Local Regulation of Dynamic Billboards and Signs: Bridging Research, Planning Policy, and Law

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A. There are seven key regulatory issues regarding dynamic signs: (1) the appropriate duration of dynamic messages, (2) whether, and under what conditions, to permit motion, animation, and video messages, (3) the appropriate level of brightness of dynamic signs, (4) the appropriate placement and spacing of signs, (5) whether to treat on-site and off-site dynamic signs differently, (6) the appropriate size of dynamic signs, and (7) the appropriate text size for dynamic signs. 25

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I. Five pillars of dynamic sign regulation

A. The authority of local government to regulate signs more restrictively than state and federal governments has been a pervasive and intended part of the overall system from the outset.

a. The federal Highway Beautification Act (1965) was intended to increase respect for local communities, not to ignore them. As President Johnson stated when articulating to Congress the goals of his initiative, "The roads themselves must reflect, in location and design, increased respect for the natural and social integrity *and unity of the landscape and communities through which they pass*." See Special Message to the Congress on Conservation and the Restoration of Natural Beauty, 1 Pub. Papers 159 (Feb. 8, 1965) (recommending legislation to control highway billboards) (emphasis added).

b. The existence of state regulations does not necessarily preclude local regulation. In denying the plaintiffs' motion for a preliminary injunction in *Clear Channel Outdoor v. City of Minnetonka*, Court File No. 27-CV-06-23485 (Henn. Co. Dist. Ct. Jan. 30, 2007), Judge Lloyd Zimmerman stated that "the record does not demonstrate that the Minnesota legislature intended to occupy the field of outdoor billboard regulation, and preclude municipalities from imposing more restrictive rules. The relevant Minnesota statutes discussed above specifically contemplate more restrictive local control." *Id.* at 19.

B. A legally sufficient factual basis exists to adopt significant limits (or even bans) on dynamic signs.

a. Long before large LED signs appeared, courts recognized that billboards can distract drivers, and that cities can regulate (or even ban) billboards for that reason. "No empirical studies are necessary for reasonable people to conclude that billboards pose a traffic hazard, since by their very nature they are designed to distract drivers and

their passengers from maintaining their view of the road." *Major Media of the Southeast v. City of Raleigh*, 621 F. Supp. 1446, 1450 (E.D.N.C. 1985).

(i) As Judge Diana E. Murphy wrote for the Eighth Circuit in August 2006 regarding an attempt to install billboards that would have completely changed their display every six to ten seconds (though "trivision" technology rather than digital technology), "distracting roadside billboards of the type Advantage sought to erect could also pose real danger to both motorists and nearby pedestrians." *Advantage Media LLC v. City of Eden Prairie*, 456 F.3d 793, 803 (8th Cir. 2006).

b. As explained in greater detail in the last half of this report, in this field – like many others – conclusive scientific proof is elusive, for reasons that need not preclude thoughtful regulation.

c. Legitimate studies of sign safety (conducted and sponsored by those without a financial interest in a particular answer) form pieces of a broader puzzle. When fit together properly, these pieces support the conclusion that the replacement of static signs with frequently-changing dynamic signs can create an added safety hazard.

(i) There is reason to believe that billboards tend to distract drivers.

(ii) There is reason to believe that *dynamic* billboards tend to distract drivers to a greater degree.

(iii) Drivers are distracted to a dangerous degree if their eyes are diverted from a highway for even two seconds (or, when congestion may require braking, for ¾ of a second).

(iv) Certain types of dynamic signs can create "the Zeigarnik effect" – named for a human behavioral pattern. When a sign appears to present a visual

story or message, a driver may be motivated, or even compelled, to watch the story through to completion.

d. In affirming the constitutionality of a flat ban on "electronic message center type signs," the City of Concord, New Hampshire's "legislative conclusion" that such signs are likely to prove distracting to drivers to the extent the signs are visible from roadways, thereby adversely affecting traffic safety, is hardly unreasonable, and would appear to be supported by common sense." *Nasar Jewelers, Inc. v. City of Concord, New Hampshire*, Civil No. 06-CV-400-SM at 9 (D.N.H. June 25, 2007) (citing *Chapin Furniture Outlet v. Town of Chapin*, 2006 WL 2711851, *4 (D.S.C. Sept. 20, 2006) ("Contrary to Plaintiff's contentions, the Town's judgment that flashing or scrolling signs constitute a traffic hazard and are inconsistent with the rural community aesthetic is not unreasonable")).

C. Picking the best policy for your community unavoidably involves the degree of risk-aversion, and aesthetic and policy preferences, of your elected officials.

a. Identifying a safety risk is just the beginning – cities must also consider how *averse* they are to that level of risk.

b. Sign regulation can and does involve values other than safety – such as aesthetic concerns (which are capable of cutting either way on this subject), communication, wayfinding, and creativity.

c. As Judge McAuliffe also concluded in *Nasar Jewlers*, "And, while taste and aesthetic sensitivity are debatable topics, it would seem well within the City's legitimate discretion to conclude that bright, colorful, electronic signs that change color and messages – or signs similar to those, are inconsistent with the aesthetic values the City seeks to promote." *Id., slip op.* at 10.

D. A well-tred "middle path" –a general ban on signs that change, with a public information exception – is vulnerable to a First Amendment attack.

a. Following the lead of federal and state laws, many communities have carved out exceptions to allow dynamic signs that present "public service information," "electronic message centers," or signs owned by governments or non-profits.

b. However, in the eyes of *some* judges:

(i) A sign regulation is only as constitutional as its exceptions (*Metromedia v. City of San Diego,* 453 U.S. 490, 540 (1981) (plurality)), and

(ii) the constitutional requirement of content-neutrality should be taken literally, see *Advantage Media LLP v. City of Hopkins*, 379 F.Supp.2d 1030, 1040-41 (D. Minn. 2005) (Davis, J.); *Clear Channel Outdoor, Inc. v. City of St. Paul*, No. 02-1060 (DWF/AJB), 2003 WL 21857830 (D. Minn. Aug. 4, 2003) (Frank, J.), so that

(iii) exceptions for dynamic signs displaying public service information may violate the requirement of content-neutrality because their enforcement depends on what a sign says.

c. Even when content-neutrality is established, exceptions allowing the government itself to "participate in the vice" complicate its ability to justify treating such signs as harmful. *See Rubin v. Coors Brewing Co*., 514 U.S. 476, 489 (1995) (there was "little chance" that the speech restriction could have directly and materially advanced its aim, "while other provisions of the same Act directly undermined and counteracted its effects"); *Lawson v. City of Kankakee, Ill.,* 81 F.Supp.2d 930, 934 (C.D.Ill. 2000) ("If the City were so worried that signs on terraces looked bad, it would not have chosen to place a sign

there itself. Surely its own sign is no less unattractive than Plaintiff's.").

E. The impact of nonconforming use statutes.

a. The original Highway Beautification Act was enacted based on the expectation that nonconforming billboards would eventually fade away. Charles Floyd, "A Requiem for the Highway Beautification Act," APA Journal (Autumn 1982).

b. Some states have laws that –

(i) Withdraw authority to amortize nonconforming uses;

(ii) Require cities to allow lawful nonconforming uses to be "improved" (but not expanded) and destroyed uses to be rebuilt if a building permit is timely sought, subject to an exception allowing the protection of health, safety or welfare; and/or

(iii) Require cities that condition official controls on the removal of a lawful nonconforming use to pay "just compensation" for the value of the nonconforming use.

c. These statutes take prior nonconforming billboards off the endangered list, and leave cities with few options but to allow their owners to give them an extended life.

d. The result: to get such signs to disappear may require agreement (between the sign company and the fee owner, or local regulators), including through locally-created incentives.

e. However, the Virginia Supreme Court has concluded that the replacement of a static billboard face with a digital billboard face constitutes an "enlargement" of the billboard for purposes of nonconforming use law, even if the area of the face itself is no larger than the area of the face of the original static sign. *Adams Outdoor*

Advertising, L.P. v. Board of Zoning Appeals of City of Virginia, --- S.E.2d ----, 2007 WL 1651100 (Va. June 8, 2007).

II. Modes of regulation

a. Whether and how to regulate dynamic signs are discretionary choices. Those choices should be made in light of the pillars of dynamic sign regulation and the local government's cost-benefit analysis of safety, aesthetics, planning, and other policy considerations.

b. Local governments that have devoted the most attention to this subject recently have taken approaches that tend to fall within six discrete "modes" of regulation, ranging from an absolute or near-absolute prohibition of dynamic signs to encouraging dynamic signs.

A. Unsafe (and unlawful) at any speed: Complete or near-complete bans

1. Maple Valley, WA (2003): a complete ban

a. ORDINANCE NO. O-03-228, Amending Title 18 of the Maple Valley Municipal Code relating to signs

D. PROHIBITED SIGNS:

The following signs or displays are prohibited in all zones within the City.

* * *

3. Animated signs or displays;

* * *

6. Electronic changeable message signs,[1] except for temporary signs required by government agencies for

[1] DEFINITIONS: * * * 24. Electronic Changeable Message Sign: An electronically activated sign whose message content or display, either whole or in part, may be changed by means of electrical, electronic or computerized programming. A sign

road and street repairs, and similar activities. This prohibition includes, but is not necessarily limited to, signs which include animation, flashing, traveling, or scrolling messages or displays[2];

7. Flashing signs[3] or displays,;

* * *

12. Moving signs;

* * *

14. Festoons, pennants, or blinking lights;

2. St. Croix County, WI (June 19, 2007): a ban with a time-and-temperature exception

a. St. Croix County Code of Ordinances/Land Use and Development

b. Findings of Fact (§17.65(A) (1) (a)(3, 7)):

(i) "Signs can create safety hazards that threaten the public health, safety or welfare. Such a safety

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or portion of a sign on which the message or display is an electronic indication of fuel price shall be considered an Electronic Changeable Message Sign. A sign on which the sole message or display is an electronic indication of time and/or temperature shall be considered an Electronic Changeable Message Sign. Drive-through Business/menu signs are not considered Electronic Changeable Message Signs.

[2] DEFINITIONS: * * * 72. Scrolling Displays: The vertical movement of a static message or display on an electronic changeable message sign.

[3] DEFINITIONS: * * * 29. Flashing Sign: A sign of which any portion of it changes light intensity, switches on and off in a constant pattern, or contains moving parts or the optical illusion of motion caused by use of electrical energy or illumination, with a display that appears for less than one and one-half consecutive seconds.

threat is particularly great for signs that are structurally inadequate, or that may confuse or distract drivers or pedestrians, or that may interfere with official directional or warning signs."

(ii) "With one narrow exception, only static signs (which change, if at all, only on rare occasions when they are repainted or covered with a new picture) constitute a customary use of signage in the County.[4] The only non-static signs that constitute a customary use of signge in the County are components of on-premise signs for which frequent changes are necessary for the purpose of updating numerical hour-and-minute, date, and temperature information. Such changes are unique because their accuracy depends upon their ability to frequently change, and because in their customary use such signs are apt to distract drivers or pedestrians to a dangerous degree than other types of non-static signs."

c. Prohibitions (§ 17.65 (C) (3)):

d. Signs and sign components and elements of faces of signs shall not flash, move, travel or use animation.

e. Unless a sign's only illumination is external and uncolored, the following additional regulations shall also apply to that sign:

[4] St. Croix County's findings regarding "customary use" have the intended effect of causing "non-customary use" signs that are adjacent to federal-aid highways to also violate the federal Highway Beautification Act, even if they are in a commercial or industrial zone. See 23 U.S.C. § 131 (d) ("Whenever a bona fide State, county, or local zoning authority has made a determination of customary use, such determination will be accepted in lieu of controls by agreement in the zoned commercial and industrial areas within the geographical jurisdiction of such authority.") and Wisc. Trans. R. 201.20 (5).

(i) No illuminated off-premises sign which changes in color or intensity of artificial light at any time while the sign is illuminated shall be permitted.

(ii) No illuminated on-premises sign which changes in color or intensity of artificial light at any time when the sign is illuminated shall be permitted, except one for which the changes are necessary for the purpose of correcting hour-and-minute, date, or temperature information.

(iii) A sign that regularly or automatically ceases illumination for the purpose of causing the color or intensity to have changed when illumination resumes shall fall within the scope of the prohibitions of par. f. 1) and 2) above.

(iv) The scope of [this subsection's] prohibitions include, but are not limited to, any sign face that includes a video display, LED lights that change in color or intensity, 'digital ink,' and any other method or technology that causes the sign face to present a series of two or more images or displays.

3. Bloomington, MN (2006): small steps short of a full ban

a. Bloomington Zoning Code §§ 19.66 and 19.100-108.

b. Findings (§ 19.100):

(i) "With respect to electronic signs, including video display signs, the City Council finds that they are highly visible from long distances and at very wide viewing angles both day and night and are designed to catch the eye of persons in their vicinity and hold it for extended periods of time. If left uncontrolled, electronic signs, including video display signs, constitute a serious traffic safety threat." A set of enumerated reports and studies "reveal that electronic signs are highly distracting to drivers and that driver distraction

continues to be a significant underlying cause of traffic accidents."

c. Prohibitions (§§ 19.66(b), and 19.108 (h) (4-6, 8)):

d. **Billboards** (i.e. advertising signs which have an area exceeding 150 square feet)) **which utilize electronic display techniques**-

(i) **must have a minimum duration of 20 minutes and must be a static display**;

(ii) cannot move or appear to move;

(iii) cannot fluctuate in light intensity or use intermittent, strobe or moving light to create the illusion of movement;

(iv) are only permitted in certain commercial and industrial districts; and

(v) must meet specified standards prohibiting non-instantaneous transitions, limiting brightness, and requiring dimmer controls.

e. **Video display signs** (i.e. a sign that changes its message or background in a manner or method of display characterized by motion or pictorial imagery, which may or may not include text and depicts action or a special effect to imitate movement, the presentation of pictorials or graphics displayed in a progression of frames which give the illusion of motion, but not including electronic changeable copy signs as defined below) that are not billboards-

(i) must not be visible from residential property or from any motored way,

(ii) are excluded from residential, conservation and bluff protection zones; and

(iii) must be set back 100 feet from an abutting residential district and 35 feet from other electronic changeable copy signs.

f. **Electronic graphic display signs** (i.e. a sign or portion thereof that displays electronic, static images, static graphics or static pictures, defined by a small number of matrix elements using different combinations of LEDs, fiber optics, light bulbs or other illumination devices within the display area where the message change sequence is accomplished immediately or by means of fade, repixalization or dissolve modes) that are not billboards-

(i) cannot change more frequently than every 20 minutes;

(ii) may be seen from a motored way, but must not be visible from residential property if within 150 feet;

(iii) are excluded from residential, conservation, and bluff protection zones; and

(iv) must be set back 100 feet from an abutting residential district and 35 feet from other changeable copy signs.

g. **Electronic changeable copy signs** (i.e. a sign or portion thereof that displays electronic, non-pictorial, text information in which each alphanumeric character, graphic, or symbol is defined by a small number of matrix elements using different combinations of LEDs, fiber optics, light bulbs or other illumination devices within the display area, but not including time-and-temperature signs as defined below) that are not billboards-

(i) **may include up to ten words of text, but not pictures**;

(ii) **cannot change more frequently than every 8 seconds (in a non-residential area), and every one hour in a residential area**;

(iii) may be seen from a motored way, but must not be visible from residential property if within 150 feet;

(iv) may in theory appear in a residential zone, but not in a conservation or bluff protection zone;

(v) must be set back 100 feet from an abutting residential district and 35 feet from other changeable copy signs.

h. **Time and temperature signs** (i.e. a sign which displays exclusively current time and temperature information) that are not billboards –

(i) Cannot change more frequently than every 2 seconds;

(ii) No visibility or special setback limits; and

(iii) are excluded from residential, conservation, and bluff protection zones.

4. Judge Zimmerman's interim compromise in *Clear Channel Outdoor v. City of Minnetonka.*

a. In his order on reconsideration, Judge Zimmerman ruled that, on an interim basis, the City could not interfere with the operation of the two LED signs installed by Clear Channel "during daytime hours, to the extent that (a) the electronic messages on the sign change no more than once each hour (b) the brightness, color, and illumination of the signs are calibrated by Clear Channel to the minimal level of illumination equivalent to conventional non-LED electronic billboard signs. Pending the outcome of this litigation, Clear Channel is enjoined from operating the two signs before and after day-light hours."

B. Constitutional safety, for that city whose council just can't bring itself to "dumb down" that neat sign outside City Hall

1. Minnetonka's new approach to off-premise dynamic displays: citywide permission to operate, under distraction-reducing and proliferation-reducing conditions

a. The provisions that have been replaced:

(i) [in the criteria in subd. 4 for a monument identification sign], "7) *message centers/time and temperature displays permitted* but the maximum area for display is 50 percent of the potential copy and graphic area of the monument identification sign."

(ii) [in the prohibitions section], "revolving and moving signs *except electronic message center/time and temperature display signs according to subdivision 4* and search lights according to subdivision 8," and "flashing, blinking or animated signs including but not limited to traveling lights or any other means not providing constant illumination *except electronic message center/time and temperature display signs according to subdivision 4* and search lights according to subdivision 8."

(iii) The City's definition of "flashing sign" is very broad, extending the ban to signs on which illumination is not kept stationary or constant in intensity and color at all times when such sign is in use." §300.02 (117).

b. The new prohibition: "signs with dynamic displays **except** search lights under subdivision 8 and **those allowed under subdivision 14**;"

c. New subsection 14 ("Dynamic Displays")

a) Findings. Studies show that there is a correlation between dynamic displays on signs and the distraction of

highway drivers. Distraction can lead to traffic accidents. Drivers can be distracted not only by a changing message, but also by knowing that the sign has a changing message. Drivers may watch a sign waiting for the next change to occur. Drivers are also distracted by messages that do not tell the full story in one look. People have a natural desire to see the end of the story and will continue to look at the sign in order to wait for the end. Additionally, drivers are more distracted by special effects used to change the message, such as fade-ins and fade-outs. Finally, drivers are generally more distracted by messages that are too small to be clearly seen or that contain more than a simple message. Time and temperature signs appear to be an exception to these concerns because the messages are short, easily absorbed, and become inaccurate without frequent changes.

Despite these public safety concerns, there is merit to allowing new technologies to easily update messages. **Except as prohibited by state or federal law, sign owners should have the opportunity to use these technologies with certain restrictions. The restrictions are intended to minimize potential driver distraction and to minimize proliferation in residential districts where signs can adversely impact residential character**.

Local spacing requirements could interfere with the equal opportunity to use such technologies and are not included. Without those requirements, however, there is the potential for numerous dynamic displays to exist along any roadway. if more than one dynamic display can be seen from a given location on a road, the minimum display time becomes critical. If the display time is too short, a driver could be subjected to a view that appears to have constant movement. This impact would obviously be compounded in a corridor with multiple signs. If dynamic displays become pervasive and there are no meaningful limitations on each sign's ability to change frequently, drivers may be subjected to an unsafe degree of distraction and sensory overload. Therefore, a longer display time is appropriate.

A constant message is typically needed on a sign so that the public can use it to identify and find an intended

destination. Changing messages detract from this way-finding purpose and could adversely affect driving conduct through last-second lane changes, stops, or turns, which could result in traffic accidents. Accordingly, dynamic displays generally should not be allowed to occupy the entire copy and graphic area of a sign.

In conclusion, **the city finds that dynamic displays should be allowed on signs but with significant controls to minimize their proliferation and their potential threats to public safety**.

b) Regulations. Dynamic displays on signs are allowed subject to the following conditions:

1) Dynamic displays are allowed only on monument and pylon signs for conditionally permitted uses in residential districts and for all uses in other districts. **Dynamic displays may occupy no more than 35[[5]]percent of the actual copy and graphic area.** The remainder of the sign must not have the capability to have dynamic displays even if not used. Only one, contiguous dynamic display area is allowed on a sign face;

2) **A dynamic display may not change or move more often than once every 20[[6]] minutes, except one for which changes are necessary to correct hour-and-minute, date, or temperature information.** Time, date, or temperature information is considered one dynamic display and may not be included as a component of any other dynamic display. A display of time, date, or temperature must remain for at least 20 minutes before

[5] The Minnetonka Planning Commission has recommended that the City Council consider increasing the percentage of permitted dynamic area on the sign face above the 35 percent proposed by staff. The Commission also recommended that the Council not preclude the remaining percentage from being electronic (so long as it is permanent and does not in fact change electronically).

[6] The Planning Commission also recommended that the City Council consider reducing the minimum duration below the 20 minutes proposed by staff.

changing to a different display, but the time, date, or temperature information itself may change no more often than once every three seconds;

3) The images and messages displayed must be static, and the transition from one static display to another must be instantaneous without any special effects;

4) The images and messages displayed must be complete in themselves, without continuation in content to the next image or message or to any other sign;

5) **Every line of copy and graphics in a dynamic display must be at least seven inches in height on a road with a speed limit of 25 to 34 miles per hour, nine inches on a road with a speed limit of 35 to 44 miles per hour, 12 inches on a road with a speed limit of 45 to 54 miles per hour, and 15 inches on a road with a speed limit of 55 miles per hour or more. If there is insufficient room for copy and graphics of this size in the area allowed under clause 1 above, then no dynamic display is allowed**;

6) Dynamic displays must be designed and equipped to freeze the device in one position if a malfunction occurs. The displays must also be equipped with a means to immediately discontinue the display if it malfunctions, and the sign owner must immediately stop the dynamic display when notified by the city that it is not complying with the standards of this ordinance;

C. Consolidating advertising in a few well-placed dynamic signs

1. Minnetonka's "incentives" provision

a. **Purposes and Findings**:

Outdoor advertising signs do not need to serve the same way-finding function as do on-premises signs. Further, outdoor advertising signs are no longer allowed in the city, and there is no potential that they will proliferate. Finally, outdoor advertising signs are in themselves

distracting and their removal serves public safety. The city is extremely limited in its ability to cause the removal of those signs. **This clause is intended to provide incentives for the voluntary and uncompensated removal of outdoor advertising signs in certain settings. This removal results in an overall advancement of one or more of the goals set forth in this section that should more than offset any additional burden caused by the incentives. These provisions are also based on the recognition that the incentives create an opportunity to consolidate outdoor advertising services that would otherwise remain distributed throughout the community.**

b. Criteria for issuance of an enhanced dynamic signage permit:

c. (1) "A person may obtain a permit for an enhanced dynamic display on one face of an outdoor advertising sign if the following requirements are met:"

(a) **The applicant agrees in writing to permanently remove, within 15 days after issuance of the permit, at least two other faces of an outdoor advertising sign in the city that are owned or leased by the applicant, each of which must satisfy the criteria of parts (b) through (d) of this subsection.** This removal must include the complete removal of the structure and foundation supporting each sign face. The applicant must agree that the city may remove the sign if the applicant does not timely do so, and the application must be accompanied by a cash deposit or letter of credit acceptable to the city attorney sufficient to pay the city's costs for that removal. The applicant must also agree that it is removing the sign voluntarily and that it has no right to compensation for the removed sign under any law.

(b) The city has not previously issued an enhanced dynamic display permit based on the removal of the particular faces relied upon in this permit application.

(c) **Each removed sign has a copy and graphic area of at least 288 square feet and satisfies two or more of the following additional criteria:**

(1) The removed sign is located adjacent to a highway with more than two regular lanes and with a general speed limit of 45 miles per hour or greater, but that does not have restrictions on access equivalent to those of an interstate highway;

(2) All or a substantial portion of the structure for the removed sign was constructed before 1975 and has not been substantially improved;

(3) The removed sign is located in a noncommercial zoning district;

(4) The removed sign is located in a special planning area designated in the 1999 comprehensive plan; or

(5) The removed copy and graphic area is equal to or greater than the area of the copy and graphic area for which the enhanced dynamic display permit is sought.

(d) If the removed sign face is one for which a state permit is required by state law, the applicant must surrendered its permit to the state upon removal of the sign. The sign that is the subject of the enhanced dynamic display permit cannot begin to operate until proof is provided to the city that the state permit has been surrendered.

(e) **The applicant must agree in writing that no dynamic displays will ever be used on one additional outdoor advertising sign that has a copy and graphic area of at least 288 square feet in size.** This agreement will be binding on the applicant and all future owners of the sign. If the sign is subsequently removed or destroyed and not replaced, the holder of the enhanced dynamic

display permit is not required to substitute a different sign for the one that no longer exists.

d. **The benefits of an enhanced dynamic display permit**:

2) If the applicant complies with the permit requirements noted above, the city will issue an enhanced dynamic display permit for the designated outdoor advertising sign. **This permit will allow a dynamic display to occupy 100 percent of the potential copy and graphic area and to change no more frequently than once every eight seconds.** The designated sign must meet all other requirements of this ordinance.

D. A Euclidean approach: allowing flashy signs in one or two zoning overlay districts

1. Minneapolis, MN's "downtown opportunity billboard district"

a. The City's "Downtown 2010 Entertainment Policy" noted that the policy's goals would be furthered by steps to "create street level excitement in the Entertainment District. A successful urban entertainment district requires a street level environment that is visually exciting and that encourages pedestrian flow between various attractions."

b. Minneapolis City Code § 544.60. Opportunity billboard districts, provides:

(a) Establishment and restrictions. This section establishes the following opportunity billboard districts:

* * *

(2) Downtown opportunity billboard district. The downtown opportunity billboard district shall comprise the area bounded by the Mississippi River, I-35W, I-94, and I-394/Third Avenue North (extended to the river), except that in no case shall a sign or billboard be constructed or structurally altered along or within three hundred (300) feet of either side of Nicollet Avenue

between Washington Avenue and Ninth Street South, between LaSalle Avenue and Marquette Avenue between Ninth Street South and Grant Street, or north of Washington Avenue. No advertising sign or billboard shall be constructed or structurally altered within the downtown opportunity billboard district except as provided in this section and subject to all other applicable regulations of this zoning ordinance.

c. Minneapolis City Code § 544.20 (13). General provisions - Flashing signs, provides:

Flashing, blinking or animated signs, including but not limited to traveling lights or other means not providing constant illumination, shall be prohibited **except in the downtown opportunity billboard district. Such signs shall be allowed in the downtown opportunity billboard district, provided flashing signs containing changing written messages shall be limited to the news, weather, time or other public service messages, and provided further that the vertical dimension of such changing written message shall not exceed four (4) feet.**

2. East Dundee, IL's video display overlay district and static electronic display overlay district (2006)

a. James Carlini, one of the Trustees of the Village of East Dundee, has characterized sign ordinances as a "horse-and-buggy bridle on business," and has advocated that local governments should "turn on profits by turning on the lights." James Carlini, "Electronic Signs for Municipalities: Las Vegas or Lost Revenues?" Wisconsin Technology Network, online edition, 05/17/06.

b. Last year East Dundee amended its sign ordinance in the following respects:

(i) In the East Side Commercial Overlay District, "*for new car dealerships, multi-tenant retail centers and amusement establishments only*, the

freestanding sign permitted" on a parcel "may contain a fully electronic message display consisting of words, symbols, figures or images that can be electronically or mechanically changed by remote or automatic means, *including animated graphics and video,* subject to the following: (a) the area of the electronic message shall not exceed 75 % of the sign area; and (b) the intensity of illumination and the movement of any illumination or the flashing, scintillating or varying of light intensity shall not constitute a traffic hazard as described in subsection 156.03(E)[7]." Ordinance No. 06-46, amending Code of Ordinances § 156.04 (E).

(ii) In the Hilltop Commercial Overlay District, "*for new car dealerships, multi-tenant retail centers and amusement establishments only,* the freestanding sign may contain a *static electronic message display capable of displaying words, symbols, figures or images that can be electronically or mechanically changed by remote or electronic means,"* subject to the same 75 percent limit and traffic hazard limit as signs in the other overlay district, plus a requirement that "each message on the sign shall be displayed for a minimum of 10 seconds," and "said messages shall change only through dissolve or fade transitions, or with the use of other subtle transitions and frame effects that do not have the appearance of moving text or images, but which may otherwise not have movement, or the appearance or optical illusion of

[7] Under 156.03(E), "In order to assure traffic safety, no sign shall be erected, relocated or maintained in a manner as will, in the determination of the Building Official, (1) by reason of size, location, content, coloring or manner of illumination, obstruct the vision of drivers or obstruct or detract from the visibility or effectiveness of any traffic signal or control device on streets and roads within the village; or (2) make use of words, phrases, symbols, lights or characters, in a manner as to interfere with, mislead or confuse traffic."

movement, of any part of the sign structure, design or pictorial segment of the sign, including movement of any illumination or the flashing, scintillating or varying of light intensity." Ordinance No. 06-46, amending Code of Ordinances § 156.04 (F).

(iii) Everywhere else in the Village, "flashing signs" shall be prohibited, "moving, rotating, or animated signs or signs creating the illusion of movement shall be prohibited," and "illumination shall be constant in intensity and color, and shall not consist of flashing, animated, chasing, scintillating or other illumination conveying the sense of movement except for those signs that exhibit time and temperature . . ." Ordinance No. 06-46, amending Code of Ordinances § 156.03 (F) and (G)(5).

E. *Encouraging* certain kinds of dynamic signs through regulation

1. Cuyahoga Falls, OH (2003)

a. Cuyahoga Falls' 2003 overhaul of its sign ordinance is characterized as an "outside the box" approach by the planning consultant who drafted it, John Gann of Gann Associates. Gann believed that "the best solution to temporary clutter is permanent signs with designed-in readerboards or electronic message centers. Temporary signs exist because businesses and other sign users have a legitimate need to display temporary messages. Doing this on a permanent panel that is physically part of and visually integrated with a good permanent sign may be the most compatible way to do this." Author's Answers to Questions about "Sign Control in Cuyahoga Falls: Regulating Outside the Box" (July 2003 Zoning News), available on the American Planning Association website.

b. § 1147.03 (C): Displays prohibited:

(i) d. Flashing signs.

(ii) f. Moving signs.

c. § 1147.06.A: Rules for Special Signs: Changeable Sign Areas

(i) "1. *Sign Area Bonus for Inclusion in Permanent Sign.* To meet the need businesses and organizations have for timely and variable sign messages and also to prevent the clutter that can be created by portable signs, *the Permanent Sign Allowance of a property shall be increased as provided in Table 1147-4 if a changeable copy area or electronic message center*, both as defined herein, of no less than 16 square feet *is incorporated into a permanent non-portable Non-Surface Sign on the lot or building site*."

(ii) Under Table 1147-4, the lawful surface area of a permanent sign – known as its "permanent sign allowance" – increases by 20 percent if "a changeable copy area or electronic message center is permanently part of a permanent non-portable sign conforming to 1147.06.A.

(iii) 2. *Single Electronic Message Center.* Electronic message centers shall be allowed only on a single Permanent Sign per lot or building site.

(iv) 3. *Integration into Sign.* Changeable copy areas and electronic message centers on permanent signs shall be part of the same sign panel as a non-changeable sign and shall be integrated into the face of such sign by use of a border or similar design treatment that provides a visual linkage to the rest of the sign.

(v) 4. *Maximum Area.* A changeable copy area or electronic message center, both as defined herein, shall be no more than 60 percent of the actual sign area of any permanent sign panel of which it is a part.

(vi) 5. *On Temporary or Portable Signs.* No temporary or portable sign shall display a changeable copy area or electronic message center.

III. At the "micro" level: recurring regulatory issues for dynamic signs

A. There are seven key regulatory issues regarding dynamic signs: (1) the appropriate duration of dynamic messages, (2) whether, and under what conditions, to permit motion, animation, and video messages, (3) the appropriate level of brightness of dynamic signs, (4) the appropriate placement and spacing of signs, (5) whether to treat on-site and off-site dynamic signs differently, (6) the appropriate size of dynamic signs, and (7) the appropriate text size for dynamic signs.

a. In assessing what regulatory options achieve their policy goals, local governments may consider the safety risks associated with dynamic signs and the costs and benefits of various regulatory options.

B. Dynamic billboards cause driver distraction and pose risks to public safety.

a. To assess the safety implications of dynamic and static signs, road safety scholars have examined (1) the relationship between static or dynamic signs and crash rates, (2) how drivers process information and limitations on their ability to process information, and (3) the factors contributing to driver distraction and the risk of crashes.

b. In general, the results of these studies indicate that dynamic billboards cause driver distraction and driver distraction causes traffic accidents. Dynamic billboards, with their ability to display high resolution color images and changing and moving images, capture the attention of drivers and capture the attention of drivers for longer periods of time than static signs. Indeed, the billboard companies design dynamic billboards precisely for the purpose of capturing the attention of the public and maximizing profitability. When drivers are looking at dynamic billboards, they are distracted and distracted drivers increase the risk of crashes and pose problems for road safety and traffic operations. Driver distraction alone can be the cause of accidents. In addition, driver distraction interacts with roadway conditions, driving

environments, weather, and traffic conditions to cause accidents.

C. Regulatory options for duration of dynamic messages: what is the appropriate time interval between message changes?

a. The implications of duration for safety: prior research indicates that the duration of dynamic messages has implications for safety:

(i) Glances of two seconds or greater double the risk of crashes or near crashes

(ii) Visual fixations on roadway signs decrease as route familiarity increases (but this decrease in visual fixations may not occur with signs that change messages)

(iii) Dynamic billboards attract more glances and longer glances than static signs and the length of those longer glances (greater than .75 seconds) is close to the minimum perception-reaction time required for a driver to react to a slowing vehicle

(iv) Signs with a visual story or message that carries for two or more frames are particularly distracting because drivers tend to focus on the message until it is completed rather than the driving task at hand

(v) Due to the Zeigarnik effect (the psychological need to follow a task to its conclusion), the desire to see a message change or read a sequence of messages causes driver distraction and unsafe driving behavior like prolonged glances away from the road, slowing, and lane departure

b. Suggested regulatory goals and options

(i) Minimize the Ziegarnik effect (the desire to see a message change) and the driver distraction associated with watching dynamic signs change by setting the duration of sign messages to minimize

the number of new messages seen by drivers. This can be calculated based on the length of time a sign is visible for particular driver's speed, speed limits, and traffic volume.

(ii) Minimize the Ziegarnik effect by requiring a dark period between successive messages.

(iii) Prohibit flashing, spinning, revolving transition methods that are distracting.

(iv) Reduce driver distraction by prohibiting signs that require or induce drivers to watch a sign for several seconds, such as signs with visual stories, signs carrying messages that are delivered through a sequence of displays, flashing messages (or by limiting such signs to certain driving environments).

(v) Reduce driver distraction by insuring that signs are conspicuous and legible.

D. Regulatory options for motion, animation, and video messages.

a. The implications of motion, animation, and video messages for safety: prior research indicates that:

(i) Video and tri-vision signs attract more long glances than static and scrolling text signs

(ii) Video and scrolling text signs received the longest average glance duration

(iii) Video signs entering into a driver's line of sight directly in front of the vehicle are very distracting

(iv) Electronic signs with moving images contribute to driver distraction for longer intervals than electronic signs with no movement

(v) Signs with a visual story or message that carries for two or more frames are particularly distracting

because drivers tend to focus on the message until it is completed rather than the driving task at hand

(vi) Scrolling messages and sequences of messages increase driver distraction

(vii) Flashing messages require more time to read and more time to comprehend and require more of the driver's time and attention.

b. Suggested Regulatory Goals and Options

(i) Minimize driver distraction by prohibiting video, tri-vision, scrolling text, flashing signs, or any other type of motion in dynamic signs or restricting motion to signs located in certain driving environments.

(ii) Set a maximum motion time frame based on the length of time a sign is visible for particular driver's speed, speed limits, and traffic volume.

(iii) Reduce driver distraction by prohibiting signs that require or induce drivers to watch a sign for several seconds, including signs with visual stories, signs carrying messages that are delivered through a sequence of displays, flashing messages.

E. Regulatory options for the brightness of dynamic signs and external illumination.

a. The implications of brightness for safety: brightness can distract drivers and impair their ability to perform driving tasks. Previous research indicates that that the brightness of dynamic signs can temporarily blind a driver or prompt a driver to look away from the light. Newer sign technologies permit dynamic signs to respond to ambient light conditions, raising additional concerns about the adequacy of those changing brightness levels.

b. The challenges of brightness regulation: there is no objective definition of excessive brightness because the

appropriate level of brightness depends on the environment within which the sign operates. Accordingly, it is difficult to establish a uniformly applicable measure of brightness for all dynamic signs. In addition, the instruments that are used to measure brightness in the field are currently very expensive and it is difficult to measure brightness in the field. For all these reasons, the enforcement of any brightness regulations is challenging.

c. Regulatory Options

(i) City of Minnetonka: "No sign may be brighter than is necessary for clear and adequate visibility."

(ii) Prohibit brightness that impairs the vision of a driver or promotes driver distraction.

(iii) Prohibit brightness that interferes with traffic control devices.

F. Regulatory options for sign placement and spacing.

a. The implications of sign placement and spacing for safety: previous research indicates that:

(i) The number of advertising signs per mile (or road section) is positively associated with crash rates, i.e., the more advertising signs per mile (or road section), the higher the crash rate

(ii) Intersections containing advertising signs have a higher crash rate than those containing no advertising signs

(iii) Street level advertising signs are more distracting than raised advertising signs

(iv) The less conspicuous the sign, the higher the likelihood of an increased crash rate

(v) Signs pose a safety hazard when they obstruct a driver's line of sight at an intersection, curve, or

point of egress from an adjacent property or obstruct a driver's view of a traffic control device

(vi) Signs pose a safety hazard when they are located where heightened driver concentration is required (high pedestrian volume intersection) or when they are likely to be mistaken for a traffic control device or as an instruction to drivers

(vii) Signs with a visual story or message that carries for two or more frames are particularly distracting because drivers tend to focus on the message until it is completed rather than the driving task at hand

b. Challenges

(i) Regulating sign spacing can be like starting a game of "musical chairs" because the ability of one company to put up a sign at one location can depend on whether another company has already put up a sign within the immediate vicinity.

(ii) This can create problems of equity because similarly situated property owners end up with different rights.

(iii) It can also create a "race" to engage in exactly the behavior that the local government is trying to regulate, because those who are first in the neighborhood to engage in the behavior are the least likely to be burdened by spacing requirements.

c. Suggested regulatory goals and options

(i) To the extent that federal and state spacing requirements are not already applicable, establish minimum distances between dynamic signs and regulations regarding the sequencing of sign messages to insure that drivers are not visually overloaded and reduce the chances of creating an over-stimulated driving environment. Minimum

distances can be calibrated based on the driving environment, traffic, speed, and distance.

(ii) Decline to supplement federal and state standards to promote fairness and avoid creating additional incentives to race to apply dynamic technology to existing static signs.

(iii) Limit or prohibit dynamic signs at intersections, in demanding driving environments, and in places where they obstruct a driver's view.

(iv) Limit or prohibit dynamic signs that resemble traffic control devices.

G. Regulatory distinctions between on-site and off-site signs.

a. The safety implications of on-site and off-site signs: previous research does not indicate that on-site and off-site dynamic signs pose distinct safety risks that warrant differential regulatory treatment. However, because on-premises signs are more likely to serve wayfinding purposes, if on-premises signs are illegible or otherwise hard to see from a safe distance, there may be a risk that they are seen too late by drivers who are trying to find their way to a particular location, and who then engage in dangerous maneuvers and lane-changes to leave the road. Local governments need not view advertising and wayfinding as equally important goals, and for that reason may choose to adopt policies that benefit the use of signage for wayfinding while burdening its use purely for advertising.

b. Regulatory goals and options: local governments may choose to regulate all dynamic signs equally, without regard to whether they on-site or off-site dynamic signs. Local governments may still choose to regulate on-site and off-site signs differently even if they do not regulate on-site and off-site dynamic signs differently.

H. Regulatory options for the size of signs.

a. The safety implications of sign size: previous research indicates that dynamic signs pose safety risks primarily by distracting drivers. The size of signs or the size of the dynamic portion of signs may be distracting because the size is too big or too small. If the size is too small, then drivers must take more time to read the sign, diverting their attention from driving tasks. In addition, advertisers have an interest in frequent message changes and using sequenced messages on small signs, features that increase driver distraction. If the sign is too big, the attention of drivers may be captured for lengthy periods of time, diverting their attention from driving tasks. Overly large signs are also more likely to obstruct a driver's ability to see other things, which may include important traffic-control devices and signs.

b. Regulatory goals and options: there is no standard approach to regulating the size of signs, and there is no standard approach to regulating the size of dynamic signs or the size of the dynamic portion of the sign. Size limitations may be established that reduce river distraction based on the driving environment in which the sign is located, distance, and legibility goals.

I. Regulatory options for the text size of dynamic signs.

a. The safety implications of text size

(i) Previous research indicates that the less legible the sign, the higher the likelihood of an increased crash rate. The preferred approach for highway signage is that sign text be 1 inch high to be readable from 30 feet away, and larger text is needed for signs to be legible at greater distances.

(ii) Sign associations have promulgated "best practices" standards for commercial on-premise signs, with a particular focus on legibility. Because there is generally a common interest

between the sign industry and regulators in avoiding signage or text that is too small to be seen and understood in particular locations, those "best practices" standards can be a useful source of potential standards for text size in particular settings.

b. Regulatory goals and options: to increase legibility, reduce the time needed to read billboards, and reduce driver distraction, local governments can follow the preferred approach used for highway signage or calibrate the appropriate text size based on distance, the driving environment, and the desired legibility.

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