

# A Legal and Technical Exploration of On-Premise Sign Regulation **An Evidence Based Model Sign Code**



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# Model Sign Code Executive Summary

The on-premise commercial sign<sup>1</sup> is one of the primary means by which a business conveys its message of commerce. These signs identify businesses by name, address, and product sold. In some cases, these signs can be used to put forth non-commercial messages that inform the community. It is to the benefit of businesses that these signs be well-designed and erected in contexts that do not diminish the messages they seek to communicate.

This objective may be accomplished through municipal regulation. Unlike most modern sign codes which attempt to regulate on-premises signs on the basis of police powers, Urban Design Associates has drafted this municipal sign code which is based on the best available transportation planning and engineering research. This evidence-based approach to regulation seeks to ensure that signs, as commercial speech, are afforded some guaranteed constitutional protections.

This report begins with a discussion of the legal issues fundamental to the regulation of on-premise commercial signs. Next, the report describes the technical research related to issues of the legibility of on-premise signs. The third section of this report features an evidence-based model sign code, crafted to reflect the identified legal and technical issues.



Multi-tenant sign

<sup>1</sup> This model sign code deals only with on-premise signs, not those signs that are off-premise, otherwise known as billboards.

# Fundamental Legal Issues in the Regulation of On-Premise Signs

# Legal Report



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# Fundamental Legal Issues In the Regulation Of On-Premise Signs

## An Introduction

The visual environment is a highly contested space. In particular, local governments and business owners often find themselves in conflict with respect to the regulation of on-premise commercial signs. Municipalities have widely begun to impose some level of regulation on this form of communication on grounds that certain types of signs interfere with public values relating to both aesthetics and traffic safety. These regulations sometimes fail to recognize the true value of signs to the businesses they advertise, as well as to the economic vitality of communities as a whole. More importantly, many of these sign codes fail to meet constitutional muster because they do not embrace the First Amendment protections to which on-premise commercial signs are entitled. This report seeks to review the legal underpinnings critical to the regulation of signage in an effort to develop a model sign code which is performance-based and which (1) embraces the value of signs in support of the local business economy; (2) recognizes that signs are speech with inherent First Amendment protection; and (3) backs all efforts to regulate this type of speech with scientific evidence justifying the need for such provisions.

## Local Government Efforts to Regulate Signage

Local governments have attempted to regulate signage for more than a century. Early efforts by municipalities to regulate signage were struck down by state courts. In *City of Passaic v. Patterson Bill Posting, Adv. & Sign Painting*, 62 A. 267 (N.J. Err. & App. 1905), a New Jersey court invalidated an ordinance which sought to regulate sign height and setbacks

on the basis of improving community aesthetics. According to the court:

Aesthetic considerations are a matter of luxury and indulgence rather than of necessity, and it is necessity alone which justifies the expertise of the police power to take private property without compensation. *Id* at 268.

At the time, the police powers of local governments in all realms of city planning were interpreted narrowly.

Zoning powers were expanded by the Supreme Court's 1926 decision in *Village of Euclid v. Ambler Realty Co.*, 272 U.S. 356, which permitted cities to engage in the regulation of those zoning activities which were to the benefit of the public's general health, safety, and welfare so long as there was a rational basis for such regulations. Pursuant to the rational basis standard of judicial scrutiny, a municipal regulation will be upheld as long as it is not arbitrary or capricious. This standard places an almost insurmountable burden of proof on the complainant to prove that there is no rational basis to support the government's regulation. Rational basis continues to be the standard of scrutiny applied to most zoning and land use regulations.

In 1954, the high court extended the reach of these objectives to issues of aesthetics. In *Berman v. Parker*, 348 U.S. 26, the Court stated, in dicta:

The concept of public welfare is broad and inclusive. The values it represents are spiritual as well as physical, aesthetic as well as monetary. It is within the power of the legislature to determine that the community should be beautiful as well as healthy, spacious as well as clean, well balanced as well as carefully patrolled (348 U.S. at 33).

While many continue to embrace the ruling in *Berman* as grounds for aesthetics-based regulation, including the regulation of signage, it is important to note that this case focused on aesthetic issues associated with urban renewal, not forms of communication protected by the First Amendment. This distinction is at the heart of a public policy divide which separates the business community from those government officials who regulate signage, and will be discussed in detail in the sections which follow.

## The Problem with Street Graphics & the Law

The aforementioned distinction has long been unrecognized in planning practice and scholarship. Rather, the planning community has historically treated signage as a land use to be regulated by the traditional tools associated with zoning activities. In *Street Graphics* (1971), William Ewald and Daniel Mandelker proposed a scheme for regulating signage that has served as the primary resource used by communities seeking to impose signage regulation. They proposed a regulatory scheme that:

[W]ill allow individuals and institutions the freedom to express their personalities and purposes—but within the framework of official guidelines that will insure that these expressions are compatible with the areas around them, appropriate to the activities to which they pertain, and clearly readable under the circumstances in which they are seen (Ewald et al., 1971, p. forward).

In this work, Ewald and Mandelker suggest: “The primary function of on-premise street graphics is to index the environment: that is signs should tell people where they can find what.”

In a 2004 issue of *Signline*, however, Dr. James Claus explains how limited this perspective is, suggesting that an on-premise sign is equal in value to that of a handshake exchanged between business owner and customer. Dr. Claus contends that signs serve a number of critical functions beyond identification, as proposed by Ewald and Mandelker, including: memory building, induction of impulses to stop at a business, enhancement of the shopping experience, as

well as informational and educational purposes. According to Dr. Claus, Ewald and Mandelker’s model sign code sets forth a series of guidelines which fail to take into account the full nature and significance of signage for commercial enterprise. Indeed, the primary purpose of on-premise signs is to propose commercial transactions to viewers of their content, the sign. This is what makes this form of communication speech, rather than a land use to be regulated. The largest shortcoming of *Street Graphics* is that the work fails to embrace the long line of Supreme Court precedent which affords First Amendment protections to the commercial speech embodied in on-premise signs.

While several key stakeholders have sought to notify the planning community with respect to the problems inherent in *Street Graphics* and the sign codes it has inspired, additional efforts, such as this Model Sign Code, are necessary in order to further the momentum of this effort. UDA seeks to use the traditional form of the sign code as a template for creating a performance-based model sign code that embraces this new way of thinking about signs, i.e. as speech and not land use activities. Exploration of federal case law pertaining to the regulation of on-premise signs emanating from U.S. Constitutional law will serve as the legal basis for the proposed code.

## Origins: First Amendment Protections Afforded to Commercial Speech

It was not until the relatively recent past that the U.S. Supreme Court recognized the application of First Amendment protections to commercial speech, including on-premise signage. In 1975, the nation’s high court ruled that First Amendment protections attach to commercial advertisements. *Bigelow v. Virginia*, 421 U.S. 809 (1975). In *Bigelow*, the Supreme Court invalidated a State law which sought to prevent a newspaper from publishing an advertisement informing women where they might find a clinic willing to perform an abortion. The court rejected the State’s primary argument that the regulation was a valid exercise of its regulatory powers due to the fact that the speech involved was commercial in nature. The high court disagreed with this proposition. Citing *Ginzburg v. U.S.*, 383

U.S. 463 (1966), the court held: that the existence of “commercial activity, in itself, is no justification for narrowing the protection of expression secured by the First Amendment.” The most important aspect of *Bigelow* was that the decision altered the Court’s previous ruling in *Railway Express*, the last case that adjudicated speech under a rational basis standard. *Bigelow* paved the way for a long line of court precedent that recognizes the free speech rights which attach to commercial speech.

A year later, the Court considered a similar issue in *Virginia Pharmacy Board v. Virginia Consumer Council*, 425 U.S. 748 (1976). There, the VCC challenged a State law which deemed it unprofessional conduct for a licensed pharmacist to advertise the price of prescription drugs. In this case, the Court recognized a reciprocal right for businesses to advertise and consumers to receive such information. The Court reiterated its previous holdings on the issue, stressing that commercial speech was entitled to no less First Amendment protection merely because of the economic nature of the communication. The Court went so far as to say that the free flow of commercial speech should be considered ...an instrument to enlighten public decision making in a democracy.” *Id.* at 766. In dicta, the Court held that some commercial speech regulations may be appropriate provided that: (1) they are justified without regard to content; (2) serve a significant governmental interest; and (3) leave open ample alternative channels for communication. *Id.*

The following year, the high court struck down a local regulation which sought to prohibit the display of “for sale” signs in an effort to promote “stable, racially integrated housing” in *Linmark Associates, Inc. v. Willingboro*, 431 U.S. 85 (1977). The Court’s opinion contained a significant discussion of evidence, finding that there was insufficient evidence to show that the restriction could, in fact, accomplish the intended purpose. Holding fast to precedent, the Court was quick to rule that this type of communication was guaranteed First Amendment protection. In this case, the Court ruled that the law was invalid because it took away the best alternative for communicating the sale of residential real estate. With respect to the significance of the governmental interest involved, the Court agreed with the municipality’s assertion that the objective was important but stated that the governmental entity had failed to show the link between the ordinance and the stated objective. *Id.* Such restrictions, if

not checked by the courts, are likely to have a chilling effect on protected speech.

Relying on the broad powers vested in them by State enabling legislation, cities are often quick to regulate on-premise signage like other land uses. This decision flies in the face of important jurisprudence which must be revisited. Due to their intended purposes, signs, including those displaying commercial messages, must be viewed as speech. This does not mean that this form of communication cannot be regulated by local government. What it does mean, however, is that great care must be taken by local governments to ensure that sign codes do not infringe upon the Constitutional protections afforded by the First Amendment.

## Sign Regulation and the Evolution of the Central Hudson Test

In 1980, the Supreme Court rendered an opinion that had a deep impact on the regulation of commercial signage. In *Central Hudson Gas & Electric Company v. Public Service Commission*, 447 U.S. 557 (1980), the Court ruled that a New York statute which prohibited electric companies from advertising to promote the use of electricity was unconstitutional. *Id.* The Court laid out what is now referred to as the Central Hudson test:

In commercial speech cases, then, a four-part analysis has developed. At the outset, we must determine whether the expression is protected by the First Amendment. For commercial speech to come within that provision, it at least must concern lawful activity and not be misleading. Next, we ask whether the asserted governmental interest is substantial. If both inquiries yield positive answers, we must determine whether the regulation directly advances the governmental interest asserted, and whether it is not more extensive than is necessary to serve that interest.

*Id.* at 566. Based on the fourth prong of the test, the high court held that regulation was broader than necessary to achieve its intended purpose. *Id.*

The following year, the high court had the opportunity to apply the test developed in *Central Hudson* in another matter. The final opinion rendered in *Metromedia*, however, failed to offer a clear application of the test. *Metromedia, Inc.*

*v. San Diego*, 453 U.S. 490 (1981). Instead, the holding in the case has been the source of great confusion with respect to the regulation of signage. Interestingly, while the Court had the opportunity to apply the intermediate scrutiny standard of review set forth in *Central Hudson*, their analysis, as further detailed in Justice Brennan’s concurring opinion, reveals that they opted to apply rational basis analysis in evaluating the constitutionality of the ordinance. *Id.*

The controversy centered on a San Diego ordinance which sought to ban off-premise billboards while exempting on-premise signs. Five separate opinions were issued by the Court in this case. The Court’s final opinion was limited to the authority of cities to regulate billboards, a form of off-premise signs. The Court recognized that other methods of communicating ideas would require “a law unto itself” and that law must reflect the “differing natures, values, abuses and dangers” of each method. *Id.* It is critical that the planning community understand the limited nature of this opinion. *Metromedia* represents the law of billboards, little else.

In spite of this limitation, this decision is often heralded as the basis for an expansion of power which enables municipalities to regulate signage on the basis of traffic safety concerns. While that may be the law with respect to the regulation of billboards, the opinion does not offer any binding legal authority which connects the proposition to on-premise signs. The City of San Diego seemed to recognize this distinction in its ordinance, by choosing to exempt on-premise signs from the proposed ban.

With respect to *Metromedia*, it is also important to note that the decision has not led to the kind of clarity with which some courts try to ascribe to it. A federal district court in Florida eloquently discussed the limitations of this ruling.

It is truly a Herculean task to wade through the mire of First Amendment opinions to ascertain the state of the law relating to sign regulations, beginning with the Supreme Court’s leading decision on billboard regulations in *Metromedia, Inc. v. City of San Diego*, 45 U.S. 490, 570, 69 L. Ed. 2d 800, 101 S. Ct. 2882, (1981) (plurality) (Rehnquist, J., dissenting, who referred to the plurality decision as a “virtual Tower of Babel, from which no definitive principles can be clearly drawn”).... There is

much variety and diversity of opinions in this area (in addition to sign ordinances, courts have reviewed First Amendment challenges to adult entertainment clubs, tobacco advertising and the noise volume of music concerts), suggesting that constitutional law on this subject is far from clear.

The ruling in *Edenfield v. Fane* represented the high court’s next meaningful application of the *Central Hudson* test. *Edenfield v. Fane*, 507 U.S. 761 (1992). In *Edenfield*, the Court was asked to adjudicate the validity of a Florida law prohibiting CPAs from engaging in the personal solicitation of new clients. The Court ruled that the personal solicitation was commercial expression, entitled to First Amendment protections. The Court held that regulation of such expression is appropriate so long as is “tailored in a reasonable manner to serve a substantial state interest.” *Id.* at 767. The Court, in applying the *Central Hudson* test to its evaluation of Florida’s law, redirected the burden of proof to the regulator. Specifically, the Court ruled: “In this analysis, the Government bears the burden of identifying a substantial interest and justifying the challenged restriction.” *Id.* at 770. Here, the Court ruled that the State had not met its burden of proof under *Central Hudson*.

The planning community must recognize that this decision represents a significant departure from broad level of deference afforded by the courts to decisions made by local government officials. Because of the holding in *Edenfield*, local governments must prove that any harm they seek to address with an ordinance is materially advanced by the proposed regulations. This ruling compels governments to do more than allege traffic safety or aesthetics concerns as they basis for signage regulations. As a result of *Edenfield*, courts will compel local governments to produce evidence that the ordinance directly accomplishes their stated goals, such as traffic safety or aesthetics. Local governments must be able to prove that on-premise commercial signs have an impact on traffic safety and the ordinance factually accomplishes an improvement in traffic safety. In the absence of such quantifiable proof, the constitutional legitimacy of sign codes stand on shaky ground.

The legacy of *Central Hudson* was again reinforced by the Court in *City of Cincinnati v. Discovery Network, Inc.*, 507

U.S. 410 (1993). Applying the four prong test, the U.S. Supreme Court overturned a city regulation which sought to prohibit the location of some commercial newsracks on city streets on the basis of aesthetics and safety concerns. In reviewing the case, the Court held that the city had failed to establish a reasonable fit between its legitimate interests in safety and aesthetics and the means chosen to serve those interests. *Id.* In the Court's view, the aesthetics and safety justification was not substantial enough to justify discrimination between permitted and unpermitted newsracks, both of which the high court deemed "equally unattractive." *Id.* at 425. In this opinion, the Court rejected two previously imposed jurisprudential requirements (1) that the regulation had to be the "least restrictive means" of achieving said goal and (2) that a rational basis was a sufficient justification for such regulations. *Id.* at 417. The Court also discounted arguments that the regulation should be allowed to stand as a content neutral time, place and manner restriction. *Id.* Here, the Court held that the ban was clearly content-based, seeking to eliminate only those newsracks that held commercial publications. *Id.*

Relying on the same line of precedents, the high court struck down a Rhode Island regulation which disallowed alcohol distributors from advertising the sale process of liquor in *44 Liquormart, Inc. v. Rhode Island*, 517 U.S. 484 (1996). The alleged substantial state interest in the case was the promotion of temperance. Despite the fact that the State produced some evidence of the relationship between the advertisement of alcohol products and the problem it sought to solve, the Court held that the State failed to show that it had employed all other means of furthering temperance. The Court stated that a regulation of speech could not be allowed to stand if it regulated more speech than necessary to achieve its intended purpose. A complete ban of alcohol-related advertising was determined to be overly restrictive because the State could not produce direct evidence that a ban on this type of speech would produce a measurable improvement in the goal of promoting temperance. This case is also important because the opinion rejected past decisions where the Court had deferred to the government even when it had failed to prove compliance with *Central Hudson*. This is another key issue to be considered by regulators who seek to place restrictions on on-premise signage. Sign ordinances that do not provide evidence of compliance with *Central*

*Hudson* can potentially be invalidated.

In 2001, the tobacco industry sued the State of Massachusetts for regulations which limited the industry's ability to advertise its products within 1,000 feet of schools and playgrounds and required all indoor advertising of such advertisements at least five feet off the floor. *Lorillard Tobacco Co. v. Reilly*, 533 U.S. 525 (2001). While the Supreme Court agreed with the State's Attorney General that the interest advanced by the regulation was legitimate at least in the case of the restrictions barring advertising near schools and playgrounds, it ruled that the regulations failed to satisfy the fourth prong of the *Central Hudson* test. *Id.* Specifically, the Court held that the burden imposed on the speech was disproportionate to any benefit that might be received from implementing the regulation. *Id.* This decision is particularly important as it denotes a possible future shift in the level of scrutiny applied to on-premise sign ordinances, as was projected by the Court in *44 Liquormart*, shifting the applicable standard of review from intermediate to strict scrutiny in cases where signage regulations are content-specific. It is important to note that most sign codes are not limited to commercial signs, and thus they must comply with the noncommercial speech standards as well.

## Time, Place and Manner Regulations

Unfamiliar with the *Central Hudson* test, the planning community often seeks to regulate signage with the same approach allowable for the regulation of other constitutionally protected land uses, like adult entertainment. Familiar with *Renton v. Playtime Theatres*, 475 U.S. 41 (1986), cities seek to regulate signage using the "time, place, and manner" (TPM) test. This test is relevant to the regulation of signage. The TPM test is appropriately applied to ordinances which seek to regulate all types of signage in content and view-point-neutral fashion. In *United States v. O'Brien*, 391 U.S. 367 (1968), the Supreme Court held that content-neutral regulations on commercial communication are subject to intermediate level scrutiny which requires such a regulation to be narrowly tailored to further an "important governmental interest unrelated to the suppression of free speech and does not burden substantially more speech than necessary to further those interests." *Turner Broadcasting Corp. v. FCC*, 520 U.S. 180 (1997). The Supreme Court relied on this test



in its analysis of a sound amplification ordinance imposed by *Rock Against Racism* for a performance at an outdoor venue when it found that said ordinance sought to protect the community from a harm, i.e. noise pollution, “in a direct way.” *Ward v. Rock Against Racism*, 491 U.S. 781, 798 (1989). In *Turner*, the Court considered the evidence before it to determine if the regulation directly and materially advances the stated purpose, abandoning the generalized deference often associated with land use policies. This, coupled with the fact that most commercial signage regulations are also reviewed for compliance with the *Central Hudson* test in the case of as-applied challenges to sign regulations, places a new burden on localities to ground their sign codes in more than mere conjecture about traffic safety or aesthetics. In the future, the production of quantifiable evidence regarding these issues may be the only way that sign codes will survive such legal challenges.

## Sign Regulation and the Public Forum Doctrine

The land use designation of the property where a sign is posted is relevant to the discussion regarding the regulation of signage. Property may be public or private. Public property includes those lands held and used primarily for some governmental purposes. The government has the authority to allow, regulate or even ban the placement of signage on public property. In 1984, the Court reviewed the constitutionality of a Los Angeles Municipal Code provision which prohibited the posting of signs on public property in *City Council v. Taxpayers for Vincent*, 466 U.S. 789 (1984). The Court held that the regulation was a content-neutral and even-handed approach that accomplished the goal of improving the city’s aesthetic interest. *Id.* In this case, the Court found that sufficient channels of communication had been left open by allowing the posting of such signs on private property. *Id.*

A different set of principles governs the regulation of signage displayed in private forums as was demonstrated by the high court’s ruling in *City of Ladue v. Gilleo*, 512 U.S. 43 (1994). Privately owned properties such as residences and businesses make up private forums. *Ladue* involved the challenge of a city sign ordinance which effectively barred private residential property owners from displaying all signs on their properties.

The City of Ladue provided the same basis of justification for this ordinance as was offered in *Vincent* — an interest in reducing visual clutter. This ordinance was enforced against *Gilleo* for displaying a sign with an anti-war message in her window at her private residence. Here, the Court applied the time, place, and manner as this was a non-commercial speech case. The Court held that the ordinance went too far, finding that such interests could have been served by more temperate measures. *Id.*

The legal distinction between public and non-public forums must be fully understood by those who seek to regulate signage. Local governments may regulate the display of signs in public forums so long as they adhere to First Amendment jurisprudence. However, when it comes to non-public forums, the rational basis standard applies so long as viewpoint discrimination does not occur. See *Perry Education Assoc. v. Perry Local Educators’ Assoc.* 460 U.S. 37(1983). As such, sign codes which attempt to regulate on-premise commercial signs, as well as other sign types, on private property must meet the heightened level of scrutiny established by *Central Hudson* and the cases that followed it.

## Content v. Viewpoint Regulation

Local government officials can be confused by a distinction made by the Court between content and viewpoint-based regulations. Content-based regulations typically seek to limit all types of communication on an issue based on subject matter regardless of view-point. With respect to signs, content-based regulations include, for example, regulations which allow the display of electronic message centers but limit the moving copy to the inclusion of date, time, and temperature. Another example of a content-based sign regulation is a requirement that dictates the placement and removal of election signs within a certain time frame surrounding an election. The U.S. Supreme Court has not been called upon to consider these the constitutionality of these arguably content-based restrictions. As a general rule, content-based regulations may be permitted if they are adopted to control secondary effects of speech, not to suppress it. Little clarity exists on this issue beyond this general principle. While this issue is unresolved by the courts, localities may be well advised to revisit any provisions of their ordinances which restrict the content of certain sign types.

A regulation which seeks to ban all signs which incite violence against any member of a particular community is viewpoint-based because it does not seek to ban other signs which do not seek to incite said violence. A regulation, such as the one drafted by the City of St. Paul in *R.A.V. v. City of State Paul*, 505 U.S. 377 (1992), will be deemed viewpoint based and will only survive judicial review if it complies with the standards applicable to the highest level of scrutiny. In *R.A.V.*, the City drafted a Bias Motivated Crime Ordinance which sought to prohibit the display of symbols known to arouse “anger, alarm or resentment in others on the basis of race, color, creed, religion or gender.” *Id* at 377. The Court judged the ordinance to be facially-unconstitutional because it sought to prohibit speakers from expressing unpopular viewpoints. *Id.* The interest in this case, i.e. sending a message that the city does not condone hate speech or hate groups, was not deemed sufficient to justify the selective silencing of speech. While the Court agreed with the city on the principle that the ordinance served a compelling state interest, they suggested that “an ordinance not limited to the favored topics, for example, would have precisely the same beneficial effect” *Id.* at 396. Cities must tread lightly when seeking to regulate either the content or viewpoint displayed on signs.

## Signage Regulation and the Law of Amortization

Whenever the government seeks to require the removal of an on-premise sign, takings challenges come into play. Regulations which compel the removal of nonconforming signs often rise to the level of a compensable taking. Several recent state court rulings indicate that such takings can be expensive propositions (Claus, 2002). In *Caddy v. Hamilton County* (lower court case; no Westlaw cite), the jury awarded \$1.8 million to a business owner for the loss of on-premise signage when his property, including grandfathered signs, was taken via eminent domain proceedings (Claus, 2006). The jury awarded an additional \$1.3 million dollars in just compensation for the value of the condemned real property and building (Claus, 2006). According to Dr. Claus (2002, p. 74):

Thus the combined award gave the owner sufficient money to not only replace land and building, but also

protect the former income stream with funds, which, if prudently invested, would annually cover replacement advertising expenses without adversely affecting land sales.

To avoid having to compensate sign owners for takings, some municipalities have developed amortization strategies which permit the continued use of nonconforming signs for a period deemed long enough to allow the owner to fully depreciate the investment. This strategy has been deemed appropriate if the term of amortization is reasonable. Reasonableness determinations involve consideration of the following factors, including initial capital investment, life expectancy, salvage value, and extent of depreciation, among others. *Georgia Outdoor Advertising Inc. v. City of Waynesville*, 900 F.2d 783, 786 (4th Cir. 1990); *Major Media of the Southeast, Inc. v. City of Raleigh*, 792 F.2d 1269, 1274 (4th Cir. 1986). Such reasonableness determinations are becoming more difficult to prove due to the fact that these criteria fail to adequately reflect the true value of signs.

In *The Value of Signs*, Dr. Claus proposes an appraisal scheme, which he has employed with great success, to assist communities in understanding the real economic impacts of “taking” or amortizing signage (Claus, 2002). The Ohio Court of Appeals validated this approach in *City of Norwood v. Burton*, 164 Ohio App.3d 136 (2005), where Dr. Claus testified that the owner of a property next to a shopping mall was entitled to compensation for the loss of a sign in the amount of \$500,000 to replace the value of the sign based on mere visibility (the City of Norwood had offered approximately \$200,000). Damages awarded in such cases may exceed the value ascribed to visibility as some courts have also made cities pay damages to and the attorney’s fees of affected property owners on the grounds that their civil rights have been violated. See *Ballen v. City of Redmond*, 463 F.3d 1020 (WA 2006); *Outdoor Systems Inc. v. City of Mesa*, 997 F.2d 604 (AZ 1993); *Dimmitt v. City of Clearwater*, 782 F. Supp. 586 (M.D. FL 1991); *XXL of Ohio, Inc. v. City of Broadview Heights*, 341 F. Supp.2d 825 (N.D. OH 2004).

Because amortization is a costly proposition to both businesses that display signs and the communities which seek to remove them, the planning community should consider new ways to solve the problems they typically ascribe to nonconforming signage. One effective method for bringing out of date or

unsafe signage into compliance with new performance standards is for municipalities to adopt standards dealing with the abandonment of signs. Arguably, when a business closes and is not reopened by its original owner or a new enterprise for a substantial period of time, a sign has been abandoned. However, this approach is not foolproof. On-premise signs function primarily as speech. However, they are also an accessory land use tied to their physical location. Dr. Claus' appraisal approach could readily conclude that a temporarily unused sign located on a legally zoned commercial property adds value to that property and cannot be removed without compensation.

Egregious failure to maintain a sign to the point at which the sign becomes hazardous may also be viewed as abandonment. In such cases, it may be appropriate to require the replacement of out of date signage with new signs that comply with modern performance standards. In order to avoid takings challenges, communities must provide a clear definition of abandonment to ensure that this sort of provision is not employed in an arbitrary fashion.

In some instances the issue of non-conformity is solely due to communities having adopted highly restrictive ordinances that infringe on free speech rights pertaining to both commercial and non-commercial communications. In order to correct this problem, planners should modify sign ordinances to ensure that they are no more restrictive than necessary to serve the community's goals while enabling effective commercial speech. If localities do not change their approach to dealing with nonconforming signage, businesses may seek to retain and maintain non-conforming signs because the alternative, new code compliant signage, is too small and restricted to fulfill the primary purpose, commercial speech.

## Signage Regulation and Prior Restraint

Most cities require those who seek to display on-premise signs to obtain a license to do so prior to construction or display. Requiring such review prior to the installation of a sign is a form of "prior restraint." The prior restraint occurs as a result of the fact that the speaker is restrained from communicating his or her message until the regulator approves the speech. Despite this limitation on speech, prior restraints are legal

in certain circumstances so long as they comply with the safeguards established by the Supreme Court in *Freedman v. Maryland*, 380 U.S. 51 (1965).

In order to survive a prior restraint challenge, a sign code must employ the safeguards outlined by the Supreme Court in *Freedman v. Maryland*, 380 U.S. 51 (1965). These include:

1. The municipality must bear the burden of taking the denial to a judicial proceeding;
2. Bear the burden of persuasion at the judicial proceeding;
3. Limit any restraint prior to the judicial determination to a specified brief period of time; and
4. Guarantee a prompt judicial determination.

*Id.* at 62. The Supreme Court has relied on the prior restraint doctrine to invalidate sign ordinances which failed to include adequate procedural safeguards set forth in *Freedman. Grayned v. City of Rockford*, 408 U.S. 104 (1972); *Kolender v. Lawson*, 461 U.S. 352 (1983).

Vagueness and unbridled discretion are two related issues of concern in the context of sign regulation. A sign code will be considered vague if it fails establish clear requirements, or to set forth a clear process for obtaining permits to construct signs, a reasonable time period for decision making by the local zoning officer, and an adequate appeals procedure in the case a denial is issued. Generally, to survive a vagueness challenge "a statute must be sufficiently clear so as to allow persons of 'ordinary intelligence' a reasonable opportunity to know what is prohibited..." *Hoffman Estates v. The Flipside*, 455 U.S. 489, 498 (1982). The standard of review is heightened when the statute in question regulates speech which is protected by the First Amendment. In such cases, "an even greater degree of specificity and clarity of the law is required." *KEV, Inc. v. Kitsap County*, 793 F.2d 1053 (9th Cir. 1986).

A sign code may also fail to meet legal muster if it gives unbridled discretion to local decision makers. For example, a review process will be deemed unfair when the decision maker may pass on permits for signage or censor the content of the commercial communication due to the absence of objective standards for issuance of the permit or, in the alternative, the presence of standards that are not clear to



**Electronic Message Center Sign**

“ordinary people,” per the high court’s ruling in *Hoffman Estates*. *Hoffman Estates*, 455 U.S. at 498. Returning to the issue of specificity, modern sign codes must outline objective standards upon which the approval or denial of permits and variances will be issued to provide guidance to both applicant and decision maker.

## Federal Trademark Law

A short mention of federal trademark law is important to the discussion of sign regulation. The Federal Lanham Trademark Act, 15 U.S.C. §1051, et seq., was adopted by Congress in an effort to preserve and protect the integrity of federally registered names, marks, emblems, slogans, and colors. The Act specifically prohibits any unit of State or local government from requiring the alteration of such marks for display purposes. 15 U.S.C. §1121(b). This Act has prevented local governments from requiring businesses to

change their names. *Sambo’s of Ohio v. City Council of Toledo*, 466 F. Supp. 177 (N.D. Ohio 1979). The issue of color is a little less settled. While the 9th Circuit struck down an ordinance which attempted to require Blockbuster to use a color scheme that did not match its federally registered trademark in *Blockbuster Video Inc. & Video Update v. City of Tempe*, 141 F.3d 1295 (9th Cir. 1998), the 2nd Circuit issued a contrary opinion in *Lisa’s Party City, Inc. v. Town of Henrietta*, 185 F.3d 12 (2d Cir. 1999). This split in jurisprudence reflects a more important and unresolved matter that the Supreme Court could one day be called upon to resolve: Does the Lanham Act protect colors in trademarks used in signs? Whether regulating colors on signs is a content-based regulation or a time, place and manner regulation, is a First Amendment issue, which, to the best of the author’s knowledge has not been tested.

## Guiding Principles for the Development of a Model Sign Code

The need for well-built and attractive on-premise commercial signage is clear. Businesses that do not have adequate signage, or that the public considers run-down or unattractive, will fail to compete in the local marketplace, potentially contributing to the destabilization of the local economy. Localities, as such, have an important role in drafting sign codes which guide businesses to craft signage. In preparing such codes, localities must tread carefully so that such regulations do not impede on the constitutional protections guaranteed to commercial speech. Localities must not treat signs, commercial or non-commercial, like traditional land uses because signs are, in fact, speech and entitled to an evolving set of protections defined by the courts. Sign code drafters must move beyond efforts to draft codes on the basis of general notions of safety and aesthetics which have little or no scientific backing. The scientific community is accumulating a significant amount of signage and its relationship to public and traffic safety. The inclusion of empirical research in signage regulation will provide the necessary basis for regulations which might otherwise be deemed to abrogate the rights afforded to this medium of communication by the Constitution.

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# Sign Legibility Considerations for On-Premise Signs **Technical Report**



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# Technical and Scientific Issues Associated with the Regulation of On-Premise Signs

Signs are a communication device. They are intended to communicate particular information to the reader of a sign. This document is concerned with how on-premise signs communicate information about a business to the customers or potential customers of a business. The effectiveness of that communication can have a significant impact on the success, or lack thereof, of the business. Certainly, the communication of information through an on-premise sign has legal, economic, business, and social perspectives. But at the basic level, the ability of a sign to communicate information, apart from all of the issues related to content, aesthetics, and economics, is essentially a technical issue of visibility and readability. For a sign to communicate the content to a user in an effective manner, a sign must be readable in the viewing conditions. This means that it must also be visible. Readability and visibility can be, and have been to some extent, defined in scientific terms. This technical report describes the technical issues associated with the readability and visibility of on-premise signs and, where that information is not specific to on-premise signs, the readability and visibility of other types of signs. These technical issues are associated with specific physical sign characteristics such as sign size, content size, sign location, user/reader characteristics, viewing environment, and many other factors described in this technical report.

## Background Information

The need to address regulations for on-premise signs has grown as planners and local jurisdictions have increased the restrictiveness of sign ordinances. Many of the existing sign ordinances in place around the country are based primarily on preferences and opinions, as there is little in the way of quantitative and scientific research that fully addresses the various issues associated with these types of signs. However,

there is a great deal of research that addresses traffic signs, some of which can be transferred to business sign applications.

## Comparison Documents

Many different agencies have developed sign ordinances. As described in the legal report, some of these sign ordinances have been challenged in court and overturned. Others have proven to be acceptable. From a technical perspective, a document which provides substantial value is the *Manual on Uniform Traffic Control Devices* (MUTCD, 2003 and 2009), which is maintained by the Federal Highway Administration (FHWA). The current MUTCD is the 2009 edition, which includes an entire part on signs (MUTCD 2009). With respect to signs, the MUTCD addresses application/selection, design, installation, operation, and maintenance. Where it is appropriate, this report will reference information in the MUTCD that may relate to the technical issues to be included in a model sign ordinance. However, there are many differences between traffic signs and business signs. The most significant of these differences is the lack of consistency in the design elements of business signs. Business signs use a wide range of shapes, typefaces, layouts, colors, lighting, and sizes to communicate the desired information while traffic signs are limited to specific type faces, shapes, sizes, and colors. It is this level of restriction on traffic signs that provide the ability to define with great precision the application, design, and installation of traffic signs. It is also what makes it sometimes challenging to transfer research findings from the traffic sign environment to the business sign environment.

Section 1A.02 of the MUTCD identifies five basic principles of traffic control devices. The critical content of this section is presented in Figure 1. Each of these basic principles — fulfill

a need, command attention, convey a clear, simple meaning, command respect from road users, and give adequate time for proper response — lead to specific measurable criteria for a sign that affect its design and placement. Some of the critical design criteria associated with traffic signs that may help to define on-premise sign criteria are listed in Figure 2.

**Section 1A.02**  
**Principles of Traffic Control Devices**

**Support:**  
 This Manual contains the basic principles that govern the design and use of traffic control devices for all streets and highways open to public travel regardless of type or class or the public agency having jurisdiction. This Manual's text specifies the restriction on the use of a device if it is intended for limited application or for a specific system. It is important that these principles be given primary consideration in the selection and application of each device.

**Guidance:**  
 To be effective, a traffic control device should meet five basic requirements:

- A. Fulfill a need;
- B. Command attention;
- C. Convey a clear, simple meaning;
- D. Command respect from road users; and
- E. Give adequate time for proper response.

Design, placement, operation, maintenance, and uniformity are aspects that should be carefully considered in order to maximize the ability of a traffic control device to meet the five requirements listed in the previous paragraph. Vehicle speed should be carefully considered as an element that governs the design, operation, placement, and location of various traffic control devices.

Figure 1. Traffic Control Devices Principles from the MUTCD

## Purpose and Objectives of On-Premise Signs

On-premise signs are intended to inform customers and potential customers of a business of a myriad of information about that business. An on-premise sign may identify the business and its location. It may give information about the business such as hours, special sales/events, and directions. It almost always serves as a branding tool for the business, regardless of whether the reader is currently considering a transaction or is just subconsciously noticing the business. To be effective,

a sign ordinance should focus on the physical and measurable aspects of the sign and its environment. Defining the minimum physical characteristics of these features for the model ordinance means that the purposes and objectives of an on-premise sign must be defined as a function of factors such as the viewers (users) of the sign, the environment it is viewed from (road/sidewalk, speed, lighting), and the intended action associated with the sign (stop, turn, other maneuver).

- **Letter size:** For ground mounted guide signs, letters shall be at least 6 inches for capital or upper-case letters and at least 4.5 inches for lower-case letters. On roads with speeds of 25 mph or less, the minimum letter size can be reduced from 6 to 4 inches. (Section 2D.06) On multi-lane roads with speeds of 40 mph and higher, the upper-case letter height should be at least 8 inches. (Section 2D.43)
- **Sign size:** Sign sizes are prescribed based on the roadway classification and type of sign.
- **Typeface:** All lettering shall be in capital letters except street name signs and destinations on guide signs are required (for new signs) to be a combination of initial upper-case letters and lower-case letters. (Section 2A.13)
- **Height:** At least 5 ft to the bottom of the sign in rural districts, 7 ft where parking or pedestrian movements occur (urban districts). (Section 2A.18)
- **Offset from road:** At least 12 ft from the edge of the traveled way and at least 6 ft from the edge of the shoulder. All sign supports should be located as far as practical from the edge of the shoulder. (Section 2A.19)
- **Orientation:** Signs should be vertically mounted at right angles to the direction of traffic. (Section 2A.20)
- **Sign spacing:** Signs requiring different decisions by road users shall be spaced sufficiently far apart for the required decision to be made safely. Overloading road users with too much information is not desirable. (Section 2A.16)
- **Legibility Index:** Lettering should be large enough to provide the necessary legibility distance. A legibility index of 30 ft/in should be used. (Section 2A.13).
- **Luminance:** All signs shall be retroreflective. There are minimum retroreflectivity levels for maintaining traffic signs (Section 2A.08).
- **Sign message:** Wording shall be as provided in the MUTCD. Only symbols shown in the MUTCD shall be used. (Section 2A.06)

Figure 2. Selected Traffic Sign Design Criteria from the 2009 MUTCD



## Sign Ordinance Regulation

In order to develop the technical criteria that can be used to define the measurable characteristics of an on-premise sign, it is necessary to first develop a list of what the possible characteristics are. Table 1 presents a partial list of characteristics that affect sign effectiveness and that might be serve as design criteria in a sign ordinance or might be used in a sign ordinance to establish the design criteria.

Sign Characteristics
<ul style="list-style-type: none"> <li>Type/style of sign</li> <li>Overall size</li> <li>Shape of sign</li> <li>Size of content</li> <li>Style of content</li> <li>Color of content</li> <li>Material composition</li> <li>Lighting/illumination</li> </ul>
Location Characteristics
<ul style="list-style-type: none"> <li>Offset from viewing location</li> <li>Distance from viewing location</li> <li>Height from viewing location</li> <li>Orientation relative to viewing location</li> </ul>
Environment Characteristics
<ul style="list-style-type: none"> <li>Characteristics of viewing background</li> <li>Characteristics of reader/user</li> <li>Travel speed of reader/user</li> <li>Time of day</li> <li>Information processing demands</li> <li>Competition for attention</li> </ul>
Note: characteristics are not in any particular order.

Table 1. Characteristics Related to On-Premise Sign Effectiveness

## Technical Issues of Sign Visibility

To be visible, an object must provide minimum performance with respect to four characteristics. It must be of adequate size, of adequate luminance, of adequate contrast, and properly located. If minimum threshold conditions are not met for

any one of these factors, then an object is not likely to be visible to the viewer. These factors are also interactive, meaning that the minimum characteristic for any one factor is dependent upon the existing performance level for the other three. Critical aspects for each of these factors are addressed in the following sections along with findings of selected previous research that gives some insight into the threshold conditions associated with each factor.

## Size

The focal point of a sign is the message within the sign. For the message to be visible, it must encompass a visual arc large enough to be discernible by the eye. As applied to reading text at a distance, the human arc can distinguish a stroke width (SW) of 1 minute and a letter height (Ht) of 5 minutes for someone with 20/20 vision. For 20/40 vision, the respective values are 2 minutes and 10 minutes. Figure 3 illustrates the concept of the visual arc. Equation 1 provides the formula that defines the relationship between these elements.

$$\tan(\theta) = \frac{\text{Height}}{\text{Distance}}$$

Equation 1. Sign Visibility

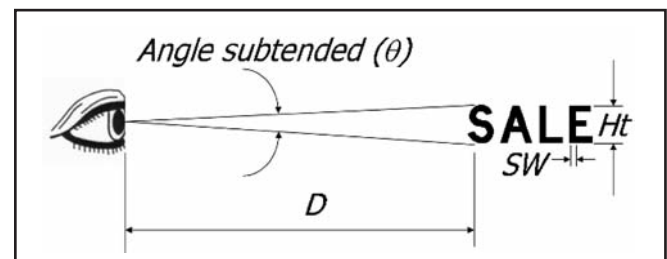


Figure 3. Concept of Visual Arc

By combining Equation 1 with the threshold criteria for visual angle, it is possible to establish a legibility index for observers of various visual acuities. For 20/20 vision (5 minute arc for letter height), the corresponding legibility index is 57.3 feet per inch of letter height (ft/in). For 20/40 vision, the legibility index is 28.6 ft/in. Table 2 indicates the legibility index associated with various Snellen visual acuities using Equation 1. These values are consistent with traditional rules of thumb for the legibility of traffic signs.

Snellen Visual Acuity	Visual Angle of Letter (minutes)	Legibility Index (ft/in)
20/10	2.5	114.6
20/20	5.0	57.3
20/30	7.5	38.2
20/40	10.0	28.6
20/50	12.5	22.9
20/60	15.0	19.1

**Table 2. Legibility Indices for Visual Acuity**

In 1939, Forbes et al. conducted the pioneering research on traffic sign legibility and established a legibility index of 50 ft/in (Forbes 1939). This served as the rule of thumb for traffic engineering until the late 1980s, when concerns about the visual abilities of older drivers become more prevalent. One of the first significant research publications addressing older drivers suggested that a legibility index of 25 or 30 ft/in was more appropriate for older drivers (Special Report 218). The MUTCD states that signs should be designed using a legibility index of 30 ft/in (MUTCD 2009).

It is worth noting that these legibility indexes are associated with a sans serif letter style with a height to stroke width ratio of about 5:1, which is consistent with that of the common letter style used in traffic signs. The 50 ft/in legibility index that Forbes established for traffic signs applied to the Series D font (see typeface in the secondary issues section). A letter style with a larger height to stroke width ratio (skinnier letter) will be less visible. This technical report addresses the impact of letter style on legibility in a later section.

Another critical element associate with the legibility index is whether the stimulus is a known or unknown stimulus. Someone looking for a specific message in a sign will be able to identify the message at a further distance than if they were trying to read a sign message that is unknown to them. Other research by Forbes compared the legibility of known and unknown messages (Forbes 1951). In his experiment, Forbes found that the legibility index for words that the subject was looking for was 10-13 percent further than that for words that the subject had no prior knowledge of. Researchers at the Texas Transportation Institute also evaluated legibility for known versus unknown sign messages and found that, in

daytime conditions, the known message could be read at about 75 percent of the distance of the unknown message (Hawkins et al. 1999). The issue of a known versus unknown message is closely related to the issue of the time required to process the information and complete an appropriate response. Reading time issues are addressed later in this document.

In most states, a minimum visual acuity of 20/40 is typically required to obtain or renew a driver license. This equates to a legibility index of about 29 ft/in. In comparison, the MUTCD recommends a legibility index of 40 ft/in. Given that on-premise signs use a range of design characteristics that may reduce legibility to a level less than that used with traffic signs, a legibility index of 30 ft/in would be appropriate for use in a model sign ordinance and would address a wide range of users, sign characteristics, and viewing conditions.

Of all the factors affecting legibility, size has the greatest impact. The sign message must have adequate size first. Legibility of a sign message of inadequate size cannot be significantly improved by increasing the luminance or contrast. From a relative standpoint, an increase of a given percentage in message height will result in a greater legibility improvement than an equal percentage increase in luminance or contrast.

## Luminance

In addition to size, a sign must also be bright enough to be seen. Luminance is the technical term used to define the brightness of a sign. Sign luminance for a static sign is provided through one of the following: ambient lighting (sun or other lighting not related to the sign), external sign lighting (lighting located on the outside of the sign intended specifically to make a sign visible at night), internal sign lighting (lighting within the sign interior that makes it visible at night), or retroreflectivity (the ability to reflect light from a source back toward the source). Sign luminance is largely a night-time issue as the ambient lighting associated with daytime viewing conditions is such that signs do not need to provide additional luminance through internal/external lighting or retroreflectivity. There is a wide range of research and guidance on the luminance levels that should be provided in signs, but most of the actual research has been associated with traffic signs. With respect to on-premise signs, the Signage Sourcebook presents a good summary of guidelines for luminance.

There are three issues related to the quantity of luminance produced by a sign. The first is that a sign must have sufficient luminance to be visible/legible to the intended users. This generally implies a minimum luminance that must be provided. At the other end of the luminance spectrum is a maximum level of luminance that would limit factors such as sky glow, light trespass on adjacent property, or glare, which are collectively referred to as light pollution. Each of these is addressed separately, along with issues related to luminance measurement.

The term “Illuminance” is also a frequently used lighting measurement. It is “a term that quantifies light striking a surface or plane at a point. Illuminance is generally used as the measurement associated with light pollution.

### Luminance Measurement

Currently there is no guideline specifying a standardized measurement method for luminance or illuminance of business signs (Garvey 2004). To isolate an individual sign in the open field, Garvey (2004) suggested that luminance be measured at a distance of 550 ft (using a 20-min of arc aperture luminance meter) with the meter placed toward the sign face, and be converted into illuminance at a distance of 16.4ft from the on-premise sign.

### Minimum Luminance for Legibility

The luminance (or brightness) of a message also has an impact on the visibility of the message. The brighter the message, the easier it is to read. Furthermore, there is a relationship between luminance and size. Carlson and Hawkins found the results shown in Figure 4 (Carlson and Hawkins). The overhead sign results are based on a Series E(Modified) legend with 16 inch upper case letters and 12 inch lower case letters. The street name sign results are based on a Series C 6 inch upper case letter. As can be seen from these plots, a sign legend that has a higher luminance can be read by a higher percentage of drivers. Another interesting aspect of these plots is that, although they are based on signs with different letter heights and designs, the results are almost identical when compared on the basis of the legibility index.

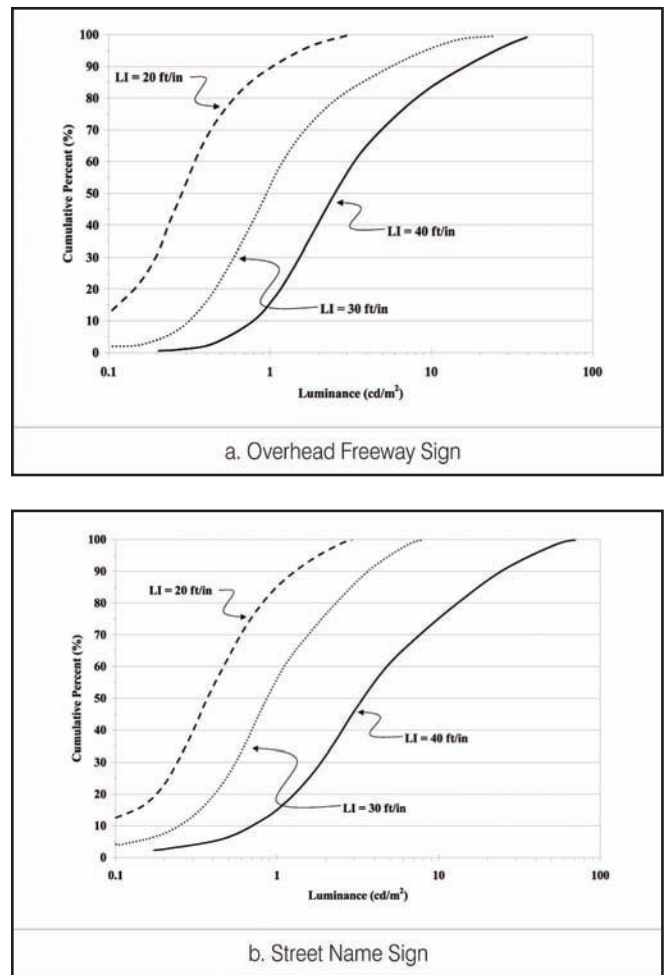


Figure 4. Impact of Luminance on Legibility Index (Carlson and Hawkins)

A recent study (Garvey, Pietrucha and Cruzado 2008) compared the daytime and nighttime visibility of internally illuminated on-premise signs with seven different levels of lighting. A lighting level defined as the “industry standard,” a value which represent 99 percent of all internally illuminated, on-premise signs installed across the U.S., represented the middle lighting condition. There were three levels higher and three levels lower than the base condition so as to examine the recognition and legibility distances under different sign luminance levels for nighttime signs. The signs also represented a range of colors, contrast orientation (positive/negative), and contrast levels. Major findings from this study are listed below:

- Different combinations of colors yield different visibility. Signs with black letters on a white background have the best visibility and signs with yellow letters on a green background have the worst visibility.

- At the worst nighttime lighting condition (40 percent of the base brightness level), daytime signs were 43 percent more legible and 40 percent more recognizable than nighttime signs; at the best lighting conditions, daytime signs were 13 percent more legible (at industrial standard nighttime brightness level) and 20 percent more recognizable (at 1.75 times of the base brightness level) than nighttime signs.
- There is a peak in both legibility distance and recognition distance as function of sign brightness. In the study, the maximum legibility distance was reached at the base level and the maximum recognition distance was reached at 1.75 times brighter than the base level.
- The researchers did not recommend a specific level of luminance (minimum or maximum) for internally illuminated signs, but the optimal performance (associated with the base lighting level) had a luminance level of 660 cd/m<sup>2</sup> for the white portion of the experimental signs (lower luminance levels for other colors).

Insofar as their study was concerned, the optimal luminance level of internally illuminated on-premise sign was suggested at the base level. However, the nighttime ambient lighting environment and driver characteristics in the test site of this study might not represent all nighttime conditions in which on-premise signs are installed, thus the visibility obtained in this study at certain luminance level will not necessarily be the same in different cases.

For externally illuminated signs, there is very limited scientific information regarding on-premise signs and external lighting design and maintenance, such as the location of the luminaire, illuminance level, or the retroreflectivity requirement of the sign face. In one study concerning the lighting design of this type of signs, a set of two 150-watt flood lamps were mounted 7 ft in front of and 7 ft behind the center of the signs (Garvey, Ramaswamy, Ghebrial, De la Riva, Pietrucha, 2004). They found that internally illuminated signs provided superior legibility distances compared to externally illuminated signs with lighting designed to match that of the internally illuminated signs. However, their research did not give luminance levels associated with the signs.

In spite of the factors affecting the visibility of internally and externally illuminated on-premise signs, there are studies concerning the relative performance of internally and externally illuminated signs under controlled test environment (Garvey, Ramaswamy, Ghebrial, De la Riva, Pietrucha, 2004)

and real open road (Garvey, Pietrucha, Damin, and Deptuch, 2009). The most relevant findings from both studies to on-premise sign ordinance are summarized in the following list:

- Gender and age do not have significant effect on the visibility distance of both types of on-premise signs. Visibility of daytime signs is better than nighttime signs for both internal and external illumination conditions.
- The degradation of the external lighting facility exacerbates the difference between the performances of the two types of signs. The degree of nighttime visibility improvement by internal illumination compared to external illumination is associated with the increased luminance level.

There are many factors that impact the optimal luminance level for an on-premise sign, more than can be conveniently addressed in a model sign ordinance. There are both minimum and maximum limits on sign luminance that should be followed for a sign to be legible. Even if luminance levels were to be selected as a measure-of-effectiveness, the resulting ranges of luminance outputs as a function of color of on-premise signs would be wide: 550~760 cd/m<sup>2</sup> for white/black signs, 30~187 cd/m<sup>2</sup> for green color and for 150~520 cd/m<sup>2</sup> for yellow color, 80~130 cd/m<sup>2</sup> for gold color etc. (Garvey, Pietrucha and Cruzado 2008, Garvey, Pietrucha, Damin, and Deptuch, 2009).

As there is little research addressing the minimum luminance levels of on-premise signs, this document presents information related to luminance levels for traffic signs for possible application into on-premise signs. A 1984 review of nighttime visibility research for overhead freeway signs found the points listed below (Gordon 1984). It is worth noting that these findings relate to overhead freeway traffic signs, where the luminance was provided through retroreflectivity.

- A white legend of 3.4 cd/m<sup>2</sup> should be taken as the lower limit of permitted sign luminance. Below this level, legibility rapidly decreases.
- While 3.4 cd/m<sup>2</sup> should be considered a minimum, 340 cd/m<sup>2</sup> should be the upper limit. Optimal legend luminance under most highway conditions is between 34 and 102 cd/m<sup>2</sup>. A dark surround permits the use of lower legend luminance.
- Under high surround illumination conditions, legend-background luminance ratios as low as 4:1 will provide satisfactory visibility. Under low ambient illuminations conditions, where the sign background is almost black, the specific legend luminance is more meaningful than one of contrast.

The third bullet point illustrates a key aspect of establishing luminance levels. The optimal luminance level is closely related to the environment in which a sign is viewed. A sign in a dark rural environment can be read with lower luminance than one in a brightly lit urban environment. Furthermore, since most on-premise signs are illuminated internally, it is possible to provide much higher luminance levels than can be achieved with traffic signs.

In 1986, Mace et al. provided an excellent literature summary based on the determination of minimum brightness standards for sign legibility (Mace et al. 1986). The findings related to minimum luminance requirements for legibility (MLRL) for overhead signs were:

- MLRL increase as the ratio of letter stroke width to letter height decreases.
- MLRL increase as the level of internal contrast decreases.
- The published data are inconsistent on the effect of sign luminance and surround luminance.
- MLRL are not influenced by glare, unless the glare source is very bright and immediately adjacent to the sign.
- MLRL increase with observer age.

In an effort documented in 1985, Schmidt-Clausen reported on minimum luminance levels needed for sufficient and optimal performance (Transportation Research Circular 297). The investigation was carried out on a scale model and compared to those values found in real-world situations. The study showed that a legend luminance of 3.5 to 10 cd/m<sup>2</sup> is sufficient. Luminance values between 10 and 35 cd/m<sup>2</sup> are optimal. The maximum luminance was determined to be about 60 cd/m<sup>2</sup>.

The actual value of the minimum and maximum luminance depends upon the level of critical detail in a sign, the contrast ratios, the level of ambient lighting, and the visual complexity of the viewing background. As indicated in the technical report, there is general agreement that 3.4 cd/m<sup>2</sup> is the absolute minimum luminance for a white sign legend. Luminance levels between 34 and 1 cd/m<sup>2</sup> are optimal, and the maximum luminance is 340 cd/m<sup>2</sup>. These luminance levels are for a white legend on a traffic sign, which uses positive contrast (light legend on a darker background). In comparison, on-premise signs often use a wider range of colors for the sign legend and background. In addition, many on-premise signs are internally illuminated, which is not a common practice for traffic signs.

The ability to transfer research findings from traffic sign research is somewhat limited due to the wider range of letter

forms, colors, sign layouts, and illumination technologies and levels associated with on-premise signs. However, the information for traffic signs provides a valuable comparison for sign legibility performance.

This report does not recommend that illuminance be a major criterion in regulating sign lighting design. Illuminance level varies with distance from the lighting source and depends on the type of and power output of the lighting facility. Furthermore, there are no standardized methods or equipment for measuring illuminance of on-premise signs that will exclude the impact of ambient lighting (Garvey 2004). Furthermore, this report recommends that luminance levels for static signs be based on legibility needs. There is currently insufficient scientific evidence to establish maximum luminance levels for on-premise static signs.

## Contrast

In addition to size and luminance, a message must also possess sufficient contrast with the background to be visible. According to Olson, contrast is defined as characteristics of a scene that cause an object to appear distinct from its background. At higher levels of illumination, contrast can be provided by such things as differences in color, pattern, shading, texture, and brightness. At night, generally only brightness contrast is available (Olson 1996).

The concept of contrast is best illustrated in Figure 5. In this figure, the color of the word “contrast” is the same shade of gray for the entire word. However, the shade of the background changes from a light gray to near black. As a result, the letter “R” is not visible due to a lack of contrast between the word and the background. Furthermore, the visibility of the first and last parts of the word has different characteristics. In the first part of the word, the object is darker than the background; this is referred to as negative contrast. In the last part of the word, the object is brighter than the background; this is referred to as positive contrast. The minimum design criteria for sign visibility can depend upon whether the sign message is presented with positive or negative contrast.



Figure 5. Example of Contrast

There are multiple contrast issues that affect sign visibility. The ability to see a sign (conspicuity) depends upon the external contrast between the sign and the background (viewing environment). The ability to read the sign depends upon the internal contrast between the sign copy and sign background. Generally, contrast is expressed as a ratio of the internal and external luminance as shown in Equation 2.

$$\text{Contrast Ratio} = \frac{\text{Luminance}_{\text{high}}}{\text{Luminance}_{\text{low}}}$$

**Equation 2. Contrast Ration Equation**

For fully reflectorized signs with almost no background complexity (i.e., values up to 0.4 cd/m<sup>2</sup>), Sivak and Olson recommend a contrast ratio of 12:1 for optimal performance (Sivak and Olson 1985). For background complexity greater than 0.4 cd/m<sup>2</sup>, the retroreflectivity needs and corresponding contrast ratio become dependent on the amount of background complexity. The values reported in their literature review range from 3:1 to 45:1. Other reported minimum contrast ratios for white on green signs have ranged from 3.3 to 7:1 (Mace et al. 1986). The Australian research recommends a value of 3:1 (Jenkins 1991). However, their guidelines call for a minimum of 7:1 but prefer 10:1 (Guide to Traffic Engineering Practices 1988).

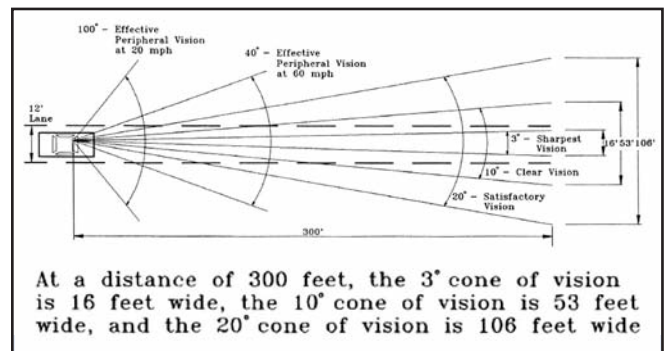
A 1988 report examining fully retroreflective signs suggested a contrast ratio range from 4:1 to 15:1 as appropriate for most conditions (Special Report 218). For example, if the luminance of the green background is 5 cd/m<sup>2</sup>, the luminance of the legend should be at least 20 cd/m<sup>2</sup>. Lower contrast ratios reduce legibility and may not be acceptable, and contrast ratios as high as 50:1 may reduce legibility but could be quite adequate under certain conditions. The Signage Sourcebook indicates that a contrast range of 4:1 to 15:1 is appropriate for most conditions (Signage Sourcebook 2003).

The current draft of the model ordinance indicates that the contrast ratio shall be between 4:1 and 15:1. This is an acceptable typical range for most conditions. As indicated in the technical report, there is research to suggest that contrast ratios as high as 50:1 may be adequate, but only under certain situations. With respect to the model sign ordinance, it would probably be appropriate to provide a mechanism where a variance can be obtained for signs that have contrast ratios greater than 15:1.

## Location

Finally, a sign with adequate size, luminance, and contrast serves no purpose and cannot be read if it is located where it is not visible to the viewer. There are many aspects to on-premise sign location. Unlike traffic signs, on-premise signs are not typically located close to the edge of the road. They must be placed on private property behind the right-of-way line. In addition to the offset from the road, they may be placed at a range of heights above the road. Finally, the orientation of the sign with respect to the viewing direction may affect its visibility.

A person's sharpest vision occurs when they are looking directly ahead. As a stimulus moves away from the visual axis, it is more difficult for the observer to detect and read the stimulus. This ability to see and read a sign is illustrated in Figure 6, which shows that the clearest vision occurs within a 3 degree cone centered on the visual axis (Texas Highway Operations Manual 1992). Clear vision occurs within a 10 degree cone, satisfactory vision within a 20 degree cone. For reading purposes, the visual field is 10 degrees or less. A driver's ability to observe and react to a sign outside the cone of vision drops rapidly outside this limit.



**Figure 6. Visual Field**

However, objects outside the cone of vision can be detected in peripheral vision. When stationary, peripheral vision is almost 180 degrees. As speed increases, the driver's ability to detect objects at the limits of peripheral vision decreases as indicated in Figure 6. The ability to detect a sign is related to the sign luminance and any motion in the sign. Figure 7 illustrates the visual acuity associated with an object in the periphery and the luminance level (Olson 1996). In this figure, 20/20 acuity is represented by 1.0 and 20/40 acuity is represented by 0.5.

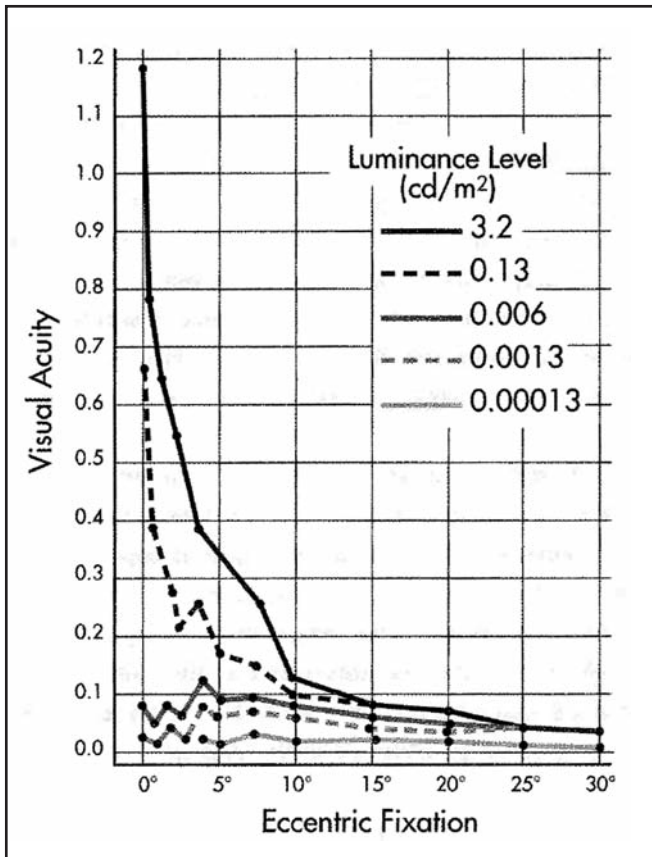


Figure 7. Relation between Eccentric Fixation and Acuity

## Sign Viewing Angle (Parallel Sign Placement)

Research by (Griffin and Bailey 2002) produced the relationship shown in Figure 8. This figure indicates that the relationship between the viewing angle and the legibility efficiency is not significantly affected until the angle to the traffic flow is

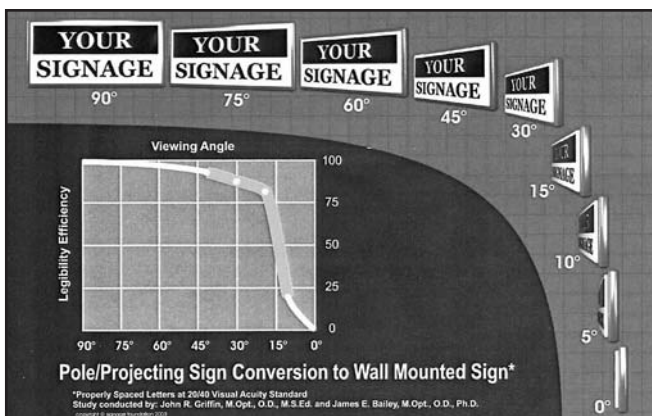


Figure 8. Legibility Efficiency and Viewing Angle

approximately 20 degrees. At an angle of about 10 degrees, the legibility efficiency is about 20 percent. These relationships indicate that the letter height does not need to be adjusted as long as the sign is oriented at an angle of 20 degrees or greater to the direction of traffic flow. However, this study also found that at the same observation angle of 30°, doubling letter height along with larger letter spacing, the amount of correctly read sign letters increased to 85 percent from 25 percent when letter height was small and letter spacing was tight. This implies that parallel sign legibility could be improved by increasing letter height and letter spacing between words/letters. At the same viewing distance and using 75 percent correct criterion, the viewing angle of a sign with crowded letters was suggested to be increased by 15 degrees over that of the sign with uncrowded letters.

Research (Garvey, Zineddin, Porter, and Pietrucha, 2002) found that increasing the size of a parallel sign did not significantly increase the probability of it being detected. In that study, researchers measured the detectability and legibility of perpendicular and parallel signs. The parallel signs were two and three times the size of the perpendicular signs. The percentage of parallel signs that were not detected was significantly greater than for the perpendicular signs, even though the parallel signs were much bigger. This implies that increasing the size of the parallel signs cannot overcome the deficiency associated with orientation to the direction of traffic flow. Accordingly, the team believes that it is not appropriate to only adjust the letter height for parallel signs at this time. Instead, business owners and governing officials need to recognize the penalties associated with orienting a sign parallel to the direction of traffic flow.

More recent research (Garvey 2006) on parallel signage issue develop a mathematical model for determining letter heights on parallel sign taking account of optimal observation angle and sign reading speed. In his model, the optimal observation angle was assumed to be 30°, resulting in a 30-60-90° triangle that the lateral sign offset from the line of sight is half the maximum legible distance. To optimize sign reading speed to minimize driver distraction, the critical letter height proving the optimal reading speed was assumed to be three times of minimum legible letter height of perpendicular sign. That is, if 30 ft/in legible index is the size threshold for perpendicular sign, 10-ft/in legible index is used for parallel sign. Two equa-

tions were provided to calculate the letter height for parallel sign, and a lookup table is also available from this study.

**Equation #1:**  $LH = (LN * 10 + LO) / 5$

**Equation #2:**  $LH = (LN * 10 + LO) / (LI/6)$

where:

LH is letter height in inches.

LN is the number of lanes of traffic.

LO is the lateral offset from curb in feet.

LI is the legibility index from Table 4.

Illumination	Letter Style	Letter Color	Backgrd Color	Legibility Index	
				Mixed Case	All Caps
External	Helvetica	Black	White	29	25
		Yellow	Green	26	22
		White	Black	26	22
	Clarendon	Black	White	28	24
		Yellow	Green	31	26
		White	Black	24	20
Internal Translucent	Helvetica	Black	White	29	25
		Yellow	Green	37	31
	Clarendon	Black	White	31	26
		Yellow	Green	37	31
Internal Opaque	Helvetica	White	Black	34	29
		Yellow	Green	37	31
	Clarendon	White	Black	26	30
		Yellow	Green	37	28
Neon	Helvetica	Red	Black	29	25
		White	Black	38	32

**Table 4. Parallel Sign Letter Index Selection Table**

A more efficient way of improving parallel sign conspicuity might be providing optimal intercharacter spacing or an optimal combination of spacing and letter height. But such quantitative requirement on letter spacing or combination of spacing and letter height needs to be identified through further research.

## Technical Implications Associated with a Model Sign Ordinance

It is not possible to succinctly describe all of the previous visibility research and related technical issues that might be used in the development of a model sign ordinance. In part, this is due to the fact that there are a multitude of approaches to the structure of a model sign ordinance, depending upon the desired framework of the ordinance. The following points define a starting point for the technical structure of the model ordinance.

### *Physical sign characteristics that should be addressed in a model ordinance include:*

- **Minimum content size.** The minimum size of the text and/or symbol in the sign as a function of road speed and the position of the sign relative to the target viewing location. The minimum size may be defined in terms of critical detail, minimum stroke width, minimum letter height, or minimum size of viewing arc. It may be appropriate to have adjustments to the minimum size if the message characteristics are below some threshold condition (such as a script font).
- **Amount of information.** In order to establish controls on the size of signs, it may also be appropriate to define the amount of information that can be presented in a sign. The amount of information defines the length of time required to read the sign. The more information presented, the further away the sign must be read, increasing the minimum size of the sign.
- **Minimum luminance.** This would apply only to signs that are internally or externally illuminated. Internal or external illumination should be required only for those signs that are intended for viewing at night.
- **Minimum contrast.** This would establish a minimum contrast level that is based on the luminance differences within a sign.
- **Orientation to roadway.** The orientation of a sign to the viewing direction affects its legibility. As the orientation angle increases, the size of sign features also need to increase to maintain the same degree of legibility.

### *Environmental factors that should be addressed in the model ordinance include:*

- **Intended viewer.** To define sign characteristics, it is necessary to first establish the intended viewing conditions for the sign. This primarily is a decision on whether the critical observer is a driver or a pedestrian.



- **Road characteristics.** For signs intended to be viewed from a moving vehicle, the road speed and number of lanes affect the reading time, viewing distance, and required maneuver.

**Other on-premise sign elements which could be in a model sign ordinance could include:**

- **Sign type.** There are many types of signs including monument, pole, wall, projecting, roof, etc.
- **Maximum sign size and maximum content size.** From a technical perspective, the larger a sign or the content is, the more visible it becomes. The authors recognize that a local jurisdiction may want to establish a maximum size for signs and/or sign content. However, doing so is a policy issue and beyond the scope of a technical review.
- **Relation to other signs.** The amount of information present in the visual field has an impact on the search and identify abilities of drivers. In an environment with a large number of brightly lit signs, a driver will have more difficulty identifying a particular sign. However, establishing limits on the number of signs that can be placed in an area presents legal issues that are beyond the technical issues of conspicuity and legibility.
- **Typeface issues.** It is not possible to restrict typefaces to only those that are approved by a jurisdiction. Furthermore, the purpose of the ordinance should not be to define sign design to the level of detail that determines whether a sign is effective. The business owner and sign fabricator have a responsibility to design a sign that is as effective as possible with the general constraints established by the sign ordinance. In addition to the typeface, the model ordinance will not address letter spacing or the amount of white space that a sign is required to have.

## Determining Letter Height and Sign Size for On Premise Signs

The minimum sign size charts are based on several research studies and findings conducted by the Pennsylvania State University. The PSU recommendations are contained in a document entitled “*On Premise Signs: United States Sign Council Best Practices Standards. A Research Based Approach to Sign Size, Sign Legibility, Sign Height*” (Bertucci, et. al 2003). This document contains guidelines for calculating the following on-premise sign factors:

- Letter height as a function of Viewer Reaction Distance (VRD) and Legibility Index (LI).
- Sign size as a function of copy area.
- Sign height as a function of blocked sight distance.

The USSC document does not distinguish between different types of signs, such as wall signs, ground signs, roof signs, or projecting signs. Nor does the best practices document present the information in tables that would be simple to apply to a variety of conditions. The USSC best practice document indicates that the sign recommendations are based on a series of USSC research reports prepared by the Pennsylvania Transportation Institute. In defining the best practices, the document does not indicate the specific research results that the recommendations are based upon.

Using a combination of the recommendations contained in the Urban Design Associates technical report and the USSC best practices guide, the team recommends the following guidelines for developing minimum dimensions for letter height and overall sign size.

## BASIS FOR CALCULATING LETTER HEIGHT

The minimum letter height required for sign legibility is a function of the distance at which the sign must be read. In turn, this distance is a function of the amount of content in the sign, the speed of the vehicle as the driver reads the sign, and the legibility index of the sign copy. Equation 3 presents the basic formula for calculating letter height. Figure 9 illustrates the application of the formula to a road situation.

$$LH = \frac{\sqrt{(LN \times 12 - 6 + LO)^2 + (1.47 \times SL \times VRT)^2}}{LI}$$

**LH** = Letter height for signs oriented perpendicular to traffic flow, inches.  
**LN** = Total number of lanes on the roadway, including the median or two-way left turn lane if present. If the two-way left turn lane or median is wider than 12 ft, then the distance should be increased to account for the wider median.  
**LO** = Lateral offset to the center of the sign from the edge of the roadway, feet.  
**SL** = Roadway speed limit, mph.  
**VRT** = Viewer Reaction Time, seconds  
**LI** = Legibility index, ft/in. The recommended legibility index is 30 ft/in.

Equation 3

In Figure 9, the line from the vehicle to the sign represents the hypotenuse of a triangle. One leg of the triangle is the distance from the vehicle to the sign perpendicular to the roadway (LN 12-6+LO in the formula) and the other leg of the triangle is the distance parallel to the traffic flow direction (1.47 SL VRT in the formula). Squaring each leg and taking the square root of the sum gives the direct line-of-sight between the vehicle and the sign.

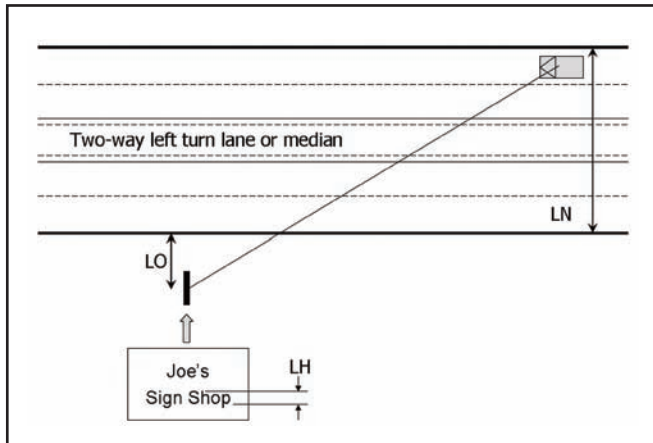


Figure 9. Road Layout

The other factors that are needed to calculate letter height are the speed limit of the roadway, the Viewer Reaction Time, and the Legibility Index of the sign. The roadway speed limit is established by the local jurisdiction. The VRT is determined from Table 5 and is a function of the amount of information in the sign and the complexity of the environment in which the sign is located. One of the weaknesses of this VRT procedure is that the message scan time is based on a per word or per symbol quantity. This is not consistent with reading research. The body of knowledge on information processing typically addresses processing time as a function of units or bits of information in the message, not the individual elements of a message. However, this procedure provides a good substitute that is easily incorporated into the model sign code. An average legibility index of 30 ft/in is appropriate for use with most sign conditions. The legibility index should be multiplied by the factors in Table 6 when the conditions match those shown in the table.

Task	Viewer Reaction Time (sec) for Driving Environment		
	Simple	Complex <sup>A</sup>	Multilane <sup>B</sup>
Detection	0.5	1.0	1.0
Message Scan	0.1 / letter 0.5 / symbol	0.1 / letter 0.5 / symbol	0.1 / letter 0.5 / symbol
Re-Orientation Scan	0.02 / letter 0.2 / symbol	0.04 / letter 0.2 / symbol	0.04 / letter 0.2 / symbol
Maneuver	4	5	6
Total	4.5 + 0.12 × # letters + 0.6 × # symbols	6.0 + 0.14 × # letters + 0.7 × # symbols	7.0 + 0.14 × # letters + 0.7 × # symbols

NOTES:  
<sup>A</sup> A developed town or city commercial area. Single or multilane travel under 35 mph.  
<sup>B</sup> A developed urban/suburban commercial area. Multilane travel over 35 mph.  
 Source: Reference (Bertucci, et.al 2003)

Table 5. Viewer Reaction Time

Adjustment Factor	Adj. Legibility Index (ft/in)	Conditions
1.00	30	For uncongested conditions.
0.83	25	For moderately congested strip, in-town, or in-city zones, usually characterized by some of the following environmental conditions: <ul style="list-style-type: none"> <li>• Moderate pedestrian and/or vehicular activity</li> <li>• Traffic signal or traffic sign control at major intersections</li> <li>• Intermittent "stop and go" traffic patterns</li> <li>• On street Parking</li> <li>• Posted speeds below 40 MPH</li> <li>• Tightly spaced retail locations</li> </ul>
0.67	20	For highly congested strip, in-town, or in-city zones usually characterized by some of the following environmental conditions: <ul style="list-style-type: none"> <li>• High pedestrian and/or vehicular activity</li> <li>• Traffic signal or traffic sign control at most intersections</li> <li>• Intermittent "stop and go" traffic patterns</li> <li>• On street parking</li> <li>• Posted speeds below 30 MPH</li> <li>• Tightly spaced retail locations</li> </ul>

Source: Reference (Bertucci, et. al 2003):

Table 6. Adjustments to Legibility Index

## BASIS FOR CALCULATING SIGN SIZE

The USSC best practice for determining minimum sign size is based on using the number of letters in the sign to define the total copy area and then using a multiplier to get the total sign size (Bertucci, et. al 2003). The procedure is listed below and is recommended by the team for the model sign code.

1. Establish the letter height using Equation 3.
2. Determine the Single Letter Area. This can be done by squaring the letter height in inches to obtain the area occupied by single letter and its adjoining letterspace. This total is divided by 144 to obtain the Single Letter Area in square feet.
3. Determine Copy Area (Single Letter Area in square feet total number of letters plus area of any symbols in square feet).
4. Determine Total Sign Area by multiplying the Copy Area by 2.5 (Sign Area = 2.5).

This procedure is based on the following assumptions which may not be accurate representations of actual sign science:

- Area of individual letters (including inter-letter spacing) is the same as the letter height.
- The total sign area should be designed so that it is 40 percent copy area and 60 percent blank space (negative area).

## SUMMARY TABLES FOR LETTER HEIGHT AND SIGN SIZE

Table 7 presents a summary for letter height and sign size based on some basic assumptions. The assumptions are listed below. The minimum letter heights and sign sizes that result from these assumptions are not sensitive to the number of lanes or the lateral offset. The results shown in Table 7 would be the same for 2, 4, or 6 lanes and for lateral sign offset of 15 to 30 ft.

- A legibility index of 30 ft/in is used for all road speeds and sign applications.
- The number of letters in a sign is 25 for speeds of 30, 45, and 65 mph. The sign is all text with no symbols or graphics.
- The sign is oriented perpendicular to the direction of traffic.
- The center of the sign is located 20 ft from the edge of the road.

- The road has 4 lanes and no median.
- Sign height is rounded to the nearest whole inch and sign area is rounded to the nearest whole square foot (up or down as appropriate).

Road Speed (mph)	Environment	Letter Height (in)	Sign Area (ft <sup>2</sup> )
30	Simple	11	53
	Complex	15	98
45	Complex	22	210
	Multilane	25	271
60	Complex	32	444
	Multilane	36	563

**Table 7. Minimum Sign Size and Letter Height Based on Assumptions**

## SIGN HEIGHT

The authors were able to identify two criteria for defining a maximum sign height as indicated below.

The Manual on Uniform Traffic Control Devices (2003) includes guidance for defining the maximum height of traffic signals at an intersection so that they are not out of view of a driver stopped at an intersection. This criterion is based on an angle of 20° from the driver's eye height. The angle is defined by the point at which a signal would be lost in the upper portion of the windshield where the line-of-sight could be blocked by the vehicle roof, a visor, or the darker tinting on a windshield.

The USSC Best Practices Standards indicates that an angle of 5-8° has been found in previous research. The best practices document indicates an angle of 5° should be used. This angle is based on locating the sign within the cone of vision.

Equation 4 is used to calculate the maximum sign height using the vertical angle, letter height, and legibility index as inputs. This formula is based on the assumption that the letter height is properly determined for the viewing distance. The maximum sign height is the distance to the top of the sign to ensure that the entire sign is located within the driver's visual field.

$$HT_{\max} = \tan\theta \times LH \times LI + HT_{\text{driver}}$$

- HT<sub>max</sub> = Maximum sign height to the top of the sign, ft.
- θ = Vertical viewing angle, degrees
- LH = Letter height, inches
- LI = Legibility index, ft / in
- HT<sub>driver</sub> = Eye height of the driver, typically assumed to be 3.5 ft

Equation 4.

For a vertical viewing angle of 5° and a driver eye height of 3.5 ft, Equation 4 can be shorted to that shown in Equation 5. Table 8 summarizes the results of applying this table to a range of letter heights based on a legibility index of 30 ft/in.

$$HT_{\max} = \tan 5^\circ \times LH \times LI + HT_{\text{driver}} = 0.087 \times LH \times LI + 3.5$$

Equation 5.

Letter Height, inches	5	10	15	20	25	30
Maximum Sign Height, ft	16.6	29.7	42.9	56.0	69.1	82.2

Table 8. Maximum Sign Height Guidelines

## EXAMPLES FOR USING THE FORMULAS AND TABLES

The following presents an example of how to use the information in this document to determine the appropriate minimum letter height, minimum sign size, and maximum sign height given inputs that represent the viewing environment.

### Given:

- An arterial roadway with three lanes in each direction and a 16 ft raised median.
- The speed limit on the road is 45 mph.
- The center of the sign is assumed to be located 30 ft from the edge of the road.
- The sign is in an area with little competition for the driver’s visual attention.
- There are 10 letters and no graphics in the sign.

### Solution:

The distance from the center of the sign to the center of the far lane is:

- $6 \times 12 - 6 + 16 = 82$  ft.

The distance from the sign to the point at which the driver needs to be able to read the sign (Visual Reaction Distance) is:

- $1.47 \times 45 (7 + 0.14 \times 10) = 555.66$  ft

The line of sign from the vehicle to the sign is:

- $\sqrt{82^2 + 555.66^2} = 561.68$  ft

Using a legibility index of 30 ft/in, the minimum letter height is:

- $561.68 / 30 = 18.7$  inches, use 19 inches.

The minimum sign size area is:

- $19^2 / 144 \times 10 \times 2.5 = 62.7$  ft<sup>2</sup>, use 63 ft<sup>2</sup>

Maximum sign height, based on a 5° vertical angle, is:

- $0.087 \times 19 \times 30 + 3.5 = 53.1$  ft, use 53 ft

## Technical Information Related to Electronic Message Displays

Electronic Message Displays (EMDs), which are also referred to as electronic message centers or electronic changeable copy signs, are a type of private sector sign that may require special treatment in the development of a model sign ordinance. These signs have unique capabilities to provide a variety of messages in a range of formats. At the low end of the technology scale, these signs use a matrix arrangement to present text and simple graphics. The message or messages may be displayed in a static mode or may scroll or flash. At the high end of the technology scale, these signs are capable of providing television quality types of images.

The use of large EMDs is more common for off-premise signing, typically in billboard-type applications. On-premise use of EMDs is more commonly limited to static, scrolling, or alternating messages. The technology for EMDs is far ahead of the research on their impacts and guidelines for use. A 2005 report by the United States Sign Council (Garvey and Pietrucha 2005) indicated that “there has been little research conducted specifically on commercial EMCs.” As such, this Technical Report and model sign code contains relatively little information regarding these types of signs.

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# Model Sign Code



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# Model Sign Code

## Section 1. Purpose of Model Sign Code

The primary purpose and intent of this model sign code is to assist municipal and regulatory agencies to regulate on-premise signs in a legal and reasonable manner that promotes economic vitality, public safety and ensures compliance with constitutionally protected First Amendment rights. The code seeks to reduce subjectivity often encountered in the regulation of signage that is either based on aesthetics or lacking in substantiation by providing a set of quantitative and researched-based criteria to support restriction on signage that take into account minimum scientific requirements for providing signage that meets generally accepted safety standards for visibility, legibility and conspicuity.

*Authors' Note: Urban Design Associates' primary purpose is twofold: First, the Model Sign Code is an effort to recognize a long line of case law, often forgotten by code drafters, which treats on-premise signs as constitutionally protected commercial speech. In addition, the Model Sign Code seeks to promote public safety by providing guidelines for the construction of on-premise signage which ensure visibility to passersby. See Chapter 1 for a further discussion of the evolution of the standard of review which applies to commercial signs. The regulations contained within are based on the best available research regarding the effective and safe display of on-premise commercial signs and current case law.*

## Section 2. Application

The model sign code applies to the construction and use of all on-premise signs, as more fully defined in Section 3 below, and those of an ancillary nature.

*Author's Note: In drafting this code, UDA focused its efforts on developing a sign ordinance that specifically regulates those outdoor signs that might appear on a commercial property, or in the windows of a commercial establishment which are otherwise known as on-premise commercial signs. While most of these signs will seek to advertise the business or product sold on the site, the provisions of this code do not regulate on the basis of content or the message and, therefore, apply equally to non-commercial messages which might appear on such signs.*

## Section 3. Prohibited and Exempt Signs

- a. The following signs shall not be allowed pursuant to the terms of this Model Sign Code:
  - i. Abandoned signs;
  - ii. Snipe signs or signs attached to trees, telephone poles, public benches, streetlights, or placed on any public property or public right-of-way; and
  - iii. Signs placed on vehicles or trailers which are parked or located for the primary purpose of displaying that sign.
- b. The following signs shall be exempt from the provisions of this Model Sign Code and construction will be permitted without a permit:
  - i. Holiday or special events signs;
  - ii. Nameplaces of two square feet or less;
  - iii. Political signs; and
  - iv. Public signs or notices.
  - v. Sign face charges of legally conforming signs



## Section 4. Definitions

**Abandoned Sign:** A sign whose message describes the availability of goods or services at a location where such goods and services are no longer available and have ceased to be available for a period of at least 60 days or, in the alternative, a sign which is non-commercial in nature and the content of the sign pertains to a time, event or purpose which has elapsed or expired in the preceding 60 days. Such abandonment should include intentional conduct, such as failure to pay taxes or permit fees, or to maintain the sign, or a negligent failure to do so.

**Animated Sign:** A sign depicting action, motion, light, or color changes through electrical or mechanical means. Although technologically similar to flashing signs, the animated sign emphasizes graphics and artistic display.

**Awning Sign:** A building mounted sign that provides additional functionality as shelter.

**Banner:** A sign made of fabric or other non-rigid material with no enclosing framework.

**Changeable-Copy Sign:** A sign or portion thereof on which the copy or symbols change either automatically through electrical or electronic means (for example, time and temperature units), or manually through placement of letters or symbols on a panel mounted in or on a track system.

**Channel Letter:** A fabricated or formed three-dimensional letter that may accommodate a light source.

**Cone of Vision:** The area that is clearly visible to a driver, generally described as a “fan-shaped envelope” preceding the driver which allows the driver to safely see and observe moving objects and persons in front of and to the immediate left and right of the driver.

**Complying Sign:** A sign that is legally installed in accordance with federal, state, and local permit requirements and laws.

**Conspicuity:** The capacity of a sign to stand out or be distinguishable from its surroundings and thus be readily discovered by the eye. It is the noticeable contrast between a sign and its background, attributed to an exogenous (unplanned) or endogenous (planned) mindset, with the display having features that attract attention to the sign.

**Contrast:** The difference or degree of difference in the appearance of adjacent surfaces, such as light and dark areas, different colors, or typefaces, and graphics appearing on various backgrounds.

**Copy:** The words and/or message displayed on a sign.

**Copy Area:** That area which displays the actual copy on a sign.

**Development Sign:** A temporary construction sign denoting the architect, engineer, contractor, subcontractor, financier or sponsor of a residential or commercial development which may also designate the future occupant or use of the development.

**Directional Sign:** Signs designed to provide direction to pedestrian and vehicular traffic.

**Dissolve/Appear:** A mode of message transition on an Electronic Message Center accomplished by varying the light intensity or pattern, where the first message gradually appears to dissipate and lose legibility simultaneously with the gradual appearance and legibility of the second message.

**Electronic Message Display:** A sign capable of displaying words, symbols, figures or images that can be electronically or mechanically changed by remote or automatic means.

**Event Sign:** A temporary sign, other than a commercial sign, posted to advertise an event sponsored by a public agency, school, church or religious institution, civic-fraternal or other organization.

**Fade/Appear:** A mode of message transition on an Electronic Message Center accomplished by varying the light intensity, where the first message gradually reduces intensity to the point of not being legible and the subsequent message gradually increases intensity to the point of legibility.

**Fascia Sign:** A building mounted sign.

**Freestanding Sign:** A sign that is not attached to a building.

**Ground Sign:** A freestanding sign with a visible support structure.

**Inflatable Device:** A sign that is a cold air inflated object, which may be of various shapes, made of flexible fabric, resting on the ground or structure and equipped with a portable blower motor that provides a constant flow of

air into the device. Inflatable devices are restrained, attached, or held in place by a cord, rope, cable or similar method.

**Internally illuminated Sign:** A sign that has the light source enclosed within it so the source is not visible to the eye.

**Illuminated Sign:** A sign with electrical equipment installed for illumination, either internally illuminated through its sign face by a light source contained inside the sign or externally illuminated by reflection of a light source aimed at its surface.

**Legibility:** The physical attributes of a sign that allow for differentiation of its letters, words, numbers, or graphics, which directly relate to an observer's visual acuity.

**Luminance:** An objective measurement of the brightness of illumination, including illumination emitted by an electronic sign, measured in candles per square foot (cd/ft<sup>2</sup>).

**Marquee Sign:** A sign mounted on a permanent canopy.

**Multi-Tenant Sign:** A freestanding sign used to advertise businesses that occupy a shopping center or complex with multiple tenants.

**Municipality:** The body of officers, taken collectively, belonging to a city, town or village, who are appointed to manage its affairs and defend its interests.

**Noncomplying Sign:** A sign that was legally erected and maintained but does not currently comply with sign restrictions because such restrictions were enacted after the sign was originally permitted and installed.

**Off-Premise Sign:** An outdoor sign whose message directs attention to a specific business, product, service, entertainment event or activity, or other commercial or non-commercial activity, or non-commercial message about something that is not sold, produced, manufactured, furnished, or conducted at the property upon which the sign is located. Also known as a third party sign, billboard, or outdoor advertising.

**On-Premise Sign:** A sign whose message and design relates to an individual business, profession, product, service, event, point of view, or other commercial or non-commercial activity sold, offered, or conducted on the same property where the sign is located.

**Organization:** An entity, including a natural person, which owns or operates the premises where an on-premise sign is displayed.

**Pennant:** a triangular or irregular piece of fabric or other material, commonly attached in strings or strands, or supported on small poles intended to flap in the wind.

**Permanent Sign:** A sign attached to a building or structure, or to the ground in a manner that enables the sign to resist environmental loads, such as wind, and that precludes ready removal or movement of the sign and whose intended use appears to be indefinite.

**Pole Sign:** A freestanding sign with visible support structure.

**Primary Copy:** The words or message on a sign meant to be read by passersby travelling at the posted speed limit.

**Projecting Sign:** A building mounted sign with the faces of the sign projecting 12 inches or more from and generally perpendicular to the building fascia, excepting signs located on a canopy, awning, or marquee.

**Pylon Sign:** A freestanding sign with a visible support structure, which may or may not be enclosed by a pole cover.

**Readability:** That which enables the observer to correctly perceive that information content of letters, numbers or symbols grouped together in words, sentences, or other meaningful relationships on the sign. Readability is the character of a sign which leads to the observer's comprehension of its intended message, and depends on legibility and other considerations of contents and time restraints.

**Real Estate Sign:** A temporary sign advertising the real property upon which the sign is located for rent, for lease, or for sale and providing the name and location of the owner or his agent.

**Roof Sign:** A building-mounted sign erected upon, against, or over the roof of the building.

**Rotating Sign:** Sign faces or portions of a sign face which mechanically revolves around a central axis as opposed to revolving around an imaginary axis created by a pattern of alternating lights which convey an appearance of rotation.

**Scroll:** A mode of message transition on an Electronic Message Center where the message appears to move vertically across the display surface.

**Secondary Copy:** The words or messages on a sign which are meant to be read by automobiles that are idling or parked along a road way.

**Sign:** Any device, structure, fixture, painting, or visual image using words, graphics, symbols, numbers, or letters designed and uses for the purpose of communicating a message or attracting attention.

**Signage:** A community's inventory of signs used to communicate information or attract attention, including signature building, product displays, and dispensers, as well as traditional projecting, wall, roof, and freestanding signs. (See signature building.)

**Signature Building:** A building architecturally designed and/or painted or decorated to reinforce individual recognition of a traditional sign's message, the identify of its speaker or sponsor of a display; it also reinforces major media advertising programs.

**Snipe Sign:** A temporary or permanent sign tacked, nailed, posted, pasted, glued, or otherwise attached to trees, poles, stakes, fences, or other objects.

**Temporary Sign:** Any sign intended to remain in use for a short period of time which is not permanently installed.

**Transition:** A visual effect used on an Electronic Message Center to allow one message to disappear while it is simultaneously being replaced by another.

**Visibility:** The physical attributes of a sign and its contents that allow for detection at a given distance, although legibility may be uncertain.

**Wall Sign:** A building-mounted sign which is either attached to, displayed, or painted on an exterior wall in a manner parallel with the wall surface, and not projecting more than 16 inches from such surface (See fascia sign).

**Window Sign:** A sign that is painted on, attached to, or suspended directly behind or in front of a window or the glass portion of a door.

*Author's Note: Most of the definitions provided in this section were prepared by the Signage Foundation for Communication Excellence in an October 2003 publication entitled, The Signage Sourcebook. Where necessary, some terms have been replaced or modified.*

## Section 5. Permitting

- a. Applicants who wish to erect new on-premise Permanent, or Temporary, signs or those seeking to significantly modify (i.e., a modification that costs 50% or more than the replacement cost of the original sign) existing signs must obtain permission from the Municipality prior to installation/modification of the signs.<sup>1</sup> Review of applications for sign permits shall be concurrent in the instance that multiple departments must approve applications.
- b. In order to apply for a sign permit, the applicant must provide the following information, in writing, to the Municipality:
  - i. Name of organization and location.
  - ii. Contact person.
  - iii. Address and phone number for contact person.
  - iv. Description of the activities occurring on the site where the sign will be installed.
  - v. Description of any existing signage that will remain on the site.
  - vi. Identification of the type of sign/signs to be erected by the applicant.
  - vii. Site plan depicting the locations of proposed signage and existing remaining signage.
  - viii. Scale drawings of the proposed signage.
  - ix. Written description explaining the drawing of the proposed signage, including a detailed description of materials, colors, and letter height, type and style.
- c. Upon submission of the written application, the Municipality shall have 10 business days to review the application for a sign permit.<sup>2</sup>

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<sup>1</sup> The term Municipality is used throughout this ordinance to represent the entity that will serve as the permitting official for the ordinance. Users of this ordinance should identify and modify this model code to designate the official charged with this task. Given the complexity of some municipal review processes, it may be necessary to designate multiple reviewing entities.

<sup>2</sup> The model code should be modified to define an application review period that reflects the complexity of the municipality's review process and the number of departments involved in the review of applications for sign permits.

- d. A permit shall be issued on or before the end of the 10 business day review period if the application for a new sign or renewal complies with the regulations contained in this Model Sign Code.
- e. If the Municipality does not issue a determination within the 10 business day period, the sign permit is deemed approved.
- f. An application for a sign permit may be denied by the Municipality within the 10 business day review period if the application fails to comply with the standards contained in this ordinance. The Municipality shall inform the applicant of the reasons for denying the application for sign permit by certified mail.
- g. Upon denial of an application for a sign permit, the applicant has 15 business days to revise and resubmit the application for review by the Municipality. In the alternative, the applicant may also appeal the decision of the Municipality to the City Council within the 15 business day time period. The City Council, at its next regularly scheduled meeting, shall review the Municipality's denial of said application.
- h. The City Council shall review the application on its face with no deference to the final determination made by the Municipality and it will make independent findings in assessing the adherence of the application to the provisions of the ordinance. If the City Council finds the application meets the requirements of this Code, it will direct the Municipality to promptly issue the permit.
- i. Upon a final determination by the City Council, unsuccessful applicants may seek to appeal to the courts.
- j. The application fee for each sign permit sought is \$ \_\_\_\_.<sup>3</sup> The fee for appeal of a sign permit denial is \$ \_\_\_\_.
- k. These permits shall not expire providing that such signs are not abandoned or destroyed. In the instance that substantial repair or replacement becomes necessary (i.e., repairs that cost more than 50% of the replacement cost of the damaged sign), the organization must apply for a new sign permit, the fee for which is \$ \_\_\_\_.

*Author's Note: The application process for sign permits can be both confusing and cumbersome. Sign ordinances often leave too much room for administrative discretion, resulting in a variety of due process violations, including prior restraint and unbridled discretion, as more fully described in Chapter 1. In addition, decision-making processes can result in added delay and expense. This section of the Model Sign Code attempts to clarify and expedite the administrative process, leaving only a small window for administrative discretion with regard to specially permitted signs.*

## Section 6. Permanent Sign Regulations

- a. **Permanent signs** include, but are not limited to the following types of signs: wall signs, roof signs, projecting signs, ground and pole signs, multi-tenant signs, awning signs, electronic message centers, and monument signs.
  - i. Number of Signs: Each business is entitled to display at least two permanent signs.
  - ii. Sign size shall be determined as follows:
    - a) Establish the letter height: Determinations as to the appropriateness of letter height shall be made on the basis of the formula established below:

### Letter Height Equation

$$LH = \frac{\sqrt{(LN \times 12 - 6 + LO)^2 + (1.47 \times SL \times VRT)^2}}{LI}$$

**LH** = Letter height for signs oriented perpendicular to traffic flow, inches.

**LN** = Total number of lanes on the roadway, including the median or two-way left turn lane if present. If the two-way left turn lane or median is wider than 12 ft, then the distance should be increased to account for the wider median.

**LO** = Lateral offset to the center of the sign from the edge of the roadway, feet.

**SL** = Roadway speed limit, mph.

**VRT** = Viewer Reaction Time, seconds.  
(See Table 3 in the technical report.)

**LI** = Legibility index, ft/in. The recommended legibility index is 30 ft/in. (See Table 4 in the technical report for adjustments to the recommended value.)

<sup>3</sup> The permit fee shall reflect the true costs associated with the review of the application and not constitute a general revenue-raising measure for the Municipality.

- b) Single Letter Area: Determine the Single Letter Area by squaring the letter height in inches to obtain the area occupied by single letter and its adjoining letterspace. This total is divided by 144 to obtain the Single Letter Area in square feet.
- c) Copy Area: Determine Copy Area by multiplying the Single Letter Area in square feet with the total number of letters plus area of any symbols in square feet.
- d) Total Sign Area: Determine Total Sign Area by multiplying the Copy Area by 2.5 (Sign Area × 2.5).
- e) The sign size standards in this code are designed for static, traditional signs. Variations from this standard will be permitted by variance upon the applicant’s production of evidence showing that circumstances require deviation from this standard to enhance the visibility, conspicuity, and legibility of the sign.

iii. Sign Angle: The visibility and legibility of signs is improved when the sign is situated at an angle 20 degrees or greater to the traffic flow because scientific research indicates that attempts to improve the efficiency of the sign by varying these requirements are unlikely to make up for efficiency losses caused by reducing the angle below 20 degrees. A sign that is perpendicular to the direction of traffic has an angle of 90 degrees. Applicants seeking to erect a sign with an angle less than 20 degrees must seek a variance. Wall signs are excluded from the sign angle requirement.

- iv. Minimum sign size shall be a function of speed (mph) and viewer reaction time (sec), as more fully detailed in the table below. This table is based on the following assumptions:
  - A legibility index of 30 ft/in is used for all road speeds and sign applications.
  - The number of letters in a sign is 25 for speeds of 30, 45, and 65 mph. The sign is all text with no symbols or graphics.
  - The sign is oriented perpendicular to the direction of traffic.

- The center of the sign is located 20 ft from the edge of the road.
- The road has 4 lanes and no median.
- Sign height is rounded to the nearest whole inch and sign area is rounded to the nearest whole square foot (up or down as appropriate).

Minimum Sign Size and Letter Height Based on Assumptions			
Road Speed (mph)	Environment	Letter Height (in)	Sign Area (ft2)
30	Simple	11	53
	Complex	15	98
45	Complex	22	210
	Multilane	25	271
60	Complex	32	444
	Multilane	36	563

This table establishes minimum sign size and letter height for all primary copy on Permanent and Temporary signs.

vi. Sign Height: The maximum sign height is the distance to the top of the sign to ensure that the entire sign is located within the driver’s visual field. Maximum sign height is a function of the vertical angle, letter height, and legibility index of a sign. The table below determines maximum sign height based on a legibility index of 30 ft/in.

Maximum Sign Height Guidelines						
Letter Height, inches	5	10	15	20	25	30
Maximum Sign Height, ft	16.6	29.7	42.9	56.0	69.1	82.2

vii. Secondary Copy: Secondary copy may be included on signs provided that it covers less than fifty percent of the copy area available for primary copy and that the letter height is no less than onehalf the size permitted for primary copy.

## b. Wall signs



- i. A permit may be obtained to erect multiple wall signs on each wall facing a street or public right-of-way, excluding those walls abutting single or multifamily residential land uses. Such wall signs shall meet the letter height and sign size requirements defined in subsection 6a based on the speed of the facing roadway. The total area of all wall signs on such a wall shall occupy no more than 50 percent of the total wall area.
- ii. Wall signs may be internally or externally illuminated.

## c. Projecting signs



- i. One projecting sign shall be permitted for each structure with accessible street frontage in lieu of a ground or roof sign.
- ii. Projecting signs may be illuminated. Those projecting over a parkway must be internally illuminated.
- iii. Projecting signs may revolve.
- iv. Projecting signs must have a minimum clearance of 8 feet from the bottom of the sign to the grade below.
- v. Projecting signs may be located no closer than 10 feet to each other.

## d. Ground (Pole or Pylon) signs



- i. One ground (pole or pylon) sign is permitted for each structure with accessible street frontage.
- ii. Ground (pole or pylon) signs are permitted in lieu of roof and projecting signs.
- iii. Ground (pole or pylon) signs may be internally or externally illuminated.
- iv. Ground signs may revolve.

## e. Roof signs



- i. An organization which inhabits a structure with accessible street frontage shall be permitted to erect one roof sign as a permanent sign.
- ii. Roof signs may not be displayed on properties displaying ground or projecting signs.
- iii. Roof signs may be internally or externally illuminated.
- iv. Roof signs shall be setback a minimum of three feet from the edge of the exterior wall on which the sign is located.

f. Multi-tenant Signs



- i. One multi-tenant commercial sign shall be permitted per business complex.
- ii. A minimum separation of fifty (50) feet shall be maintained between all other pole signs, multitenant commercial signs and off premise signs.
- iii. Multi-tenant commercial signs shall be located within the business complex for which they advertise and only tenants of that business complex may advertise on the sign. Any business advertising on a multi-tenant commercial sign may not have a pole sign on its property located within the associated business complex.
- iv. Signs for individual tenants in a multi-tenant sign shall meet the minimum letter height and minimum sign size requirements in subsection 6a. The maximum area expressed in square feet for a sign shall be calculated by multiplying the frontage by 2.
- v. Organizations advertizing on a multi-tenant sign may erect a second sign on the premises with the exception of a pole sign.

g. Electronic Message Centers (EMCs)<sup>4</sup>



- i. Such displays may include messages that are static, messages that appear or disappear from the display through dissolve, fade, travel or scroll modes, or similar transitions and frame effects that have text, animated graphics or images that appear to move or change in size, or be revealed sequentially rather than all at once.
- ii. Zoning: Only static electronic message centers may be erected in residential areas. All types of electronic message centers shall be permitted in areas designated for commercial and industrial activities.
- iii. All electronic message centers shall be equipped with automatic dimming capabilities.

h. Awning signs



- i. An organization which inhabits a structure with accessible street frontage shall be permitted to erect one awning sign.
- ii. Awning signs may be illuminated.
- iii. The size of the awning shall be determined by applicable zoning regulations.
- iv. The size of the text on the awning sign shall be based on the requirements set forth in Section 6a of this Model Sign Code.

<sup>4</sup> Due to the lack of scientific evidence available regarding how specific EMC message time intervals affect human reading and comprehension abilities, this model sign code does not offer any recommended time intervals for commercial EMCs.

## i. Monument Signs



- i. Signs located outside the cone of vision are only permitted by the application for and grant of a variance.<sup>5</sup>

*Authors Note: Given modern complex nature of messages conveyed by on premise signs, the model sign code distinguishes between primary and secondary copy. It is important to note, however, that this distinction is not scientific. Rather, it reflects a public policy modification. The secondary copy requirements are not designed to produce copy that may be read by automobiles passing at the posted speed limit. Rather, such copy will likely only be readable to pedestrians, and idling or parked cars. Given the limited value of secondary copy, Municipalities should encourage sign owners to use it sparingly.*

*Authors Note: The scientific standards upon which these guidelines are sophisticated. They require a Municipality to develop specialized knowledge in their operation. It is the complexity of these formula, we believe, that will allow such standards to survive judicial scrutiny by replacing blanket, baseless requirements with those that are specific to the conditions of the site where a given sign is to be erected.*

*Authors Note: The guidelines contained in this ordinance do not seek to create any sort of overlay zoning that would allow Municipalities to create districts with specialized signage requirements that would create a specified aesthetic. Such regulations are not necessarily based on the scientific standards on which this code is based. If Municipalities wish to pursue this end, they should be careful to craft regulations which do not overly restrict the right to advertise nor do they create new safety concerns.*

*Authors Note: Electronic message centers are a relatively new sign type that has not fully been explored by the scientific community. Given the rising popularity of this sign type as well as efforts by some Municipalities to block their installation, the aforementioned EMC requirements have been drafted to permit the use of the sign*

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<sup>5</sup> Due to the nature of their construction, monument signs sit very low to the ground, lower than the eight foot height requirement contained in this Model Sign Code. Their visibility can be limited by passing traffic, parked cars, and other types of screening. Similarly, high-rise signs outside the scope of the Sign Height calculations listed in Section 6 (vi) of this model sign code also fall outside the cone of vision. Those wishing to advertise their business should consider erecting other forms of signage with better visibility.

*type while seeking to lessen the potential impacts or perceived impacts they cause. The choice to allow the construction of static EMCs in residential areas only is a public policy decision. Communities must explore their own needs in making decisions regarding the appropriate location and type of EMCs which will be permitted.*

## Section 7. Temporary Sign Regulations

- a. A permit must be obtained for the display of temporary signs.
- b. Temporary signs are signs not intended for permanent installation which are to be used for a limited amount of time. Types of temporary signs include, but are not limited to: real estate signs, construction site signs, banners, pennants, flags, and streamers, inflatable displays, special event signs, advertising vehicles and development signs.
- c. Temporary signs shall be setback at least three feet from the public right-of-way and comply with all of the applicable regulations pertaining to size set forth in Section 6.
- d. The number of Temporary signs shall not exceed three at any given period of time.
- e. A temporary sign may only be displayed for thirty calendar days. Applicants may renew permits for the display of temporary signs for two additional thirty day periods.

## Section 8. Variances

A variance may be sought for the construction of a sign, Permanent or Temporary, which does not comply with the requirements established in Sections 5 and 6 of this Model Sign Code. A variance will be granted if the applicant can demonstrate the following criteria:

- a. The application of the Model Sign Code would substantially limit the applicant's ability to put the property to its highest and best use;
- b. Neighboring property owners would not be detrimentally harmed by the grant of the variance; and
- c. The hardship suffered is unique to the property and was not created by the applicant for the variance.

The Municipality may impose conditions on the variance, as necessary, to further the purpose of the Model Sign Code and other applicable Municipal ordinances.



## Section 9. Sign Maintenance

All signs, including noncomplying and abandoned signs, must be maintained in a condition which is safe and appears as originally permitted. The Municipality shall issue a notice of violation for all signs violating the provisions of the ordinance. The organization shall have 10 business days to correct the violation. Organizations may seek an extension of time from the Municipality to correct the violation. Such extensions will be granted if there is evidence that the organization is working to correct the violation. If the organization fails to correct the violation within the 10 day period or to obtain an extension, the Municipality may, upon inspection, issue a notice compelling the removal of those signs which continue to be in violation of this provision of the Model Sign Code. The owner or agent may challenge the notice compelling the removal of the sign by (1) filing an engineer's report stating the condition of the sign with the Municipality within 30 business days of receipt of the written notice of the violation, or (2) appealing to the City Council in the manner described in Section 5. Upon review of a favorable report by the engineer, the Municipality shall work with the organization to repair its sign. In the case where the engineer's report confirms the Municipality's inspection report, the building inspector shall serve a second written notice compelling removal of the sign at owner's expense within 30 business days receipt of said notice. Failure to remove the sign in a timely fashion shall result in a fine of \$\_\_\_\_\_ per day for each and every day the sign remains. Upon the issuance of a third citation, the Municipality may revoke the organization's permit to maintain the sign. Once a permit has been revoked, the organization must apply for a permit to reinstate the use of its signs or to install a complying replacement signs in the case of noncomplying signs.

## Section 10. Noncomplying Signs

Any sign that is not in compliance with the provisions of the Model Sign Code upon its enactment shall be deemed a noncomplying sign. All noncomplying signs shall be allowed to continue until such time that the organization owning the property where the sign is located no longer owns or operates the noncomplying signs. All signs, including noncomplying signs, must be maintained in accordance with all state and local ordinances. If structural alteration or replacement is

deemed necessary by the organization, the organization shall be required to obtain a permit to perform any type of maintenance, excluding normal replacement of sign faces, lamps, ballasts, and timers. Noncomplying sign faces shall be changed as needed so long as size and configuration remain as originally permitted. Sign structures may be repainted as needed. Permits will be required for all maintenance work with the exception of normal replacement of lamps, ballasts, timers and damaged sign faces. Any structure being structurally modified at a cost exceeding 50% of the replacement cost of the sign as to size, additions or configuration must be immediately brought into compliance with local ordinances.

*Author's Note: In an effort to encourage municipalities to regard signs as speech rather than land uses, UDA has replaced the common term, nonconforming use, with the term, noncomplying sign. A non-complying sign is one that does not conform to sign regulations at the time such regulations are enacted. Noncomplying signs, similar to nonconforming uses, shall be allowed to continue operation until such time that the sign is no longer owned or operated by the organization controlling the sign at the time it became noncomplying. Substantial modifications to size or sign configuration will trigger the need to bring the noncomplying sign into conformity with existing regulations.*

## Section 11: Sign Contractor's License and Insurance

A sign may not be erected, altered, relocated, constructed, or maintained without a valid contractor's license and all required state and federal licenses. Those holding contractor's licenses must have a current certificate of insurance on file which indemnifies the Municipality for any form of liability.

All electric signs should be constructed according to the technical standards of a certified testing laboratory.

## Section 12: Indemnification

The Municipality, its officers, agents, and employees shall be held harmless against any and all claims resulting from the erection, alternation, relocation, construction, or maintenance of on-premise commercial signs legally allowed as a result of this Model Sign Code.

## **Section 13. Violations**

The placement of any Permanent or Specially Permitted sign without a sign permit shall be unlawful. Violations of this ordinance shall be treated as strict liability offences regardless of intent. Violators will be fined \$ \_\_\_\_ per day per sign displayed in violation of this ordinance.

## **Section 14. Severability**

If any section or subsection of this Model Sign Code is found to be invalid by a court of competent jurisdiction, all remaining provision shall be deemed valid.