observed by satellite (which, to the human eye, would seem to have the same brightness).

“For that reason I expected that wealthy countries would appear to be getting darker (even if that wasn't truly the case). Instead, we observed wealthy countries staying constant, or in many cases increasing,” said Christopher Kyba, lead author of the study and a researcher at the GFZ German Research Centre for Geosciences, in an interview with Gizmodo. “That means that even though some cities are saving energy by switching to LEDs, other places are getting brighter by installing new or brighter lamps (that need new energy). So the data aren't consistent with the hypothesis that on the global scale, LEDs are saving energy for outdoor lighting applications.”

ATTACHMENT F.2 - LIGHTING ARTICLES

Researchers have been documenting the steady growth of artificial lighting ever since it was invented, and they've been wondering when the trend might stop. During the second half of the 20th century, electric light grew at an estimated rate of 3 to 6 percent per year. According to the new study, Earth's artificially lit outdoor areas grew by 2.2 percent each year from 2012 to 2015, with a total radiance growth of 1.8 percent each year. During this span, nearly 60 countries experienced rapid increases in nighttime illumination between 110 to 150 percent, while another 20 countries experienced growth rates as high as 150 percent or more. Nearly 40 remained stable, with only 16 countries experiencing decreasing rates of nighttime illumination.

Needless to say, and as Kyba pointed out, these rates weren't consistent around the globe. In developed nations like the United States and Spain, illumination rates remained stable, but most nations in South America, Africa, and Asia experienced growth. In war-torn countries, such as Syria and Yemen, the rates of outdoor lighting decreased. The new study shows that, when it comes to nighttime illumination, most of the world is still playing catch up to First World outdoor lighting standards.

Disturbingly, the results presented in the new study may actually be worse than the data suggests. As previously mentioned, DRB is not able to detect low-wavelength blue light, which humans can see. Our planet, therefore, is even brighter at nighttime than the data suggests.

"This study is important because it validates with data two things we have suspected: that the rate of growth of light pollution continues upward on a worldwide scale, and that the migration of outdoor lighting from older technologies to LED isn't having the anticipated benefit in terms of global reductions in energy usage," John Barentine, the resident physical scientist for the [International Dark-Sky Association](#), told Gizmodo. "The latter point is especially important because a number of governments have been convinced to convert their outdoor lighting to LED on the basis of promised reductions in energy usage."

Barentine, who wasn't involved in the new study, says the cost savings from the improved energy efficiency of LED lighting has been directed towards the deployment of more lighting, and with important environmental consequences both in terms of light pollution and carbon emissions.

Satellite images of Calgary, Alberta, taken from the ISS in 2010 and 2015. Many areas on the outskirts are newly lit compared to 2010, and many neighborhoods have switched from orange sodium lamps to white LED lamps. (Image: Earth Science and Remote Sensing Unit, NASA Johnson Space Center)

"It's not hyperbole to describe the global problem of light pollution as both unprecedented and astounding," he said. "Beyond the energy issue, the main environmental impact of artificial light at night is on the health and wellbeing of practically every organism on Earth, including humans."

Nighttime illumination is considered a serious environmental pollutant, one that's disruptive to nocturnal animals, plants, and microorganisms. But it's also bad for human health as it disrupts the biological circadian rhythm, leading to metabolic disorders.

ATTACHMENT F.2 - LIGHTING ARTICLES

University of Exeter community ecologist Thomas Davies, who's not affiliated with the new study, says it's no secret that artificial light at night is a globally widespread pollutant, but estimating the rate at which it is expanding has been technically challenging.

“This research overcomes many of these technical issues, providing reliable estimates of the global rate of expansion in artificial light pollution,” Davies told Gizmodo. “The numbers are truly shocking, given that we know illuminating the nocturnal environment can have widespread ramifications for the environment and human health.”

Barentine says the solution to this problem is actually quite simple, but it'll require us to gradually change our relationship with light at night.

“We could instantly reduce the problem by about half if we assured that all outdoor lighting fixtures were fully shielded, meaning that they emitted no light directly above the horizon,” he told Gizmodo. “We could then further reduce the amount of light pollution in the world if fixtures were properly designed and installed such that the light they emit was confined to the task area, and provided in no greater intensity than needed to safely illuminate the task. Lastly, we could reduce the biological harm of our lights by ensuring that they emit as little short-wavelength (blue) light as possible, by choosing ‘warmer’ lamps.”

The most effective way to bring about these changes is through public policy, says Barentine, so we should encourage the encoding of these principles into local, regional, and national laws throughout the world.

These solutions sound simple, and they're certainly sensible, but it's rather convenient for those of us in the developed world to impose such lofty standards onto places where nighttime light is being used for the very first time. Sure, we need to change the culture around the use of outdoor light, but let's start this conversation in places where we already take nighttime illumination for granted.

ITEM 18
BACKUP



MEMORANDUM

TO: Town Council
FROM: Appointments Committee
SUBJECT: Report for February 3rd Appointments
DATE: 1/28/2020

The Appointments Committee is making the following nominations:

Conservation Commission

- William Almeida for a balance of a 3-year term to begin now and to expire on May 1, 2022

Planning Board

- Sande Upedgraph (reappointment) for a 3-year term to begin February 24, 2020, and to expire on February 23, 2023

Village Review Board

- Robert Jarrett for a balance of a 3-year term to begin now and to expire on October 20, 2022

Zoning Board of Appeals

- Leland Gould as full member for a balance of a 3-year term to begin on immediately and to expire on November 20, 2022

Please type this form or it is available in a fillable form on line

Town of Brunswick
Application for
Appointment to Board/ Commission/ Committee

12/2/19	For Office Use Only Date App. Received Date App. Entered Appointed

Full Name: Sande Updegraph Date 11-29-19

Street Address: 724 Durham Rd. Home Phone # 725-1345

Cell/mobile Phone #: 838-9439 E-mail Address: sandeupdegraph@gmail.com

I live in Council Dist. #: 4 I wish to be considered for appointment to the:

Planning Board

(NAME OF BOARD/COMMISSION/COMMITTEE)

Check one or both:

FULL MEMBERSHIP STATUS: X TERM BEGINS: Winter 202

and/or

ASSOC/ALT MEMBERSHIP STATUS: _____ TERM EXPIRES: _____

Do you or any relative currently serve on any Town Board/Commission/Committee? yes If so, please state name of Board/Commission/Committee, the number of years of service, and the relationship to this applicant:

Personnel Bd # of Years 18 Date term exp. _____ Relationship husband

Your occupation:

Employer: retired Work Telephone #: _____

List any civic organizations to which you belong:

Southern Midcoast Maine Chamber, Freeport Chamber, BDA, Midcoast Literacy

Note any prior experience knowledge, or abilities that you have which would contribute to the activities of the board/committee/commission:

6 years as Econ. Development Dir. in Freeport, service on Brunswick PB, VRB, ZBA
Facilitator of Strategic Planning efforts for Frpt. Chamber and Frpt Econ.Dev.Corp [att]

Have you previously served on a Town board/commission/committee? yes If so, please list the board/commission/committee and years of service:

VRB, ZBA, Davis Fund

SIGNATURE

PLEASE COMPLETE THE QUESTIONS ON THE BACK OF THIS APPLICATION.

Applicants may submit a cover letter and resume with the application form.
Applications should be returned to the TOWN CLERK'S OFFICE, 85 Union Street, Brunswick, Me 04011.

You will be contacted to set up an interview with the Appointment Committee.

It is the intent of the Town to televise proceedings of Boards/Commissions/Committees

PLEASE NOTE: This completion of this application allows a person to be considered for a Town/Board/Commisson/Committee, but does not guarantee placement on a Board/Commission/Committee

APPLICANT – PLEASE COMPLETE THE QUESTIONS BELOW

Board/Commission/Committee Applying For: Planning Board

Term Length: 3 years

1. Do you have any questions about what the Board/Commission/Committee does or on its charge?

No

2. Do you have any practical experience or formal education that would be relevant to the Board/Commission/Committee?

Strategic planning for both the Freeport Chamber and Frpt. Econ. Development Corp. 25 years in hotel management planning marketing strategies and budgeting. Served 4 years as MRRRA Trustee. Lived in Brunswick for 19 years. Serve on the Bridge DAC.

3. Why would you like to be on the Board/Commission/Committee?

I am very interested in continuing the good work of the PB and being part of a diverse group of board members. I am also interested in land use and how Brunswick can lead the region in this effort.

4. Are you aware of the time involved and would you be able to attend most of the meetings?

Yes

5. Do you have any conflict of interest that might involve either a direct financial gain or other gain?

No

6. Do you have anything you would like to add?

I believe that my expanding knowledge in land use will serve Brunswick well.

PLEASE REVIEW THE TOWN OF BRUNSWICK BOARDS, COMMISSIONS, AND COMMITTEES APPOINTMENT POLICY PRIOR TO SUBMITTING THIS APPLICATION. YOU MAY VIEW THE POLICY AT <http://www.brunswickme.org/departments/town-clerk/boards-committees/> OR OBTAIN A COPY FROM THE TOWN CLERK'S OFFICE.

Elin Gould

From: noreply@civicplus.com
Sent: Sunday, December 22, 2019 10:20 PM
To: Fran Smith; Elin Gould
Subject: Online Form Submittal: Board Application Form

Board Application Form

Select the Board, Commission, or Committee applying for Conservation Commission

If Other, what committee OR if specific membership type
Fill this in if the Committee you are applying for is not listed OR if the Committee you applied for has different membership types (e.i. Alternate, Full) type here

First Name	William
Last Name	Almeida
Address1	323 Old Bath Rd
Address2	<i>Field not completed.</i>
City	Brunswick
State	Maine
Zip	04011
Home Phone Number	4012196823
Business Address	<i>Field not completed.</i>
Business Phone Number	<i>Field not completed.</i>
Occupation	Garbage to Garden Field Operator
Email Address	williamtalmeida@gmail.com
Are you currently serving on other Boards, Commissions, or Committees?	No
If yes, which	<i>Field not completed.</i>
Have you served on a Board, Commission, or Committee before?	No

If yes, which	<i>Field not completed.</i>
Please list civic organizations to which you belong	<i>Field not completed.</i>
Note any prior experience knowledge, or abilities that you have which would contribute to the activities of the board/committee/commission:	I have Bachelors of Science degree in Environmental Science where I gained experience collecting data in the field and organizing information in the office. All of which added to and fueled my personal passion for the environment.
Upload Resume (Optional)	<i>Field not completed.</i>
1. Do you have any questions about what the Board/Commission/Committee does or on its charge?	No
2. Do you have any practical experience or formal education that would be relevant to the Board/Commission/Committee?	I have a Bachelors of Science degree and job experience where I became familiar with collecting data in the field, organizing the data in an office setting and publishing/ presenting information to the public.
3. Why would you like to be on the Board/Commission/Committee?	I am a new member to the community and would like to immerse myself and contribute my time in a area I am passionate about.
4. Are you aware of the time involved and would you be able to attend most of the meetings?	Yes
5. Do you have any conflict of interest that might involve either a direct financial gain or other gain?	No
6. Do you have anything you would like to add	Thank you for your time.

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6:45?

Town of Brunswick
Application for
Appointment to Board/ Commission/ Committee

For Office Use Only
1/7/20 Date App.
Received
1/14/20 Date App.
Entered
Appointed

Full Name: ROBERT B. JARRATT Date 1/7/20
 Street Address: 3 Meadow Brook Rd Home Phone # 725-8971
 Cell/mobile Phone #: 844-4489 E-mail Address: RBJARRATT@GMAIL.COM I live in Council Dist. #: 2

I wish to be considered for appointment to the:
VIEWAGE REVIEW BOARD

(NAME OF BOARD/COMMISSION/COMMITTEE)

Check one or both:
 FULL MEMBERSHIP STATUS: TERM BEGINS: 1/1/20
 and/or
 ASSOC/ALT MEMBERSHIP STATUS: TERM EXPIRES: 12/31/22

Do you or any relative currently serve on any Town Board/Commission/Committee? NO If so, please state name of Board/Commission/Committee, the number of years of service, and the relationship to this applicant:
 _____ # of Years _____ Date term exp. _____ Relationship _____

Your occupation: RETIRED

Employer: _____ Work Telephone #: _____

List any civic organizations to which you belong:
PEPPERSCOT HIST. SOC BRUNSWICK PUBLIC ART, BRUNSWICK DOWNTOWN ASSOCIATION

Note any prior experience knowledge, or abilities that you have which would contribute to the activities of the board/committee/commission:
PREVIOUS EXPERIENCE (SEE BELOW); ABILITIES - "BIG PICTURE" VIEW - FAIR-MINDED, GOOD LISTENER, SOUND DECISION MAKER

Have you previously served on a Town board/commission/committee? YES If so, please list the board/commission/committee and years of service:
TOWN COUNCIL (2 YRS), PLANNING BOARD (3 YRS), DOWNTOWN MASTER PLAN COM MIT (3 YRS), BDA BOARD (7 YRS), SIGN ORDINANCE REVIEW (2 YRS)
Robert B. Jarratt
 SIGNATURE

PLEASE COMPLETE THE QUESTIONS ON THE BACK OF THIS APPLICATION

Applicants may submit a cover letter and resume with the application form.
 Applications should be returned to the TOWN CLERK'S OFFICE, 85 Union Street, Brunswick, Me 04011.

You will be contacted to set up an interview with the Appointment Committee.

It is the intent of the Town to televise proceedings of Boards/Commissions/Committees

PLEASE NOTE: This completion of this application allows a person to be considered for a Town

Board/Commission/Committee, but does not guarantee placement on a Board/Commission/Committee.

APPLICANT - PLEASE COMPLETE THE QUESTIONS BELOW

Board/Commission/Committee Applying For: Village Review Board

Term Length: 3 YRS

1. Do you have any questions about what the Board/Commission/Committee does or on its charge?

NO

2. Do you have any practical experience or formal education that would be relevant to the Board/Commission/Committee?

EXTENSIVE INVOLVEMENT IN TOWN ACTIVITIES OVER FIVE DECADES - OWNED A DOWNTOWN BUSINESS FOR 12 YRS

3. Why would you like to be on the Board/Commission/Committee?

THE WORK OF THE URIB IS VITAL TO THE PRESERVATION OF THE ~~CORE~~ CORE OF BRUNSWICK. WITH MY EXPERIENCE AND ABILITY TO WORK COLLEGIALLY WITHIN A GROUP, I WANT CONTINUE TO MAKE A DIFFERENCE IN A COMMUNITY I LOVE.

4. Are you aware of the time involved and would you be able to attend most of the meetings?

YES

5. Do you have any conflict of interest that might involve either a direct financial gain or other gain?

NO

6. Do you have anything you would like to add?

NO

PLEASE REVIEW THE TOWN OF BRUNSWICK BOARDS, COMMISSIONS, AND COMMITTEES APPOINTMENT POLICY PRIOR TO SUBMITTING THIS APPLICATION. YOU MAY VIEW THE POLICY AT <http://www.brunswickme.org/departments/town-clerk/boards-committees/> OR OBTAIN A COPY FROM THE TOWN CLERK'S OFFICE.

INDB ✓
SC

Elin Gould

From: noreply@civicplus.com
Sent: Friday, January 17, 2020 8:56 PM
To: Fran Smith; Elin Gould
Subject: Online Form Submittal: Board Application Form

Board Application Form

Select the Board, Commission, Zoning Board of Appeals
or Committee applying for

If Other, what committee OR if specific membership type
*Fill this in if the Committee you are applying for is not listed OR if the Committee
you applied for has different membership types (e.i. Alternate, Full) type here*

First Name	Leland
Last Name	Gould
Address1	35 RANGE RD
Address2	APT A
City	Brunswick
State	ME
Zip	04011
Home Phone Number	2073232778
Cell Phone Number	2073232778
Work Phone Number	<i>Field not completed.</i>
Occupation	Subcontracts Supervisor, BIW
Email Address	leland.gould@gmail.com
Are you currently serving on other Boards, Commissions, or Committees?	No
If yes, which	<i>Field not completed.</i>
Have you served on a Board, Commission, or Committee before?	No

If yes, which	<i>Field not completed.</i>
Please list civic organizations to which you belong	n/a
Note any prior experience knowledge, or abilities that you have which would contribute to the activities of the board/committee/commission:	BA in Political Science, MBA, and write/negotiate/enforce subcontracts for a DOD prime contractor.
Upload Resume (Optional)	<i>Field not completed.</i>
1. Do you have any questions about what the Board/Commission/Committee does or on its charge?	No
2. Do you have any practical experience or formal education that would be relevant to the Board/Commission/Committee?	BA in Political Science, MBA (4.0 GA), and I currently write/negotiate/enforce subcontracts for a DoD prime contractor.
3. Why would you like to be on the Board/Commission/Committee?	The subject matter is interesting
4. Are you aware of the time involved and would you be able to attend most of the meetings?	Yes
5. Do you have any conflict of interest that might involve either a direct financial gain or other gain?	No
6. Do you have anything you would like to add	No

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CONSENT AGENDA - A BACK UP MATERIALS

Draft
BRUNSWICK TOWN COUNCIL
Minutes
January 21, 2020
Regular Meeting 6:30 P.M.
Council Chambers
Town Hall
85 Union Street

Councilors Present: W. David Watson, Stephen S. Walker, Dan Jenkins, John M. Perreault, Christopher Watkinson, Toby McGrath, James Mason, Kathy Wilson, and Dan Ankeles

Councilors Absent: None

Town Staff Present: John S. Eldridge, III, Town Manager; Fran Smith, Town Clerk; Ryan Leighton, Assistant Town Manager; Matt Panfil, Director of Planning and Development; Julia Henze, Finance Director; Tom Farrell, Director of Parks and Recreation; Sally Costello, Director of Economic Development; Jay Astle, Public Works Director; Dennis Wilson, Parks and Recreation Facilities Manager, and TV video crew

Chair John Perreault called the meeting to order, asked for roll call and led the Pledge of Allegiance.

Adjustments to Agenda: None

Public Comments/Announcements (for items not on the agenda) *(This item was discussed at 6:31 p.m.)*

Jean Powers, 40 Redwood Lane, said she received the State homestead tax payment. She also asked if the town was getting funds from Portland to offset the cost of asylum seekers. She believed that the town should seek money from other sources, including the Governor.

The following people spoke regarding the lack of availability of cross-country skiing at Mere Creek Golf Club:

Bonny Wood, 22 Hovey Lane

Mark Battle, 18 Bowker Street

Kathy Thorson, 18 Bowker Street

Sarah Lawrence, 6 Longfellow

Madeline Schneider, 16 Juniper Road

MANAGER'S REPORT *(This item was discussed at 6:47 p.m.)*

a) Financial Update

Manager Eldridge provided this update.

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b) Dog Licenses

Fran Smith, Town Clerk, provided this update.

c) Bond Issue – Elementary School

Manager Eldridge provided this update.

d) Fire Station

Manager Eldridge provided this update.

e) Mere Creek Golf Course

Manager Eldridge provided this update, and responded to questions from Councilor Walker, Councilor Wilson, and Councilor Ankeles.

f) Public Transportation – Explorer

Manager Eldridge provided this update.

g) Public Transportation – Metro Breeze

Manager Eldridge provided this update.

h) Winter Operations

Jay Astle, Public Works Director, provided this update, and responded to questions from Chair Perreault, Councilor Watkinson, and Councilor Wilson.

PUBLIC HEARING

- 3. The Town Council will hear public comments on applications for Special Amusement licenses, and will take any appropriate action. (Town Manager Eldridge) *(This item was discussed at 7:17 p.m.)***

Special Amusement

**Brunswick Lodge of Elks #2043
D/B/A: Brunswick Lodge of Elks
179 Park Row**

Angela Brackett

**Odd Duck FSE, INC.
D/B/A: Odd Duck FSE
11 Pleasant Street**

Rebecca Marcos

Chair Perreault opened the public hearing.

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Fran Smith, Town Clerk, introduced this item.

Chair Perreault closed the public hearing.

Councilor Walker moved, Councilor Watson seconded, to approve Special Amusement licenses for the Brunswick Lodge of Elks, 179 Park Row, and Odd Duck FSE, 11 Pleasant Street. The motion carried with nine (9) yeas.

- 4. The Town Council will hear public comments regarding the recommended relocation of the Farmer's Market to Park Row, with accompanying fee increase and changes in the parking ordinance, and will take any appropriate action. (Town Manager Eldridge) (This item was discussed at 7:18 p.m.)**

Chair Perreault opened the public hearing.

Manager Eldridge introduced this item.

Tom Farrell, Parks and Recreation Director, and Jay Astle, Public Works Director, provided information on this item. They responded to questions from all nine Councilors.

The following people spoke regarding this item:

Randall Arndt, 6 Sparwell Lane

Abby Sadauckas, President of Brunswick Farmer's Market

Mrs. Nemrow, Park Row property owner

Bill Ferdinand, representing Eaton Peabody on Park Row

Jimmy DeBiasi, Maine Federation of Farmer's Markets

Kathy Caron, owner, Fairwinds Farm, Farmer's Market vendor

Karen Demers, 639 River Road

Richard Shapiro, 639 River Road

Hallie Daughtry, 15 Oakridge Road

Bob Martin, 93 Admiral Fitch Avenue

Nat Drummond, Treasurer of Brunswick Farmer's Market

Wander Webber Snyder, 1 Colonial Drive

Jean Powers, 40 Redwood Lane

Eileen Horner, owner of Brunswick Inn on Park Row

Bob Spear, Nobleboro, owner of Spears Farms, Farmer's Market vendor

Maina Hammaker, 10 Pleasant Hill Road

Kate Muller, Bath

Jean MacNeille, 2 Brookside Road, Topsham

Dan Sortwell, Wiscasset, Farmer's Market vendor

Jim Townsend, Manager of Nemrow properties on Park Row

Steve Weems, 44 Thompson Street

Karen Marston, Bowdoin, Farmer's Market vendor

Chair Perreault closed the public hearing.

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Manager Eldridge spoke regarding this item.

Councilor Walker, Councilor Mason, Councilor Wilson, Councilor Watkinson, Councilor McGrath, Councilor Ankeles, and Councilor Jenkins asked questions, to which Mr. Astle, Mr. Farrell, and Manager Eldridge responded.

Councilor Watson, Councilor Jenkins, Councilor Watkinson, Councilor Ankeles, Chair Perreault, Councilor Walker, Councilor McGrath, and Councilor Jenkins spoke to this item.

This item will come back at the next meeting with a proposal for use of an area on the mall, with no vehicles allowed.

- 5. The Town Council will hear public comments regarding proposed changes to outdoor seating on public ways for the 2020 licensing year, and will take any appropriate action. (Town Manager Eldridge) (This item was discussed at 10:00 p.m.)**

Chair Perreault opened the public hearing.

Ms. Smith introduced this item.

Councilor McGrath spoke regarding this item.

Chair Perreault closed the public hearing.

The Council supported suspending the rules to vote tonight.

Councilor Jenkins moved, Councilor Watkinson seconded, to adopt changes to Chapter 10 – Licenses and Business Regulations, Chapter 14 – Streets, Sidewalks and Other Public Places, and the Master Schedule of Revenues, Charges, Fees and Fines, Appendix B, to increase the fee from \$150.00 to \$200.00 for vendors with nine (9) or more outdoor seats, and to set the time outdoor seating is allowed to the period between April 15th and November 1st. The motion carried with nine (9) yeas.

(A copy of the adopted ordinance will be attached to the official minutes.)

- 6. The Town Council will hear public comments regarding changes to mooring fees, and will take any appropriate action. (Town Manager Eldridge) (This item was discussed at 10:06 p.m.)**

Chair Perreault opened the public hearing.

Ms. Smith introduced this item.

Councilor Ankeles asked questions, to which Ms. Smith responded.

Chair Perreault closed the public hearing.

The Council supported suspending the rules to vote tonight.

Councilor Wilson moved, Councilor Ankeles seconded, to adopt the proposed changes to mooring fees. The motion carried with nine (9) yeas.

(A copy of the adopted ordinance will be attached to the official minutes.)

NEW BUSINESS

7. **The Town Council will consider a request from the Brunswick Downtown Association for a waiver of fees for the 2020 Community Barbecue and the 2020 Brunswick Outdoor Arts Festival, and will take any appropriate action. (Town Manager Eldridge) *(This item was discussed at 10:09 p.m.)***

Councilor Ankeles moved, Councilor Mason seconded, to waive the \$500.00 event fees for the BDA events “Community Barbeque” and “Brunswick Outdoor Arts Festival”, taking place in June and August of 2020 respectively. The motion carried with nine (9) yeas.

8. **The Town Council will consider forwarding a request from Sitelines to the Planning Board for a boundary change to the Shoreland Protection Overlay (SPO) to be consistent with the Town of Brunswick’s GIS and Zoning Map, and will take any appropriate action. (Town Manager Eldridge) *(This item was discussed at 10:10 p.m.)***

This item will come back at a future meeting.

9. **The Town Council will hear a proposal from Brunswick Housing Authority to convert its Section 9 Public Housing Program to Section 8 assistance, and will take any appropriate action. (Town Manager Eldridge) *(This item was discussed at 10:11 p.m.)***

John Hodge, Executive Director, introduced this item and responded to questions from Manager Eldridge.

Councilor Watkinson and Councilor Walker spoke regarding the item.

(A copy of a memo from John Hodge, Executive Director of the Brunswick Housing Authority, will be attached to the official minutes.)

10. **The Town Council will consider giving its annual authority to the Brunswick Marine Resource Committee to open and close coastal waters within the Town’s jurisdiction, and will take any appropriate action. (Town Manager Eldridge) *(This item was discussed at 10:17 p.m.)***

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Fran Smith introduced this item.

Councilor Watson moved, Councilor Walker seconded, to allow the Marine Resource Committee the authority to open and close coastal waters within the Town of Brunswick's jurisdiction for the year 2020. The motion carried with nine (9) yeas.

- 11. The Town Council will consider ratifying a contract between the Town of Brunswick and the Teamsters Local Union #340 for the Brunswick Parks & Recreation Maintenance Workers, and will take any appropriate action. (Town Manager Eldridge) (This item was discussed at 10:20 p.m.)**

Manager Eldridge introduced this item.

Councilor Watson moved, Councilor McGrath seconded, to ratify a contract between the Town of Brunswick and the Teamsters Local Union #340 for the Brunswick Parks & Recreation Maintenance Workers. The motion carried with nine (9) yeas.

(A copy of the union contract will be attached to the official minutes.)

- 12. The Chair will make appointments of Council members to represent various boards and subcommittees, and will take any appropriate action. (Council Chair John Perreault) (This item was discussed at 10:22 p.m.)**

Chair Perreault made the following appointments:

Appointments Sub-committee: Councilor Watkinson, Councilor Ankeles, and Councilor McGrath

Bicycle & Pedestrian Advisory Committee: Councilor Ankeles

Brunswick Development Corporation: Councilor Mason and Councilor Wilson

Cable Television Committee: Councilor Watson

Citizen's Initiative Clarity Board: Councilor Jenkins and Councilor Ankeles

Downtown and Outer Pleasant Street Master Plan Implementation Committee: Councilor McGrath and Councilor Wilson

Finance Committee: Councilor Jenkins, Councilor Ankeles, and Councilor Walker

Recycling and Sustainability Committee: Councilor Walker

Rivers and Coastal Waters Commission: Councilor Wilson and Councilor Watson

Solid Waste Task Force: Councilor Jenkins, Chair Perreault, and Councilor Walker

Teen Center Advisory Board: Councilor McGrath

TIF – MRRRA Districts Committee: Councilor Mason, Councilor Watkinson and Councilor Watson

Tree Committee: Councilor Walker

Trust Fund Advisory Committee: Councilor Mason

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COMMITTEE REPORTS *(This item was discussed at 10:22 p.m.)*

Reports were given for the Bicycle and Pedestrian Advisory Committee and the Comprehensive Plan Steering Committee.

CONSENT AGENDA *(This item was discussed at 10:23 p.m.)*

a) Approval of the minutes of December 16, 2019

Councilor Watson moved, Councilor Wilson seconded, to approve the Consent Agenda. The motion carried with nine (9) yeas.

Councilor Watson moved, Councilor Walker moved, to adjourn the meeting. The motion carried with nine (9) yeas.

The meeting adjourned at 10:24 p.m.

PLEASE NOTE: THESE MINUTES ARE ACTION MINUTES. THE ENTIRE MEETING CAN BE VIEWED AT WWW.BRUNSWICKME.ORG.

*Frances M. Smith
Town Clerk
January 19, 2020*

February 3, 2020
Date of Approval

Council Chair

CONSENT AGENDA - B
NO BACK UP MATERIALS