

ENVIRONMENT AND ENERGY COMMISSION
CITY OF COLUMBIA / BOONE COUNTY, MISSOURI
DANIEL BOONE BUILDING, THIRD FLOOR CONFERENCE ROOM

Tuesday, March 22, 2005

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Submitted by:
Andrew Spain
December 28, 2004

Summary of the activities for the Columbia-Boone County Energy & Environment Commission for the period of July 2003 to June 2004:

- **Renewable Energy Recommendation:** At the request of the Columbia City Council, the EEC reviewed an ordinance proposal about implementing renewable energy in the power supply. The EEC reviewed the proposed ordinance and recommended its passage, and also advised that the City should seek increased use of renewable energy as compared to the minimum levels stated in the ordinance. The EEC has taken the stance that renewable energy sources should be identified and pursued in all forms, minimizing the future use of conventional power production.
- **Porous Pavement:** The EEC has been following the implementation of porous pavement options in the Phillips tract project. Porous pavement presents a very real opportunity to minimize runoff. The EEC has recommended in the past that porous pavement be used in new construction projects. The recommendation has been made to institute porous pavement as a best management practice in all construction projects in Columbia and Boone County.
- **Clean Indoor Air:** The EEC has been monitoring the different laws that have been passed in Missouri, and in similarly sized cities throughout the U.S. The EEC has been working toward improving the indoor air quality in all public places, especially restaurants and establishments that serve alcohol. A letter was sent to the City Council requesting that a survey be done as a means of determining the feasibility of implementing similar laws in Columbia. The EEC remains committed to this, and recommends that the City Council and the Boone County Commission continue to work toward improving indoor air by removing cigarette smoke from all public places.
- **Sewer Infrastructure:** The EEC examined the problem that exists within Columbia of older homes that are not a part of the city sewer system, and still have a septic tank. This represents a high risk for contamination of ground and surface water as these old septic tanks decay. A recommendation was made to the City Council to become proactive in identifying those neighborhoods and properties and creating a plan to have all of these properties put onto the central sewer system.
- **Comfort Rooms:** The EEC discussed the concept of comfort rooms as a means of energy saving in both the winter and the summer. While investigating this, presentations were requested to educate the council on different construction techniques and the options available for heating old and new construction. The EEC published an article in the monthly City of Columbia newsletter that described comfort rooms, and was designed to aid the public in understanding the concept, and also to save money.
- The EEC has discussed a number of other topics and has requested presentations on many of these items to include:
 - Sedimentation as a result of poor construction techniques
 - Ground Source Heat Pumps and ways in which they could be utilized in new construction, especially for larger buildings such as schools or shopping districts
 - The Blue Bag Recycling Program and how to improve the use of this program
 - Emissions Standards for Vehicles and the possibilities for implementing a program here in Columbia and Boone County
 - Energy Efficient Building Techniques
 - Hybrid Cars
- The EEC has also addressed issues in the bylaws, especially as related to the attendance requirements as stated in the bylaws, and has modified those to ensure that a quorum is more readily obtained at each meeting, and that any member that does not routinely attend meetings is addressed.

Andrew E. Spain
EEC Chair

ENVIRONMENT AND ENERGY COMMISSION

CITY OF COLUMBIA / BOONE COUNTY, MISSOURI

DANIEL BOONE BUILDING, THIRD FLOOR CONFERENCE ROOM

Tuesday, June 22, 2004

Storm Water Task Force
C/O Columbia City Council
Columbia, MO 65201

Gentlemen and Ladies:

The use of porous pavement as a best management practice (BMP) for stormwater control has received increasing attention by the City of Columbia since its inclusion in the recently approved Phillips Farm Rezoning Applications. The potential for porous pavement applications was also recently considered in regard to several of the Centerstate C-P Development Plans because of the unique permeable geology of the Centerstate tracts bordering Hinkson Creek.

The Environment and Energy Commission (EEC) recommends that the Columbia Storm ^{Water} Task Force include and advocate porous pavement as a valid BMP in future design and development projects, in its efforts to implement the Environmental Protection Agency's (EPA) Phase II stormwater requirements for the City of Columbia.

Sincerely,

Andrew Spain
EEC, Acting Chair

February 24, 2004

The Honorable Mayor and City Council
City of Columbia
PO Box 6015
Columbia, MO 65205

Dear Mayor & Council Members;

The Environment and Energy Commission (EEC) has been discussing the sewer systems of the City of Columbia for several months. In an effort to highlight the importance of effective sewers and inherent dangers of inadequate ones, the EEC would like to direct the Council's attention to some problems experienced in parts of the City.

- 1) Some homes within the city limits are not connected to City gravity sewers
 - A) A number of private systems remain. These systems do not "treat" the sewage and may or may not be working adequately
 - B) Some properties that are connected have lines that run across tracts of land without properly recorded easements, thus complicating repairs and/or maintenance.
 - C) Properties not connected should be identified and encouraged to connect. It may be necessary to connect these properties for free or at a reduced rate in order to get cooperation.
- 2) Old systems leak and collapse. Such 'at risk' sections should be identified. A plan should then be developed to make these improvements as soon as possible.
- 3) Infill development puts less stress on the City infrastructure (extending utilities, streets, etc.) when these areas are considered ahead in planning. Lack of or inadequate sewer connections in identified infill areas diminish efficient utilization and best use of this land. Therefore, a plan should be developed to consider all future aspects of these areas to encourage infill development.

Respectfully submitted,

Doug Wheeler
Chair, Environment and Energy Commission

Missouri Masonry Stove

ENERGY COMFORT ROOM

WHAT IS A COMFORT ROOM

A. Any room in any structure that can be used as a temporary retreat from undesirable heat or cold but mostly applies to cold temperatures.

WHY HAVE A COMFORT ROOM

B. If and when a furnace or electricity or fuel supply fails the comfort room can be created in a short time by closing doors, hanging blankets or drapes on pre installed hangers to retain heat for comfort and to prevent freezing the occupants. (SEE END)

WHAT DOES A COMFORT ROOM LOOK LIKE

C. The space should be compact but large enough for reasonable personal comfort for several people and preferably should be insulated above average home standards to trap any heat gained in the room. It can be a kitchen, living room or dining room or other the space. When ever possible it should have a south facing widow to take advantage of passive solar heat. Even body heat is important

D. Some dense mass such as concrete, bricks, tile floors or walls to store the sun's heat should be in the room so that room retains the daily solar heat gain and releases the heat over 24 to 72 hours.

HOW TO HEAT A COMFORT ROOM

A. Electric lights, radiant electric heaters preinstalled in ceilings, walls or floors and portable electric heaters will help if the electric is working. Other items for heating can include kerosene stoves, camping lights, candles and building bricks. The bricks can be heated else where, wrapped in multiple layers of news print and placed close to your body. Jugs filled with water also work but not as well as ceramic objects.

B. Fire places work well if the wood pile has been cut and split for at Least six months before burning. Non dried wood creates more creosote in the chimney that can cause a fire that sometimes destroys houses. The English style fire place, over a yearly cycle, has a 10% negative heat efficiency. Much of the heat leaks to the sky because the fire place extends through the house wall. The baffled fire place is not well known and misnamed as the (Russian) fire place has an efficiency of 85% to 93% and burns much cleaner.

BRIEF REVIEW OF SCATTERED NEWS PAPER ARTICLES

The natural gas industry is pushing hard to greatly increase the ship docking and pipe line infrastructure for importation of liquid natural gas before major shortages occur in the U.S. Liquid gas won't be cheap or obtained quickly.

*Survey - the computer
looked up - unable
to make certain
corrections*

Eighty percent of all existing buildings in the country have been built since 1950. Sixty percent of these buildings are heated by natural gas. Natural gas consumption is increasing, domestic supply is decreasing. Many tractor truck trailers are burning natural gas to offset pollution in major cities

We have had some major local, regional, temporary and severe energy shortages (California-2002-New York 2003.) Will they come more frequently, more wide spread, more severe. †

HOW WILL COLUMBIA DEAL WITH ^{Potential} FUTURE SHORTAGES OF ENERGY. ^{natural gas}

Where will the unprepared people ^{Hearns} go for shelter. Where do we have enough space. At the Armory, ^{Hern's} Center, The Field house? Where are the beds, the heat source the food and water supply? How long can we maintain even one thousand families? Would they be better at home in a comfort room? Shortages may not occur but history ^{has already occurred.} does repeat itself, ESPECIALLY on finite resources. †

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Submitted to The Columbia/Boone County Environment and Energy Commission For the December 2003 December Meeting
By Norman Lenhardt

ENVIRONMENT AND ENERGY COMMISSION

CITY OF COLUMBIA / BOONE COUNTY, MISSOURI

DANIEL BOONE BUILDING, THIRD FLOOR CONFERENCE ROOM

September 18, 2003

Mr. Mayor and Council:

The Environment and Energy Commission (EEC) has been researching and discussing the issue of Clean Indoor Air for the past several months. The May 27, 2003 EEC Minutes contain the record of a unanimously supported motion to request permission from the City Council to seek Staff support to survey the Columbia business community and research the issue of clean indoor air with respect to other comparable communities.

There is no doubt of the deleterious effects of second hand smoke on non-smokers. Both Columbia and the State of Missouri addressed clean indoor air in the early 1990's and chose to establish designated smoking areas for public places. Recently, there has been much attention given to other state and municipal ordinances designed to improve indoor air quality in public places by providing smoke-free environments, e.g., California, Connecticut, Delaware, Oklahoma, New York, Boston, MA, New York City, NY, Dallas, TX, et al., and recently both Springfield & Maryville, MO.

Several members of the Columbia business community have been engaged in a public dialogue as to the merits of a voluntary as opposed to a mandatory ban on smoking in public places in order to protect the health of employees and the public. Some in the business community see the issue as one of fairness and others fear the loss of customers. The EEC would like to ask the City Council to direct the Staff to assist the EEC with a very modest research effort of comparable communities that have had recent experience regarding this issue so that a suitable survey instrument can be developed to assess the attitudes of Columbia's business community with regard to this issue.

The EEC would ask the City Council to support the Commission in its efforts to engage the community on the Clean Indoor Air issue in accordance with Commission responsibilities as set forth in the City Code of Ordinances to "Act in an advisory capacity to the council in all matters pertaining to environmental protection ... promote and stimulate public interest ... solicit to the fullest possible extent the cooperation of other public and private agencies." {Section 2-350, paragraphs (2) & (3)}

Clearly there remains much work to be done to provide the information necessary to protect the residents of our community from the adverse health effects of smoking in confined public places while enhancing the business community's ability to attract its customers and successfully conduct its business.

Respectfully Submitted,

Doug Wheeler
Columbia/Boone County Environment and Energy Commission, Chair

Cc: Karen Miller, Boone County Commission, Southern District Commissioner
Stephanie Browning, Columbia/Boone County Health Department, Director

ENVIRONMENT AND ENERGY COMMISSION

CITY OF COLUMBIA / BOONE COUNTY, MISSOURI

DANIEL BOONE BUILDING, THIRD FLOOR CONFERENCE ROOM

Monday, May 12, 2003

Mr. Mayor and Council:

On September 3, 2002 the City Council requested the Environment and Energy Commission (EEC) to report on the issue of Wind Energy with respect to the city's consideration of the inclusion of renewable power in its energy portfolio. The report is herewith enclosed as an EEC Wind Energy Position Paper.

The EEC began the final work on this paper with a unanimously supported motion at the March 25, 2003 regular meeting which read, "Following a discussion of wind power options, a *motion* was made by Doug Wheeler for the EEC to encourage the City of Columbia to purchase renewable supplemental power, including wind power, to supplement its energy needs. Roll call vote: Yes to recommend approval. Voting yes: Jeff Bush, Nan Collins, Norm Lenhardt, John Miles, Kurt Schaefer, Karl Skala, Andrew Spain, Alyce Turner, and Doug Wheeler. Voting no: No one. Motion Carries: 9-0."

One of the key recommendations contained in the paper suggests that the Council consider the "implementation of a suitable questionnaire to a sample of the citizenry, in which the costs and benefits of such a purchase of wind energy are clearly identified". The Commission is aware that the Water and Light Advisory Board Minutes of February 28, 2002 include discussion of a "staff survey" reported to have indicated qualified support for the city's purchase of supplemental renewable energy. But the costs and benefits were not clearly defined to the citizenry, nor were results of this survey derived from a well-designed psychometric model and representative sample.

Though our discussions of renewable energy have identified many of these specific costs and benefits, the implementation of an adequate instrument to assess community opinion may be beyond the capacity of the EEC, without staff support (although one of the members of our Commission has considerable survey design and analysis expertise). If the Council wishes, however, we would be willing to continue to explore the issue of supplemental renewable power and commit our past and future renewable energy discussions to paper, for your review.

Respectfully Submitted,

Karl Skala
EEC Chair

ENVIRONMENT AND ENERGY COMMISSION

CITY OF COLUMBIA / BOONE COUNTY, MISSOURI

DANIEL BOONE BUILDING, THIRD FLOOR CONFERENCE ROOM

WIND ENERGY POSITION PAPER

The generation cost of Wind Energy as determined by commonly used accounting methods (i.e., neglecting environmental and foreign-dependency factors) is higher than the generating costs for more conventional sources of electrical energy generation (i.e., coal, nuclear, gas, hydro). Currently, this cost excess for wind energy is around 20%, and has been continuously decreasing through the application of refined technology and the economics of scale.

As an example, the purchase by the City of 2% of its electrical energy from wind sources (at the 20% cost excess) would result in approximately a 0.4% increase in annual electricity costs for residents, if borne by all.

The environmental and health benefits from such a purchase would be imperceptible to our citizens, in as much as the environment in Columbia is impacted by a very large region, not simply the micro-ecology of Columbia. The purchase would, however, send a political signal regarding Columbia's support for clean energy sources and it would help strengthen the pace of development of more efficient wind energy technology.

Predictions by credible authorities of complete generating cost competitiveness by wind energy in a matter of a few years are plausible, even without favoring tax credits.

The inclusion of appropriate cost offsets for environmental factors and for foreign-dependency could possibly make wind energy competitive today.

Some European countries with particularly favorable wind resources and political climates have escalated wind energy utilization to the point of providing up to 17% of their electrical energy. This significant reliance on wind sources should alleviate concerns about the availability of wind energy, both locally and nationally, at the modest levels being proposed; i.e., currently about 0.5% of US electrical energy comes from wind sources.

The issue of accounting for environmental and foreign-dependency factors is a national issue, rather than one that can be resolved at the local level.

The Environment and Energy Commission (EEC) questions whether the citizens of Columbia are presently supportive of paying the cost excess for purchasing a portion of the City's electricity from wind energy sources.

The EEC recommends that the cited question be addressed by the preparation and implementation of a suitable questionnaire to a sample of the citizenry, in which the costs and benefits of such a purchase of wind energy are clearly identified.

The EEC recommends that the City maintain timely updates on the key economic performance indicators associated with wind energy, as well as the political climate regarding the inclusion of environmental and foreign-dependency factors in energy cost accounting.

Respectfully Submitted,

John B. Miles, EEC Wind Energy Subcommittee, Chair

05/12/03
Date

Karl Skala, EEC, Chair

05/12/03
Date

ENVIRONMENT & ENERGY COMMISSION

CITY OF COLUMBIA & BOONE COUNTY

RECORD OF MEETING

October 22, 2002

CALL TO ORDER

Chairman Karl Skala, in the conference room of the Daniel Boone Building, called the meeting to order at 7:05 PM.

ROLL CALL

Nine voting members were present including: Vice-Chair Robert Walters, Secretary Nan Collins, Jeff Bush, Norman Lenhardt, John Miles, Kurt Schaefer, Alyce Turner, and Doug Wheeler (seven voting members are required to make a quorum). Also present: Liaison David Mars. Absent were: Lisa Eimers and Michael Morrison.

ANNOUNCEMENTS

AGENDA

The agenda was approved with the Vice-Chair report on computer recycling deferred to next meeting by request of Bob Walters. The vote was unanimous.

MINUTES

The minutes of September 24, 2002 were approved by unanimous voice vote. A motion to, table for amending, approval of the corrected minutes of May, June, July and August until the next meeting was approved 6-1 by voice vote.

CHAIR REPORT

Absence Procedures: A motion by Norman Lenhardt to allow 48 hours notice for excused absences failed 5-4; voting Yes: Bush, Collins, Miles, Lenhardt, No: Schaeffer, Skala, Turner, Walters, Wheeler.

Appointment to the Street Standards Planning Group: A motion by Karl Skala to appoint Vice-Chair Bob Walters to serve as representative to the Street Standards Planning Group passed unanimously.

VICE CHAIR REPORT

Computer Recycling & Rain Barrels. Moved to October meeting.

UNFINISHED BUSINESS

Columbia Tree Ordinance Final Report

A motion by Bob Walters on item #2 of the tree ordinance, to change the language in the penalty portion

of the Columbia Tree Ordinance passed 6-3 in favor; voting Yes: Collins, Miles, Lenhardt, Schaefer, Skala, Turner. No: Bush, Walters, Wheeler. The EEC recommendation to the City Council will be that the prosecution clause of the penalty provision of the Columbia Tree Ordinance should stipulate prorated penalties of up to \$25,000.00 per acre of violation.

A motion by Bob, seconded by Norman on item #3 failed; that language conflicts in the Columbia Tree Ordinance with regard to calculations of undisturbed areas should be reconciled; giving special attention to the exemption of utility easements & Right of Ways. The methodology for these calculations should be stipulated. Voting Yes: Collins, Miles, Skala, Turner. No: Bush, Lenhardt, Schaefer, Walters, Wheeler, 5-4 in opposition.

A motion by Kurt on item #4 of the tree ordinance pertaining to specimen trees, to retain the language as it stands, failed 5-4; to consider the preservation of exemplary specimen trees in already developed areas as a related but separate issue from the existing ordinance; consider safety and liability in such cases, e.g., empower a city panel (i.e., EEC, Water & Light Advisory Board, or other) to hear grievances from residents and/or developers resulting from City Arborist decisions with regard to safety, liability, and the preservation potential for existing specimen trees. Voting yes: Collins, Lenhardt, Turner, Skala. No: Bush, miles, Schaefer, Walters, Wheeler.

A motion pertaining to item #5 by Jeff Bush, to recommend a study of the process of providing incentives for the Transfer of Development Rights (TDR) for the areas to be preserved, as it would apply to developers and subsequent purchasers of developed property (conservation easements, etc) in order to maintain preservation goals. Stipulate responsibilities for preserved areas passed 9- 0 in favor.

A motion by Bob, seconded by Norman on item #6, to recommend that the City Council promote and encourage the use of curvilinear streets with center islands or parking/pedestrian peninsulas for the preservation of trees as a credit toward compliance with the twenty-five (25) percent rule, passed 7-2 in favor. Voting Yes: Bush, Collins, Miles, Skala, Turner, Walters, Wheeler. No: Lenhardt, Schaefer.

Cell Tower Co-Location:

NEW BUSINESS

Clean Air: Due the lack of time; Alyce gave a very brief report; the chair promised to schedule her report first in the next meeting.

ADJOURNMENT

The meeting adjourned at 9:30 PM by unanimous voice vote, on a motion by Kurt Schaefer, seconded by Bob Walters.

The next meeting will be November 26, 2002

Respectfully submitted by

Nan C. Collins, Secretary

Approved/Amended _____ 11/26/02 _____

ENVIRONMENT AND ENERGY COMMISSION

CITY OF COLUMBIA / BOONE COUNTY, MISSOURI

Monday, October 28, 2002

The Mayor & City Council
C/O Office of the City Manager
701 E. Broadway
5th Floor, Daniel Boone Building

Mr. Mayor & Council:

The Environment and Energy Commission wishes to respectfully submit the attached Columbia Tree Ordinance Final Report for your review, in accordance with our duties and responsibilities as described in Chapter 2, Article V, Division 8, Section 2-350, Paragraph (2), of the Columbia Code of Ordinances.

Sincerely,

Karl Skala
Environment and Energy Commission, Chair

ENVIRONMENT AND ENERGY COMMISSION

CITY OF COLUMBIA / BOONE COUNTY, MISSOURI

- COLUMBIA TREE ORDINANCE FINAL REPORT -

October 22, 2002

Background & Context:

From Metro 2020 Community Structure Plan (Appendix A): revised 06/01/99

A.6 Tree Preservation (excerpted)

Tree preservation ordinance was adopted in 1991 and last amended in 1995.

Thoughts and Observations:

- a. At present, there is no regulatory mechanism for saving individual trees, especially in older, established areas in Columbia that lack natural forest cover.
- b. Consider changes to the penalty portion of the tree preservation ordinance from a per tree cost for fines to a square footage assessment.
- c. Review the current methods for calculating undisturbed area; especially review the exemption for utility easements.

Note: The entire A.6 Tree Preservation section was not included within the body of the approved *Metro 2020 Community Structure Plan, revised 06/06/00*.

From Planning & Development Staff to P&Z Commission MEMO: 06/20/00

... staff assumes that the following items from Appendix A are considered too proscriptive to be in a policy plan. These items will be referred to the Planning and Zoning Commission for further study:

- **Tree preservation (A.6)**
- Gated communities (A.8)
- Sign Regulations (A.13)
- Off-street parking/shared parking (A.17)
- Pedestrian connectors (A.18)
- Commercial interconnections (A.19)
- Access management (A.20)
- Site plan review (A.21)

EEC Recommendations to City Council:

1. The penalty provision of the Columbia Tree Ordinance be should be changed from a per tree assessment to an acreage assessment. (EEC recommendation: **6-1 in favor** 08/27/02).
2. The prosecution clause of the penalty provision of the Columbia Tree Ordinance should stipulate prorated penalties of up to \$25,000.00 per acre of violation. (EEC recommendation: **6-3 in favor** 10/22/02¹).
3. All language conflicts in the Columbia Tree Ordinance with regard to calculations of undisturbed areas should be reconciled; give special attention to the exemption of utility easements & Right of Ways. The methodology for these calculations should be stipulated. (EEC recommendation: **5-4 in opposition** 10/22/02²).
4. Consider the preservation of exemplary specimen trees in already developed areas as a related but separate issue from the existing ordinance; consider safety and liability in such cases, e.g., empower a city panel (i.e., EEC, Water & Light Advisory Board, or other) to hear grievances from residents and/or developers resulting from City Arborist decisions with regard to safety, liability, and the preservation potential for existing specimen trees. (EEC recommendation: **5-4 in opposition** 10/22/02³).
5. Study the process of providing incentives for the Transfer of Development Rights (TDR) for the areas to be preserved, as it would apply to developers and subsequent purchasers of developed property (conservation easements, etc) in order to maintain preservation goals. Stipulate responsibilities for preserved areas. (EEC recommendation: **9-0 in favor** 10/22/02).
6. Promote and encourage the use of curvilinear streets with center islands or parking/pedestrian peninsulas for the preservation of trees as a credit toward compliance with the twenty-five (25) percent rule. (EEC recommendation **7-2 in favor** 10/22/02).

¹ Examples: The owner of one (1) acre of City Arborist certified forested property in violation of the revised Tree Ordinance with only 12.5% of the trees preserved could incur a fine of \$12,500.00; the owner of one (1) acre of City Arborist certified 50% forested property with 12.5% of the trees preserved would be in compliance with the revised ordinance.

² The EEC discussion revealed a general consensus to resolve language conflicts with regard to calculations of undisturbed areas but the members indicated that there was not adequate expertise to determine how the calculations affecting utility easements & Right of Ways should be stipulated.

³ Issues affecting property rights & liability were discussed and considered.

Resources:

- City of Columbia Tree Preservation & Landscape Ordinance:
http://www.gocolumbiamo.com/dept/council/columbia_code_of_ordinances/Chapter_12A/49.html
- Columbia Metro 2020: A Planning Guide for Columbia’s Future:
<http://www.ci.columbia.mo.us/dept/plan/met-plan.htm>
- Guidelines for Developing and Evaluating Tree Ordinances: <http://www.isa-arbor.com/tree-ord/>
- Google search for ‘tree preservation ordinance’ yields 83 pages of related info:
<http://www.google.com/>

10/22/02
 EEC Approval Date

(Signed) 10/28/02
 Nan Collins, Secretary Date

(Signed) 10/28/02
 Karl Skala, Chairman Date

**ENVIRONMENT & ENERGY COMMISSION
CITY OF COLUMBIA & BOONE COUNTY**

**RECORD OF MEETING
July 24, 2001**

CALL TO ORDER

The meeting was called to order by Chairman Karl Skala in the third floor conference room of the Daniel Boone Building at 7:05 PM. Seven members were present including: Secretary Nan Collins, City Liaison Jay Hasheider, P&Z representative (Chair), Norman Lenhardt, Michael Morrison, Robert Walters and Bruce Williams (seven voting members are required to make a quorum). Absent were: D. Wolersshine, Vice-Chair Alyce Turner and Kurt Schaffer.

AGENDA

The agenda was approved with the addition (at the request of Norm Lenhardt) of the issue of city water.

MINUTES

The minutes of the June 26, 2001 meeting were approved as amended, at the request of the secretary (page 2 , paragraph 2, porous pavement).

CHAIR REPORT

None

VICE CHAIR REPORT

None

ANNOUNCEMENTS

None

OLD BUSINESS

Cell Tower Mounts

Deferred to a later meeting, in the absence of Kurt Schaffer, presenter of subject information.

Rules of Procedure

The Chair explained the proposed Rules of Procedure, and the changes that seem more appropriate to the EEC, and each was approved by consensus (to be put to official vote with a quorum later) or amended as follows:

(1) Quorum (Sec. 2)

Motion (unofficial) (Sec, 2)--concerning a quorum, any *formal* recommendations to a city body shall require the vote of a quorum of seven members, (according to the city ordinance) however, business can be conducted, and discussion, conclusions and consensus reported, with the understanding that it is without a quorum. Approved by consensus.

(2) Duties of the chair (Sec. 6)-- limiting power of the chair

Motion (unofficial) (Sec. 6)--that the commission approve the language in sec. 6. Approved by consensus.

**(3)Agenda (Sec 10)-- emergency business not on the agenda
Motion (unofficial) (sec. 10) --the language should be changed to reflect the opinion of a simple majority of those present. Approved by consensus.**

(4) a. Situations not covered in the rules (Sec, 27)

b. How rules are appealed, altered or amended (Sec. 28)

Motion (unofficial) (Secs. 27 & 28--to amend the original document to read "by a 2/3 majority vote". Approved by consensus.

(5) Addressing the chair (sec, 11)

Motion (unofficial)--to amend the original document to read, "Commissioners shall address each other and visitors respectfully." Approved by consensus.

(6) Speaking (Sec, 13)--number and length of times

No motion; the Chair felt it was covered adequately in other sections.

A motion was made (unofficial) to adopt the Rules of Procedure.

Approved by consensus (agenda item for August).

NEW BUSINESS

Lighting Ordinance pertaining to Gasoline Stations

A sub-committee was formed to research, study and report on this part of the Lighting Ordinance by the next meeting. to prepare a report by September 20th (agenda item for August).

Porous Pavement

A sub-committee was formed to research, study and report on this issue to present information to the Planning Department (agenda item for August).

City Water

Discussed briefly (agenda item for August).

OTHER BUSINESS

2020 Plan--to be discussed at a later date.

Billboards--to be discussed at a later date.

ADJOURNMENT

The meeting adjourned at 8:50 PM.

The next meeting will be August 28, 2001.

**Respectfully submitted by
Nan C. Collins, Secretary**

[EEC LETTERHEAD]

Columbia Environment & Energy Commission (EEC)
Gasoline Station Canopy Lighting Final Report

October 23, 2001

RECOMMENDATION:

By a vote of 7 in favor, 2 opposed, and two absent, the EEC is recommending that the Columbia City Council adopt the language of the Planning & Development Staff Draft Ordinance Relating to Regulations For Outdoor Lighting of Gasoline Service Stations, in its entirety. Both Commissioners who were absent have since indicated their support for the recommendation. The EEC further recommends as a part of its final report that the City Council consider the following answers to the questions posed by the Planning & Development Staff in its Agenda Report of September 20, 2001.

This EEC recommendation differs in three respects to the recent recommendation forwarded to the City Council by the Planning & Zoning Commission. The EEC recommends that the City Council broaden the consideration of uses to be regulated, especially with regard to 'dusk to dawn,' parking lot, and municipal applications (refer to question #2). Further, the EEC recommends that the City Council consider a "sunset" provision that would bring all lighting into conformance after some period of time (refer to question #3). Finally, the EEC would recommend that the City Council direct staff to insure that the height of gasoline station canopies be considered with respect to lumen allowances.

1. *Does the City need an ordinance to regulate outdoor lighting?*

Yes, the problems caused by excessive lighting are becoming increasingly significant and do warrant the adoption of a regulation to restrict new lighting installations. It is not our [EEC] intention to turn the lights out in Columbia; rather we seek to insure safe, energy efficient, and fully adequate outdoor lighting along with the consideration of our neighbors. The justification for such a lighting ordinance falls into four general categories:

- a. *Safety*
- b. *Economy*
- c. *Equity*
- d. *Aesthetics*

a. Safety -- Despite mounting evidence to the contrary, there is a prevailing view that brighter light is always safer. A study of perceptions of high-risk urban areas indicates that the perception of security increases as lighting levels increase, but only up to an average illumination

level of ~ 3.0 foot-candles (ftc.), beyond which there is little sense of additional security. In fact, over-lit streets have often become associated with high crime areas.¹ Constant overly bright light will cause potential witnesses to look the other way. In particular, gasoline canopy lighting levels significantly higher than those of surrounding areas actually limit visibility into and out of the canopy area until the eye is able to adapt to the contrast. In addition, the increased glare from unshielded canopy luminaires can adversely affect those driving by. This is a particular problem for elderly drivers whose eyes are more susceptible to the glare caused by excessive and/or unshielded lighting. In terms of lighting guidelines, there exists a uniformity ratio by which adequate and appropriate lighting is evaluated. This ratio is defined as the ratio of the average to minimum illumination. A principle in good lighting design maintains that the brightest areas in a person's field of vision should not exceed ten times the brightness of the average level to which the eye is adapted. If roadways are to be taken as the reference level, illuminated at 0.3 to 1.6 ftc., then this common sense rule is being exceeded in many cases by great margins. This is a serious problem leading to compromised visibility and safety, particularly for the ageing eye.² Further, a recent survey commissioned by the California Energy Commission included the following observations: "We're looking at extremes. Gas station canopies are an example. Many of them nowadays are lit to 100 ftc. - three to four times indoor office lighting. Businesses are saying, 'we need it for security' or 'so people can read the No Smoking signs.' I think they are doing it for advertising." & "A couple of nights ago I went to a brand new Texaco station. It was so well lit and it was advertising itself well - even though it was lit with 15 ftc. It was low-glare and it got very high ratings from a subjective evaluation." & "Excessive lighting is particularly a problem for older people. Every 20 years, the effects of aging on our eyes almost doubles. An 80-year-old is really affected by glare. Some people just cannot drive."³ Finally the IDA Outdoor Lighting Code Handbook makes the following observation: "The tendency for upward ratcheting of lighting levels is viewed by many as a simple advertising ploy, though in public fora it is always justified with arguments about safety and security"⁴

b. Economy -- Most efforts to conserve energy for exterior lighting have focused on the use of more efficient lamps. In the mistaken belief that more light is always better, and because electricity has been relatively inexpensive (though operating costs continue to increase), the tendency has been to use efficient lamps to increase light levels. The by-product of this trend has been an increase in glare and unbalanced illumination which then generates a pattern of further light escalation.⁵ The International Dark Sky Association estimates that at least 30 to 50% of all outdoor lighting is wasted due to the use of inefficient non-cut-off fixtures. Effective shielding standards, as recommended in their Outdoor Lighting Code Handbook (and as proposed by the Columbia Planning & Development Staff Draft Ordinance), will reduce the amount of light escaping into the sky by fifty percent or more compared to typical unregulated lighting practice. In the majority of cases, these shielding standards will also virtually eliminate glare.⁶ In

¹"Lights Out," Russell P. Leslie, *Progressive Architecture*, November 1995, pp. 80-83.

² IDA Outdoor Lighting Code Handbook, Version 1.11, p. 12.

www.nofs.navy.mil/about_NOFS/staff/cbl/LC_Handbook_v11.html

³ New Buildings Institute survey commissioned by the California Energy Commission, 2000, conducted by Clanton & Associates, Inc. and Neils Engineering, Boulder, CO.

⁴ IDA Outdoor Lighting Code Handbook, op. cit., p. 13.

⁵ Outdoor Lighting Manual for Vermont Municipalities, Chittendon County Regional Planning Commission, 1996, Essex Junction, VT, p.18.

⁶ IDA Outdoor Lighting Code Handbook, op. cit., p. 4.

applications where overlighting has become a common practice, such as in service station canopy and much convenience store lighting, the overall lighting limits recommended in the USA Pattern Lighting Code, expressed as lumens per acre caps, will reduce unnecessary lighting, glare and stray light by even greater proportions.⁷ And, unlike other forms of pollution, the elimination of light pollution in all its forms actually saves money. Quality lighting costs less than bad lighting, in the long term and even usually in the short term. Everyone wins when lighting is done right. Though our charge here is to deal with gasoline station canopies, consider the considerable savings to our city's taxpayers if the annual \$665,000.00⁸ in outdoor lighting costs were reduced by 30 to 50%.

c. *Equity* -- Equity and equal treatment before the law may become an issue only if the proposed ordinance is narrowly applied to a single group of businesses, such as gasoline stations. We believe that the scope of these regulations should be broadened to include all commercial as well as municipal lighting applications. The equity issue was also alluded to above, with regard to the pattern of light escalation that is generated between adjacent businesses as efficient and adequate outdoor lighting gives way to the business of attracting attention. Site lighting should serve the needs of the users but not adversely impact adjacent properties. Of course, the adjacent properties in question may also involve residential areas whose residents must also be considered in terms of glare and light trespass.

d. *Aesthetics* -- To many, this category is extremely important. On a relatively mundane level, it includes those who find themselves living next to or near an overlit gasoline station canopy. Many Columbia citizens have described their discomfort in public hearings. It might also include those that value proportion, balance, and beauty when it comes to lighting designs. But importantly, the category of aesthetics also includes those of all persuasions who look to the stars, even occasionally, i.e., lovers, philosophers, artists, poets, astronomers, and of course, our children, ... and we are losing the ability to see those stars, or at least, to see as many of them. The tragedy here is that the complaints are mounting and the stars are fading in the face of totally wasted light, i.e., excessively bright, unshielded, and increasingly expensive luminaires that in some cases (e.g., inappropriately angled swiveled floodlights or completely unshielded lamps) direct more than 90% of their light above the horizontal plane. Surely we can do better. Many of the solutions are contained in the Planning & Development Staff Draft Ordinance.

2. *If an ordinance is believed to be needed, what uses should be regulated?*

The list of regulated uses should be expanded. The original City Council motion to refer the outdoor lighting issue to the EEC was made on October 19, 1998. The motion read: The staff report on outdoor lighting is referred to the E&E Commission, accompanied by the Outdoor Lighting Manual for Vermont Municipalities which contains a model outdoor lighting ordinance. It is requested that the Commission: 1) review the staff report, the manual, and the model ordinance contained therein, 2) provide opportunities for public input, and 3) make recommendations to the Council by March 1, 1999 regarding public policy with respect to outdoor lighting, including street lighting and lighting on private developments. On June 21, 1999 the City Council approved changes to Chapter 27 of the City Code relating to street lighting standards after reviewing recommendations submitted by the EEC. In the fall of 1999 the EEC

⁷ IDA Outdoor Lighting Code Handbook, op. cit., USA Pattern Lighting Code, p. 37.

⁸ City of Columbia website: <http://www.ci.columbia.mo.us/>

began work on the commercial aspects of an outdoor lighting proposal and submitted its subsequent draft report to the City Council in June of 2000.⁹ The final revision of that draft report contained specific recommendations for the regulation of nine different outdoor lighting applications, (e.g., parking lot lighting, street lighting, lighting of gasoline station/convenience store aprons & canopies, lighting of exterior display/sales areas, lighting of outdoor sports/performance facilities, security lighting, illumination of building facades, illuminated signs, and lighting of walkways, bikeways & parks). It is the sense of the EEC that this kind of comprehensive approach provides the best framework for achieving the primary goal of any lighting ordinance, i.e., to stop overlighting but to implement the ordinance in a practical manner that allows design flexibility to assure that efficient lighting is always ample for true safety and security.

3. *Should existing uses with non-conforming lighting be allowed to remain or be brought into compliance within a certain period of time?*

It is the sense of the EEC that non-conforming lighting be brought into compliance within a period of ten (10) years based on the age of the fixtures. Newer fixtures could be allowed more time to be amortized. Such compliance could simply involve the repositioning of fixtures or the installation of shielding to the fixtures.

The City of Columbia has set such precedence before with regard to the sign ordinance.¹⁰ The USA Pattern Lighting Code recommends, “ Commonly, codes eventually require conformance of all lighting, usually after a period of time of from a few to ten years (a so-called sunset clause). If sunsets are feasible in your jurisdiction, they are to be strongly recommended. Generally a period of from five to ten years has been found practical in many areas.” The authors of this lighting code support this recommendation with the following comments: “Permanent grandfathering of old lighting installations will cause ongoing enforcement problems. In principle all old lighting will eventually be changed, because the fixture breaks, the site is re-developed or just redesigned. But in practice what often happens is that such lighting will be replaced piece-meal, and no permit is taken for the replacement or upgrade, and therefore no review is done and the replacement will often be as bad as the old lighting. Further, lighting will often be simply added to sites with grandfathered lighting. Though replacing or adding lighting without approval is not allowed the way most codes are written, in practice someone must first notice. But even if someone notices that the lighting has been changed or supplemented, on a grandfathered site there may exist no documentation of the previous lighting, and the situation can degenerate to one person's or group's word against another. Such situations are economically and politically costly and should be avoided if possible by including a sunset clause in the code. If after ten years (for example) all old lighting must be brought into compliance, then there is no question - if the light is non-compliant, it is a violation; no-one has to prove when it was installed. The costs of bringing lighting into compliance will in many cases

⁹ EEC Report: Proposed Outdoor Lighting Regulations, 6/26/00 draft (final revision 8/22/00)

¹⁰ City of Columbia, MO Code of Ordinances, Section 27, City of Columbia website:
www.ci.columbia.mo.us/dept/council/columbia_code_of_ordinances/Chapter_23/index.html

be offset by decreased operational costs associated with higher-quality modern lighting, and by the improved quality of the lighting.¹¹

4. *Will the proposed regulation be a burden on city staff to administer, result in a delay in obtaining permits or be unduly costly to applicants?*

There will be some cost and perhaps some minor delays associated with compliance of the regulations contained within the Planning & Development Staff Draft Ordinance. However, most, if not all of that cost is recoverable in the savings and safety provided by the utilization of efficient, yet fully adequate outdoor lighting. The staff draft ordinance also provides for lighting regulations based on lumen allowances per acre rather than specifying lighting levels. This approach yields the best results with the least cost and allows the most efficient permitting procedure while requiring the least inspection. The IDA Outdoor Lighting Code Handbook addresses this issue as follows: "After-construction determination of compliance with any rule is a risky course, risking discovery of non-compliance after the money has been spent, the design finished, and the lighting literally set in concrete. To avoid these problems a code may consider defining compliance as occurring at design stage - but this approach then requires a professional design for every lighting permit application - an expensive requirement for small projects, and substantial training for staff to allow them to competently evaluate whether the designs offered are correctly done and without error. Lighting codes are interpreted, implemented, and enforced by persons that generally have limited expertise in the technical aspects of lighting design. The cost and training implications of extensive illuminance specification (or any technical specification) in a lighting code are severe. Either the planning departments must obtain and maintain this expertise, or the costs must be imposed on the development community, including every small business that puts up a light. The control of the majority of overlighting problems can be addressed effectively by an overall cap on the amount of light permitted, scaled to the area to be developed - lumens per acre caps. The amount of light included in a plan, measured in lumens, is practical and simple to verify from a simple list of lamps, and requires no special lighting expertise. It also leaves the maximum flexibility for the lighting designer, to work within an overall "lumen budget" to creatively achieve the goals presented by clients."¹²

Respectfully submitted to the Columbia City Council,

Karl Skala
Environment & Energy Commission, Chair

¹¹ IDA Outdoor Lighting Code Handbook, op. cit., USA Pattern Lighting Code, Section 3 Overview: Applicability, p. 49.

¹² IDA Outdoor Lighting Code Handbook, op. cit., pp. 12-13.

Appendix A

The appended sample of Columbia gasoline station canopy light measures and accompanying remarks were submitted in response to a request by members of the Environment & Energy Commission on September 25, 2001. A copy of this text has been sent to all members of the EEC, P&Z, and to the City Planning & Development Staff.

All of the following values (in foot-candles {ftc.}, i.e., a measure of light falling on a given surface. One foot-candle is equal to the amount of light generated by one candle on a square foot of surface one foot away) were sampled under the approximate center of each respective canopy, at just below eye level and directly beneath a light source or luminaire. Interestingly, such readings were not always absolute peak but were approaching peak levels. Though average illumination levels would be a better index, simple peak sampling in nearly all of the samples would have exceeded the maximum average levels for gasoline station/convenience canopies recommended by the Illuminating Engineering Society of North America (IESNA). It is important to note that all of the canopies sampled utilized semi-cutoff refractive luminaires (i.e., luminaires protruding from 1-4" below the canopy and enclosed in glass or plastic prismatic lenses to direct and/or intensify the light).

- 38 ftc. Casey's General Store, Clark Lane, (3-4" unshielded & spaced ~12' apart)
- 26 ftc. Quick Trip, Clark Lane, (1" unshielded & spaced ~10' apart)
- 20 ftc. Sinclair, Stadium @ Rock Quarry, (2-3" unshielded under canopy + 4 supplementary swiveled floodlights)
- 52 ftc. Breaktime, Forum @ Stadium, (4" unshielded & spaced ~20' apart)
- 56 ftc. Texaco, Stadium @ Worley, (4" unshielded & spaced ~12' apart)
- 40 ftc. Shell, Lake of the Woods @ I70, (4" unshielded & spaced ~6' apart)
- 62 ftc. Texaco, Lake of the Woods @ I70, (4" unshielded & spaced ~12' apart + 4 supplementary swiveled floodlights + unshielded wall packs)

There exists a uniformity ratio by which adequate and appropriate lighting is evaluated. This ratio is defined as the ratio of the average to minimum illumination. A principle in good lighting design maintains that the brightest areas in a person's field of vision should not exceed ten times the brightness of the average level to which the eye is adapted. If roadways are to be taken as the reference level, illuminated at 0.3 to 1.6 ftc. then this common sense rule is being exceeded in many cases by great margins. This is a serious problem leading to compromised visibility and safety, particularly for the ageing eye (IDA Outdoor Lighting Code Handbook, www.nofs.navy.mil/about_NOFS/staff/cbl/LC_Handbook_v11.html). Research on gasoline station lighting suggests that average illumination in excess of 10 ftc. serves no purpose other than attracting attention to the site (Outdoor Lighting Manual for Vermont Municipalities, 1996, Chittendon County Regional Planning Commission). Parenthetically, a minimum illumination

level of no more than 5.5 ftc. with a uniformity ratio of 4:1 which yields an average illumination of 22 ftc. (i.e., a reasonable, achievable, and IESNA recommended goal) was the initial recommendation of the Environment & Energy Commission's (EEC) Report: Proposed Outdoor Lighting Regulations, Section F., Paragraph ii, revised 8/13/00. At least two, and perhaps three of the above sample readings would conform to those recommended guidelines.

With specific regard to safety concerns, the roadways adjacent to each and all of these canopies measured within the range of <0.5 to 1.5 ftc. Additionally, a Boone County Bank ATM less than 100' from the most brightly lit Lake of the Woods Texaco canopy was barely illuminated with < 0.5 ftc. Importantly, driving either to or from the more brightly lit canopies required some considerable time for the eye to accommodate to the contrast between the illuminated canopies and the much darker surroundings and roadways. Further, it would have been impossible to witness a potential assault at the ATM from underneath the gasoline station canopy.

I sense that the EEC is moving toward support of the city staff position for manufacturer specified output allowances per acre (in lumens, i.e., a measure of light energy generated by a light source. Manufacturers list lumen ratings for all their lamps.) including requirements that all canopy luminaires either be mounted flush with the canopy or otherwise conform to full cut-off specifications (this also happens to be the approach recommended by the USA Pattern Lighting Code). We have yet to decide whether to consider specific numbers (i.e., lumens per acre), swiveled floodlights, and finding a solution to the question of whether or not to retrofit post-ordinance non-conforming uses, should this ordinance be adopted.

Finally, please also consider the appropriateness or desirability of petitioning the City Council to include other categories of outdoor lighting, such as parking lot, security, retail sales, etc. in its considerations of these issues.

Karl Skala
Environment & Energy Commission, Chair

Appendix B

DRAFT DATED 6/11/01

AN ORDINANCE

Adopting Chapter _____ of the City Code
Relating to Regulations For Outdoor
Lighting of Gasoline Service Stations

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS
FOLLOWS:

A. Purpose and Intent.

It is the intent of this Code to define practical and effective measures by which the obtrusive aspects of excessive outdoor light usage can be minimized, while preserving safety, security, and the nighttime use and enjoyment of property. These measures are intended to curtail the degradation of the nighttime visual environment by encouraging lighting practices that direct appropriate amounts of light where and when it is needed, increasing the use of energy-efficient sources, and decreasing the wastage of light and glare resulting from overlighting and poorly shielded or inappropriately directed lighting fixtures.

B. Definitions.

As used in this Code, unless the context clearly indicates otherwise, certain words and phrases shall mean the following:

1. Abandonment means the discontinuation of use for a period of six months.
2. Class 1 Lighting means all outdoor lighting used for but not limited to outdoor sales or eating areas, assembly or repair areas, advertising and other signs, recreational facilities and other similar applications where color rendition is important.
3. Class 2 Lighting means all outdoor lighting used for but not limited to illumination for walkways, roadways, equipment yards, parking lots and outdoor security where general illumination of the grounds is the primary concern.
4. Class 3 Lighting means any outdoor lighting used for decorative effects, including but not limited to architectural illumination, flag monument lighting, and illumination of trees, bushes, etc.
5. Development Project means any residential, commercial, industrial or individual building development or remodeling plan which is submitted to the City for approval.
6. Direct Illumination means illumination resulting from light emitted directly from a lamp, luminary or reflector, not light diffused through translucent signs or reflected from other surfaces such as the ground or building faces.
7. Fully Shielded Fixture means that fixtures are shielded in such a manner that light rays emitted by the fixture, either directly from the lamp or indirectly from the

fixture, are projected below a horizontal plane running through the lowest point on the fixture where light is emitted.

8. Installed means attached, or fixed in place, whether or not connected to a power source.

9. Light Trespass is spill light falling over property lines that illuminates adjacent grounds or buildings in an objectionable manner.

10. Lumen is the unit used to measure the actual amount of visible light, which is produced by a lamp as defined by the manufacturer.

11. Luminary means the complete lighting assembly, less the support assembly.

12. Net Acreage means the remaining ground area of a parcel after deleting all portions for proposed and existing public rights-of-way and undeveloped area.

13. Outdoor Light Fixtures means all outdoor illuminating devices, reflective surfaces, lamps and other devices, either permanently installed or portable, which are used for illumination or advertisement.

14. Public Works Director means the Director of Public Works for the City of Columbia or his or her designated representative.

15. Security Lighting is lighting designed to illuminate a property or grounds for the purpose of visual security. This includes fully shielded lighting designed to be left on during night time hours as well as motion sensing lighting fixtures.

16. Temporary Lighting means lighting which does not conform to the provisions of this Code and which will not be used for more than one thirty (30) day period within a calendar year. Temporary lighting is intended for uses which by their nature are of limited duration; e.g., holiday decorations, civic events, or construction projects.

17. Total Outdoor Light Output means the maximum total amount of light, measured in lumens, from all outdoor light fixtures on a property. For lamp types that vary in their output as they age (such as high pressure sodium and metal halide), the initial output, as defined by the manufacturer, is the value to be considered.

18. Unshielded Fixture means a fixture that allows light to be emitted above the horizontal directly from the lamp or indirectly from the fixture or a reflector.

19. Watt is the unit used to measure the electrical power consumption (not the light output) of a lamp.

C. Conformance with Applicable Codes.

All outdoor illuminating devices shall be installed in conformance with the provisions of this Code, the Building Code, the Electrical Code, and the Sign Code of the City of Columbia as applicable and under appropriate permit and inspection.

D. Applicability

1. **New Uses, Buildings and Major Additions or Modifications.** All outdoor lighting fixtures for all proposed new land uses, developments, buildings, and structures subject to the provisions of this Code and that require a permit, shall meet the requirements of this Code. All building additions or modifications of twenty-five (25) percent or more in terms of additional dwelling units, gross floor area, or parking spaces, either with a single addition or with cumulative additions, for land uses, developments, buildings and structures subject to the provisions of this code completed subsequent to the effective date of this ordinance, shall invoke the

requirements of this Code for the entire property, including previously installed and any new outdoor lighting. Cumulative modification or replacement of outdoor lighting constituting twenty-five (25) percent or more of the permitted lumens for the parcel, no matter the actual amount of lighting already on a non-conforming site, shall constitute a major addition for purposes of this section.

2. Minor Additions. Additions or modifications of less than twenty-five (25) percent to existing uses, as defined in Section D.1 above, and that requires a permit, shall require the submission of a complete inventory and site plan detailing all existing and any proposed new outdoor lighting. Any new lighting on the site shall meet the requirements of this Code with regard to shielding and lamp type; the total outdoor light output after the modifications are complete shall not exceed that on the site before the modification, or that permitted by this code, whichever is larger.

3. Resumption of Use after Abandonment. If a property or use with non-conforming lighting is abandoned, then all outdoor lighting shall be reviewed and brought into compliance with this Code before the use is resumed.

E. Covered Uses.

The lighting requirements specified herein shall only apply to outdoor lighting fixtures for the following uses, developments, buildings, and structures, unless otherwise exempted: Gasoline Service Stations.

F. Lighting Requirements.

1. All light fixtures which are required to be shielded shall be installed in such a manner that the shielding complies with the definition of fully shielded fixtures.

2. All light fixtures, including security lighting, except street lamps, shall be aimed or shielded so that the direct illumination shall be confined to the property boundaries of the source. Particular care is to be taken to assure that the direct illumination does not fall onto or across any public or private street or road. Motion sensing lighting fixtures shall be properly adjusted to turn off when detected motion ceases.

3. Class 1 lighting, including but not limited to, sales, service, commercial, assembly, repair, maintenance, and industrial areas, may only continue in operation until 10:00 p.m., or for as long as the area is in active use. This provision is not applicable to fixtures lawfully installed or implemented prior to the adoption of this Code.

4. Except as permitted in subsection F.6., total outdoor light output, excluding streetlights used for illumination of public rights-of-way, of any development project shall not exceed 100,000 lumens per net acre, averaged over the entire property. No more than 5,500 lumens per net acre may be accounted for by lamps in unshielded fixtures permitted in subsection F.5.

5. The requirements for lamp source and shielding of light emissions for outdoor light fixtures are as follows:

Shielding/Use Code: A = allowed, unshielded; F = allowed, fully shielded

LAMP TYPE	SHIELDING
Class 1, 2 and 3 lighting:	
All lamp types above 2050 lumens (See Note 1)	F
All lamp types below 2050 lumens	A (See Note 2)
All neon tube lighting	F
Lamps in Motion Sensing Security Lights	A (See F.2)

Note 1. Examples of lamp types of 2050 lumens and below (the acceptability of a particular light is decided by its lumen output, not wattage. Check manufacturer's specifications):

- a) 100 Watt Standard Incandescent and less
- b) 100 Watt Midbreak Tungsten-Halogen (quartz) and less
- c) 25 Watt T-12 Cool White Fluorescent and less
- d) 18 Watt Low Pressure Sodium and less

Note 2. Lights shall be shielded whenever feasible to minimize light spilled into the night sky or adjacent properties. Unshielded lights (all types) are limited to a maximum of 5,500 lumens per net acre (see subsection F.4.). Development parcels containing one net acre or less are allowed 5,500 lumens of unshielded light (all Classes).

6. Lighting for Gasoline Service Station or similar canopies shall be considered Class 1 lighting. All luminaries shall be flush with the lower surface of canopies and utilize flat glass or plastic covers. The total light output used for illuminating service station canopies, defined as the sum of under-canopy initial bare-lamp outputs in lumens, shall not exceed Twenty (20) lumens per square foot of canopy when located adjacent to a residential or agricultural zoning district and forty (40) lumens per square foot of canopy in all other locations. All lighting mounted under the canopy except internally illuminated signs, shall be included in the total. Fifty percent (50%) of the lumen output of all lamps mounted within or under a canopy, except internally illuminated signs, is included in the lumen caps in subsection F.4.

G. Approved Materials and Methods of Construction or Installation.

The provisions of this Code are not intended to prevent the use of any design, material or method of installation or operation not specifically prescribed by this Code, provided any such alternate is: 1) at least equivalent to the applicable specific requirements of this Code; and 2) otherwise satisfactory and complies with the intent of this Code.

H. Submission of Plans and Evidence of Compliance

1. Submission Contents. The applicant for any permit required in connection with proposed work involving outdoor lighting fixtures shall submit (as part of the application for permit) evidence that the proposed work will comply with this Code. Even should no other such permit be required, the installation or modification (except for routine servicing and same-type lamp replacement) of any exterior

lighting shall require submission of the information described below. The submission shall contain but shall not necessarily be limited to the following, all or part of which may be part or in addition to the information required elsewhere upon application for the required permit:

- a. Plans indicating the location on the premises of all lighting fixtures, both proposed and any already existing on the site;
- b. Description of all lighting fixtures, both proposed and existing. The description may include, but is not limited to, catalog cuts and illustrations by manufacturers (including sections where required); lamp types, wattages and initial lumen outputs;
- c. Photometric data, such as that furnished by manufacturers, or similar showing the angle of cut off of light emissions.

2. Additional Submission. The above required plans, descriptions and data shall be sufficiently complete to enable the designated official to readily determine whether compliance with the requirements of this Code will be secured. If such plans, descriptions and data cannot enable this ready determination, the applicant shall additionally submit as evidence of compliance such certified reports of tests as will do so provided that these tests shall have been performed and certified by a recognized testing laboratory.

3. Lamp or Fixture Substitution. Should any outdoor light fixture or the type of light source therein be changed after the permit has been issued, a change request must be submitted to the designated official for approval, together with adequate information to assure compliance with this Code, which must be received prior to substitution.

4. Plan Approval. If the designated official determines that the proposed lighting does not comply with this Code, the permit shall not be issued or the plan approved.

5. Certification of Installation. For all projects where the total initial output of the proposed lighting equals or exceeds 100,000 lamp lumens, certification that the lighting, as installed, conforms to the approved plans shall be provided by a certified engineer. Until this certification is submitted, a Certificate of Occupancy shall not be issued for the project.

I. Exemptions. The following outdoor lighting fixtures are exempt from the requirements of this Code:

1. Fixtures producing light directly by the combustion of fossil fuels, such as kerosene lantern or gas lamps.

2. All neon outdoor lighting fixtures.

3. All outdoor lighting fixtures on streets, facilities or lands owned, operated, or controlled, by the United States Government, State of Missouri, County of Boone, Columbia School District, or any other public entity or public agency, including the City of Columbia.

4. Emergency lighting operated by a public utility or agency during the course of repairing or replacing damaged facilities.

5. Emergency lighting and fixtures necessary to conduct police, firefighting or rescue operations, provide emergency medical treatment or address any other emergency, public health or safety situations.

6. Lighting fixtures within five (5) feet of an entrance or exit door and/or alcove of a building not exceeding a height of eight (8) feet and a wattage exceeding 75 watts, provided there is no light trespass or the lighting fixtures are regulated by motion detector.

7. Internally illuminated signs.

8. Holiday lighting fixture displays.

9. Architectural lighting whether it is freestanding or attached to a building which does not exceed an intensity of 40 watts.

10. Pedestrian lighting which does not have an intensity greater than 40 watts.

11. Vertical lighting for a properly displayed U.S. flag which does not exceed an intensity of 140 watts.

12. Swimming pool or fountain lighting used for underwater illumination.

J. Nonconforming Uses.

1. No outdoor lighting fixture or use which was lawfully installed or implemented prior to the enactment of this Code shall be required to be removed or modified except as expressly provided herein; however, no modification or replacement shall be made to a nonconforming fixture unless the fixture thereafter conforms to the provisions of this Code, except that identical lamp replacement is allowed.

2. In the event that an outdoor lighting fixture is abandoned or is damaged to the point of requiring repairs for safe operation, the repaired or replacement fixture shall comply with the provisions of this Code.

3. If the property is abandoned, or if there is a change in use of the property, the provisions of this Code will apply when the abandonment ceases or the new use commences.

K. Administration and Enforcement. The Director of Public Works, or his or her designee, shall administer and enforce the provisions of this Code. Any person who wishes to appeal any order, decision, or determination made by the Director may do so in accordance with procedures established for appeals to the Building Code.

L. Law Governing Conflicts.

Where any provision of federal, state, county, or city statutes, codes, or laws conflicts with any provision of this Code, the most restrictive shall govern unless otherwise regulated by law.

M. Violation and Penalty.

It shall be a civil infraction for any person to violate any of the provisions of this Code. Each and every day during which the violation continues shall constitute a separate offense. A fine shall be imposed of not less than _____ dollars nor more than _____ dollars for any individual or not less than _____ nor more than _____ dollars for any corporation, association, or other legal entity for each offense. The imposition of a fine under this Code shall not be suspended.

N. Severability.

If any of the provisions of this Code or the application thereof is held invalid, such invalidity shall not affect other provisions or applications of this Code which can be given effect, and to this end, the provisions of this Code are declared to be severable.

O. Effective Date.

This ordinance shall be in full force and effect from and after its passage.

PASSED this _____ day of _____, 2001.

ENVIRONMENT AND ENERGY COMMISSION
CITY OF COLUMBIA & COUNTY OF BOONE

RECORD OF MEETING OCTOBER 24, 2000

- **CALL TO ORDER:** Vice Chairperson Nan Collins tried to call the meeting to order about 7:10 PM, in the absence of the Chairperson, but there was not a quorum, so certain items below *<in italics>* were only discussed in the pre-meeting "work session" and no votes were taken then. Two more members were phoned, and they arrived to form a quorum, about 7:40 PM, when the regular meeting began. *The minutes of the September 26th meeting were approved as circulated.* (8/22 revised. Minutes to be given out in Nov.)
PRESENT: City appointees Nan Collins, Tim Echternach, Kurt Schaeffer, Fred Springsteel & Bruce Wilson; P&Z rep Karl Skala; County appointee Vernon Gross.
ABSENT: N. Lenhardt; A. Turner.

- **CHAIR & VICE-CHAIR REPORTS:** *In the absence of the Chair, the Vice Chair presided and gave a brief summary of the sidewalks' widths issue, which became the 2nd Old Business item.*

- **OLD BUSINESS:**
 - **Proposed revision of EEC ordinance (Secs. 2-345 to 2-350):** *The secretary reviewed key provisions of this DRAFT proposal, which was deferred from September New Business to October Old Business, as follows: to reduce EEC's size from 13 to 11 by dropping non-participating Health Board and W&L Board reps, so that our stated quorum requirement may drop from 7 to 6; and, to not require monthly summer meetings unless we so decide. Mr. Skala objected to reducing city representatives without a reduction in county appointees. Mr. Springsteel pointed out that the ratio of Columbians to non-Columbians in Boone County is, to the nearest digit (7 to 4), the same as the proposed EEC membership ratio. Ms. Collins observed that the County could appoint its members from city residents, if it so chose. ~~Were it to do so, it was noted, that would increase City representation at the expense of Boone County's (non-city) interests.~~*
The EEC was not ready to vote; a final vote was set for first item in November.

 - **Sidewalk Width Recommendation:** The discussion above was continued, wherein the presented Alternate "G" of Mr. Skala - in his Report of October 9th - was adopted:
MOTION (Skala; passed 7-0): That the EEC support an effort - in the City Planning and Zoning Commission - to implement the following sidewalk width policy: **"(G) Alternate F+ including provisions of Alternate E."**
[C is included in E; each of C,E,F,G is a separate paragraph in Mr. Skala's report.]

- **Metro 2020 Plan's Appendix A items - for individual consideration:** On a suggestion coming from the P&Z Commission to spread the work of P&Z to incorporate these previous sections of the (former, deleted) Appendix A of 2020, each EEC member present willingly accepted one or more topics to self-consider and to report on at a future meeting, namely

K. Skala	A6/20	Tree Preservation & Site Plan Review
B. Wilson	A8	Gated Communities
F. Springsteel	A13	Signs and Outdoor Advertising
T. Echternach	A17	Off-street & Shared Parking
V. Gross	A18	Pedestrian Connections
N. Collins	A19	Commercial Interconnection
K. Schaeffer	A21	Site Access Mngmnt.

- **PEDNET Endorsement:** Although the EEC had previously envisaged endorsing PEDNET's goals, rather than joining it, with further information we realized PEDNET *is* a Coalition that several official City groups already belong to; joining it was OK'ed by the City Attorney.

MOTION (Springsteel; passed 7-0) (A Substitute motion for Ms. Turner's endorsement motion): That the EEC JOIN the PEDNET Coalition.

- **NEW BUSINESS:** After the delayed start, there was not enough time to consider well the Global Water Crisis or 'Proposed Changes to EEC Rules of Procedure', which items will be carried over to future.
- **ADJOURNMENT:** The meeting was adjourned about 8:40 PM
The next meeting will be November 28, 2000, 7 pm at the same place.

Frederick N. Springsteel

Frederick N. Springsteel, recorder, Secretary of the EEC

NOV. 28, 2000

DATE APPROVED

**ENVIRONMENT & ENERGY COMMISSION
CITY OF COLUMBIA & BOONE COUNTY**

**RECORD OF MEETING
July 24, 2001**

CALL TO ORDER

The meeting was called to order by Chairman Karl Skala in the third floor conference room of the Daniel Boone Building at 7:05 PM. Seven members were present including: Secretary Nan Collins, City Liaison Jay Hasheider, P&Z representative (Chair), Norman Lenhardt, Michael Morrison, Robert Walters and Bruce Williams (seven voting members are required to make a quorum). Absent were: D. Wolersshine, Vice-Chair Alyce Turner and Kurt Schaffer.

AGENDA

The agenda was approved with the addition (at the request of Norm Lenhardt) of the issue of city water.

MINUTES

The minutes of the June 26, 2001 meeting were approved as amended, at the request of the secretary (page 2 , paragraph 2, porous pavement).

CHAIR REPORT

None

VICE CHAIR REPORT

None

ANNOUNCEMENTS

None

OLD BUSINESS

Cell Tower Mounts

Deferred to a later meeting, in the absence of Kurt Schaffer, presenter of subject information.

Rules of Procedure

The Chair explained the proposed Rules of Procedure, and the changes that seem more appropriate to the EEC, and each was approved by consensus (to be put to official vote with a quorum later) or amended as follows:

(1) Quorum (Sec. 2)

Motion (unofficial) (Sec, 2)--concerning a quorum, any *formal* recommendations to a city body shall require the vote of a quorum of seven members, (according to the city ordinance) however, business can be conducted, and discussion, conclusions and consensus reported, with the understanding that it is without a quorum. Approved by consensus.

(2) Duties of the chair (Sec. 6)-- limiting power of the chair

Motion (unofficial) (Sec. 6)--that the commission approve the language in sec. 6. Approved by consensus.

(3)Agenda (Sec 10)-- emergency business not on the agenda Motion (unofficial) (sec. 10) --the language should be changed to reflect the opinion of a simple majority of those present. Approved by consensus.

(4) a. Situations not covered in the rules (Sec, 27)

b. How rules are appealed, altered or amended (Sec. 28)

Motion (unofficial) (Secs. 27 & 28--to amend the original document to read "by a 2/3 majority vote". Approved by consensus.

(5) Addressing the chair (sec, 11)

Motion (unofficial)--to amend the original document to read, "Commissioners shall address each other and visitors respectfully." Approved by consensus.

(6) Speaking (Sec, 13)--number and length of times

No motion; the Chair felt it was covered adequately in other sections.

A motion was made (unofficial) to adopt the Rules of Procedure.

Approved by consensus (agenda item for August). *Approved unanimously 9-28-01*

NEW BUSINESS

Lighting Ordinance pertaining to Gasoline Stations

A sub-committee was formed to research, study and report on this part of the Lighting Ordinance by the next meeting. to prepare a report by September 20th (agenda item for August).

Porous Pavement

A sub-committee was formed to research, study and report on this issue to present information to the Planning Department (agenda item for August).

City Water

Discussed briefly (agenda item for August).

OTHER BUSINESS

2020 Plan--to be discussed at a later date.

Billboards--to be discussed at a later date.

ADJOURNMENT

The meeting adjourned at 8:50 PM.

The next meeting will be August 28, 2001.

**Respectfully submitted by
Nan C. Collins, Secretary**

Report from the
ENVIRONMENT & ENERGY COMMISSION¹

SIDEWALKS

Revised 10/25/00

BACKGROUND:

A proposal to revise Chapter 25 of the Columbia City Code (Subdivision Regulations) which would specify that new sidewalks be a minimum of five (5) feet in width is pending. At present, the minimum sidewalk width is four (4) feet by city policy and is not specified by ordinance in the subdivision regulations.

On 7/5/00 the City Council (CC) referred the issue of sidewalk width to the Planning & Zoning Commission (P&Z) for a subsequent public hearing and recommendation.

On 7/26/00 P&Z held a work session with the Planning (PD) and Public Works (PW) staff to discuss the sidewalk width issue. P&Z decided to hold a public hearing on 9/7/00 after which the decision was made to table the question until 11/9/00. Two (2) P&Z work sessions were also scheduled for 9/20/00 and 10/11/00 for members, P&D staff, and representatives of the Bicycle/Pedestrian Commission (BPC), the Disabilities Commission (DC), and the Environment & Energy Commission (EEC). The ensuing discussion resulted in a P&Z request for recommendations with regard to the sidewalk width issue in the form of BPC, DC, and EEC reports.

ALTERNATIVES:

- A. Amend Subdivision Regulations to require 4' wide sidewalks in all locations.
- B. Amend Subdivision Regulations to require 5' wide sidewalks in all locations.
- C. Require a 5' wide sidewalk only in locations with high pedestrian traffic, e.g. schools, parks, churches, shopping centers, etc.
- D. Require a 5' sidewalk in all locations (only in high pedestrian traffic areas) but tie this change to a reduction in the local residential street width from 32' to 28' and a reduction of the front yard setback in R-1 and R-2 from 25' to 20'.
- E. Alternate C. above except provide that when variances are granted that payment in lieu of construction is made to a sidewalk construction fund.
- F. Allow maximum flexibility by requiring a pedestrian plan at the time of preliminary plat review. This plan would specify locations and widths (4-8') of sidewalks and any alternative walkways. These specifications could include walkways (and/or bicycle paths) on one or both sides of the street.
- G. Alternative F. plus including the provisions of alternative E.

DISCUSSION OF ALTERNATIVES:

In general, much of the discussions between P&Z, staff, invited city commissions, and the public included the desirability of wider walkways in the context of the associated costs (to the homebuilder, to the homeowner, and to the environment {i.e., increases in impervious surface, stormwater runoff, etc.}). The lack of planning flexibility and criticism of the concept that "one size fits all" was a recurrent theme.

- A. Some locations require sidewalks wider than four (4) feet, e.g., arterial, collector, high traffic, etc.
- B. Four (4) foot sidewalks are adequate in some areas, e.g., residential, low traffic, etc., and preserve pervious surface. Even five (5) foot sidewalks are not adequate to allow simultaneous passage of two wheelchairs or two baby carriages.

¹Prepared by Karl Skala at the request of the Environment & Energy Commission

- C. Five (5) foot sidewalks in high pedestrian (or even high vehicular) traffic areas are desirable. The proposed Metro 2020 Community Structure Plan, Chapter 9., Section 9.2, Subsection c., states "Consider changes to the sidewalk design standard to establish a 5-foot sidewalk width on collector and arterial streets or in areas with high pedestrian traffic. Retain the existing 4-foot minimum width for local streets within residential subdivisions".
- D. As stated in B., it follows that universally mandating five (5) foot sidewalks is not desirable. Proposed reductions in residential street widths have gained both city and public support but need not be tied to sidewalk width. Proposed reductions in front yard setbacks in R-1 and R-2 from 25' to 20' have been discussed but also need not be tied to sidewalk width. (Front yard setbacks in R-2 areas could be problematic due to increase off street parking demands in higher density residential areas. Maximum flexibility for determining front yard setbacks could be insured by encouraging and streamlining Planned Unit Development (PUD) zoning requests.
- E. A sidewalk/walkway construction fund for appropriate granted variances is desirable.
- F. This alternative offers maximum planning flexibility with projections of cost, can accommodate difficult topography, may yield considerable environmental benefit, and could even address aesthetic concerns. The recommendations highlighted in the Metro 2020 Plan with regard to arterial and collector streets could be accommodated.
- G. This alternative adds a mechanism to partially subsidize the city's sidewalk infill efforts with revenue generated by those properties granted appropriate sidewalk variances.

CONCLUSIONS:

With regard to sidewalk widths, only alternative G. (which includes provisions of C., E., & F.) provides the means to resolve disparate views between commercial & public interests. Alternative G. could also potentially provide low income & affordable housing areas with a partial subsidy to offset additional costs.

Reduction of street widths could provide for additional decreases in impervious surfaces (e.g., the increased space between the street and sidewalks could encourage street tree plantings). Reductions in the front yard setbacks could provide for increases in pervious surfaces, but these gains might be best realized in the context of PUDs. These changes need not be tied to sidewalk width considerations.

Although the original proposal to revise the Subdivision Regulations is under consideration, approval of the Metro 2020 Community Structure Plan would seem to be a logical precursor to specific amendments of the city ordinances, which might contradict the general plan.

EEC RECOMMENDATION:

The EEC met on 10/24/00 and unanimously recommended that the P&Z Commission adopt the CONCLUSIONS as set forth above. The following is a summary of its recommendation:

1. A four (4) foot default with a requirement for five (5) foot sidewalks on collector and arterial streets or in areas of high pedestrian traffic.
2. A sidewalk construction fund to be established in lieu of sidewalk construction as a result of granted sidewalk variances to be used solely to construct or improve sidewalks within the City.
3. Require a pedestrian plan at the time of final plat review for straight zoning and as an integral part of the site plan for commercial and/or residential planned development.

¹Prepared by Karl Skala at the request of the Environment & Energy Commission

[EEC LETTERHEAD]

**RULES OF PROCEDURE
ENVIRONMENT & ENERGY COMMISSION
COLUMBIA, MISSOURI**

SECTION 1. MEETING TIME AND PLACE

The Environment and Energy Commission shall hold regular monthly meetings at a time and place to be designated by the Chairman.

SECTION 2. QUORUM

A quorum of six (6) Commissioners shall be necessary to conduct official business at any regular or special meeting. In the absence of a quorum, agenda items may be considered and the subsequent discussion recorded, but no recommendation shall be forthcoming.

SECTION 3. RESPONSIBILITIES OF COMMISSIONERS

All Commissioners are subject to the rules adopted by the Commission. The vote of all Commissioners shall be equal. The Commissioners should carry out their duties in a serious and considerate manner. It will be the responsibility of each Commissioner to research all available background information related to past actions of the Commission and the City Council. Commissioners should make every effort to attend all meetings of the Commission; any extenuating circumstances that would cause repeated absence from meetings would be cause for a Commissioner's resignation to the appointing authority.

SECTION 4. SPECIAL MEETINGS

Special meetings of the Environment and Energy Commission may be called by the Chairman or by a majority of its duly appointed Commissioners. At least forty-eight (48) hours notice shall be given before any special meeting is held unless said time for notice of special meeting is waived by unanimous consent of the Commissioners.

SECTION 5. OFFICERS

At the first meeting in June of each calendar year, the Commission shall elect the following officers: Chairman, Vice-Chairman and Secretary. Election of a Chairman: the names of all Commissioners shall be placed alphabetically on a ballot, to be distributed and marked secretly by each Commissioner and returned for tabulation to the Secretary or any other person appointed by the Commission. Tie votes shall be decided by a runoff ballot of the persons tied with the highest number of votes. Election of a Vice-Chairman and a Secretary shall proceed in the same manner, with the deletion of previously elected officers from the ballot. Before distribution of the ballots, a Commissioner may request that his or her name be stricken from the list.

SECTION 6. DUTIES OF THE CHAIRMAN

The Chairman shall preside at all the meetings in which he or she is in attendance, shall preserve order and decorum and decide all questions of order subject to an appeal by the Commission. The ruling of the Chairman may be overturned by a 2/3-majority vote of the Commissioners present. All final rulings must be consistent with established rules of parliamentary procedure². At the hour designated for Commission meetings, the Chairman shall call the Commission to order, and after the roll call, if a quorum be present, he or she shall present the minutes of the last meeting for correction and approval. The agenda, which has been prepared by the Chairman, or caused to have been prepared by him, shall then be followed as to the order of business unless changes in the order of business are made by a majority of the Commissioners present. The Chairman shall conduct all meetings expeditiously and may, if the situation warrants, set reasonable time limits at public hearings. The Chairman may introduce motions on his or her own.

SECTION 7. DUTIES OF THE VICE-CHAIRMAN

The Vice-Chairman shall assume the duties of the Chairman during the Chairman's absence or disability. If a vacancy in the office of Chairman should occur, the Vice-Chairman shall become Chairman for the completion of the unexpired term of the Chairman.

SECTION 8. DUTIES OF THE SECRETARY

The Secretary shall be responsible for the maintenance of a record of the proceedings of all meetings of the Environment and Energy Commission, said record to be known as the minutes of the Commission meetings. This record is to consist only of what was done and what was said and must never include criticism, argument or comment, favorable or otherwise, on anything said or done. In the absence or disability of the Chairman and Vice-Chairman, the Secretary shall assume their duties and responsibilities. If a vacancy in the office of Vice-Chairman occurs, the Secretary shall become Vice-Chairman for the completion of the unexpired term of the Vice-Chairman. If a vacancy in the office of Secretary occurs, the Chairman shall appoint a successor to fill the unexpired term.

SECTION 9. ORIENTATION OF INCOMING COMMISSIONERS

It shall be the duty of the Chairman to see that all incoming Commissioners are:

- 1) Introduced to the Staff Liaison;
- 2) Introduced to other Commissioners;
- 3) Provided with all necessary reports, ordinances and material;
- 4) Given a brief meeting on the mechanics of the Commission.

The above orientation shall be accomplished prior to the incoming Commissioner's first regular meeting.

SECTION 10. AGENDA

An agenda stating the items to be discussed at each meeting, accompanied by a copy of the minutes of the preceding meeting, shall be mailed or otherwise conveyed to each member of the Commission at least forty-eight (48) hours before the meeting at which the agenda is to be considered. Emergency business not on the agenda may be included in the discussion by the consent of a majority vote of the Commissioners present at the meeting.

SECTION 11. ADDRESSING THE CHAIR

When a Commissioner is about to speak, he or she shall respectfully address himself or herself to the presiding officer, but shall not proceed with his or her remarks until recognized and named by the Chair. Commissioners shall address each other and visitors respectfully.

SECTION 12. NAMING SPEAKER

When two or more Commissioners address themselves to the presiding officer at once, the presiding officer shall name the person who is to speak first, the other having preference to speak next.

SECTION 13. NUMBER OF SPEECHES: DISRESPECT

The Chairman may rule that no Commissioner shall speak more than twice on the same question, nor more than once until every Commissioner choosing to speak shall have spoken; and in all discussions, disrespectful language or personalities shall be avoided.

SECTION 14. INTERRUPTING SPEAKER

While a Commissioner is speaking, other Commissioners shall not hold private discourses or in any other manner interrupt the speaker.

SECTION 15. CALLING COMMISSIONERS TO ORDER

A Commissioner called to order shall immediately desist from speaking unless permitted to explain. If there is no appeal, the decision of the chair shall be conclusive, but if the Commissioner appeals to the Commission from the decision of the Chair, those Commissioners present shall decide the question without debate.

SECTION 16. COMMISSIONERS WHO SHALL VOTE

Every Commissioner who shall be present when a question is stated by the Chair shall vote thereon, unless excused by the Chairman, unless he or she has a direct pecuniary interest in the question, or unless he or she feels that voting on the question would be improper for any reason.

SECTION 17. REDUCING MOTIONS TO WRITING

Every motion shall be reduced to writing if the Chairman so desires.

SECTION 18. SECRETARY TO READ MOTIONS: SECOND REQUIRED

When a motion is made and seconded, it may be read aloud before it is debated. No motion shall be debated until seconded.

SECTION 19. WITHDRAWING MOTIONS

After a motion is made and seconded, it shall be deemed to be in the possession of the Commission. The maker may withdraw the motion at any time before a vote or amendment, without consent of the second. The question may be reconsidered after a vote during the same meeting, only if a majority of those present vote favorably to re-open the item for another vote.

SECTION 20. VOTING ORDER FOR ROLL CALL VOTES

Commissioners shall vote in alphabetical order, rotating in succeeding meetings.

SECTION 21. TIE VOTES

In the event of a tie vote on a motion, the motion shall be sent forward to the appropriate body without recommendation, but with the indication of the tie vote.

SECTION 22. AMENDMENT OR SUBSTITUTE MOTION OR PROPOSITION

No new motion or proposition shall be admitted as an amendment or as a substitute for any pending motion that does not relate to the subject matter of the original motion.

SECTION 23. MOTIONS WHEN QUESTION IS UNDER DEBATE

When a question is under debate, no motion shall be entertained except for: "the question"; to amend; to refer to a committee or to an office of the City or the Commission; to table; to continue; or to adjourn.

SECTION 24. WHEN MOTION TO ADJOURN IS IN ORDER

A motion to adjourn shall always be in order, except: (1) when a member is in possession of the floor; (2) while the yes and no votes are being called; (3) while the Commissioners are voting; (4) when it was the last preceding motion; and (5) when it has been decided that "the question" shall be taken.

SECTION 25. THE "QUESTION"

The motion to call for "the question" shall be in this form: "Call the Question". When recognized by the Chairman, the motion shall preclude all debate and amendments and the Chairman will immediately call for a vote on the main question, motion or amendment.

SECTION 26. WHEN INDIVIDUAL YES AND NO VOTES ARE RECORDED

If any Commissioner so requests, the individual yes and no votes upon any question shall be taken and entered upon the minutes.

SECTION 27. SITUATIONS NOT COVERED UNDER THE ABOVE RULES

The Chairman shall rule on all questions that arise which are not otherwise covered by the above. The ruling of the Chairman under these circumstances may be overturned by a 2/3-majority vote of the Commissioners present. All final rulings must be consistent with established rules of parliamentary procedure².

SECTION 28. HOW RULES ARE REPEALED, ALTERED OR AMENDED

These rules shall not be repealed, altered or amended except by receiving the affirmative vote of a majority of Commissioners present, except such rules that may limit the rights of individual members which shall require a 2/3-majority vote of the Commissioners present.

SECTION 29. PREVIOUS RULES

All previous rules and regulations of the Commission are hereby repealed and become null and void.

²*Robert's Rules of Order Revised*, General Henry M. Robert, 1915 Version, Public Domain,
<http://www.constitution.org/rror/rror--00.htm>

**ENERGY & ENVIRONMENT COMMISSION
CITY OF COLUMBIA & BOONE COUNTY**

**RECORD OF MEETING
MAY 23, 2000**

Chairman Norman Lenhardt called the meeting to order at 7 pm in the third floor meeting room of City Hall. Others present were Nan Collins, Alyce Turner, Vernon Gross, Fred Springsteel, Karl Skala, Bruce Wilson and Graham Jones. Absent were Mike Kilfoil, Randy Williams, Tim Echternach and David Mars. Christina Claassen from the *Missourian* was also present.

The April 25, 2000 meeting minutes and the May 23 agenda were approved thru a motion by Fred and second by Vernon.

Chair Report. Norm had recently returned from Florida and said he saw many examples of *porous pavement*. He passed around a report on the voracious aquatic plant (*giant salvinia*) that he has been concerned about and asked if anyone sees it here to report it promptly.

Vice-Chair Report. Nan handed out some articles clipped from local papers in March and April describing the new executive of Regional Economic Development Inc. (REDI) and some of their tactics along with critical articles by Ken Midkiff of the Sierra Club. She is concerned about REDI's operations.

Announcements. Graham Jones announced he is stepping down after three+ years on the Commission. He thanked everyone for their cooperation and hearkened back to some of the wins and losses during his tenure. He especially thanked Karl Skala for his work as the P&Z liaison member.

OLD BUSINESS

Commercial Lighting Final Draft Report. Karl Skala reported on the CLS meeting held just prior to the Commission meeting. Fred suggested he clarify Sec. A - Permits. It was decided to prepare another draft with this and other changes from the CLS meeting. Nan moved that this new draft be sent to the 31 people who received the first draft, as an approved version by the EEC, seconded by Fred (who suggested a specific response time be added), and motion carried. Karl will send an E-mail to Pat Daugherty, Jim Pinkerton and Karl Kruse saying we are "considering the issues you raised, we will respond later and thank you for your responses." So moved by Vernon, seconded by Nan and approved.

Metro 2020 - Appendix A. Karl handed out a letter he had written to the Mayor, Council, City Manager and City Clerk on May 1st about Appendix A and our request for an additional public hearing on same. Thus far there has been no response.

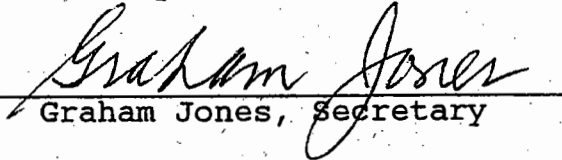
Karl offered to go to the June 5th Council meeting and raise the issue; there was some question whether he or Norm would go. Fred moved for approval of the following resolution: "The EEC wishes to express its grave concern that the Metro 2020 plan may be altered without public comment. For now, as cited in the document (App. A, p.83), we favor preservation of the Metro 2020 Community Structure Map's *Open Space/Greenbelt*." This was seconded by Karl and approved. Norm will present this at the June 5th Council meeting.

NEW BUSINESS

Stephens Lake. Fred had disseminated a letter to members expressing his concern about the possible purchase of the Lake by the City for \$10 million. He feels this is exorbitant and favors "eminent domain for this essential key lynchpin of our Greenbelt". He is afraid the city will downzone the property from low-density single family residential to high-density multiple-unit commercial. Alyce, a Friends of Stephens Lake member, expressed some of her concerns.

Election of Officers. Since June begins a new year for the EEC, officers were elected. Chairperson Norman Lenhardt and Vice-Chairperson Nan Collins were re-elected by acclamation. With the departure of Secretary Graham Jones, Fred Springsteel was nominated and elected unanimously.

Meeting adjourned about 9 pm; next meeting July 27th at 7 pm.



Graham Jones, Secretary

ENVIRONMENT AND ENERGY COMMISSION
CITY OF COLUMBIA AND BOONE COUNTY

RECORD OF MEETING
JUNE 27, 2000

Chairman Norman Lenhardt convened the meeting at 7:00 pm and noted that there was an insufficient number of members to form a quorum. Six members were present: Nan Collins; Tim Echternach; Norm Lenhardt; Karl Skala; Vernon Smith; and Alyce Turner. Seven are required to form a quorum. Also present were Jay Hasheider (staff liaison) and Chip Cooper of the Ped Net Committee.

Noting Mr Cooper's presence, the chair announced that although the Commission was not able to conduct business in any official capacity, discussions of agenda items, and especially Mr Cooper's address, were welcome. The following discussions were made.

Mr Skala gave a hand-out of recent correspondence with Fred Springsteel regarding a number of issues, including the *ability* of a representative from another commission to hold office on the EEC Commission. Mr Skala serves on the Planning and Zoning Commission and was elected as Vice- Chair of the Environment and Energy Commission. As evidenced by the e-mail correspondence this matter was resolved: being that representatives from other commissions *can* serve as EEC office holders.

Lighting Issue: The draft of the outdoor lighting regulations was given to Council and has since been referred to city staff. Mr Skala shared correspondence with Chuck Bondra, Planning and Development Director, regarding this. In the correspondence Mr Bondra indicated he will keep Mr Skala informed of the progress. Mr Skala emphasized to the group that the main ingredients to this issue are: Safety (in terms of glare); Economics; and Aesthetics. It was suggested that the Commission invite Mr Bondra to a future meeting to update the commission on how staff is proceeding with their review of the draft regulation.

Metro2020: Mr Skala shared copies of a staff memo regarding revision of the Metro 2020 Plan. The revision included removal of Appendix A with its issues either rolled into the body of the plan or, where designated as too 'proscriptive', referred to Planning and Zoning. Mr Skala felt that the EEC should have a role in the discussions of some of these issues. A general public meeting will be held on July 10 on the plan and it is important for EEC members to try to attend. Alyce Turner would like to have a letter written requesting that Stephens Lake property be included in the plan. Due to the lack of a quorum, it was suggested that she write a letter that could be signed by individuals from the commission, since the the commission *as a whole* could not make that recommendation until the next official meeting.

Pednet: Chip Cooper of the Bicycle Commission presented an informational talk on Ped Net which is a plan to eventually create a road system in Columbia that accommodates all types of travel including bicyclists, wheelchairs, and pedestrians, as well as cars. He explained how road designs could be changed to allow safe passage for wheelchair travelers and children cyclist (the

two target groups of Pednet) without increasing costs of construction. Pednet recently accomplished its goal of 1,000 members. E&E Commission members are encouraged to review the Ped Net web site at pednet.org and join in the 'virtual public hearing' that is ongoing. Pednet has a long term goal of connecting all of Columbia with a system of 'pednet friendly' roadways within 20 years, and two short term goals of getting specific new road construction to conform the pednet concept and making improvements to existing roadways that connect Columbia's green belt corridors.

Computer recycling: Mr Lenhardt will bring in an article regarding computer recycling from US News and World Reports for the next meeting.

Water Rates: Mr Lenhardt objected to the Water and Light's suggestion that customers water 3 times per week. He feels that is too frequent - one inch every month should be enough. Nor is the water surcharge enough. Instead of simply charging incrementally more for summer water use through a surcharge, costs should *increase* proportionally with increased use. According to Mr Lenhardt, using the existing rates, a 10,000 square foot plot would only cost \$6 more per month to water. Mr Hasheider pointed out that there might be some misunderstanding about recommended watering rates and volunteered to make a presentation to the Commission at their next meeting regarding the Department's water rates and conservation program.

Wednesday, May 10, 2000

Mr. Darwin Hindman
P.O. Box 6015
Columbia, MO 65205

RE: Outdoor Lighting Report (rev 5/10/00)

Dear Mr. Mayor:

The Commercial Lighting Subcommittee (CLS) of the Environment & Energy Commission (EEC) presented the enclosed report for Outdoor Lighting Regulations to the EEC on April 25, 2000. By unanimous consent, the EEC has directed me to distribute this preliminary draft to the Mayor & City Council, the City Manager, the City Attorney, and the Acting Planning & Development Director for criticism, comment, advice, and procedural direction (in preparation for public hearings).

Please refer all comments to the Environment & Energy Commission (C/O Karl Skala, 5201 Gasconade Drive, Columbia, MO 65202 – Phone (573) 474-2195 – email: skalak@missouri.edu) so that these comments may be considered in the preliminary discussion of this report before the May 23, 2000 meeting of the CLS & the EEC.

Very truly yours,

Karl Skala
Environment & Energy Commission
Commercial Lighting Subcommittee, Chair

CC: The Mayor & City Council
The City Manager
The City Attorney
The Acting Planning & Development Director

EEC REPORT: PROPOSED OUTDOOR LIGHTING REGULATIONS

Outdoor Lighting:

The residents of Columbia value our community's special blend of rural and urban qualities, including the ability to view the stars against a dark sky. They recognize that inappropriate and poorly designed or installed outdoor lighting causes unsafe and unpleasant conditions, limits their ability to enjoy the nighttime sky, and results in unnecessary use of electric power. On the other hand, it is also recognized that well designed outdoor lighting is appropriate, useful, and often necessary in areas such as the downtown business district, satellite clusters of commercial activity, and other areas requiring special public safety considerations. To ensure appropriate lighting while minimizing its undesirable side affects, the following regulations are established.

A. Permit Required:

On all properties except those of one- and two-family residential structures and active farms, the installation or replacement of any outdoor lighting fixtures shall require a zoning permit. Said permit may not be issued unless the proposed installation is found (by the Planning & Zoning Commission or the Planning & Development Department) to conform to all applicable provisions of this section.

B. Creation of Lighting Districts:

For the purposes of this section, the zoning districts established elsewhere in these regulations are consolidated into lighting districts, as follows:

- i. Lighting District 1 shall consist of the industrial districts and the high-density commercial districts (i.e., zoning districts MR, MC, M-1, C3, and equivalent high-density C-P designations).
- ii. Lighting District 2 shall consist of the low-density commercial districts (i.e., zoning districts C-1, C-2, O-1, O-2, and equivalent low-density C-P & O-P designations).
- iii. Lighting District 3 shall consist of the higher-density residential districts (i.e., R-3, R-4, and equivalent high-density PUD designations).
- iv. Lighting District 4 shall consist of the low-density residential districts, the rural and agricultural districts, and the special or overlay districts (i.e., R-1, R-2, A-1, and equivalent low-density PUD designations).

C. General Requirements:

- i. When the outdoor lighting installation or replacement is part of a development proposal for which site plan approval is required under these regulations, the Planning & Zoning Commission must recommend and the City Council must approve the lighting installation as part of its site plan approval.
- ii. Outdoor lighting installations not requiring site plan approval and involving the installation or replacement of two or fewer lighting fixtures (free standing or facade mounted) may be approved by the Planning & Development Department,

provided that no single lamp (bulb) exceeds 150 watts, and that the total wattage of all bulbs in all fixtures does not exceed 300. The Planning & Zoning Commission must approve all other exceptional installations.

iii. The applicant shall submit to the City of Columbia sufficient information, in the form of an overall exterior lighting plan, to enable the City to determine that the applicable provisions will be satisfied. The lighting plan shall include at least the following:

- a) A site plan, drawn to a scale of one inch equaling no more than twenty (20) feet, showing buildings, landscaping, parking areas, and all proposed exterior lighting fixtures;
- b) Specifications for all proposed lighting fixtures including photometric data, designation as Illuminating Engineering Society of North America (IESNA) "cut-off" fixtures, Color Rendering Index (CRI) of all lamps (bulbs), and other descriptive information on the fixtures;
- c) Proposed mounting height of all exterior lighting fixtures;
- d) Analyses and illuminance level diagrams showing that the proposed installation conforms to the lighting level standards in this section; and
- e) Drawings of all relevant building elevations showing the fixtures, the portions of the walls to be illuminated, the illuminance levels of the walls, and the aiming points for any remote light fixtures.

iv. Wherever practicable, lighting installations shall include timers, dimmers, and/or sensors to reduce overall energy consumption and eliminate unneeded lighting.

v. When an outdoor lighting installation is being modified, extended, expanded, or added to, the entire outdoor lighting installation shall be subject to the requirements of this section.

vi. Expansions, additions, or replacements to outdoor lighting installations shall be designed to avoid harsh contrasts in color and/or lighting levels.

vii. Electrical service to outdoor lighting fixtures shall be underground unless the fixtures are mounted directly on utility poles.

viii. For the purposes of these regulations, the mounting height of a lighting fixture shall be defined as the vertical distance from the grade elevation of the surface being illuminated to the bottom of the lighting fixture (i.e., luminaire).

ix. Holiday lighting during the months of November, December, and January shall be exempt from the provisions of this section, provided that such lighting does not create dangerous glare on adjacent streets or properties.

x. Proposed lighting installations that are not covered by the special provisions in this section may be approved only if the Commission finds that they are designed to minimize glare, do not direct light beyond the boundaries of the area being illuminated or onto adjacent streets or properties, and do not result in excessive lighting levels.

xi. Where the Commission finds that undue hardships or practical difficulties may result from strict compliance with these requirements, it may recommend and the Council may approve variances from these regulations so that substantial justice may be done and the public interest secured, provided that any such variance shall not have the effect of nullifying the intent and purpose of these regulations; and further provided, that the Commission shall not recommend variances unless it finds and determines that:

- a) The granting of the variance will not be detrimental to public safety, health or welfare or injurious to other property or improvements in the neighborhood in which the property is located.
- b) The conditions upon which the request for a variance is based are unique to the property for which the variance is sought, and are not applicable generally to other property, and are not self-imposed.
- c) Because of the particular physical surroundings, shape or topographical conditions of the specific property involved, a particular hardship to the owner would result, as distinguished from a mere inconvenience, if the strict letter of these regulations was carried out; and
- d) The variance will not in any manner abrogate the provisions of the comprehensive plan of the City.

xii. These regulations are not intended to interfere with, abrogate or annul any other City regulation, ordinance, statute, or other provision of law. Where any provision of these regulations imposes restrictions different than those imposed by any other provision or regulation, whichever provisions are more restrictive or impose a higher standard shall control.

D. Parking Lot Lighting:

Parking lot lighting shall be designed to provide the minimum lighting necessary to insure adequate vision and comfort in parking areas, and to not cause glare or direct illumination onto adjacent streets or properties.

- i. All lighting fixtures serving parking lots shall be cut-off fixtures as defined by IESNA.
- ii. Alternatives: The design for an area may suggest the use of parking lot lighting fixtures of a particular "period" or architectural style, as either alternatives or supplements to the lighting described above.

- a) If such fixtures are not "cut-off" fixtures as defined by IESNA, the maximum initial lumens generated by each fixture shall not exceed 2000 (equivalent to a 150-watt incandescent bulb).
- b) Mounting heights of such alternative fixtures shall not exceed fifteen (15) feet.

iii. Parking area lighting standards in the various lighting districts are as shown in Table 1.

iv. Parking area lighting in the low-density rural district: Parking areas in the low-density rural district shall not be illuminated unless there exist specific hazardous conditions that make illumination necessary. In such cases, the lighting shall meet the standards for the next higher lighting district.

E. Street Lighting:

i. General Street Lighting Standards

- a) General levels of illumination shall be consistent with guidelines published by the IESNA, provided that the average illumination level may not exceed that specified in those guidelines by more than 0.2 foot-candles.
- b) The uniformity ratio shall not exceed that suggested by IESNA guidelines.
- c) Lamps shall have a Color Rendering Index (CRI) of no less than sixty-five (65).
- d) Mounting heights shall not exceed thirty-five (35) feet.

ii. Fixtures

All street lighting fixtures shall be "cut-off" fixtures as defined by IESNA, if necessary, fixtures shall include "house side shields" to minimize light directed to the rear of the fixtures.

Alternatives: The design for an area may suggest the use of street lighting fixtures of a particular "period" or architectural style, or there may be existing historical fixtures to be retained. In such cases, the non-cut-off fixtures may be used either as alternatives or supplements to street lighting described above.

- a) For fixtures that do not meet the "cut-off" criteria, the maximum initial lumens generated by each fixture shall not exceed 2000 (equivalent to a 150-watt incandescent bulb).
- b) Mounting heights of such fixtures shall not exceed twenty (20) feet for new fixtures. Where historic fixtures are being retained (and/or extended) mounting height shall be that of the existing fixtures and every effort shall be made to use brackets that match existing brackets.

iii. Location

- a) Streetlights shall be located in the public right of way.
- b) If the street has a sidewalk along one side, the streetlights shall generally be located on the sidewalk side of the street.

F. Lighting of Gasoline Station/Convenience Store Aprons and Canopies:

Lighting levels on gasoline station/convenience store aprons and under canopies shall be adequate to facilitate the activities taking place in such locations. Lighting of such areas shall not be used to attract attention to the businesses. Signs allowed under the appropriate section of the Columbia City Ordinances regulating signs (Chapter 23) shall be used for that purpose.

- i. Areas on the apron away from the gasoline pump islands used for parking or vehicle storage shall be illuminated in accordance with the requirements for parking areas set forth elsewhere in this section. If no gasoline pumps are provided, the entire apron shall be treated as a parking area.
- ii. Areas around the pump islands and under canopies shall be illuminated so that the minimum horizontal illuminance at grade level is at least 1.0 foot-candle and no more than 5.5 foot-candles. The uniformity ration (ratio of average to minimum illuminance) shall be no greater than 4:1, which yields an average illumination level of no more than 22.0 foot-candles.
- iii. Light fixtures mounted on canopies shall be recessed so that the lens cover is recessed or flush with the bottom surface (ceiling) of the canopy and/or shielded by the fixture or the edge of the canopy so that the light is restrained to no more than 85 degrees from vertical (see Figure 1).
- iv. As an alternative (or supplement) to recessed ceiling lights, indirect lighting may be used where light is beamed upward and then reflected down from the underside of the canopy. In this case light fixtures must be shielded so that direct illumination is focused exclusively on the underside of the canopy.
- v. Lights shall not be mounted on the top or sides (fascias) of the canopy, and the sides (fascias) of the canopy shall not be illuminated.

G. Lighting of Exterior Display/Sales Areas:

Lighting levels on exterior display/sales areas shall be adequate to facilitate the activities taking place in such locations. Lighting of such areas shall not be used to attract attention to the businesses. Signs allowed under the appropriate section of the Columbia City Ordinances regulating signs (Chapter 23) shall be used for that purpose. The applicant shall designate areas to be considered display/sales areas and areas to be used as parking or passive vehicle storage areas. The Planning & Zoning Commission must recommend and the City Council must approve this designation.

- i. Areas designated as parking or passive vehicle storage areas shall be illuminated in accordance with the requirements for parking areas suggested elsewhere in this section.
- ii. Areas designated as exterior display/sales areas shall be illuminated so that the average horizontal illuminance at grade level is no more than 5.0 foot-candles. The uniformity ratio (ratio of average to minimum illuminance) shall be no greater than 4:1. The average and minimum shall be computed for only that area designated as exterior display/sales area.
- iii. Light fixtures shall meet the IESNA definition of cut-off fixtures, and shall be located, mounted, aimed, and shielded so that direct light is not cast onto adjacent streets or properties.
- iv. Fixtures shall be mounted no more than twenty-five (25) feet above grade, and mounting poles shall be located either inside the illuminated area or no more than ten (10) feet away from the outside edge of the illuminated area.

H. Lighting of Outdoor Sports/Performance Facilities:

Outdoor nighttime performance events (concerts, athletic contests, etc.) have unique lighting needs. Illumination levels vary, depending on the nature of the event. The regulations in this section are intended to allow adequate lighting for such events while minimizing skyglow, reducing glare and unwanted illumination of surrounding streets and properties, and reducing energy consumption.

- i. Design Plan: A lighting design plan shall be submitted which shows in detail the proposed lighting installation. The design plan shall include a discussion of the lighting requirements of various areas and how those requirements will be met.
- ii. Dual System: The main lighting of the event (spotlighting or floodlighting, etc.) shall be turned off no more than forty-five (45) minutes after the end of the event. A low level lighting system shall be installed to facilitate patrons leaving the facility, cleanup, nighttime maintenance, etc. The low level lighting system shall provide an average horizontal illumination level, at grade level, of no more than 3.0 foot-candles with a uniformity ratio (average to minimum) not exceeding 4:1.
- iii. Primary Playing Areas: Where playing fields or other special activity areas are to be illuminated, lighting fixtures shall be specified, mounted, and aimed so that their beams fall within the primary playing area and immediate surroundings, and so that no direct illumination is directed off the site.
- iv. Parking Areas: Lighting for parking areas shall meet the requirements suggested elsewhere in this section.
- v. Pedestrian Areas: Areas intended solely for pedestrian circulation shall be provided with a minimum level of illumination of no less than 0.1 foot-candles

and no more than 0.2 foot-candles and a uniformity ratio (average to minimum) not exceeding 4:1.

vi. Security Lighting: Security lighting shall meet the requirements suggested elsewhere in this section.

I. Security Lighting:

The purpose of and the need for security lighting (i.e., lighting for safety of persons and property) must be demonstrated as part of an overall security plan which includes at least illumination, surveillance, and response, and which delineates the area to be illuminated for security purposes. To the extent that the designated area is illuminated for other purposes, independent security lighting installations will be discouraged.

i. In addition to the application materials set forth in the general provisions of this section, applications for security lighting installations shall include a written description of the need for and purposes of the security lighting, a site plan showing the area to be secured and the location of all security lighting fixtures, specifications of all fixtures, the horizontal and vertical angles in which light will be directed, and adequate cross-sections showing how light will be directed only onto the area to be secured.

ii. All security lighting fixtures shall be shielded and aimed so that illumination is directed only to the designated area and not cast on other areas. In no case shall lighting be directed above a horizontal plane through the top of the lighting fixture, and the fixture shall include shields that prevent the light source or lens from being visible from adjacent roadways and properties. The use of general floodlighting fixtures shall be discouraged.

iii. Security lighting may illuminate vertical surfaces (e.g., building facades and walls) up to a level eight (8) feet above grade or eight (8) feet above the bottoms of doorways or entries, whichever is greater.

iv. Security lighting fixtures may be mounted on poles located no more than ten (10) feet from the perimeter of the designated secure area.

v. Security lights intended to illuminate a perimeter (such as a fence line) shall include motion sensors and be designed to be off unless triggered by an intruder located within five (5) feet of the perimeter.

vi. Security lighting standards in the various lighting districts are shown in Table 2.

vii. Security lighting in low-density residential and rural areas: Security lighting shall be allowed in low-density residential and rural areas only if unusual hazardous conditions make it necessary. In such cases, indirect and reflected lighting techniques shall be used to provide soft lighting under canopies, entry porches, or soffits. Lighting levels shall not exceed the standards established for the next higher density residential area.

J. Illumination of Building Facades:

With the exception of structures having exceptional symbolic (i.e., churches and/or public buildings) or historic significance in the community, exterior building facades shall not be illuminated. When buildings having symbolic or historic significance are to be illuminated, the Planning & Zoning Commission shall recommend and the City Council shall approve a design for the illumination and the following provisions shall be met:

- i. The maximum illumination on any vertical surface or angular roof surface shall not exceed 5.0 foot-candles.
- ii. Lighting fixtures shall be carefully located, aimed, and shielded so that light is directed only onto the building façade. Lighting fixtures shall not be directed toward adjacent streets or roads.
- iii. Lighting fixtures mounted on the building and designed to "wash" the façade with light are preferred.
- iv. To the extent practicable, lighting fixtures shall be directed downward (i.e., below the horizontal) rather than upward.
- v. When landscaping is to be illuminated, the Commission shall first approve a landscape lighting plan that presents the purpose and objective of the lighting, shows the location of all lighting fixtures and what landscaping each is to illuminate, and demonstrates that the installation will not generate excessive light levels, cause glare, or direct light beyond the landscaping into the night sky.

K. Illuminated Signs:

Signs may be illuminated only during those hours that the business being advertised is open for business. It is the intent of this section to allow illuminated signs but to ensure that they do not create glare or unduly illuminate the surrounding area. The applicant shall provide the Planning & Zoning Commission with sufficient technical and design information to demonstrate that the following provisions are met.

A) Externally Illuminated Signs:

- i. The average level of illumination on the vertical surface of the sign shall not exceed 3.0 foot-candles, and the uniformity ratio (the ratio of average to minimum illumination) shall not exceed 2:1.
- ii. Lighting fixtures illuminating signs shall be carefully located, aimed, and shielded so that light is directed only onto the sign façade. Lighting fixtures shall not be aimed toward adjacent streets, roads, or properties.
- iii. Light fixtures illuminating signs shall be of a type such that the light source (bulb) is not directly visible from adjacent streets, roads, or properties.

iv. To the extent practicable, fixtures used to illuminate signs shall be top mounted and directed downward (i.e., below the horizontal).

B) Internally Illuminated Signs:

Internally illuminated signs are allowed only in lighting districts i, ii, and iii. In order to prevent internally illuminated signs from becoming light fixtures in their own right, it is the intent of this section that such signs consist of light lettering or symbols on a dark background. The lightness or darkness is a function of the luminous transmittance of the translucent surface material, and the light source (the higher the luminous transmittance, the lighter the color).

i. The lettering or symbols shall constitute no more than forty (40) percent of the surface area of the sign.

ii. The luminous transmittance for the lettering or symbols shall not exceed thirty-five (35) percent.

iii. The luminous transmittance for the background portion of the sign shall not exceed fifteen (15) percent.

iv. Light sources shall be fluorescent tubes, spaced at least twelve (12) inches on center, mounted at least 3.5 inches from the translucent surface material.

L. Lighting of Walkways/Bikeways and Parks:

Where special lighting is to be provided for walkways, bikeways, or parks, the following requirements shall apply.

i. The walkway, pathway, or ground area shall be illuminated to a level of at least 0.3 foot-candles and no more than 0.5 foot-candles.

ii. The vertical illumination levels at a height of five (5) feet above grade shall be at least 0.3 and no more than 0.5 foot-candles.

iii. Lighting fixtures shall be designed to direct light downward, and light sources shall have an initial output of no more than 1000 lumens.

iv. In general, lighting shall be consistent with IESNA guidelines.

Table 1. Parking lot Lighting Standards

	<u>District 1</u> Industrial/ Commercial	<u>District 2</u> City Center/ Commercial	<u>District 3</u> High-Density Residential	<u>District 4</u> Low-Density Residential/Rural
Mounting Height (Maximum)*	25 ft.	20 ft.	20 ft.	Discouraged
Minimum Illumination Level (at darkest spot On the parking area)	No less than 0.3 fc. No more than 0.5 fc.	No less than 0.2 fc. No more than 0.3 fc.	No less than 0.2 fc. No more than 0.3 fc.	Discouraged
Uniformity Ratio**	4:1	4:1	4:1	Discouraged
Minimum CRI***	20	65	70	Discouraged

* Mounting height is the vertical distance between the surface being illuminated and the bottom of the lighting fixture.

** Uniformity ratio is the ratio of average illumination to minimum illumination.

*** CRI is the Color Rendering Index.

Table 2. Security Lighting Standards

	District 1 Industrial/ Commercial	District 2 City Center/ Commercial	District 3 High-Density Residential	District 4 Low-Density Residential/Rural
Mounting Height (Maximum)*	25 ft.	20 ft.	20 ft.	Discouraged
Average Horizontal Illumination Level on Ground	No more than 1.5 fc.	No more than 1.0 fc.	No more than 0.5 fc.	Discouraged
Average Illumination Level on Vertical Surface	No more than 1.5 fc.	No more than 1.0 fc.	No more than 0.5 fc.	Discouraged
Minimum CRI**	20	65	70	Discouraged

* Mounting height is the vertical distance between the surface being illuminated and the bottom of the lighting fixture.

** CRI is the Color Rendering Index.

Figure 1. Gasoline Station/Convenience Store Canopy

