

Dynamic Display Signs in the City of Knoxville

MPC Work Session

1/31/08

Purpose

- Provide an overview of the current regulatory environment
 - Local
 - State
 - Federal
- Provide an overview of potential regulatory parameters
- Provide a look at options

Mayor's Study Committee

- Appointed in February
- To explore issues relative to the regulation of digital display billboards
- Government, industry and members of the public represented
- Provided report and recommendation to Mayor
- Report and Recommendation forwarded to MPC in August for further action.

MPC Time Line

- October 25 – Public Meeting
- November 15 – City Council Workshop
- November 29 – MPC Work Session CANCELLED
- December 13 – MPC public hearing and postponement of decision to February
- January 24 – Staff meeting with sign companies involved with Electronic Message Centers
- January 31 – MPC Work Session
- February 14 - MPC public hearing and consideration of recommended amendments to code

Why MPC

- Sign regulations are embedded in the City of Knoxville zoning ordinance.
- Before City Council may adopt any amendment to the text of the zoning ordinance (or zoning map), a recommendation from the Planning Commission must be provided.

Digital Display Billboards aka

- CEVMS – Changeable electronic variable message signs (FHWA)
- Changeable message signs (TCA)
- Digital billboards
- Electronic billboards
- Dynamic displays (Proposed Amendment)

Local Examples

- Two digital billboards are operating on a structure in Solway. In a “V” shape on the structure, one billboard reads from the southbound lane and the other from the northbound lane of Oak Ridge Highway.
 - A series of displays shows on about an 8 second interval, with instant change.
- A new sign has been erected on Lovell Road south of 1-40/75 on a parcel that is not in the city

This is what we are talking about



**Local
Regulatory
Environment**

Current Status of Billboards

- New billboards are prohibited in the City.
- Existing legal, non-conforming billboard structures may be maintained and sign messages may be replaced.
- An existing billboard structure in the City was being upgraded with digital capabilities to provide changeable messages when ...

Current Status (continued)

- The City filed a stop work order and injunction preventing the billboard from being “turned on.”
- The billboard owner has filed a lawsuit against the City seeking to overturn the injunction.
- So , here we are

Questions

- Should the City allow the use of this new technology to allow changeable electronic messages on existing billboards?
- If no, why not?
- If so, what regulations must be put in place to address concerns about safety and aesthetics?

Existing Billboards

- When amended in 2001 to prohibit the installation of new billboards, the zoning ordinance:
 - Created an amortization process for billboards within the A-1, R-1, R-2 and R-3 zone districts (Article 6, Section B). All billboards had to be removed within 2 years, while ...
- Previously, when billboard regulations were enacted in 1984, owners of billboards were provided a date certain (July 1, 1984) to register the structure and achieve legal, non-conforming status (Article 5, Section 10, K).

Existing Billboards

- Since there was no provision to eliminate legal, existing billboards within non-residential zone districts, the amendments prohibiting new billboards established a cap on the number of billboards at the existing number of legal structures.
- There is no policy or program to eliminate billboards from the City of Knoxville.
- It was estimated in 2001 that there were approximately 500 billboards within the City, with about 200 along the interstate highway system.

Existing Billboards

- Considerations:
 - Is digital technology simply the latest method to change the content on legal, non-conforming billboards, replacing paper, vinyl and rotating tri-vision panels?
 - Is changing the message display of a billboard an expansion or alteration of the billboard structure?

Statewide Regulatory Environment

Tennessee Code Annotated

13-7-208

The State's Business and Industry
Grandfather Act

13-7-208

- Outdoor West (Lamar) v. City of Johnson City established “Billboard Structures” and “Billboard Sites” as businesses. There are often two businesses associated with each billboard structure.
- Attorney General opinions (06-006 and 06-125) affirm protection of nonconforming billboard sites.

13-7-208

- Industrial, commercial or business establishments in operation and permitted to operate under zoning regulations in effect immediately preceding a change in zoning:
 - (b) shall be allowed to continue in operation;
 - (c) shall be allowed to expand operations and construct additional facilities; and
 - (d) shall be allowed to destroy present facilities and reconstruct new facilities necessary to the conduct of such industry.

Tennessee Code Annotated

- Public Chapter 76, signed into law May, 2007, amended TCA 54-21-102, for interstates and primary highway system
- “Changeable message sign” means an off-premise advertising device which displays a series of messages at intervals by means of digital display or mechanical rotating panels.
- Changeable message signs may be double faced, back-to-back or “V” type signs.

Chapter 76 (continued)

- Changeable message signs with a digital display which meet all other requirements pursuant to this chapter are permissible subject to the following restrictions:
 - The message display time shall remain static for a minimum of 8 seconds with a maximum change time of 1 second
 - Video, continuous scrolling messages and animation are prohibited
 - The minimum spacing on the interstate or controlled access highways is 2,000 feet

Federal Regulatory Environment

Highway Beautification Act

- Requires states to maintain effective control of outdoor advertising adjacent to certain controlled routes.
- A September, 2007 memorandum provides that “proposed laws, regulations and procedures that would allow CEVMS subject to acceptable criteria **do not violate a prohibition against “intermittent” or “flashing” or “moving” lights** as those terms are used in the various Federal/State Agreements that have been entered into during the 1960s and 1970s.
- However, it goes on to say: This Guidance is applicable to conforming signs, as **applying updated technology to nonconforming signs would be considered a substantial change and inconsistent** with the (Fed.) requirements.

FHWA/HBA criteria

- Duration of Message
 - Duration of each display should be between 4 and 10 seconds – 8 is recommended.
- Transition Time
 - Time between messages should be between 1 and 4 seconds – 1 to 2 is recommended.
- Brightness
 - Brightness should be adjustable in response to changes in light levels so signs are not unreasonably bright.

FHWA/HBA criteria (cont.)

■ Spacing

- Spacing should be no less than current state agreement to assure public safety

■ Locations

- Locations should be those in current state agreement to assure public safety (Interstates and primary highway system)

■ Default design

- There should be a default design to freeze a display in event of a malfunction

FHWA/HBA criteria (cont.)

- Capability for modification
 - There should be a process to modify lighting levels to assure public safety
- Prohibition against movement such as animation, flashing, scrolling, intermittent or full-motion video.

Key Regulatory Parameters

- There are several key regulatory areas:
 - Location
 - Duration of messages
 - Extent of motion, animation and video
 - Brightness and adjustability
 - Spacing
 - Size of Signs
 - Text Size on Signs
 - Default design

Study Committee recommendations

- The Committee recommends that in formulating any amendments to the zoning regulations to allow this type of structure, consideration be given to developing appropriate regulations addressing:
 - Location
 - Spacing
 - Size
 - Static Hold Time
 - Brightness Control
 - Movement of Display
 - Prohibitions against certain conversions

Study Committee recommendations

■ Location

- Should only be allowed on interstate routes and major arterial roads
- When an arterial road is visible from an interstate (Kingston Pike from Papermill to Gallaher View), no two structures reading in the same direction should be located closer than 4,000 ft on either road

Major Arterials in the City

- Highways and Pikes
 - Alcoa, Asheville, Chapman, Clinton, John Sevier
 - Kingston, Middlebrook, Rutledge, Strawberry Plains
- Avenues
 - Broadway, Cumberland, Magnolia, Western
- Roads
 - Cedar Bluff, Emory
- Streets and Drives
 - Cherry, Ed Shouse, Henley, Main, Northshore, Parkside, Summit Hill

Study Committee recommendations

■ Spacing

- 4,000 feet, reading in the same direction, on both interstate routes and major arterial roads.
- Considered a range of 3,000 to 5,000 feet.
- I-40 from Asheville Highway to Pellissippi Parkway is about 18 miles, or 95,000 feet, or 23 segments of 4,000 ft. but there are not existing signs along some of the length.

Study Committee recommendations

■ Size

- On the interstates, a maximum size of 672 square feet (typically 14 ft. by 48 ft.).
- On the major arterial roads, a maximum size of 378 square feet (typically 10.5 ft. by 36 ft.).

Study Committee recommendations

■ Display Controls

■ Static Hold Time

- 10 seconds on both interstates and major arterials

■ Brightness Control

- Measurement of “candela per square meters (cdms)”, or nits, should be established.
- Some ordinances establish a relationship between the allowable nits and the ambient light level (Mesa, AZ)
- Some ordinances have daytime and nighttime allowable levels (San Antonio, TX)
- Measurement devices must be provided to appropriate inspection departments

Study Committee recommendations

■ Display

- No scrolling or continuation of messages
- No fade in or out allowed – only instant message change (less than 1 second)
- No moving parts
- No video, animation or other forms of moving images

Other Considerations

This discussion draws in more than just the latest technology. It also has implications with regard to:

- First Amendment Rights
- Equity
- Safety
- Aesthetics

First Amendment (Freedom of Speech)

- Time, manner and place, but not content may be regulated.
- Knoxville may be subject to a first amendment violation because of its prohibition of flashing and animated signs – except for signs that are “primarily” time/temp/public info/business identification signs
- Local government exceptions complicate its ability to justify treating such signs as harmful.

Equity Issues

- On-premise (EMC) and off-premise signs (billboards) are often located on the same lot and easily read from the Interstate highways. They have dramatically different operating characteristics.
- “First in” gets to set the spacing under the study committee’s proposed regulations.
- Owners of just a few billboards and sites may be eliminated from conversion opportunity due to spacing requirements dictated by the first signs

Safety

- Dynamic displays are designed to grab attention
 - Changing images
 - Motion
 - Brightness
- Diverted attention leads to decreased safety
- These issues can be addressed through proper regulations
- Safety of “billboard industry” enhanced by new technology

Effects on Safety

- The “two second” effect
 - Glances of two seconds or more double the risk of crashes and near crashes
- The Zeigarnik effect
 - The cliff hanger effect. Humans need to follow a task to its conclusion --- by viewing the next display.
 - Drivers’ desire to read an entire message before it changes has been shown to negatively impact drivers’ tendencies to maintain a constant speed or remain in a lane.

Safety Studies

- The Impact of Driver Inattention on Near-Crash/Crash Risk. April, 2006
 - Sponsored by National Highway Traffic Safety Administration. Completed by Virginia Tech
 - Established that short, brief glances away from the forward highway for the purpose of scanning the driving environment are safe and decrease crash risk. In the case of secondary task engagement (looking at a sign) if the task is simple and requires a single short glance the risk is elevated only slightly, if at all. **However, glances totaling more than 2 seconds for any purpose increase crash risk by at least two times that of normal, baseline driving.**

Other Studies

- There is talk of a FHWA study that would be due in 2009, there is funding, and there is confirmation that a study is underway.
- FHWA, 2001. Research Review of Potential Safety Effects of Electronic Billboards on Driver Attention and Distraction.
- Wisconsin. DOT, 1994. Milwaukee County Stadium Variable Message Sign Study: Impacts of an Advertising Variable Message Sign on Freeway Traffic.

Safety

- Motion and Brightness are distractions
 - Motion attracts and holds attention
 - Bright lights attract attention
 - Blinding light can be dangerous
- Motion and Brightness can be regulated

Current City Sign Prohibitions

City zoning ordinance (Article 5, Section 10. A. 3, 4, 5, 6) currently prohibits:

- Moving parts;
- Red, green, yellow, amber or blue lights (except EMC);
- Flashing or blinking lights (except EMC, H-1, or D-1);
- No flashing, intermittent or animated illumination or moving parts except EMC for the purpose of providing time, temperature, public service announcements or name of business;
- No illuminated signs within 100 ft of any Residential District (unless properly designed).

Aesthetics

- As characterized by *Scenic America*, “Litter on a stick” has turned into “Powerpoint on a stick.”
- Reduced billboard blight may improve economy
- Night sky impacts of existing billboards with spotlights could be reduced with LED technology

Other Considerations

- Sign Regulation involves values other than safety – such as aesthetic concerns, communication, wayfinding, and creativity.

Two Viewpoints

■ Those against

- Aesthetics
- Distractions affect Highway Safety
- **Want reductions in visual blight and distractions**

■ Those in favor

- Digital display is now mainstream
- Provides flexible opportunities
- **Want to utilize new technologies**

Two Viewpoints

- Those against
 - Want to prohibit digital technology on billboards
- Those in favor
 - Recognize that regulations are justified

Two Viewpoints

- Leads to Two Opposed Approaches
 - Prohibit digital displays on billboards (Option “A”)

Or

- Permit modifications of the sign face of lawfully existing billboards with dynamic display in conformance with the regulations recommended by the study committee (Option “B”)

A Third Way (Option “C”)

- Address those who want reductions in visual blight and distractions
- Address those who want to utilize the flexibility of new technologies
- Through a combination of prohibitions, regulations and **incentives** to reduce the number of billboards in Knoxville

Prohibit

- To eliminate really dangerous effects, prohibit:
 - Flashing, blinking or strobe like effects
 - Moving parts or scrolling messages
 - Moving, animated or video images

Regulate

- To reduce distractive effects, regulate:
 - Location
 - Spacing between display
 - Size of sign face and text
 - Duration and transition of images
 - Brightness

Incentives

- Create incentives to reduce overall effect of billboards by:
 - Allowing enhanced dynamic displays by changing two operational parameters

In Exchange For

- Removal of other existing billboards

The Minnetonka Strategy

- Allow properly regulated dynamic displays as off-premise and on-premise signs
- Limit dynamic display to 35% of sign area
- Limit static time of dynamic display to a minimum of 20 minutes
- Eliminate spacing requirements
- Create billboard reduction incentive program.

The Minnetonka Strategy

■ Incentives

- **Enhanced** Dynamic Display sign face eligibility
 - With removal of two other qualifying sign faces
- Enhanced sign face may be 100% dynamic with a minimum static time of 8 seconds
- Criteria for sign faces to be removed
 - Location
 - Size
 - Age

The Minnetonka Strategy

- Brightness Standards
 - No sign may be brighter than is necessary for adequate visibility... as determined by city officials
- Other Communities
 - San Antonio, TX
 - Day time versus night time standards
 - Mesa, AZ & Lincoln, NE
 - Relationship between sign luminance and ambient illumination

The Minnetonka Strategy

Fewer, better billboards

As a result of their new code, Minnetonka cut in half the number of billboards within the city - and the remaining signs are half dynamic displays and half standard billboards.

Option “A”

- Provides a prohibition on the use of dynamic display on existing billboards within the City.
- Eliminates the use of any technology, other than physically changing and replacing the sign area, to modify existing signs.
- This amendment recognizes that local government may enact regulations that are more restrictive than state or federal regulations.
- To proceed a finding should be made that these displays contribute to the general distraction and complexity of the driving environment which could lead to decreased driving safety.

Option “B”

- Provides regulations tailored after the Mayor’s advisory study committee
- The definition of dynamic display does not include rotating, moving parts (tri-vision boards) which are prohibited.
- It provides a location along the Interstates as a first step, compared to the advisory committee recommendation of major arterials as well
- It provides minimum text size, which is something the advisory committee did not address

Option “C”

- Provides a way to allow use of new technology while reducing the overall number of billboards in the community.
- Regulations tailored after the Minnetonka ordinance
- Provides greater equity between off-premise and on-premise signs
- Provides incentive to enhance display by removing other billboards

Option “C”

- Three key dimensional and operating components:
 - Spacing
 - Static hold time on message
 - Maximum sign area for dynamic display
- These factors work together
 - To reduce distraction spacing, hold time and sign area should increase

Spacing

- If a sign is visible from $\frac{1}{2}$ mile away, at 55 mph:
- The sign is visible for 33 seconds and
 - At a 1 minute static hold time, 2 messages are visible
 - At a 10 second static hold time, 4 messages are visible

Spacing

- Option “B” proposes 4,000 ft spacing between signs utilizing dynamic displays
- Option “C” proposes 2,000 ft. spacing between signs utilizing dynamic displays

Static Hold Time

- A review of ordinances across the nation found times that varied from 4 seconds to 24 hours.
- Option “B” proposes a minimum static hold time of 10 seconds
- Option “C” proposes a minimum static hold time of 60 seconds as a base
 - But for an “enhanced dynamic display billboard the static hold time is reduced to 10 seconds
- A time of 30 seconds could be considered and the results would be about the same as far as the number of images read while traveling at 55 mph

Dynamic Sign Area

- Current code allows no dynamic displays on existing billboards and allows up to 33% or 100 sf on EMC
- Option “B” allows 100% dynamic display area on eligible signs, but only 33% on EMC
- Option “C” allows 35% dynamic display area on all eligible signs
 - But for an enhanced dynamic display the area is increased to 100%
- An increased area could be considered for EMC along roads with lower speed limits

“Enhanced” Dynamic Display

- 35% Dynamic Sign Area



100% Dynamic Sign Area

- 1 Minute Static Hold Time



10 Second Static Hold Time

Incentive Program

- To get 1 enhanced dynamic display the billboard owner must:
 - Remove 2 billboards of at least the same size and eliminate the possibility of the same site being used for a billboard
 - Pledge that 1 additional billboard of the same size will never be converted to dynamic display

EMC

- The sign code currently allows electronic message centers.
- An electronic message center (EMC) is a sign which uses a bank of lights that can be individually lit to form copy such as words, letters, logos, figures, symbols, illustrations, or patterns to form a message without altering the sign face.
- An EMC is allowed as on-premise sign within all C, I and SC districts except C-1.

EMC Regulations

- Parcel must have 200 ft of frontage and only 1 EMC per parcel. Changeable letter reader boards must be removed.
- May be a wall sign or “integrated” into free standing sign
- Minimum EMC area of 20 sq. ft.
- Maximum EMC area of 33% of total sign area (for a free standing sign) or 100 sq. ft. whichever is less.
- Minimum 5 second display time per image.
- Brightness must be adjusted automatically
- If “primarily” a time/temp/public service/business identity sign, EMC are allowed flashing, intermittent, or animated illumination or moving parts
- May have colored lights

EMC Regulations

Parameter	Current Regulations	Proposed Option “C” Regulations
Location	C, I, SC districts except C-1	Same
Spacing	1 sign per lot; 200 ft minimum lot width	Same
Size of Sign Area	20 sf minimum; 33% maximum or 100 sf	Same, except 35% maximum

EMC Regulations

Parameter	Current Regulations	Proposed Option “C” Regulations
Brightness	Automatic adjustment required	Same
Text Size	No requirements	15” for 55 mph + To 7” for less than 35 mph

EMC Regulations

Parameter	Current Regulations	Proposed Option “C” Regulations
Duration of Message	Minimum 5 Seconds	
Transition Time between messages	No requirements	Instantaneous – Less than 1 second
Continuing Messages	No prohibition	Prohibited

EMC Regulations

Parameter	Current Regulations	Proposed Option "C" Regulations
Scrolling Messages	No Prohibitions	Prohibited
Flashing & Blinking Lights	Permitted	Prohibited
Animated / Moving Images	Permitted, if part of public service/ business identification sign	Prohibited

Scrolling Messages



Animated Messages



Continuing Messages



Continuing Messages



“Integrated” into Sign?



“Integrated” into Sign?

