060497C

City of Gainesville

Inter-OfficeCommunication

Planning Division
X5022, FAX x2282, Station 11

Item No. 1

TO: **City Plan Board**

DATE: March 15, 2007

FROM: **Planning Division Staff**

SUBJECT: **Petition 139TCH-06 PB.** City Plan Board. Amend the City of Gainesville Land Development Code to add regulations pertaining to electronic signs (including digital and LED signs), and to amend the definition of "animated signs."

Recommendation

Staff recommends administrative approval of electronic signs based on recommended criteria.

Explanation

Electronic, digital, light-emitting-diode (LED) signs are a recent technological innovation rapidly being adopted for use by businesses for signage, primarily because their imagery is able to seize the attention of even the most inattentive of viewers. The attractiveness of these signs to many businesses is due to their unusually strong and effervescent light intensity, their ease of being programmed to change messages and animate, and their low power consumption.

While they are still relatively expensive compared to more traditional signs (and therefore not as available to most smaller businesses), continued technological advances are expected to substantially lower the cost of electronic signs.

When this happens, staff expects that the signs will proliferate throughout the city due to their ability, like billboards, to seize the attention of viewers. This proliferation is already being seen along Interstate highways throughout Florida.

Over the past number of decades, billboards have been the most important form of visual blight associated with signs in communities throughout the nation. Indeed, billboards have been seen so universally as a scenic detriment that over 700 communities in the US now prohibit them.

Staff believes that the newly-emerging digital electronic signs may replace billboards as the leading cause of sign-induced visual blight, and that communities which do not adopt

attended, including a number of Plan Board members, representatives from several local sign companies and businesses now using electronic signs, and other interested citizens. Staff made a presentation about issues and regulatory options pertaining to electronic signs, then accepted citizen questions and comments. The meeting lasted approximately 90 minutes.

Nearly all in attendance agreed that the City should have a sign ordinance and that blinking or flashing or animated signs should continue to be prohibited.

Concerns were expressed about:

1. Electronic signs being a safety hazard for motorists.
2. Electronic signs not being compatible with residential areas (they are "out of context")
3. Whether this petition before the Board was inappropriately initiated unilaterally by staff, rather than as a result of citizen outcry.
4. A representative from the Florida Credit Union indicated that most calls the Credit Union has received about their electronic sign have been supportive
5. A citizen indicated that the City sign regulations are sufficient. ("If it ain't broke, don't fix it.")
6. Another indicated that rather than punitive regulations, the City should establish incentives.
7. Another suggested that the City should better enforce the existing sign regulations
8. A citizen indicated that the cost of electronic signs has only gone down 2 or 3 percent in the past 14 years.
9. Another suggested that if the City decided to prohibit electronic signs, the City should be obligated to buy all existing electronic signs in order to have them removed (so that businesses with such signs do not have an unfair advantage over their competitors)
10. Another was concerned that if electronic signs were not regulated, a form of "one-upmanship" would be engaged in by local businesses striving to "out-shout" each other with signs.
11. One question asked if City staff had complained when the University of Florida installed electronic signs at some of their gateways.

At its January 30, 2007 special meeting, after numerous public comments and lengthy discussion, the Plan Board voted to continue this item, and asked staff to complete the following actions:

1. Speak with stakeholder representatives (from the Chamber of Commerce, sign companies and City Beautification Board) regarding this petition.
2. Prepare a list of options for how to regulate (or not regulate) electronic signs.

Electronic sign means any sign, or portions of a sign, where any light source, including but not limited to incandescent bulbs or light-emitting diodes (LED), constitute the sign text or image. This type of sign includes, but is not limited to electronic message boards; television screens; plasma screens; digital screens; flat screens; LED screens; video boards; other types of electric and electronic display boards and screens; and holographic displays. Electronic signs include projected images or messages onto buildings or other objects. Signs that are illuminated by light sources only for the purpose of internal or external illumination are not considered electronic signs, nor are non-animated neon signs.

Sec. 30-316. Sign Regulations. General Restrictions

(b) **Prohibited Signs.**

(8) Animated sign(s), including time and temperature devices. (See section 30-23. Definitions)

~~(9) Changing message devices, except for time and temperature devices. (See section 30-23. Definitions)~~

Option 1. Allow electronic signs through administrative approval based on special criteria

Sec. 30-316. Sign Regulations. General Restrictions.

(xxx) Electronic signs. It shall be unlawful to erect, cause to be erected, maintain or cause to be maintained any electronic sign unless the electronic sign conforms to the following criteria:

a) Special Area Plans (SAPs). Where such signs are not prohibited by sign materials or other requirements in the Traditional City, College Park, University Heights, Southwest 13th Street, or the Five Points Special Area Plans, the sign area of an electronic sign shall be no larger than 6 square feet.

b) Types of sign. Electronic signs shall be either *Ground-mounted signs for single- and multiple-occupancy developments* (Sec. 30-318 (b)), or *Wall-mounted, roof, projecting and marquee signs* (Sec. 30-318 (c)). Ground-mounted signs that are electronic shall be monument signs only, as defined by Sec. 30-23. The provisions in this section shall also apply to church signs, subdivision signs, multi-family signs and pedestrian signs.

Street frontage (ft)**	# of Signs	Size of Ground-Mounted Sign (sq ft)*	Size of Monument Sign (sq ft)	Size of Monument Sign if Part of Sign is Electronic (sq ft)	Size of Electronic Sign (sq ft)***	Distance from Side Property Line (feet)	Distance from Other Signs (feet)
Less than 50	1	24	29	15	7	10	---
50 to less than 100	1	32	38	19	10	10	---
100 to less than 200	1	64	77	39	19	20	---
200 to less than 300	1	72	86	43	20	50	50
Greater than 300	1	96	115	58	20	50	100
Greater than 600 with no outparcels	2 (only 1 if an electronic sign is used)	Total sq footage no more than 144; neither sign may be greater than 96 sq ft or more than 10 ft in ht.	Total sq footage no more than 173; neither sign may be greater than 96 sq ft or more than 10 ft in ht.	60	20	50	250

*Maximum height of a ground-mounted and a monument sign is 10 feet; 8 feet for a secondary frontage sign.
**Only one street frontage may be used to determine the maximum size of ground-mounted or monument sign.
***Electronic signs that are ground-mounted shall be monument signs only, as defined by Sec. 30-23.

[NOTE: Table above revises table in Sec. 30-316 (b)]

(NOTE: Size examples on page 6 and Table on page 7 of this report are also part of Option 2.)

d) Animation. Animated signs, as defined by Sec. 30-23, are not allowed.

e) Non-Conformities. New electronic signs shall only be allowed only if any existing, non-conforming signage on the property is made to conform.

f) Brightness. The maximum brightness of an electronic sign shall not exceed illumination of 3,500 nits (candelas per square meter) during daylight hours, nor of 500 nits (candelas per square meter) between dusk to dawn, as measured from the signs face at maximum brightness. The signs must have an automatic dimmer control to produce a distinct illumination change from a higher illumination level to a lower level for the time period between one half hour before sunset and one half hour after sunrise.

Option 3. Prohibit electronic signs, including time/temperature signs

(b) Prohibited signs. It shall be unlawful to erect, cause to be erected, maintain or cause to be maintained any of the following signs:

(15) Electronic signs (including time and temperature devices).

Recommendation
Allow electronic signs through administrative approval based on special criteria (Option 1).

Fiscal Note
Brightness measurement equipment must be purchased and staff must be trained to use equipment.

Respectfully submitted,

Ralph Hilliard

Ralph Hilliard
Planning Manager

DM: DN
Appendix:

- Examples of regulating electronic sign brightness
- Comparison of City Planning Division recommendations to Gainesville Chamber of Commerce Recommendations
- Chamber of Commerce Position Paper – received 3/2/07.
- Letter from John Hudson to City Plan Board – dated 2/22/07
- Letter from City Beautification Board to City Commission – dated 2/26/07

060497

Appendix

Regulating Electronic Sign Brightness

Example Ordinance Language

From Duluth MN:
The maximum brightness of a flashing, video display, or electronic graphic display sign shall not exceed illumination of 3,500 nits (candelas per square meter) during daylight hours, nor of 500 nits (candelas per square meter) between dusk to dawn, as measured from the signs face at maximum brightness. The signs must have an automatic dimmer control to produce a distinct illumination change from a higher illumination level to a lower level for the time period between one half hour before sunset and one half hour after sunrise.

From Murfreesboro TN:
"*Brightness*: Also known as intensity. The brightness/intensity of LED is measured in candelas per square meter, which is also referred to as "nits"
[dd] brightness/intensity does not exceed 3,000 nits in daylight and 750 nits at night;
[ee] is controlled by a light detector with dimmer with dimming set to "AUTO" (it is the responsibility of the permit holder to demonstrate compliance);
[gg] has a minimum display time of thirty seconds;

From Bloomington MN:
(F) Brightness. The sign must have a maximum illumination of 3,500 nits (candelas per square meter) during daylight hours and a maximum illumination of 500 nits (candelas per square meter) between dusk to dawn as measured from the sign's face at maximum brightness;
(G) Dimmer control. Video display signs must have an automatic dimmer control to produce a distinct illumination change from a higher illumination level to a lower level for the time period between one half-hour before sunset and one half-hour after sunrise;

From Vernonhills IL:
The brightness level of the electronic message center sign shall not exceed 3,250 nits. From dusk to dawn the brightness level shall not exceed 812.5 nits. Sign messages shall not change more frequently than once every 30 minutes. The change shall be a full screen replacement without fading, motion, or other action techniques.

Anchorage AK:
nighttime luminance standard was raised to 750 candelas per square meter from 600 candelas per square meter that was in the initial review draft. This change is being proposed by staff to minimize the potential number of fluorescent backlit signs that may not meet the initially proposed luminance standard. At the same time, this increase still meets the overall intent of reducing sign brightness. Regulation: "During daylight hours between sunrise and sunset, luminance shall be no greater than 5,000 candelas per square

060497

Plymouth MN:
[a similar provision will be necessary for our sign application if we adopt a brightness regulation] All applications for signs which are to be internally illuminated shall indicate the lamp wattage and luminance level in candelas per square meter (nits), and a permit shall only be issued upon the determination by the Zoning Administrator that the luminance level is within the adopted standards of Section 21105.06

Range of Illumination Regs Found

Daytime Candelas	Dusk to Dawn Candelas
3,000 to 5,000 nits	500 to 812.5 nits

Comparison of City Planning Division Recommendations to Gainesville Chamber of Commerce Recommendations (dated 3/2/07)

	City Planning Division	Chamber of Commerce
Special Areas (SAPs)	Max Size = 6 square feet	Max Size = 10 square feet
Size	If wall-mount is at least partly electronic, 25% of what is allowed for non-electronic wall mount In no case larger than 20 square feet. If monument sign is at least partly electronic, 50% of the maximum allowable size for a non-electronic monument sign. If monument is at least partly electronic, the electronic portion of the sign may be no larger than 50% of this reduced sign size. In no case larger than 20 sf.	If entire wall-mount is electronic, 75% of what is allowed for non-electronic wall-mount. If entire monument is electronic, 75% of what is allowed for monument. If only a portion of monument sign is electronic, the full non-electronic monument sign is allowed, but the electronic portion can be no more than 50% of face. In no case larger than 60 square feet.
Animation	Same standard	
Non-Conformities	Same standard	
Brightness	Same standard	
Number of Signs	No standard proposed	Only one electronic sign allowed on property, even if street frontage exceeds 600 feet

060497

Electronic Sign Regulation

Position Paper

Gainesville Area Chamber of Commerce

Gainesville Area
CHAMBER OF COMMERCE

Position

It is the Chamber's position that no action is needed at this time regarding this matter

1. Beauty is in the eye of the beholder and difficult to define through regulation. In fact, at least one parcel that includes an electronic sign in the City of Gainesville has been singled out for a beautification award by Keep Alachua County Beautiful.
2. There are sound studies that have found commercials signs did not adversely affect safety. Several researchers have independently concluded that well-designed and strategically placed signs may actually "wake up" drivers suffering from "highway hypnosis" by attracting their attention to their surroundings.
3. Creating regulation at this time will create an un-level playing field between those companies that currently have electronic signs and those that may wish to have electronic signs. It is a soundly-researched and well-established fact that the on premise sign, when readable and conspicuous, can greatly increase the income of a business
4. Most electronic signs in use in our community not only promote the first impression of the business but also assist our not-for-profit organizations acting as a vital method of communication.

However, noting the comments of the Plan Board members at the January 30, the Chamber is advocating a compromise approach to this subject.

The Chamber supports developing new regulations that would allow for staff approval of electronic signs based on special criteria.

The specific regulations that are agreeable to the Chamber are:

1. Addition of electronic signs to the Land Development Code as proposed by city planning staff.
2. Allow electronic signs through administrative approval based on special criteria, to wit:
   a. Special Area Plans (SAPs). Where such signs are not prohibited by sign materials or other requirements in the Traditional City, College Park, University Heights, Southwest 13th, or the Five Points Special Area Plans, the sign area of an electronic sign shall be no larger than 10 square feet
   b. Size. When installed as a wall-mounted sign, the electronic sign may be no greater than 75 percent of the maximum allowable size for a non-electronic wall-mounted sign for the building in question. When installed as a ground mounted sign, the electronic sign must be a monument sign as defined by Sec. 30-23. If the entire face of the monument sign is to be utilized as an electronic sign, the size of the sign may be no larger than 75 percent of the maximum allowable size for a non-electronic monument

Exhibit A

Street Frontage (feet)	Number of Signs	Size of Ground-Mounted Sign (square feet)	Size of Monument Sign (square feet)	Maximum Electronic Portion Allowed if a Mix of Electronic and Non-Electronic (square feet)	Maximum Size Allowed if Entire Face is Utilized as Electronic Sign (square feet)
Less than 50	1	24	29	14.5	21.75
50 to less than 100	1	32	38	19	28.5
100 to less than 200	1	64	77	38.5	57.75
200 to less than 300	1	72	86	43	60
Greater than 300	1	96	115	57.5	60
Greater than 600 with no outparcels	2 (only 1 if an electronic sign is utilized)	Total square footage no more than 144; neither sign may be greater than 96 square feet or more than 10 feet in height	Total square footage no more than 173; neither sign may be greater than 96 square feet or more than 10 feet in height	60	60

HUDSON & COMPANY, INC.
BUILDING CONSTRUCTION CONSULTANTS
352-377-0623

06049%

02-26-07A02:32 RCVD

February 22, 2007

City of Gainesvile
Planning Department
Station 9, P.O. Box 490
Gainesville, FL 32602-0490

Attn: Dean Mimms

Re: Petition 139TCH-06PB

Dear Dean,

Please provide copies of this letter and the attachments to all Plan Board members in their packets for the next meeting dealing with electronic signs I am writing to urge the members of the Gainesville Plan Board to modify the sign ordinance to prohibit the use of any device that directs light sources toward the Right of Way and any property not owned by the owner of the offending sign by simply adding a reference to the existing code section 30-345 (b) (8) (a)

Our Land Development Code already contains provisions to prevent "Light Trespass and Glare" in Section 30-345 (b) (8) (a) Quoting from the code "Directional luminaires such as floodlights, spotlights, **sign lights**, and area lights shall be so installed and aimed that they illuminate only the task intended and that the light they produce **does not shine directly onto neighboring properties or roadways**." The existing LED signs in Gainesville that I have observed violate this provision of our code. Apparently the staff permitting these signs are not aware of the design of LED's, and that they have a focused beam of light of about 20 to 30 degrees which is aimed toward the viewer of the sign and **does shine** directly onto neighboring properties or roadways.

Brightness in LED's is controlled by the angle of light being emitted which is built into the LED's themselves, or by adding a current limiting circuit that is very cheap, typically less than $2 00 This is a concern in sign codes as some light sources are very bright (by being more focused) such as lasers, and have gotten cheap enough to be used in signs (like LED's have), so any code must be broad enough to restrict any light source from being directed into the roadways. It appears to me that the drafters of our existing code have covered these concerns very well and application of the current code should prohibit LED signs due to their design Conventional back-lit sign boxes would be illegal if the diffusers (sign faces) were removed and one could look directly at the florescent lamps that are typically used to illuminate them. LED signs could be made acceptable if the LED's were not able to shine directly onto roadways and neighboring properties, and instead could glow through a diffuser that could be mounted over the lamps to achieve compliance.

Finally, I must comment that in all of my 25+ years in development I never had a client who came in and said "I'd like a small sign." They ALL want to know how big and how bright they can be. Unless we want to look at these electronic signs for a LONG time we need to stop them now. I recently removed the old Plaza Theater sign that had polluted the 13th Street corridor for almost half a century, and I was only able to remove it because it had deteriorated structurally to the point that metal parts were falling onto the street below

Sincerely,

Hudson & Company, Inc.

John E Hudson
President

Cc: Ralph Hilliard

Large AC LED lights

Large LED clusters that run on 120VAC are extremely expensive to purchase--usually US$200 and up. You can home build them, but the electronics and design are much more complicated than the DC circuits above. Because LEDs are directional, they are not always a very good choice for room lighting... but work very well for task lighting. Here's some more information:

3-watt AC 10-LED Reading Lamp Circuit

LEDs are excellent for task lighting, and this circuit also has battery backup built in -- when AC power goes out, the LED cluster switches to battery power. Submitted by Pranab Kumar Roy, an electrical engineering student at Nagpur University, India. Designed for 230VAC European grid power, and could be used on 120VAC USA grid power by replacing the transformer. Circuit and text image is 500K bytes

More AC LED circuit design information:
http://ourworld.compuserve.com/homepages/Bill_Bowden/page10.htm#lineled.gif

We'd appreciate any other links you can send us about designing LED lighting fixtures, especially for 120v AC house current applications.

Other LED design and handling concerns

- If your LED mounting does not allow any air circulation, we recommend running them at 18-20ma instead of 25ma to avoid any heat buildup, which will shorten their life.
- LED lights generally do not need reflectors, as the angles at which they emit light are set internally. Our white LEDs emit in a 20 degree arc. Very little light is wasted from shining in the wrong direction.
- Although our LEDs are not powerful enough to require eye protection labelling, DO NOT look directly into the beam from a close distance, just like with a halogen lamp.
- Solder your connections quickly and efficiently, using a small (less than 30 watt) soldering iron. LEDs can be ruined if the internal temperature gets too high from soldering.
- Do not place too much strain on the LED leads when bending them. Bend the leads ONLY below the sqaure tab on each lead.
- LEDs are sensitive to static. The manufacturer recommends a grounding wrist strap, but we have had no problems without one during our research. Just be careful not to drag your feet across the carpet and grab a handful of LEDs....or simply touch a grounded metal chassis before handling LEDs.

HOME	PRODUCTS	DISCUSSION BOARD	DAILY NEWS
CONSERVATION	BATTERIES	SUN	WIND
HYDRO	FOSSIL FUELS	EXPERIMENTS	ORDER NOW!
WATER PUMPING	POWER SYSTEMS	EFFICIENT LIGHTING	LINKS

Questions or comments? Click here to send us an email at our new email address.!

This page last updated 12/04/2006

an LED is normally of the order of a square mm. If one magnifies the image of a laser diode, one sees a brilliant source, frequently oblong, sometimes a line, and sometimes nearly a point. This geometry allows the laser beam energy to be collimated, as with other lasers, to beam divergences of the order of one milliradian. By contrast, the LED emitter when magnified appears as a large disc or square area of high brightness, and if one attempts to collimate the beam, it is simply not readily possible without a large lens, as in a flashlight (hand torch). Fig. 1 compares the emission characteristics of laser diodes and light-emitting diodes (LEDs).

The radiance of a surface-emitting LED is limited both by semiconductor physics and device structure. At room temperature, nonradiative mechanisms often mediated by phonons (lattice vibrations) limit the likely achievable quantum efficiency to below 40%. State-of-the-art LEDs have a quantum efficiency of roughly 20%; that is, 20% of the electrons flowing through the semiconductor junction are converted into photons. As more current flows through the semiconductor junction, these nonradiative mechanisms heat the semiconductor and reduce the efficiency resulting in a self-limiting radiance. For visible LEDs, light is typically emitted only from the front facet of the device, then collected by an integral molded plastic lens. IREDs often have substrates transparent to the generated photons, resulting in a greater external efficiency—more photons escape the device before being absorbed. However, for IREDs, roughly half the totally emitted optical power emanates from the edges of the device through the transparent substrate, and is often redirected by an annular reflecting cup (Sze 1981). In all IREDs known, this annular reflection (Fig. 1) has a much larger area and a size greater than the minimum angular subtense (α_{min}) for extended sources, hence a lower radiance and less hazard than the front-facet die emission. This fact was taken into account when computing radiance values in Table 1. Only the highest radiance value, that of the front facet of the die, is included in the table. Because of the fundamental limitations in quantum efficiency without optical gain, the room-temperature radiance is not likely to increase by more than a factor of two in the future.

The radiance of a laser is typically much more than a 1,000 times greater than that of a surface-emitting LED. Because of the limited radiance of surface-emitting LEDs, far less radiant power can be launched into optical fibers compared to lasers; therefore, their use is limited in optical fiber communications. Because of lower cost, LEDs are generally favored in applications where either an LED or a laser can be employed. An additional incentive to use an LED rather than a laser has been the lack of safety regulations applying to LEDs, as compared to the maze of regulations related to lasers.

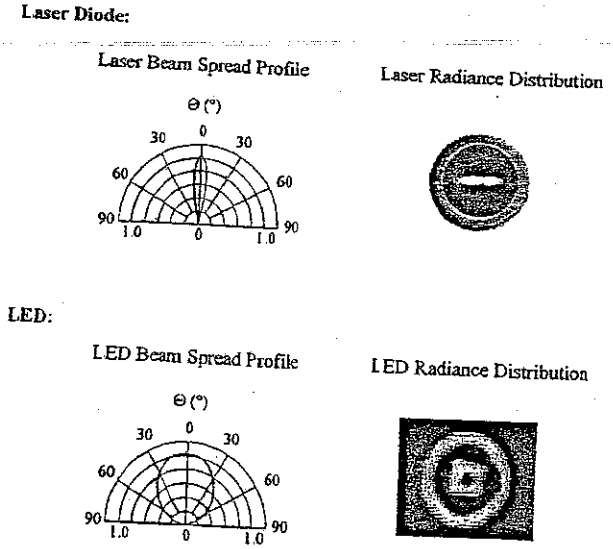

Fig. 1. Differences between diode lasers and LEDs. The beam spread is generally smaller for a laser (top) and it is clearly smaller than that for an LED. The source size of the LED (bottom, right) is much larger than that of a laser diode (top, right) as shown in the magnified near-field photographic images. In addition, the spectral bandwidth of laser diodes is far narrower than for any LED (not shown here).

New device types and comparisons

New developments in semiconductor technology have allowed new DE devices to be created that have led to the question whether these should be treated as laser diodes or LEDs for safety evaluations. The properties of some of these devices fall between conventional LEDs and diode lasers. A simple distinction between what a user would call a laser and an LED is no longer possible.

These device types are as follows:

1. Surface-emitting (large area) LED (SLED);
2. Micro-cavity surface emitter;
3. Edge-emitting LED (ELED);
4. Super-luminescent diode emitter (SLD);
5. Vertical-cavity surface-emitting laser (VCSEL); and
6. Ridge-wave guide laser (clearly a full-fledged laser; included for comparison)

Each of these devices will be described in the following.

Surface-emitting LEDs (or SLEDs) are the conventional LEDs which have existed for decades. In comparison to the latter types, these emit from relatively large surfaces oriented orthogonally to the axis of the emission pattern.

Micro-cavity surface emitters are SLEDs with an internal mirror and layer thicknesses tailored to act as a low-finesse Fabry-Perot cavity. These devices do not show optical gain; the cavity is added only to reduce the optical linewidth. This micro cavity also has the effect of reducing the emission half-angle, since the layer thicknesses forming the cavity reduces emission efficiency at larger angles. Assuming that device structures can be designed which reduce the half angle while preserving the total power emitted from the front facet of the device, one obtains the maximum brightness. These devices are

060497

City Beautification Board

Station 27, P.O. Box 490
Gainesville, FL 32602
352-334-2171
duffiedl@cityofgainesville.org

February 26, 2007

Gainesville City Commission
P O. Box 490
Station 19
Gainesville, FL 32601-0490

Dear Members of the Gainesville City Commission:

As an advisory board, the City Beautification Board wishes to express its strong opposition to electronic signs within the City of Gainesville

Thanks to the foresight and historic past efforts of the Gainesville City Commission, we are fortunate to have effective landscape, lighting and sign ordinances – along with other excellent civic design measures – that contribute significantly to the quality of life and economic attractiveness of our city We believe the presence of electronic signs will diminish the appearance of the community by turning our major gateway corridors into a display of competing messages.

LED lighting is distracting to passing motorists. If electronic signs were not attention-grabbing, they would not serve the purpose for which they were designed. Worse yet, bright red LEDs may be a safety hazard At a time when we are already exposed to so many signs along our major streets, electronic signs will add even more distracting visual clutter.

In almost every case, electronic signs go beyond the basic purpose of identifying a business and become electronic billboards conveying non-essential information. One service station uses its electronic sign to advertise cigarettes for $29.29 a carton while another business uses its electronic sign to post slogans that have nothing to do with the business All diminish the quality and ambiance of our cityscape.

While the number and location of electronic signs in the city is currently relatively "few and far between," if these signs are not immediately regulated, they will continue to proliferate, competing with one another and diminishing the quality of the urban space we have worked so hard to enhance and protect for so many years.

Furthermore, the cost of electronic signage is expected to decline in the future, making these devises increasingly affordable for even the smallest business.