

S T A T E O F N E W Y O R K

4105--A

2011-2012 Regular Sessions

I N S E N A T E

March 17, 2011

Introduced by Sen. MARCELLINO -- read twice and ordered printed, and when printed to be committed to the Committee on Environmental Conservation -- committee discharged, bill amended, ordered reprinted as amended and recommitted to said committee

AN ACT to amend the environmental conservation law and the public service law, in relation to enacting the healthy, safe and energy efficient outdoor lighting act

THE PEOPLE OF THE STATE OF NEW YORK, REPRESENTED IN SENATE AND ASSEMBLY, DO ENACT AS FOLLOWS:

1 Section 1. The environmental conservation law is amended by adding a
2 new article 20 to read as follows:

ARTICLE 20

3 HEALTHY, SAFE AND ENERGY EFFICIENT OUTDOOR LIGHTING ACT

4 SECTION 20-0101. LEGISLATIVE FINDINGS AND POLICY.

5 20-0103. SHORT TITLE.

6 20-0105. DEFINITIONS.

7 20-0107. PERMANENT OUTDOOR LUMINAIRE.

8 20-0109. DARK-SKY PRESERVES.

9 20-0111. MODEL COMPREHENSIVE OUTDOOR LIGHTING ORDINANCE.

10 20-0113. INFORMATIONAL PAMPHLET.

11 20-0115. APPLICABILITY.

12 S 20-0101. LEGISLATIVE FINDINGS AND POLICY.

13 THE LEGISLATURE FINDS THAT CAREFUL MANAGEMENT OF OUTDOOR LIGHTING IS
14 NECESSARY TO PROTECT THE HEALTH, SAFETY, ENERGY SECURITY, ENVIRONMENT
15 AND GENERAL WELFARE OF THE PEOPLE OF THE STATE.

16 UNTIL THE END OF THE NINETEENTH CENTURY, WANING DAYLIGHT BROUGHT AN
17 END TO MANY OF MANKIND'S ACTIVITIES. THIS BEGAN TO CHANGE WITH THE
18 INTRODUCTION OF INCANDESCENT LAMPS, WHICH DRAMATICALLY INCREASED THE
19 RANGE OF PURSUITS POSSIBLE AFTER DARK. CIVIC, SOCIAL, CULTURAL, EDUCA-
20 TIONAL, AND COMMERCIAL ENDEAVORS NOW GO FORWARD WITH AN EASE AND FREEDOM
21 UNIMAGINABLE IN EARLIER TIMES. AS THE SCIENCE OF LIGHTING EVOLVED,
22

EXPLANATION--Matter in *ITALICS* (underscored) is new; matter in brackets
[] is old law to be omitted.

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1 HOWEVER, TECHNICAL ADVANCEMENTS GRADUALLY OUTSTRIPPED THE BASIC REQUIRE-
2 MENT OF PROVIDING ADEQUATE ILLUMINATION FOR THE TASK AT HAND. AT LEAST
3 IN THE CASE OF OUTDOOR LIGHTING, THERE IS NOW GROWING RECOGNITION THAT
4 THE CONSEQUENCES ARE NOT ALTOGETHER BENIGN.

5 INCREASING SCIENTIFIC AND EXPERIENTIAL EVIDENCE DEMONSTRATES THAT
6 MISDIRECTED, UNSHIELDED, EXCESSIVE OR UNNECESSARY OUTDOOR NIGHT LIGHTING
7 HAS MAJOR DETRIMENTAL EFFECTS. ENERGY IS WASTED WHEN ILLUMINATION IS
8 USED EXCESSIVELY AND INEFFICIENTLY, CAUSING UNNECESSARY HEALTH-THREATEN-
9 ING EMISSIONS FROM BURNING OF FOSSIL FUELS. SUCH EMISSIONS ALSO POLLUTE
10 THE STATE'S WATERS AND CONTRIBUTE TO GLOBAL WARMING.

11 BECAUSE THE HUMAN EYE AUTOMATICALLY ADJUSTS TO THE BRIGHTEST LIGHT IN
12 VIEW, THE GLARE FROM UNSHIELDED OR EXCESSIVELY BRIGHT OUTDOOR LIGHTING
13 CAN ACTUALLY INTERFERE WITH THE CLEAR PERCEPTION OF OTHER OBJECTS IN
14 ONE'S FIELD OF VISION.

15 INAPPROPRIATE USE OF OUTDOOR LIGHTING CAN HAVE A NEGATIVE IMPACT ON
16 THE NATURAL ENVIRONMENT, INTERFERING WITH NORMAL PATTERNS OF ACTIVITY,
17 BEHAVIOR AND PHYSIOLOGY OF FLORA AND FAUNA. RECENT RESEARCH HAS INDIC-
18 CATED THAT EXPOSURE TO LIGHT AT NIGHT CAN UPSET NORMAL HUMAN CIRCADIAN
19 RHYTHMS, THEREBY DISRUPTING HORMONE SECRETIONS AND WEAKENING THE BODY'S
20 IMMUNE SYSTEM.

21 IN ADDITION, SKY GLOW FROM UNSHIELDED AND UNNECESSARY OUTDOOR LIGHTING
22 THWARTS THE AGES-OLD HUMAN YEARNING TO GAZE AT, LEARN FROM AND ENJOY THE
23 WONDERS OF THE NIGHT SKY.

24 THE LEGISLATURE FURTHER FINDS THAT COST-EFFICIENT MEANS AND PRACTICES
25 EXIST THROUGH APPROPRIATE USE OF LUMINAIRES TO PROVIDE ADEQUATE NIGHT
26 LIGHTING WHEN NEEDED THAT IS SAFE AND EFFECTIVE BUT CAUSES MINIMAL LIGHT
27 TRESPASS, GLARE, AND SKY GLOW. THESE MEANS AND PRACTICES ARE POSSIBLE
28 WITH INCREASED PUBLIC AWARENESS THROUGH EDUCATION AND PRUDENT PUBLIC
29 ACTION AS PROVIDED IN THIS ARTICLE.

30 THEREFORE, IT IS THE PURPOSE OF THIS ARTICLE TO BEGIN LIMITING LIGHT
31 POLLUTION IN THE STATE IN A COST-EFFECTIVE AND SOCIALLY FEASIBLE MANNER
32 IN ORDER TO PROTECT PUBLIC HEALTH, SAFETY AND THE ENVIRONMENT.

33 S 20-0103. SHORT TITLE.

34 THIS ARTICLE SHALL BE KNOWN AND MAY BE CITED AS THE "HEALTHY, SAFE AND
35 ENERGY EFFICIENT OUTDOOR LIGHTING ACT".

36 S 20-0105. DEFINITIONS.

37 AS USED IN THIS ARTICLE:

38 1. "LUMINAIRE" MEANS A COMPLETE LIGHTING UNIT, INCLUDING A LAMP OR
39 LAMPS TOGETHER WITH THE PARTS DESIGNED TO DISTRIBUTE THE LIGHT, TO POSI-
40 TION AND PROTECT THE LAMPS, AND TO CONNECT THE LAMPS TO THE POWER
41 SUPPLY; A LIGHT FIXTURE.

42 2. "GLARE" MEANS LIGHT EMITTED BY A LUMINAIRE THAT CAUSES REDUCED
43 VISIBILITY OR MOMENTARY BLINDNESS BY SHINING DIRECTLY INTO THE EYES OF
44 THE VIEWER.

45 3. "LAMP" MEANS THE COMPONENT OF A LUMINAIRE THAT PRODUCES LIGHT; A
46 LIGHT BULB.

47 4. "LIGHT POLLUTION" MEANS ANY ADVERSE EFFECT OF OUTDOOR LIGHTING
48 INCLUDING, BUT NOT LIMITED TO, GLARE AND SKY GLOW.

49 5. "LUMEN" MEANS THE UNIT OF MEASUREMENT USED TO QUANTIFY THE AMOUNT
50 OF LIGHT PRODUCED BY A LAMP OR EMITTED FROM A LUMINAIRE, AS DISTINCT
51 FROM "WATT", A MEASURE OF POWER CONSUMPTION.

52 6. "FULLY SHIELDED LUMINAIRE" MEANS A LUMINAIRE CONSTRUCTED AND
53 INSTALLED IN SUCH A MANNER THAT ALL LIGHT EMITTED BY IT, EITHER DIRECTLY
54 FROM THE LAMP OR A DIFFUSING ELEMENT, OR INDIRECTLY BY REFLECTION OR
55 REFRACTION FROM ANY PART OF THE LUMINAIRE, IS PROJECTED BELOW A HORIZON-
56 TAL PLANE THROUGH THE LUMINAIRE'S LOWEST LIGHT EMITTING PART.

1 7. "PERMANENT OUTDOOR LUMINAIRE" MEANS ANY LUMINAIRE OR SYSTEM OF
2 LUMINAIRES THAT IS OUTDOORS AND THAT IS USED FOR MORE THAN TEN DAYS IN A
3 THREE HUNDRED SIXTY-FIVE DAY PERIOD.

4 8. "ROADWAY LIGHTING" MEANS PERMANENT OUTDOOR LUMINAIRES THAT ARE
5 SPECIFICALLY INTENDED TO ILLUMINATE ROADWAYS FOR AUTOMOTIVE VEHICLES.

6 9. "CONTINUOUS ROADWAY LIGHTING DESIGN" MEANS A LIGHTING PLAN THAT
7 ESTIMATES LIGHT ON A ROADWAY FROM CALCULATIONS UTILIZING FACTORS INCLUD-
8 ING, BUT NOT LIMITED TO, A PARTICULAR LUMINAIRE, MOUNTING HEIGHT, OR
9 POLE SPACING, IN ORDER TO MEET A SPECIFIED GOAL SUCH AS MINIMUM LIGHTING
10 LEVEL, UNIFORMITY, OR SMALL-TARGET VISIBILITY. LIGHTING PLACED ONLY AT
11 INTERSECTIONS OR OTHER POTENTIALLY HAZARDOUS LOCATIONS SHALL NOT BE
12 CONSIDERED CONTINUOUS.

13 10. "SKY GLOW" MEANS THE ILLUMINATION OF THE NIGHTTIME SKY THAT
14 RESULTS FROM UPWARD SHINING LIGHT, WHICH IS REFLECTED OFF MOLECULES AND
15 PARTICLES OF DIRT AND MOISTURE IN THE ATMOSPHERE.
16 S 20-0107. PERMANENT OUTDOOR LUMINAIRE.

17 1. NO STATE AGENCY OR PUBLIC CORPORATION OPERATING IN THE STATE SHALL
18 INSTALL OR CAUSE TO BE INSTALLED ANY NEW OR REPLACEMENT PERMANENT
19 OUTDOOR LUMINAIRE UNLESS THE FOLLOWING CONDITIONS ARE MET:

20 (A) ANY LUMINAIRE WITH A LAMP OR LAMPS HAVING TOTAL INITIAL OUTPUT
21 GREATER THAN 1800 LUMENS SHALL BE FULLY SHIELDED, EXCEPT THAT A HISTOR-
22 IC-STYLE DECORATIVE LUMINAIRE MAY EMIT UP TO TWO PERCENT OF ITS TOTAL
23 LUMENS ABOVE THE HORIZONTAL PLANE;

24 (B) IF A LIGHTING RECOMMENDATION PUBLISHED BY THE ILLUMINATING ENGI-
25 NEERING SOCIETY OF NORTH AMERICA APPLIES, FULL CONSIDERATION IS GIVEN TO
26 THE MINIMUM MAINTAINED LIGHT LEVEL ADEQUATE TO MEET THE RECOMMENDATION;

27 (C) IF NO SUCH LIGHTING RECOMMENDATION APPLIES, NO MORE THAN THE MINI-
28 MUM MAINTAINED LIGHT LEVEL ADEQUATE FOR THE INTENDED PURPOSE IS USED;

29 (D) FOR ROADWAY LIGHTING UNASSOCIATED WITH INTERSECTIONS, A DETERMI-
30 NATION IS MADE THAT THE PURPOSE OF THE LIGHTING INSTALLATION OR REPLACE-
31 MENT CANNOT BE ACHIEVED BY INSTALLATION OF REFLECTORIZED ROADWAY MARK-
32 ERS, LINES, WARNINGS OR INFORMATIONAL SIGNS, OR OTHER PASSIVE MEANS;

33 (E) ADEQUATE CONSIDERATION HAS BEEN GIVEN TO CONSERVING ENERGY AND
34 MINIMIZING GLARE AND SKY GLOW; AND

35 (F) THE NEW OR REPLACEMENT LUMINAIRE MEETS THE LUMINAIRE EFFICIENCY
36 AND LAMP LUMINOUS EFFICACY STANDARDS DEVELOPED PURSUANT TO SUBDIVISION
37 FIVE OF THIS SECTION.

38 2. THE FOLLOWING SITUATIONS SHALL BE EXEMPT FROM THE REQUIREMENTS OF
39 SUBDIVISION ONE OF THIS SECTION:

40 (A) SITUATIONS WHERE FEDERAL LAWS, RULES AND REGULATIONS TAKE PRECED-
41 ENCE; AND

42 (B) SITUATIONS WHERE FIRE, POLICE, RESCUE, OR REPAIR PERSONNEL INCLUD-
43 ING UTILITY PERSONNEL NEED LIGHT FOR TEMPORARY EMERGENCIES OR ROAD
44 REPAIR WORK.

45 3. THE FOLLOWING SITUATIONS SHALL BE EXEMPT FROM THE REQUIREMENTS OF
46 PARAGRAPHS (A) AND (B) OF SUBDIVISION ONE OF THIS SECTION:

47 (A) THE LUMINAIRE IS A REPLACEMENT FOR A LUMINAIRE THAT IS PART OF A
48 CONTINUOUS ROADWAY LIGHTING DESIGN;

49 (B) THE LUMINAIRE IS A HISTORIC-STYLE DECORATIVE LUMINAIRE WHICH IS
50 PART OF A CONTINUOUS ROADWAY LIGHTING DESIGN WHERE THE REPLACEMENT OF
51 THE LUMINAIRE PIECEMEAL WITH COMPLIANT LUMINAIRES WOULD UNACCEPTABLY
52 DEGRADE THE AESTHETIC CHARACTERISTICS OF THE EXISTING LIGHTING DESIGN;

53 (C) SITUATIONS WHERE THERE ARE SPECIAL REQUIREMENTS, SUCH AS SPORTS
54 FACILITIES, TUNNELS, TRAFFIC CONTROL DEVICES, NAVIGATION LIGHTING,
55 AIRPORTS, UNDERBRIDGE LIGHTING, NATURAL AND CULTURAL MONUMENTS, OR FLAG
56 LIGHTING; PROVIDED, HOWEVER, THAT ALL SUCH LIGHTING SHALL BE SELECTED

1 AND INSTALLED TO SHIELD THE LAMP OR LAMPS FROM DIRECT VIEW AND TO MINI-
2 MIZE UPWARD LIGHTING AND GLARE TO THE GREATEST EXTENT POSSIBLE; AND

3 (D) SITUATIONS WHERE A WRITTEN DETERMINATION WITH FINDINGS HAS BEEN
4 MADE THAT A SPECIFIED EXEMPTION TO ANY REQUIREMENT OF SUBDIVISION ONE OF
5 THIS SECTION IS NECESSARY AND APPROPRIATE FOR A COMPELLING SAFETY INTER-
6 EST THAT CANNOT BE ADEQUATELY ADDRESSED BY ANY OTHER METHOD. WHERE THIS
7 EXEMPTION IS FOR A STATE AGENCY OR STATE PUBLIC CORPORATION, THE WRITTEN
8 DETERMINATION SHALL BE MADE BY THE CHIEF EXECUTIVE OFFICER OF THE AGENCY
9 OR CORPORATION OR HIS OR HER DESIGNEE. WHERE THE EXEMPTION IS FOR A
10 COUNTY, CITY, TOWN, OR VILLAGE, OR A PUBLIC CORPORATION THEREIN, THE
11 WRITTEN DETERMINATION SHALL BE MADE BY THE APPROPRIATE COUNTY EXECUTIVE,
12 MAYOR, SUPERVISOR, OR CHIEF EXECUTIVE OFFICER OR HIS OR HER DESIGNEE.

13 4. THE DEPARTMENT, IN CONSULTATION WITH THE DEPARTMENT OF TRANSPORTA-
14 TION AND THE OFFICE OF GENERAL SERVICES AND GIVING CONSIDERATION TO THE
15 RECOMMENDED PRACTICES ADOPTED BY THE ILLUMINATING ENGINEERING SOCIETY OF
16 NORTH AMERICA, SHALL ESTABLISH RULES TO IMPLEMENT THE PROVISIONS OF THIS
17 SECTION, INCLUDING A SYSTEM TO ENSURE THAT THE USE OF STATE FUNDS FOR
18 STREET LIGHTING COMPLIES WITH THE REQUIREMENTS SET FORTH HEREIN AND
19 SHALL PROVIDE FOR THE WIDE DISSEMINATION OF THIS INFORMATION.

20 5. THE COMMISSIONER, IN CONSULTATION WITH THE NEW YORK STATE ENERGY
21 RESEARCH AND DEVELOPMENT AUTHORITY, SHALL DEVELOP LUMINAIRE EFFICIENCY
22 AND LAMP LUMINOUS EFFICACY STANDARDS FOR LIGHTING REGULATED UNDER THIS
23 SECTION. FOR PURPOSES OF THIS SECTION "LUMINAIRE EFFICIENCY" SHALL MEAN
24 THE PERCENTAGE OF LUMENS GENERATED BY A LAMP WHICH ACTUALLY LEAVE A
25 LUMINAIRE; AND "LAMP LUMINOUS EFFICACY" SHALL MEAN THE AMOUNT OF LIGHT
26 GENERATED BY A LAMP/BALLAST SYSTEM (IN LUMENS) DIVIDED BY THE POWER IT
27 USES (IN WATTS). SUCH STANDARDS SHALL BE PROMULGATED ON OR BEFORE THE
28 EFFECTIVE DATE OF THIS ARTICLE AND SHALL TAKE EFFECT ONE HUNDRED EIGHTY
29 DAYS AFTER SUCH EFFECTIVE DATE.

30 6. IN RECOGNITION OF THE ONGOING RESEARCH INTO AND DEVELOPMENT OF NEW
31 TECHNOLOGIES IN THE OUTDOOR LIGHTING FIELD, THE DEPARTMENT, IN CONSULTA-
32 TION WITH THE NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY,
33 SHALL REPORT TO THE LEGISLATURE REGARDING NEW FINDINGS FROM RESEARCH AND
34 NEW TECHNOLOGIES THAT MAY AFFECT THE PROVISIONS OF THIS ARTICLE. SUCH
35 REPORTING MAY INCLUDE RECOMMENDED AMENDMENTS TO THIS ARTICLE TO INCREASE
36 ITS EFFECTIVENESS IN IMPLEMENTING THE PURPOSES OF ACHIEVING HEALTHY,
37 SAFE AND ENERGY EFFICIENT OUTDOOR LIGHTING.

38 S 20-0109. DARK-SKY PRESERVES.

39 1. THE COMMISSIONER IN CONSULTATION WITH AFFECTED STATE AGENCIES AND
40 LOCAL AUTHORITIES MAY IDENTIFY AND NOMINATE AS "DARK-SKY PRESERVES"
41 AREAS OF THE STATE WHICH ARE ESPECIALLY SUITABLE FOR ASTRONOMICAL OBSER-
42 VATIONS AND/OR WHICH PROVIDE, DUE TO THEIR DARKNESS, NOCTURNAL BENEFITS
43 TO FLORA AND FAUNA, OR TO CITIZENS DESIRING VIEWS OF UNPOLLUTED OR RELA-
44 TIVELY UNPOLLUTED NIGHT SKIES.

45 2. WITHIN EIGHTEEN MONTHS OF THE NOMINATION OF THE FIRST DARK-SKY
46 PRESERVE, THE COMMISSIONER SHALL PREPARE AND SUBMIT TO THE GOVERNOR AND
47 LEGISLATURE FOR REVIEW AND APPROVAL A PROPOSED PLAN TO PRESERVE THESE
48 AREAS AS NECESSARY AND APPROPRIATE TO PROTECT ASTRONOMICAL OBSERVATIONS
49 AND/OR FLORA AND FAUNA.

50 S 20-0111. MODEL COMPREHENSIVE OUTDOOR LIGHTING ORDINANCE.

51 THE COMMISSIONER, IN CONSULTATION WITH THE NEW YORK STATE ENERGY
52 RESEARCH AND DEVELOPMENT AUTHORITY, THE SECRETARY OF STATE AND THE
53 COMMISSIONERS OF TRANSPORTATION AND THE OFFICE OF GENERAL SERVICES,
54 SHALL PREPARE OR CAUSE TO BE PREPARED AND DISTRIBUTED TO CITIES, TOWNS
55 AND VILLAGES A MODEL COMPREHENSIVE OUTDOOR LIGHTING ORDINANCE FOR THE

1 PURPOSE OF SAVING ENERGY, REDUCING UNNECESSARY GLARE AND REDUCING UNNEC-
2 ESSARY SKY GLOW.

3 S 20-0113. INFORMATIONAL PAMPHLET.

4 THE COMMISSIONER, IN CONSULTATION WITH THE NEW YORK STATE ENERGY
5 RESEARCH AND DEVELOPMENT AUTHORITY AND GIVING CONSIDERATION TO THE
6 RECOMMENDED PRACTICES ADOPTED BY THE ILLUMINATING ENGINEERING SOCIETY OF
7 NORTH AMERICA, SHALL DEVELOP AND DISTRIBUTE TO EVERY MUNICIPALITY AND
8 EVERY ELECTRIC CORPORATION OR MUNICIPALITY PROVIDING ELECTRIC SERVICE IN
9 THIS STATE A PAMPHLET CONTAINING INFORMATION REGARDING THE PROVISIONS OF
10 THIS ARTICLE WITH RESPECT TO OUTDOOR LIGHTING.

11 S 20-0115. APPLICABILITY.

12 1. THE PROVISIONS OF THIS ARTICLE ARE CUMULATIVE AND SUPPLEMENTAL AND
13 SHALL NOT APPLY WITHIN ANY COUNTY OR MUNICIPALITY THAT, BY ORDINANCE OR
14 RESOLUTION, HAS ADOPTED PROVISIONS RESTRICTING LIGHT POLLUTION THAT ARE
15 AS, OR MORE, STRINGENT THAN THE PROVISIONS OF THIS ARTICLE.

16 2. NO PROVISION OF THIS ARTICLE SHALL BE CONSTRUED AS TO PERMIT THE
17 PRACTICE OF ARCHITECTURE AS SUCH PRACTICE IS DEFINED IN SECTION SEVEN-
18 TY-THREE HUNDRED ONE OF THE EDUCATION LAW, OR THE PRACTICE OF ENGINEER-
19 ING AS SUCH PRACTICE IS DEFINED IN SECTION SEVENTY-TWO HUNDRED ONE OF
20 THE EDUCATION LAW.

21 S 2. Section 44 of the public service law is amended by adding a new
22 subdivision 6 to read as follows:

23 6. THE COMMISSION SHALL REQUIRE EVERY ELECTRIC CORPORATION OR MUNICI-
24 PALITY PROVIDING ELECTRIC SERVICE TO SEND TO EACH CUSTOMER IN ITS BILLS
25 A COPY OF THE INFORMATIONAL PAMPHLET RELATING TO OUTDOOR LIGHTING DEVEL-
26 OPED BY THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PURSUANT TO SECTION
27 20-0113 OF THE ENVIRONMENTAL CONSERVATION LAW. THE COMMISSION SHALL
28 COORDINATE WITH THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION TO ENSURE
29 THAT EVERY ELECTRIC CORPORATION AND MUNICIPALITY PROVIDING ELECTRIC
30 SERVICE SHALL RECEIVE AN ADEQUATE SUPPLY OF SUCH PAMPHLETS SUITABLE FOR
31 DISTRIBUTION TO ITS CUSTOMERS IN THEIR UTILITY BILLS.

32 S 3. This act shall take effect on the first of January next succeed-
33 ing the date upon which it shall have become a law; provided, however,
34 that effective immediately, the addition, amendment and/or repeal of any
35 rule or regulation or development of any standards necessary for the
36 implementation of this act on its effective date is authorized to be
37 made and completed on or before such effective date; and provided
38 further that on and after the date on which this act shall have become a
39 law every state agency and public corporation shall comply with the
40 requirements of paragraphs (a) through (e) of subdivision 1 of section
41 20-0107 of the environmental conservation law as added by section one of
42 this act, but provided further that this act shall not apply to projects
43 for the installation or replacement of permanent outdoor luminaires
44 which have already received final design approval prior to the effective
45 date of this act.