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Preliminary Results of an Analysis of 491 Community Noise Ordinances

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ABSTRACT

The noise ordinances from 491 of the largest communities in the United States were analyzed with respect to the tools, metrics and criteria communities use to regulate noise. The prevalence of various techniques employed in noise regulations are presented and discussed. The regulatory tools and techniques analyzed include decibel-based standards, plainly audible standards, nuisance standards, quiet zones and restrictions based on zoning, setbacks, time-of-day regulations, and bans (prohibitions).

1 INTRODUCTION

The Noise Pollution Clearinghouse, in an effort to update its online law library of noise regulations, is collecting and analyzing the community noise ordinances of approximately 1,000 communities. The preliminary results of the analysis of 491 of the largest communities in the United States are presented here. The noise ordinances were analyzed to determine what regulatory tools and techniques communities employed to control noise pollution. These tools and techniques included decibel-based standards, plainly audible standards, nuisance standards, quiet zones and restrictions based on zoning, setbacks, time-of-day regulations, and bans (prohibitions).

2 METHODOLOGY

Hundreds of noise regulations were read to determine the most common regulatory tools and techniques. These were determined to include decibel-based standards, plainly audible standards, nuisance standards, quiet zones and restrictions based on zoning, setbacks, time-of-day regulations, and bans (prohibitions).

Next, the noise ordinances of the largest communities in the country were obtained, roughly in descending order of population. The eventual goal is to analyze the noise ordinances of at least the 500 large communities in the country, which would mean communities with more than approximately 65,000 people according to the 2010 Census. The current set of 491 ordinances is missing 70 of the 500 largest communities, and includes some cities with fewer than 65,000 people. To be considered for this paper, the noise ordinance had to be found on the website of the city, or in a legal library (such as West Law, Municode, etc.).

Each of the 491 noise ordinances was examined to determine which tools and techniques the regulations used, and the metrics and criteria used. For this paper, the categories for the various tools and techniques are defined as follows:

- The ordinance was considered to use a decibel-based standard if it prescribed a decibel level that was not to be exceeded, or a decibel level above ambient noise levels that was not to be exceeded. This category could include frequency weighted and octave band criteria. An ordinance was said to employ decibel noise standards even if the regulation was not comprehensive, that is, if it regulated only a few specific noise sources. However, vehicle decibel noise limits were not considered in this category for this paper.
- Plainly audible standards were ones in which the noise was regulated based on the audibility or detectability of the noise at either a specified distance (such as 100 feet) or specified location (such as a property line or inside a home).
- Regulations were determined to include a nuisance standard if they specifically mentioned criteria such as *nuisance*, *unreasonable*, *unnecessary*, or *disturbing the peace* within the noise regulation. Nearly all cities have a *disturbing the peace* clause outside of the noise regulation which was not considered in this category for this paper.
- Quiet zones and restrictions based on zoning were those regulations that identified specific areas of the town for special protection.
- Regulations requiring a minimum distance from a property line or receiver were considered to employ the setbacks technique.
- Decibel-based restrictions that varied depending on the time of day, for example, day or night, were considered to employ time-of-day techniques.
- Regulations that specifically prohibited specific noise sources, such as gas-powered leaf blowers, for example, were considered to employ bans.

Clearly, a community noise regulation could employ some or all of the above techniques.

The tools and techniques were investigated with respect to several variables, including population and geographical location. The regions are defined as follows:

- Pacific: California, Hawaii, Oregon, Washington
- West: Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, South Dakota, Utah, Wyoming
- Midwest: Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, Wisconsin
- South: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia
- Northeast: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont

The number of regulations employing each technique was counted. Various metrics and criteria were also noted and counted.

3 RESULTS

The most prevalent noise regulatory technique was the nuisance standard, which was contained in 418 of the 491 noise regulations or 85%. Restrictions based on zoning appeared in 320 regulations or 65%. Plainly audible restrictions are the next most popular technique, found in 298 community regulations or 61%. Decibel-based restrictions appeared in 268 of the regulations or

55%. Time-of-day restrictions occurred in 231 regulations or 47%. Setbacks were found in 174 noise regulations or 35%.

Noise ordinances tended to rely on several techniques or tools. For example, 237 of the 418 cities that have a nuisance standard also have a decibel standard. Conversely, only 35 cities rely on a decibel standard but do not also rely on a nuisance standard.

Concerning decibel-based ordinances by geographical region, Midwestern cities are the least likely to contain a decibel standard (42%) while West Coast/Pacific cities are most likely (61%).

Most decibel noise ordinances specify a specific instantaneous maximum value. A-weighting is used in 253 ordinances; C-weighting, in 14 ordinances; and specific octave band limits appear in 28 ordinances. (Remember that these categories are not mutually exclusive. If a noise ordinance has a C-weighted value, it can also have an A-weighted value, for example.) *Fast* time response is specified in 71 ordinances and *slow* response is specified in 149 ordinances. (These too are not mutually exclusive, as *fast* response is sometimes specified for impulsive noise and *slow* response for continuous noise within the same regulations.)

The daytime A-weighted residential noise limits ranged from 50 dBA to 85 dBA (Waco, Texas gets the award for least protective noise regulation). One community uses a 100 dBA value but due to other aspects of the regulation, this is effectively an impulse noise standard. The median value is 60 dBA, and the mode is 55 dBA. The nighttime A-weighted residential noise limits range from 40 dBA to 80 dBA (Waco, Texas again gets the award for least protective noise regulation). The median and mode are both 50 dBA.

There were 47 communities employing an over ambient standard. Over ambient standards range from 0-15 dBA over ambient, with the median and mode being 5 dBA.

Only 40 communities rely on a Leq metric, and many of those also provide an instantaneous value. The Leq time period ranges from 1 minute to 24 hours.

In the noise ordinances, there is remarkable agreement as to when the day begins, with 83% of the ordinances specifying that time as 7:00 AM. There was greater variation on when night began, with a range between 6 PM and midnight, and 72% choosing 10 PM.

Interestingly, there does not appear to be a correlation between population and decibel noise limits. Smaller cities and towns, however, are more reliant on nuisance-based standards.

4 DISCUSSION

There are many questions concerning noise regulation in the United States that are not answered by this paper: There are, for example, according to the U.S. Census Bureau, 19,492 municipal governments, 16,519 township governments and 3,033 county governments in the United States.¹ The sample of noise regulations discussed in this paper cover approximately one-third of the US population and only slightly more than 1% of the local government units in the country. The remaining two-thirds of the US population live in the remaining 99% of US communities which are much smaller than those represented in this study.

Moreover, community noise control is based on a combination of noise regulations and noise enforcement. The more interesting question is not “what is in the noise ordinance?” but “what part of the noise ordinance do police officers rely on when they are in the field and why?”

This paper presents the preliminary results of our research. As more ordinances are added to our database, the results will be updated and revised, and these further questions concerning smaller communities and police enforcement will be explored at the Noise-Con 2016 presentation. If you bring a flash drive to the Noise-Con 2016 presentation, you are welcome to copy the entire noise ordinance library at that time.

5 REFERENCES

1. US Census Bureau, *Local Governments and Public School Systems by Type and State: 2007*, <http://www.census.gov/govs/cog/GovOrgTab03ss.html>.