Fall 2006

THE Quiet Zone

Hybrid Cars, Air Conditioners, Lawnmowers, and String Trimmers

Come along for an acoustic test ride in six gasoline-electric hybrid cars. Chill out with us as we test air conditioner noise. And get ready to listen to a soundscape that sounds as good as the landscape looks with our pick of the quietest lawnmowers and string trimmers.

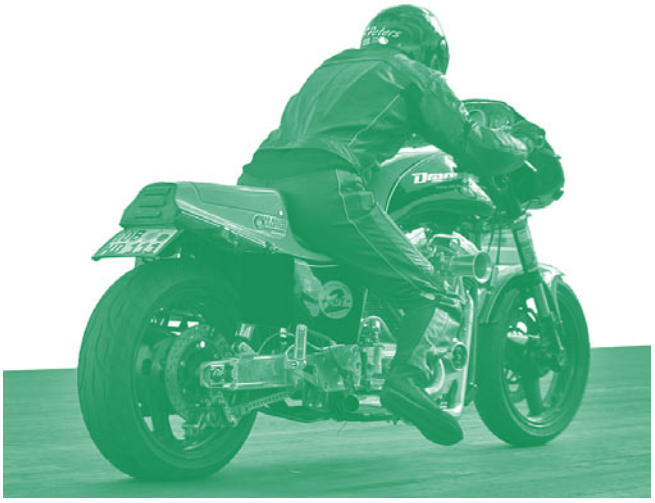
continued on page 8

From The Director

NPC is ten years old this fall. In this issue of the *Quiet Zone*, we reflect upon what we've learned about noise, noise pollution, and noise polluters in the last decade. We examine "what is noise pollution?" and come to a very surprising conclusion in *Noise (is) Pollution*. In *The Nature of Noise* we explore the seven things everyone needs to know about noise problems. We also report on our ongoing noise testing program, with updates on hybrid cars, air conditioners, lawnmowers, and string trimmers.

I hope you enjoy this alternately philosophical, psychological, practical, and ultimately hopeful look at reducing noise at the beginning of the 21st century.

Les Blomberg,
Executive Director



Noise (is) Pollution

Just as Americans settle onto their porch or deck for a peaceful end to a busy day, a chorus of lawnmowers, weed whackers, hedge trimmers, and leaf blowers drown out the sound of birds. An unmuffled motorcycle roars by... a car alarm screeches. It doesn't have to be that way.

We call noise "pollution," but we don't treat it like a pollutant. Society, noise experts, and even the noise polluted often make the same mistake. A mistake so serious that it is probably the greatest single impediment to a quieter world. Yet a mistake so boring and mundane that you probably wouldn't read the rest of this article without a little suspense.

So what can possibly rank above Harley Davidson's muffler-less motorcycles, SONY's boom cars, Fed Ex's nighttime jets, the Reagan Administration's closing of the EPA noise office, etc., as the number one perpetrator of noise today? How is it that even noise experts and the noise polluted make the same mistake? And why did it take NPC more than five years to figure out we had it wrong too?

continued on page 2

Noise (is) Pollution

continued from page 1

The Mistake Heard Round the World

The mistake we almost all share is that ***we fail to treat noise like an objective pollutant that needs to be cleaned up.***

Now here is the really important part, and the really boring part. Noise, for too long, has been defined as "unwanted sound" and associated with annoyance. The focus on a psychological definition of noise as unwanted and the psychological response to noise as annoyance has kept noise from being treated like the pollutant it is. At best, noise is today considered a subjective pollutant, and at worst, a personal problem. In the end, we are saddled with the often repeated standoff—"One person's music is another person's noise."

As long as noise remains in the realm of sound one likes or dislikes, wants or doesn't want, noise will remain the forgotten stepchild of the environmental movement. For noise to be taken seriously by society, we must focus public attention to the issue of noise as an objective pollutant, a contaminant released into the environment.

There you have it. The biggest problem facing the anti-noise movement is that we can't find the words to describe noise accurately. Anti-climactic, as promised, but vitally important--please read on.

Finding the Words to Describe It

Noise is not unwanted sound. "Unwanted sound," like most of the noise we are forced to listen to, is a 20th century invention. Older definitions of noise concerned sound that was out-of-place or inharmonious. It was during the first decades of the last century when the term noise was hijacked, misdirected, and misapplied. Without the static on early radios and telephones—the pesky unwanted sound that obscured the wanted sound, the radio or telephone signal, we would probably still think of noise as out-of-place, and not psychologically as wanted or unwanted.

As long as noise remains in the realm of sound one likes or dislikes, wants or doesn't want, noise will remain the forgotten stepchild of the environmental movement.

There are many problems with thinking about noise as unwanted sound. First, unwanted sound places too much emphasis on the subjective aspect of noise and the subject, the "unwanter." While it is true that people's response to noise is subjective, this is certainly not the most important attribute of noise. Moreover, people have subjective responses to nearly every pollutant. By focusing on the "unwanter," noise becomes relative. I want it; you don't; and there is no reason to favor one's wants over another's except brute force—whoever has more physical, political, or economic power wins. (And if you haven't noticed, at least until recently, the noise polluters have been winning.)

Second, the subjective emphasis of "unwanted sound" leads to blaming the victim—something that happens with noise more than any other pollutant. "If you don't like the noise, move." "You chose to live next to the airport (highway, train track, race track, etc.,) so don't look to anyone else for sympathy." Imagine telling people near a chemical spill if they don't like the leak, just move. If noise were considered a "real" or "objective" pollutant as it should be, the emphasis would be on the objective polluter, not the polluted.

Third, "unwanted sound" doesn't work—it doesn't accurately describe noise. Unwanted sound doesn't work for scientists who primarily mean a random sound when they speak of noise. It doesn't work for

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noise experts—they don't run around measuring the unwanted sound (which would require some sort of desire meter—how else would one measure whether a sound is wanted?), but with a sound level meter measuring objective sound pressure levels. It doesn't work for community noise. How can we even say what noise is if one person's wanted sounds are another's unwanted ones? And it doesn't work for hearing loss. Imagine a rock-and-roll groupie trying to explain her hearing loss: "the unwanted sound of all those concerts I wanted so badly to hear has left me deaf, so I can no longer hear those unwanted sounds I used to enjoy so much."

Finally, "unwanted sound" doesn't work in describing the effects of noise. Noise causes hearing loss, stress, high blood pressure, sleep loss, lost productivity, and a general reduction in the quality of life and opportunity for personal and collective tranquility. It clutters up our acoustic environment with other people's trash. "Unwanted" doesn't begin to describe or even pertain to living with noise induced hearing loss, sleep awakenings, stress, etc. It isn't the unwanted aspect of noise that interferes with children's learning and education. It is the pollutant, the contaminant in the school room that interferes with learning.

The static on earlier radios and telephones that led to the 20th Century definition of noise as "unwanted sound" has drowned out earlier concepts of noise as sounds that are inharmonious or out-of-place, or just plain too loud, and in so doing, created a whole host of new problems.

Aural Litter and Audible Trash

The definition of noise is a one-size-doesn't-fit-all problem. Noise has mathematical, acoustical, electromagnetic, community and health related definitions. "Unwanted" is a poor definition for all of them. But there isn't one definition that will work. NPC proposes the following:

For scientists: They can define noise as they want. And if they want to keep "unwanted," that's okay, but it seems best for scientists to keep their desires out of their work.

For community noise: Noise is a human caused acoustic contaminant, aural litter or audible trash. At NPC we like to say that noise is the litter of the soundscape. This is still not a perfect definition, because litter usually isn't associated with adverse health effects, but adverse health effects often accompany noise. It does, however, at least shift the focus to where it belongs, away from a subjective pollutant and a personal problem to an objective pollutant and a community problem. Moreover, it is a very useful definition, especially for the next couple of decades at least, as NPC is trying to bring about a cultural shift around noise similar to the one that occurred concerning litter in the 1960s and 1970s. (Send us your ideas for a better definition of noise—we've gotten it wrong once before and we still haven't completely purged our website of references to unwanted sound, so there's still time.)

Noise is a human caused acoustic contaminant, aural litter or audible trash.

For hearing loss: Noise is a sound of such loudness or duration that it can potentially cause hearing loss.

For sound quality (for example, does a product sound good?): Noise is unwanted sound. That's right, "unwanted sound" has its place. It is just not in community noise. For companies that "want" their product to sound a certain way, they can call it noise if it doesn't sound the way they want.

So why does it matter so much that we get our terms right? In our modern world, controlling the language is half the battle—literally. Controlling public debate is all about controlling the terms. Is it kidnapping and torture or rendition? Is it a war in Iraq or an occupation? Is it sectarian violence or civil war? It matters what we call things because what we call things shapes our response.

As the noise polluted, we should strive to be as accurate as possible in our definition of noise, and pragmatically, we should not be using terms that shift the emphasis (and often blame) from the polluter to the polluted. "Unwanted sound" trivializes a real and objective problem. Our acoustic environment is contaminated with a bunch of junk—trash really, and it needs to be cleaned up.

Convincing the general public that our acoustic environment is contaminated and that it can be cleaned up is an effort we can win. Convincing the public that they ought to want the same sounds we want is an effort we can't win, because even the noise polluted can't agree on what sounds they want and don't want. Never again do I want to hear from a victim of noise that they don't mind the airplanes (leaf blowers, motorcycles, or whatever) but they can't stand the motorcycles (leaf blowers, airplanes, or whatever). **Noise is pollution. The defining characteristic of community noise is not whether we like it, but that it is a waste product, escaping from one person's property, and contaminating another's property or a public space.**

The Nature of Noise

Civility, sovereignty, community, reciprocity, power, tyranny, and technology. These seven terms pretty much explain noise pollution in the modern world. This is the language of the hundreds of people contacting NPC each week. They express outrage at how poorly they are treated by their neighbor, how their right to quiet enjoyment of their property is violated, how neighbors act without any sense of community, and how they receive much more than their share of the noise. For many in our society, noise has become an expression of power or (perhaps) a reaction to their powerlessness. It is a realm of life they can control and inflict on others. And since noise always trumps quiet, it is easy. The tyranny of noise lies in its ability to always disturb the peace. It only takes one noise, or one noisemaker, to disturb the peace.

Civility, sovereignty, community, reciprocity, power, and tyranny are ethical issues, not acoustical ones, and not technical ones. But technology plays a very big role in our noisy world. Noise seems to flow from each new technical innovation. Technology, together with civility, sovereignty, community, reciprocity, power, and tyranny express the nature of noise.

The accompanying article, *Noise (is) Pollution,* suggested that we shouldn't think of noise in psychological terms, but in terms of an objective acoustical contaminant in the environment. Noise problems, however, are not purely acoustical, because we live in a society with others. They are by necessity political and ethical. We need to think of noise problems in social, political, and ethical terms.

Noise is an unusual pollutant, because more so than perhaps any other pollutant, it is a pollutant we impose directly on our neighbors. Acid rain might fall 1,000 miles from the smokestack, but since noise decreases by about six decibels for every doubling of the distance, noise problems often occur within 1,000, or even 100 feet. About the only other pollutant as directly imposed on others is second-hand smoke.

To fully understand what makes noise a unique pollutant, one needs to examine closely the relationship of noise to civility, sovereignty, community, reciprocity, power, tyranny, and technology.

Civility and Sovereignty

Unrepentant noisy neighbors either do not care about their impact on others or claim it is their right to make noise (which is more often than not, a way of hiding their uncaring). That is the testimony of thousands of quiet activists who contact the Noise Pollution Clearinghouse. Listen carefully to someone suffering a noise polluter, and you will hear the language of civility and sovereignty. More than anything else, the noise polluted speak of an amazing lack of concern and respect on the part of noise makers, and a hubris that comes from falsely thinking one is in the right.

Selfishness is not listening to what one wishes, it is asking others to listen to what one wishes.

The central question of civility is, “how should we treat our neighbors?” And this question is central to noise problems, because noise is quite often directly imposed on others. The noise polluter can be amazingly uncivil, waking people in the middle of the night, often repeatedly, or imposing noise on others without their consent.

As the Noise Pollution Clearinghouse motto suggests, good neighbors keep their noise to themselves; bad neighbors don’t. This seems to be universally true, as even noise polluters don't want to live next to people who impose their noise on them.

The problem of noise highlights both an ethical and religious problem—a failure to follow the “Golden Rule”—to treat others as we would like to be treated. From this perspective, noise is a selfish act. Oscar Wilde's comments on selfishness clearly pertain to noise: "Selfishness is not living as one wishes to live, it is asking others to live as one wishes to live." We could say, “selfishness is not listening to what one wishes, it is asking others to listen to what one wishes.”

The central questions of sovereignty are, “who owns the air?” and “do people have a right to pollute it?” Sovereignty deals with the issues of rights and ownership. Much of the noise pollution we experience results from individuals and businesses who believe that it is their right or freedom to make noise. The most common right claimed is a property right. They claim that they should be free to use their property as they see fit without interference from others. The second most common right cited is that of prior occupation. People often assume that if the noise source “was there” before the complainant, then the noise is permissible. Finally some people claim that they should be free to act as they wish without interference from others or the state, or they claim specific rights such as the freedom of speech. It is worth examining these claims,

because anyone subjected to noise will eventually be subjected to these arguments.

My right or freedom to swing my fist ends at your nose. My right to make noise ought to end at your ear.

Each of the claims of noise polluters about rights shows a fundamental misunderstanding of noise, ownership, and the western tradition of freedom. Persons making the first claim, that it is their property right, are wrongly assuming that they own the air over and around their neighbors. If the noise was limited to their property their case would be slightly stronger. Even then, however, it is not an absolute right. Smoking, for example, is prohibited in many public places by the states, even though the pollution is limited to air within private property.

In the case of noise heard on public property or another's private property, the noise maker has no claim to owning the air on which the noise travels. Therefore, they have no private property right to broadcast the noise.

Another version of the property rights argument claims that because the air is common property owned by everyone, everyone has the right to do as he or she pleases. This too is clearly a flawed argument. Roadways are also common property, but no one has the right to drive left of the yellow line or park their car in the middle of the street. Common property does not entail universal entitlement. In fact, such a policy leads to what is known as the "tragedy of the commons."

The term "tragedy of the commons" comes from the experience on common grazing fields in England. If everyone acts in his or her own self-interest on common property (in the common grazing fields, that meant grazing your sheep or cattle as much as possible), the common resource is degraded (the field is overgrazed and therefore supplies only a fraction of the feed it otherwise could have if it was better regulated).

The antidote to the tragedy of the commons is an ethic of the commons: common property needs to be managed so that uses that do not degrade or detract from others' use and enjoyment are encouraged, and uses that detract from others' use and enjoyment are discouraged. With respect to noise, that means encouraging quieter uses and discouraging noisy ones.

The claim of prior occupation clearly does not provide justification for noise pollution. One way to see the weakness in this argument is to realize that the argument is not used in reverse. Communities do not give neighbors the right to prohibit the introduction of new noises in their neighborhood because the prior use was quiet. People lived near almost all major noise sources before those sources existed. Moreover, there were people living there before the source was expanded. At some point there were no motorized boats on lakes, no airports, no jets, yet there have always been people seeking quiet. Their claims to (a quiet) prior occupation were obviously ignored, and still are today.

The claim of freedom (from government interference or free speech) seems to overlook the very nature and development of the concept of freedom in western cultures. Even at the height of laissez-faire attitudes in the 18th century, philosopher John Stuart Mill, one of the greatest defenders of the freedoms of individuals, recognized that people ought to be free to do as they please so long as they do not harm others. This is a concept well understood in America today. My right or freedom to swing my fist ends at your nose. My right to make noise ought to end at your ear.

Clearly, though the claims to a right to pollute are often repeated, and uncritically held by many, they are quite weak. There is no right to noise pollute.

Community and Reciprocity

While "civility" and "sovereignty" provide the philosophical and ethical framework for a quieter world, the concepts of "community" and "reciprocity" are the practical conditions that make quiet more or less likely. Community is the antidote to uncaring and incivility, while reciprocity is the embodiment of the Golden Rule, and the most important factor in determining how great a problem a particular noise will cause.

When a neighborhood fails to develop a sense of community, when anonymity rules, noise usually follows.

It is exceedingly rare to see a noise problem in a well functioning community. A good sense of community is critical to a quiet neighborhood. Noise problems occur most often when neighbors don't know each other or don't care about each other. People don't wake their neighbor at 2 AM if that neighbor is taking their kids to school at 7 AM or coming over for dinner at 7 PM the next day. So getting to know the neighbors is key to peace and quiet. Ironically, perhaps the best way to make a quiet neighborhood is to throw a party (and invite the neighbors).

From psychology, we know that anonymity increases anti-social and destructive behavior. Not surprisingly, most noise polluting in our world is done anonymously. An unmuffled motorcycle driven though the neighborhood, waking dozens of people. A redeye flight, taking off late at night, waking more people. The anonymous individual in some large corporation

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responsible for siting noisy compressors, deliveries, or trash next to residential neighbors.

When a neighborhood fails to develop a sense of community, when anonymity rules, noise usually follows. Without some connection to your neighbors, one must either hope for naturally quiet neighbors, or rely on noise ordinances that are rarely protective of peace and quiet, and poorly enforced.

In a good working community, noise levels may even occasionally increase, even while noise problems decrease. This is because noise becomes a problem when if flows onto other's property without their consent. In a good working community, it is not unusual for neighbors to seek that consent—tell their neighbors of a party, invite them to attend, and offer to turn it down if it is too loud or too late.

Building a good sense of community, like building a quiet community, takes time, and may even be impossible if one is faced with an uncaring "neighbor from hell"—either an individual, corporation, or government entity that has no wish to live in community with their neighbors.

Ultimately, a good community doesn't have to be made up of best friends, although a sense of concern for each other is ideal; at minimum what is needed is a sense of interdependence. At NPC we recommend borrowing and loaning as many tools as possible—hand tools, ladders, lawn equipment, etc. High on that list should be quiet lawn equipment. If you've bought a quiet lawnmower, you ought to be sharing it with all your neighbors, particularly since a quiet mower sitting in your garage doesn't quiet your environment when your neighbors' noisy mowers are going, and doesn't create any connections with your neighbors.

If a good community is the key to preventing noise problems, the lack of reciprocity is the key to understanding the severity of a noise problem. When it comes to noise, no single factor predicts a noise problem better than reciprocity, or the lack of it. If the noise between neighbors is roughly equal and travels both ways, rarely does the noise rise to the level of a noise problem. If I mow my yard and you mow yours, we make accommodations for each other's noise. If the noise is not reciprocal, if it primarily travels one way, then problems ensue. A lack of reciprocity is the defining characteristic of almost every major noise problem. Ironically, noise experts have done almost no research into the role of reciprocity among the non-acoustical factors affecting noise problems. But from the thousands of calls to the Noise Pollution Clearinghouse that we receive, it is plainly obvious that the level of reciprocity is the key to determining the severity of a noise problem.

The key role of reciprocity is not surprising once one recognizes the role of sovereignty, civility and the Golden Rule. The Golden Rule is really just an ethic of reciprocity. "Do unto others as you would have them do unto you." "Love your neighbor as yourself." "Hurt no one so that no one may hurt you." Jesus, Moses, and Muhammad all agree on the importance of reciprocating, of treating others as you would like to be treated.

Power and Tyranny

One of the problems with defining noise as "unwanted sound" is that it places too much emphasis on the psychology of the noise polluted. What is more interesting and important, however, is the psychology of the noise polluter. Why would someone knowingly and willfully do things that degrade the environment and cause adverse physiological changes in others? What is the source of this anti-social behavior?

The psychology of noise is evident in most noise problems, but most obvious in the case of an unmuffled motorcycle or car. Together with boom cars, they scream, "here I am, look at me, you can't do anything about it." A motorcyclist can have the same very loud and shaking experience with a vibrator and good headphones. For the money spent on boom cars, drivers could buy the most amazing headphones, and have enough money left over to vibrate their car seats at 70 hertz and to buy hundreds of CDs. They choose unmuffled exhaust pipes and booming stereos, not for themselves, but for everyone else. Whether it is an unmuffled vehicle, boom car, or other source, noise is often used as an expression of power. For the noise polluter, the pleasure comes not (only, and probably not primarily) from hearing the noise, but from the power and dominance of making others listen to the noise—the power of turning heads and imposing one's actions on another.

Noise, vandalism, and graffiti often provide pleasure to people. Psychology can offer both an explanation of why this occurs, and how to overcome this problem as a society, and therefore prevent future noise polluters. The problems occur when people get their

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self-esteem and fulfillment from having power over other people. This seems to affect both those with inferiority complexes and superiority complexes. The antidote to "power over others as self-fufillment" is to create legitimate outlets for personal expression, to make people feel secure in their self-esteem and power.

Unfortunately, this is rarely taught in schools, where too often a good education means students can pass a standardized test at the least cost to property-taxpayers. From the sheer number of young noise polluters who could be engaged in more productive activities, it is clear that civility is not something a standardized test can create and that society is not directing these people into legitimate and productive expressions of their self. Society's neglect of the very real human needs of its young, to establish their own identity and feel good about themselves, can be heard on most streets in America. We are paying for our neglect in decibels.

Noise provides the perfect tool for those who want to express their existence and power in anti-social ways. The tyranny of noise results from the fact that noise always disturbs the peace and the peaceful, while quiet never disturbs noise or the noise maker. Noise always has power over quiet. From the perspective of someone with feelings of inadequacy, noise is a reliable, reasonably safe (to themselves), not too violent, but effective bullying tool (governments even use it in torture) that is likely to turn heads and attract attention, without risking physical harm or landing one in jail.

As with political tyranny, the way to fight the tyranny of noise is with the masses. The "whack a mole" approach of tackling individual noise polluters is undermined by the fact that it only takes one noise polluter to disturb the peace. We need to change community expectations and ethics. Our goal is not to quiet individual noise makers—another will surface before the last one is silenced. Our goal should be a change in societal attitudes towards noise like what occurred towards litter in the 1960s and 1970s, or what is occurring towards recycling more recently. We need to make quiet the norm and expectation. Then silencing the individual disturbances of the peace will be much easier.

Long-term and long-range efforts like this, however, are difficult when an individual disturbance of the peace just woke you up at 2 AM. At the very least, we must make sure that our short-term efforts enhance long-term ones also. Support for noise control must be much broader than the 10 to 20 percent of the public that is most exposed or sensitive. If our efforts are not broad enough, we'll not overcome the tyranny of noise.

Noise is not a necessary by-product of modern technological societies. Noise is the cost we pay for not protecting our soundscape, not for living in a modern world.

Technology

Noise seems to flow from every new invention of the modern society. A century ago it was the car, motorcycle, and airplane—we made a racket by burning fossil fuels in an internal combustion engine. Today, it is the car, the motorcycle, the airplane, the car alarm, the lawn mower, the weed whacker, the leaf blower, the air conditioner, the stereo, etc. —we've added and continue to add novel and unimagined ways of disturbing the peace. In the 21st Century, we make noise with technology (well, there still are barking dogs, too.).

The good news, however, is that our 21st Century choice is not between technology and quiet. Noise is not a necessary by-product of modern technological societies. Noise is the cost we pay for not protecting our soundscape, not for living in a modern world. Sure, the modern world is noisy, but modern technology can create quiet as well as noise. For most of the noise problems today, there is at least a 10 decibel range between the loudest and quietest—there are lawnmowers, chain saws, air-conditioners, etc., one-half (10 decibels less) and even one-quarter (20 decibels less) as loud as others. But most of the time we're not using that quieter technology to improve our environment and quality of life.

Technology shapes the nature of noise in another, more subtle way. Technology, like age, is the great equalizer. It is easy to slip into thinking of noise polluters as the other, an uncivil, uncaring, (fill in the blank)…. Technology, however, makes noise polluters of us all.

We are all accomplices, at least in some way. Even the quietest among us mow our lawns, drive cars, ride public transit, or fly in airplanes. In our own ways we contribute to the din, and even to the incivility. If we send an overnight package, we disturb the sleep of hundreds of people. And while it may take hundreds of car tires to equal the noise of one mufferless car, the typical suburban soundscape, even if a mile from a highway, is filled with the noise of thousands of tires. Even the small contributions of 300,000,000 people add up to a noisy country.

Today it is nearly impossible to function in modern society without making a racket occasionally. Our role as users of technology should add a little humility, and a lot of energy to our efforts to quiet the world. It might even be the case that we will be able to change our technology faster than we can change others' attitudes about caring and community. Quieter technology is likely the first step to a quieter world. And once we do quiet our technology, finding and quieting the remaining noise polluters will be much easier and socially acceptable. It is hard to think of graffiti as vandalism on a wall already covered with it, but much easier on a perfectly clean wall. The same is true for noise. If the boom car isn't any louder than the noise of a trash truck or the airplane in a neighborhood, the challenge of quieting it is greater than if dominates the soundscape.

People don't ask their realtor for a nice house in the noisy neighborhood, with obnoxiously loud neighbors—not even an obnoxious motorcyclist would do that.

The Nature of Noise

A noisy world is a choice, but one people often do not make or do not know they can make. If people actually had the chance to think about that choice before they made it (or it was made for them), few would choose noise. There will always be some who want to choose noise for others, such as motorcyclists with straight pipes, but almost no one would choose it for themselves. People don't ask their realtor for a nice house in the noisy neighborhood, with obnoxiously loud neighbors—not even an obnoxious motorcyclist would do that.

Since most choices about noise are made for us, our challenge is to get those people to start making quieter choices. Noise is a complex mix of bad behavior and bad technology; sometimes it is more one or the other, but in all cases, understanding the nature of noise helps. **Civility matters.** Our message should be that good neighbors keep their noise to themselves. **Sovereignty matters.** People do not have the right to pollute. **Community matters.** We need to create better communities because people tend to noise pollute anonymously and do not pollute people they care about. **Reciprocity matters.** Noise and zoning regulations need to recognize that allowing governments, businesses, or individuals to make a lot more noise than their neighbors create is looking for trouble. **Power matters.** We will continue to create new generations of noise polluters until we provide people, especially young people, with better ways than dominating others to express themselves and feel good about themselves. **Tyranny matters.** Noise will always trump quiet, so even a 51% majority of quiet wishers isn't enough, we need to convince all but the noise makers, and maybe even some of them to keep it down. And finally, **technology matters.** The 21st Century can either be the noisiest in history, or reasonably peaceful. We have the technology for either.

NPC Product Noise Testing

continued from page 1

Hybrid Cars

With their increased fuel efficiency, hybrid cars (with both a gas and electric motor) are becoming more popular. We tested six hybrid vehicles (a Honda Civic, Honda Accord, Honda Insight, Toyota Camry, Toyota Highlander, and Toyota Prius), using 5 interior and 5 exterior tests, to compare the noise of the hybrid version to the conventional gas-powered version (when they existed). Engine noise tends to be the dominant noise at idle, low speeds, and during acceleration, while tire noise tends to be the dominant noise at high speeds. We wanted to know if the hybrid's smaller engine and use of the electric motor at low speeds translated into quieter vehicles.

We found an improvement in noise levels in city driving conditions, especially in the Honda line, where a full throttle acceleration averaged 6 decibels quieter than the gasoline only Honda equivalent. In absolute terms, however, the quietest hybrid we tested was the Toyota Camry hybrid when both interior and exterior levels were considered. The interior levels in constant speed tests were a remarkable 5 to 10 decibels quieter than the Hondas. The first generation hybrids (the Honda Insight and Toyota Prius) as opposed to the hybrids that are converted conventional cars (such as the Civic, Accord, and Camry) performed the best in exterior noise tests. This is unfortunate since the Honda Insight is no longer available in the US, and manufacturers are relying more on the gasoline engine in newer models. The gas engine of the Prius runs less than any of the other

The Toyota Prius hybrid had the lowest exterior noise levels in our test.

vehicles, and was therefore quieter. And, as might be expected, all the hybrids did much better at stop lights, when the engines turn off completely—a result not to be ignored in congested urban areas.

What does this mean for surface transportation noise? The quieter urban noise levels of the hybrids are promising, but limited. Just as the fuel efficiency improvement in hybrid cars occurs primarily in city driving (with several models reporting better city mileage than highway mileage), the noise reduction occurs primarily in city driving. In some sense, it is good that the fuel efficiency and acoustic benefits of hybrids overlap, since the likely market for hybrids is people who do a lot of city driving. If gas prices remain high, as is likely, hybrid vehicles will become more common and a future fleet of hybrids could result in the acoustical equivalent of removing half the vehicles from city roads.

Hybrids are a promising start to quieter roads. If, in the future, car makers combined the benefits of the Honda Civic and Accord hybrids (quieter acceleration) with the Toyota Camry hybrid (overall quiet) with the Honda Insight and Toyota Prius (much smaller gas engines and more reliance on electric power), urban areas could be significantly quieter. Fuel cell and electric vehicles have the potential to radically quiet urban areas. A totally electric vehicle could totally eliminate urban transportation noise problems for millions of people. Unfortunately, the major auto manufacturers scrapped their electric vehicle programs (and literally scrapped their vehicles) after G.M., DaimlerChrysler, and the Bush Administration sued the California Air Resources Board (CARB) to repeal the Zero Emission Vehicle (electric vehicle) mandate, setting back urban quiet signifcantly.

What does this mean for the car buyer today? If you want a nice quiet car, test drive the Toyota Camry Hybrid. In general, however, the hybrid's fuel economy seems to outperform its noise reduction.

The most promising technology we observed in our tests was not the cars, but the rear back-up camera on the Toyota Prius. Shift the car into reverse, and you immediately see what's behind you displayed on the console. This technology, if widely used, could increase safety (it really should be standard or required on every car, truck, and construction vehicle) and could eliminate perhaps one of the most stupid noises we experience today—the highly ineffective backup beeper. A recent study has shown that children are actually attracted to the beeping (toddlers are more likely to look toward and move toward the beeping than run away). In another study, the beepers were shown to be a dangerous warning device at worksites because the beeping can actually get quieter as a vehicle is approaching a worker because of interference caused by reflections off the ground. Unfortunately, like the seatbelt, airbag, and other automotive safety measures, back-up cameras probably will have to be required before they are widely used.

Window Air Conditioners

We tested 15 new window air conditioners this year. This was really a preliminary test, as we were looking to develop criteria for sleep interference for future tests, as much as to find the quietest window units. Some of our preliminary findings are that if you have problems sleeping at night, stay away from window air-conditioner units because the cycling on and off of the compressor can cause problems, even in the quietest units we tested (our sample was small so we are likely to find quieter window units in the future). If you have sleep problems, look at a central air system or a ductless system. The Lennox XC21 or the XC15 central systems are exceptionally quiet, both inside and out. A ductless system tends to be louder than a central air unit inside your home, but quieter than a window unit. The compressor in ductless systems resides outside like a central air unit, so inside you only hear the fan noise from the wall or ceiling mounted unit. Small pipes carry the refrigerant from the outside compressor to the indoor unit, so the compressor can be sited to cause the least outdoor noise problems.

One surprising result we found in our tests was that two medium sized (7,500 BTUs) window units are generally quieter, more energy efficient, and better at reducing humidity than one big one. So if you have additional window space, consider two, and set one a couple degrees higher than the other. Smaller (5,000 BTU) air conditioners were actually louder than the medium sized ones in our tests, so stick to the 7,500 BTU range. Finally, the Sears brand window units tended to be quieter than others, although our test sample size was small.

Lawnmowers and String Trimmers

We've now tested more than 100 mowers. Reel and electric models are ¼ to ½ as loud as gas-powered units, and still the best alternative for small yards. Buying an electric or reel mower is still the greatest single thing a typical homeowner can do to quiet the neighborhood soundscape, followed by replacing a noisy air conditioner with a quieter one (see above).

Perhaps the most disturbing thing we found in our testing was the introduction of cheap Chinese made lawnmowers

continued on page 12

Send Us the Proof

The Federal Aviation Administration (FAA) hasn't yet admitted that airplanes wake people up. The Federal Rail Administration hasn't yet admitted that trains and train horns wake people up. They are afraid that if they did they might have to do something about it.

The latest absurdity from the FRA is that people don't hear train horns from less than 1/8 of a mile away. That's right. Read what the FRA said, in concluding that train horns don't harm hearing:

"Sound exposure from locomotive horns in the community does not reach the cumulative levels that would exceed risk criteria for hearing damage.

Train horn noise can be so loud that workers in day care facilities like the one shown above are required to wear hearing protection by OSHA regulations. Our national hearing loss-related noise policy is so messed up that the children at this day care facility are not required to be protected, even though the adults in this situation are. The fence of this day care facility is 8 feet from the tracks at its closest. Noise levels can easily exceed 115 dBA if a horn is sounded. 115 dBA is the noise level above which no unprotected exposure to noise is permitted in US workplaces, not even for one second. This facility is a perfect example of children being exposed to dangerous train horns, and proof that children are exposed to train horns at distances less than 1/8 of a mile, something the FRA is apparently not aware of.

The horn noise model established by measurements for the Federal Railroad Administration is based on ... locations not closer than 1/8 mile from a grade crossing. In order to risk the onset of hearing damage, a person at that distance would have to hear more than 180 horn events during each 8-hour period for five days a week and continuously for 40 years."

What the FRA didn't tell you is that the same federal standard, the one that they used to determine that people 1/8 of a mile away can listen to 180 train horns a day, prohibits any unprotected exposure to train horns from less than about 40 or 50 feet from the tracks. Either the FRA officials knowingly used the 1/8 mile distance to hide that fact, don't know what they're talking about, or don't know that people are actually within 1/8 of a mile of tracks.

At NPC, we're going to assume the people at the FRA are neither manipulative liars nor stupid, but just don't know that there are people within 1/8 of a mile of train tracks in the US. So, send us your photos of people within 1/8 of a mile of a train track, or better yet, send us a photo of schools, day care facilities, children's play grounds or swing sets within 1/8 of a mile of train tracks. The photos should come from areas where train horns sound. Put the location on the back of each photo, so the FRA can verify the locations themselves. We'll use them as part of our effort to get the the US Department of Transportation to adopt a reality based noise policy.

From two or three miles, the train horn is a romantic sound from a more romantic era. For children 20 feet away, the distance to this municipal recreation center, the train horn is a danger to hearing. The choice is not between risking children's hearing and risking accidents at rail/roadway intersections. The train horn is 18th Century safety technology designed to frighten cows off train tracks. There are much better 21st Century safety alternatives that can actually increase safety without harming hearing or waking those nearby. Your photos of similar facilities where children or pedestrians often gather within 1/8 of a mile of train tracks will help us protect children's hearing and increase the safety of rail/roadway intersections.

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NPC PRODUCT NOISE TESTING

continued from page 9

that are significantly louder than typical mowers. These cheap mowers could eliminate gains made in lawnmower noise in recent years. Perhaps Briggs and Stratton might now appreciate noise regulations for mower engines as a means of protecting market share in the US?

We've also tested 20 string trimmers. To reduce both noise and air pollution, stay away from trimmers with two-cycle engines. Of the alternatives, the electric models are quieter, but not as powerful as the four-cycle trimmers. If you only need light duty trimming, you might look at the new battery powered string trimmers like the BTE-1 Lawn trimmer from Sunlawn. If you need a stronger unit, consider a corded trimmer, and finally, if you need something closer to a brush hog, consider a four-cycle trimmer.

For already considerate neighbors, using an electric or reel mower is the greatest single thing they can do to quiet the neighborhood soundscape.

INSIDE THIS EDITION