



MOTORSPORTS TASK FORCE

AGENDA

WEDNESDAY, JANUARY 31, 2007

COUNTY-CITY BUILDING

555 S. 10TH STREET, ROOM 113

7:30 A.M. - 8:30 A.M.

1. Approval of Minutes - January 3, 2007 and January 24, 2007
(see attached)
2. Subcommittee Reports
 - a. Economic, Fiscal, Social & Environmental - Jeff Maul
 - b. Location - Mike DeKalb
 - c. Demand - Darl Naumann
3. Environmental Impact Considerations: Sound, Noise and Drag Racing - Dr. Dominique J. Chéenne, Ph.D., Director of Acoustics, Audio Arts and Acoustics Department, Columbia College Chicago
4. Suggested Future Agenda Items

MINUTES
MOTORSPORTS TASK FORCE
Wednesday, January 31, 2007 - 7:30 a.m.
County-City Building, Room 113

Task Force Members Present: Russ Bayer, Chair; Carol Brown, Dave Dykmann, Randy Harre, Gary Juilfs, Chris Kingery, Karen Kurbis, Mike Tavlin, Greg Osborn, Stan Patzel, Larry Lewis, Mike DeKalb, Lincoln-Lancaster County Planning Department (Ex-officio); Kerry Eagan, County Chief Administrative Officer (Ex-officio); Darl Naumann, Lincoln-Lancaster County Economic Development Coordinator (Ex-officio), Jeff Maul, Convention & Visitors Bureau Executive Director (Ex-officio) and Scott Holmes, Lincoln-Lancaster County Health Department (Ex-officio)

Task Force Member Absent: None

Others Present: Dr. Dominique Chéenne, C & C Consultants; Marvin Krout and Kent Morgan, Lincoln-Lancaster County Planning Department; Mark Kenne and Gary Walsh, Lincoln-Lancaster County Health Department; Marlene Tracy, Randy Moore, Jeff Atkinson, Gary Dominguez, Jill Bailie, Tom Keep, Becky Keep, Jean Ortiz, Lincoln Journal Star; Cori Beattie, County Board Secretary; and other interested parties

Minutes

Brown moved approval of the minutes from January 3, 2007; seconded by Patzel. Motion passed unanimously.

With regard to the minutes of January 24, 2007, the following changes were offered:

1. On page one, second paragraph under "Motorsports Overview", Brown indicated the \$10 million economic impact to the area was for one weekend national event as opposed to annually.
2. On page two, first paragraph, Kurbis added the following text prior to the last sentence, "A long cue area is needed to avoid back-up traffic onto the highway. You have to get them off the road." Additionally, she added the following sentence to the end of the second to the last paragraph, "Wednesday night street drags run from 9:00 p.m. to 12:00 a.m. or 1:00 a.m. They don't make much money off kid entries but do make money off concessions. Weekly races have mufflers."

Brown moved approval of the January 24, 2007 minutes with the changes noted above; seconded by Osborn. Motion passed unanimously.

Subcommittee Reports

Economic, Fiscal, Social and Environmental

Maul indicated this subcommittee's job became easier with the release of Dr. Thompson's study, as well as last week's presentation. He noted an obvious economic impact exists and members are continuing to study the short-term and long-term magnitude. Additionally, they are looking at potential facility uses during down time, growth of the business sector around a complex including job creation, a stand-alone facility versus a multi-use complex and other social and environmental issues.

Osborn suggested the subcommittee and other interested members tour the Topeka facility within the next few weeks as the demographics are relatively similar to Lincoln's. Bayer asked those who are interested in attending to contact Osborn by the end of the week with their schedule of availability. The subcommittee was also asked to prepare an itinerary for the trip.

Maul noted Dr. Thompson has volunteered to meet with the Task Force on February 14, pending schedule confirmation.

Location

DeKalb distributed a Location Subcommittee Report. **(See Exhibit A.)** The members looked at proposed County criteria, existing City criteria and criteria from other jurisdictions. Three maps were discussed - the map generated by the original motorsports committee and displayed at the January 3 meeting; the proposed County race track zoning analysis map (lower right-hand map) and the City Zoning Racetrack Analysis: Composite (lower left-hand map).

DeKalb noted the County map showed 230 square miles which would meet the criteria without waivers. The City map reflected 11 square miles, again without any waivers or adjustments.

The subcommittee addressed impacts, needs and general area requirements. They also discussed criteria and potential "locations of opportunity." DeKalb noted some generalized areas with potential included an area along Highway 6 and Interstate 80 near Waverly, an area south of Lincoln near Hallam/Sprague and various smaller opportunities including next to the Abbott Sports Complex. He said the subcommittee will attempt to further locate and rank potential sites.

Bayer asked if the subcommittee was going to provide recommended criteria whether it does or does not match the County Board's. DeKalb thought so - if members agree. He said the charge given to the subcommittee was to review criteria, make a recommendation on appropriate criteria, locate potential sites and rank sites best to least. Bayer questioned whether sites will be considered even if waivers are required. DeKalb said a first shot should be given to a site with no waivers but if there is a good one which needs a waiver, he didn't think that would prevent the subcommittee from recommending it. Bayer said a couple good suggestions were offered in the past which probably don't meet all the criteria but would be worth discussing. With regard to the site north of the Abbott Sports Complex, DeKalb noted it would need some waivers.

Demand

Naumann said this subcommittee is trying to measure demand. Because of time and cost considerations, they decided the best way to do this would be by an online survey. He noted Beattie would be responsible for getting the information on the City-County website. Bayer said he has seen the draft and various changes recommended by Task Force Members. He questioned if the subcommittee was satisfied with the product. Naumann said yes and indicated the survey is now being electronically developed. With regard its status, Beattie indicated it will be done pending further direction from the Task Force.

Brown said she did not realize members were supposed to offer changes. She thought it was going to be brought back to the Task Force for consideration. Bayer suggested members forward any changes to Naumann by this Friday (February 2) for consideration by the subcommittee next week. After that time, the final version can be shared electronically with the Task Force. If there are no strong objections, the survey can be posted to the website.

Kurbis asked how the survey will be advertised. Naumann said the Wi-Fi survey was advertised through Chamber members. He was not quite sure how to get this one out to a broad spectrum of people. Maul said Brown is aware of many grassroots message boards and other avenues to

contact. The idea is to spread the word without weighing too heavily on one side of the issue or the other. Brown suggested asking the newspaper to promote the site. It was noted this is not a scientific survey by any means.

Tavlin asked if those not on the locations subcommittee could receive criteria information in order to be able to provide input in the future, if necessary. Bayer said there will be many of these opportunities in the future. DeKalb said this information was distributed to members at the January 3rd meeting. Bayer asked that he resend (via e-mail) the existing City criteria and the proposed County criteria.

Lewis said he felt a particularly good location would be near the airport on the north side of the Interstate. DeKalb said this area was included in the subcommittee's discussion on other opportunities.

Bayer reminded the group that the subcommittees will not be dictating the policies of the full Task Force. He said the next few weeks will be intense. Votes will be taken, likely not all unanimous, and then the information will be presented to the County Board who will make the ultimate decision.

DeKalb requested that the locations subcommittee stay after the presentation to discuss how the information presented today will effect location.

Environmental Impact Considerations: Sound, Noise and Drag Racing

Dr. Chéenne began by providing various definitions and units as they relate to the issue at hand. He outlined the following:

"Level" - the strength of a sound measured in decibels (dbs)

"Frequency" - the pitch of a sound measured in hertz (hz)

"Spectrum" - the type of sound

"Duration" - how long in seconds the sound lasts

"Noise" - unwanted sound

He demonstrated sound levels at 85 and 65 dbs, as well as 10 db and 1 db differentials. A 10 db differential equates a noise about half as loud (or quiet). With regard to frequencies, sounds were provided at the following hertz: 40 (deep bass), 200 (lower, mid-range), 1,000 (center of pitch range) and 5,000 (high pitch sound). Also demonstrated were sounds of a top fuel car burnout, jet car (dragster), pro-stock car on passby and pro-stock motorcycle on passby. In response to Brown's inquiry, Dr. Chéenne said the recordings were done at a distance of roughly 45'.

With regard to noise levels, Dr. Chéenne noted 35 dbs and below are recommended for good sleep. Local ordinances usually limit outdoor noise levels at 65 dbs during the day and 55 dbs at night. Federal mandates work exposure levels at 90 dbs and less. Levels at 100 dbs are considered unsafe under prolonged exposure and levels in excess of 120 dbs are considered dangerous under any exposure.

Dr. Chéenne highlighted various parts of outdoor sound propagation. He noted under normal temperature conditions, air becomes colder at higher elevations. Temperature inversion is what takes place when cold air gets warmer as it rises then gets colder again. Under these conditions a warm air layer is created whereby sound waves get trapped. This layer can be anywhere from a few 100' to a few 1,000' above the ground. He added when wind is present under the layer the sound waves bend down downwind and bend up upwind.

Dr. Chéenne noted the more stagnate the air, the greater chance for temperature inversion. In Nebraska during the month of July, 40-50% of the days have air stagnation. This means the conditions are very good for long-term propagation of sound. The intonation of sound in the atmosphere is strongly dependent on frequency and humidity. Therefore, the weather is a critical factor when predicting sound propagation outdoors. He added dry air provides more sound absorption than humid air. Thus, sound would propagate farther on hot and humid days than cool and dry days. He also noted rumble and bass sounds travel farther than high pitch sounds under identical temperatures.

The following scenarios were offered:

With a sound source of 115 db (louder than a motorcycle but quieter than a dragster) on a hot and humid day with good conditions of propagation (ISO 9613), a rumble and bass sound (<200 hz) would measure 56 dbs at one mile. Dr. Chéenne said this would be audible but not really bothersome. The same sound would measure 48 dbs and 43 dbs at two and four miles respectively. On a cool and dry day, the same sound would measure 53 dbs at one mile; 45 dbs at two miles; and 38 dbs at four miles. He added on a hot and humid day, the measurements for a mid-range to high frequency noise would be 49 dbs at one mile; 31 dbs at two miles; and 5 dbs at four miles. (It was noted these were all flat land measurements.)

Dr. Chéenne noted other factors to consider are ground absorption. Thick grass and soft ground provide effective attenuation but only at high frequencies. He added trees and other vegetation provide very few results. In order for berms and barriers to be effective, they must be located very close to the sound source. They would need to be very tall to be effective at low frequencies.

With regard to assessing noise, Dr. Chéenne said there are three contributing factors - level, spectrum and duration. He noted it is important to consider where, when and how to measure noise. He recommended testing proposed sites using sounds similar to those generated at events and to do this testing under inversion conditions. Sensitive locations should also be tested. Once the final location is selected, Dr. Chéenne advised on-site monitoring during events.

Kurbis requested a copy of Dr. Chéenne's power point presentation. He indicated a copy would be forwarded to the Health Department for distribution.

In response to Brown's inquiry, Dr. Chéenne explained more noise would be heard near an oval track versus a dragstrip but the sound quality would be much different - higher pitches as opposed to lower rumbles. With regard to decreasing decibel levels by building a track in a bowl, Dr. Chéenne said the decibel level will vary depending on bowl depth and noise frequency. Any kind of depression will help mitigate high frequency noise but would do very little for low frequency noise unless it was a very deep bowl and this would not be practical. Brown asked if a bowl would change the direction of noise. Dr. Chéenne said it would abate some mid to high-range frequencies but lower frequency sound waves would simply go over the sides.

Holmes questioned whether people are more irritated by higher or lower noises and if such a facility would be located near other sources of sound, would people's perception of noise be lessened. Dr. Chéenne said everyone's perception of sound is different. As a rule, higher frequency noises tend to be more annoying but they are easier to abate than low frequency rumbles. Again, the duration of the noise is key.

Patzel said under poor weather conditions at a mile away, the worst case scenario was 56 decibels - which he thought wasn't too bad. On the flip side, he did not know how the Task Force was going to convince neighbors near the proposed north site that this noise level was not annoying. Brown said the noise in the conference room today ranged from 50-70 dbs (based on readings from a meter she had on the table). Dr. Chéenne pointed out some feel this level is too loud.

Future Agenda Items

Kurbis felt the social and environmental issues have been minimized and asked that they be addressed. Additionally, she recommended the Task Force hear from the other side of the issue. Lewis said he is concerned about decreased property values near the complex. Brown pointed out over 400 homes were built near the Brainerd, MN, racetrack. Kurbis volunteered to put together a packet containing information from other localities. Bayer suggested Maul's subcommittee work on this. He added while the County Board expects something by March 1st, additional time may be needed to further address certain issues.

Bayer suggested subcommittees meet on February 7th and the Task Force meet on February 14th, February 21st and February 28th. He noted Osborn will also work on scheduling a trip to Topeka within the next two weeks.

Upon confirmation, the February 14th meeting will include a 30-minute presentation on the motorsports study by Dr. Eric Thompson of UNL, as well as additional time for subcommittee reports and group discussion. On February 21st, preliminary reports from subcommittees will be scheduled for 20 minutes each with finalization to take place on February 28th.

Bayer hoped the County Board would ask the Task Force to continue especially if there are gaps in the recommendation. Eagan said he could see a draft done by February 28th but couldn't see turning in a final report to the Board on the next day. He added the Board may choose to grant the Task Force additional time.

There being no further business, the meeting adjourned at 8:40 a.m.

Submitted by,



Cori Beattie
County Board Secretary

Motorsports Task Force, Jan 31, 2007

Location subcommittee report

The committee has met on Jan 3(post task force), 10th and 17th

We have reviewed

- the proposed Lancaster County zoning criteria
- the existing City of Lincoln zoning criteria
- Cass County, Crow Wing (Brainerd MN), and Shanwee Co KS codes

We have reviewed

- a map developed for the motocross committee using 6 criteria (the "red" map)
- a map using the proposed Lancaster County criteria with no wavers (this shows about 232 square miles would meet the criteria)
- a map using the existing Lincoln criteria (showing about 11 square miles)

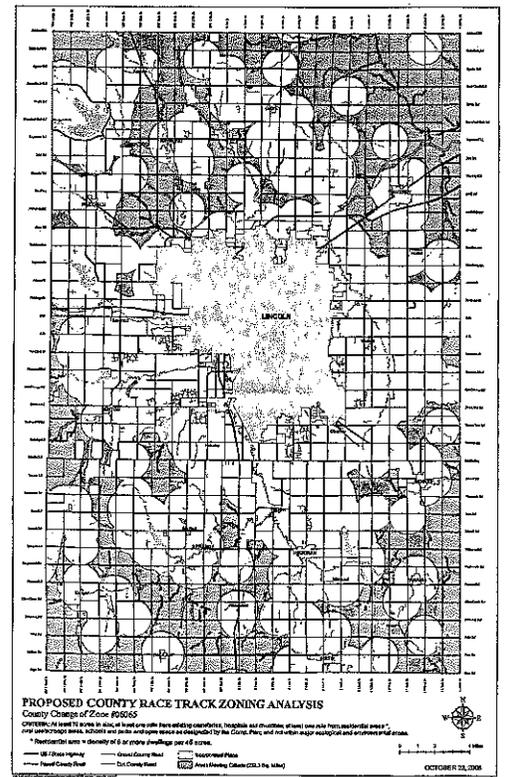
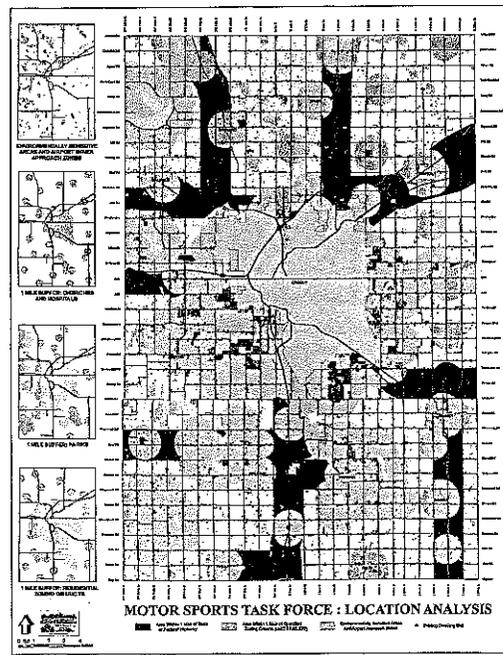
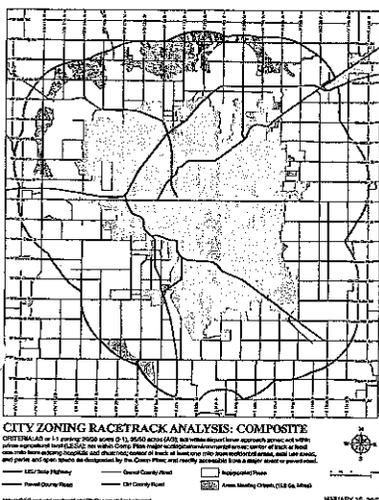
We have discussed impacts, needs and general area requirements

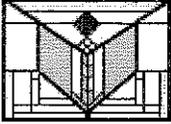
We have discussed criteria and *potential "Locations of Opportunity"*. An initial review indicates potential in the Waverly area around Hwy 6/I-80, south of Lincoln in the Hallam/Sprague area and various other smaller opportunities including next to the Abbott Sports complex.

We will attempt to further locate and rank potential sites.

Respectfully submitted
Mike DeKalb

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Michael V Dekalb/Notes
01/31/2007 11:02 AM

To Cori R Beattie/Notes
cc carolserv@hotmail.com, cekingery@gmail.com, Darl A Naumann/Notes@Notes, dd12914@alltel.net, gjuilfs@netinfo.ci.lincoln.ne.us, jmaul@lincoln.org,
bcc

Subject Re: Motorsports Task Force request

The Task Force asked for the criteria used on producing the three maps. I would note the Lincoln criteria is per the zoning code today and the County is per the proposed zoning code now pending at the County Board.

Here is the 'Short form' of criteria for each map.

1. The prior motorsports (motocross) task force asked for a map showing the following; Area within 1 mile of a State or Federal Highway; environmental areas, airport noise zone, existing dwellings and a one mile buffer to churches, hospitals, parks and residential zoning. We did not run an "Square miles" number available but will provide that.
2. The City zoning composite shows only AG or I-1 zoning, 20/30 acres if I-1 or 35/40 acres if AG zoned, not in Prime farm land, not within a Comp Plan ecological/environmental area, one mile from a hospital, church, residential area, rural use area, park or open space. Major and paved roads were shown but not "buffered". 11.8 square miles meet the criteria.
3. The proposed County zoning composites shows, parcels 70 acres in size, one mile from cemeteries, hospitals, and churches, residential areas, acreage areas, schools and parks, and open space shown in the Comprehensive Plan and major ecological/environmental areas. Roads are shown but not buffered. 232.3 square miles meet the criteria

It should be noted that both the City and County zoning codes provide for adjustments to the criteria so other potential sites are still being discussed.

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Environmental Noise

An Introduction

Prepared for

The Lancaster County Motor Sports
Task Force

By

Dominique J. Chéenne, *Ph.D.*
C & C Consultants

Lincoln . Chicago . Puisserguier

DEFINITIONS & UNITS

- **Level:** the “strength” of a sound. It is measured in Decibels (dB).
- **Frequency:** the “pitch” of a sound. It is measured in Hertz (Hz)
- **Spectrum:** which frequencies are in the sound. The “type” of the sound.
- **Duration:** how long does the sound last. It is measured in seconds.
- **Noise:** unwanted sound.

A FEW EXAMPLES

- A sound pressure level of **85 dB** 
- A sound pressure level of **65 dB** 
- Two sounds that are **10 dB** apart 
- Two sounds that are **1 dB** apart 
- A **40 Hz** pure tone 
- A **200 Hz** pure tone 
- A **1,000 Hz** pure tone 
- A **5,000 Hz** pure tone 

A FEW MORE EXAMPLES

- A top-fuel car (burnout) 
- A jet car (afterburner pops) 
- A pro-stock car (pass-by) 
- A pro-stock motorcycle (pass-by) 

**These examples were NOT played
back at the actual level**

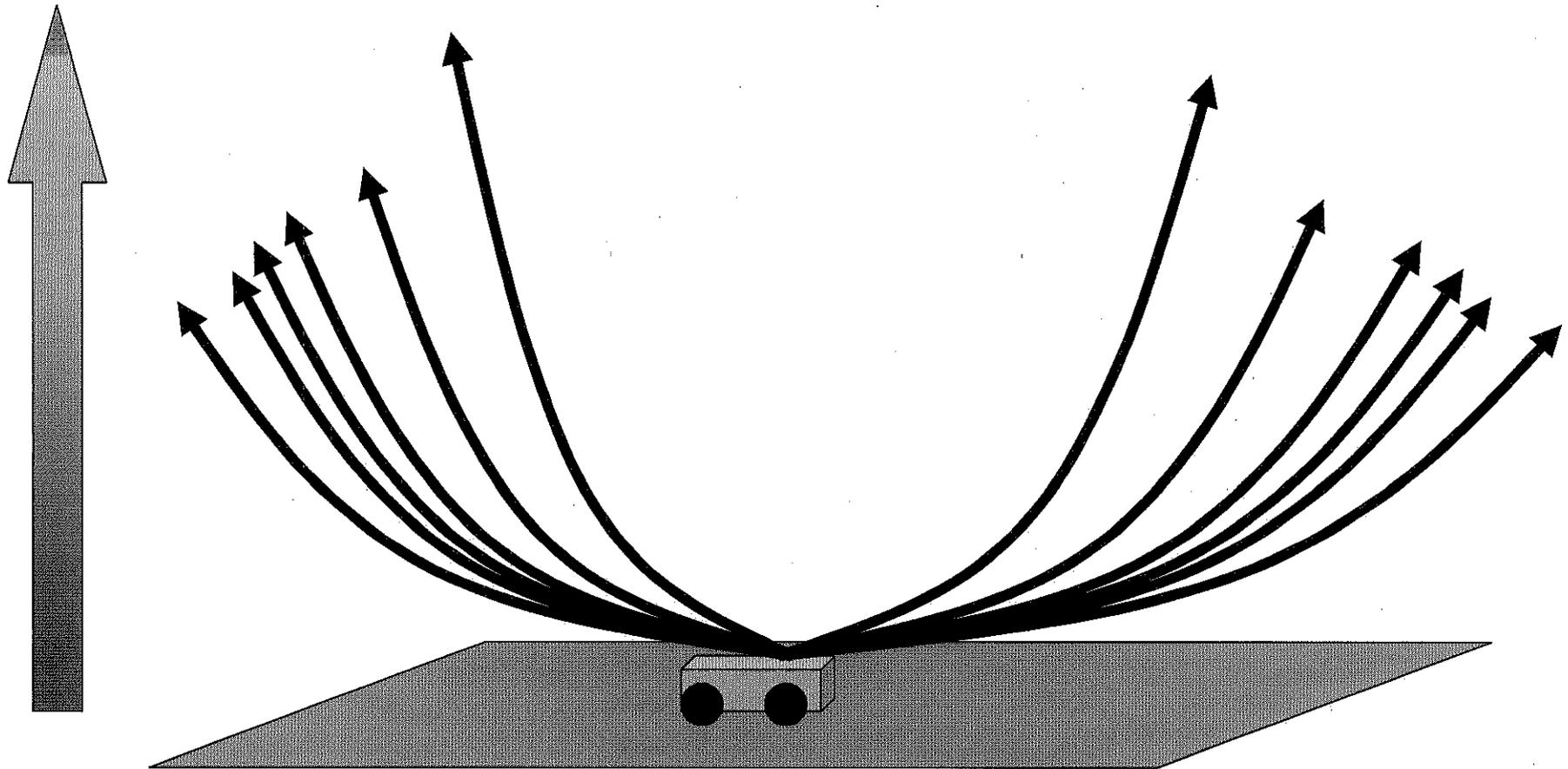
All sounds from the National Hot Rod Association website
<http://www.nhra.com/sounds/index.htm>

HOW LOUD IS LOUD?

- Indoor noise levels below **35 dB** are recommended for optimum sleep.
- Local ordinances usually limit outdoor noise levels to **55 dB** during nighttime & **65 dB** during the daytime.
- Federal mandates limit work-related noise exposure to be less than **90 dB/8** hours.
- Levels in excess of **100 dB** are considered unsafe under prolonged exposure.
- Levels in excess of **120 dB** are considered dangerous under any exposure.

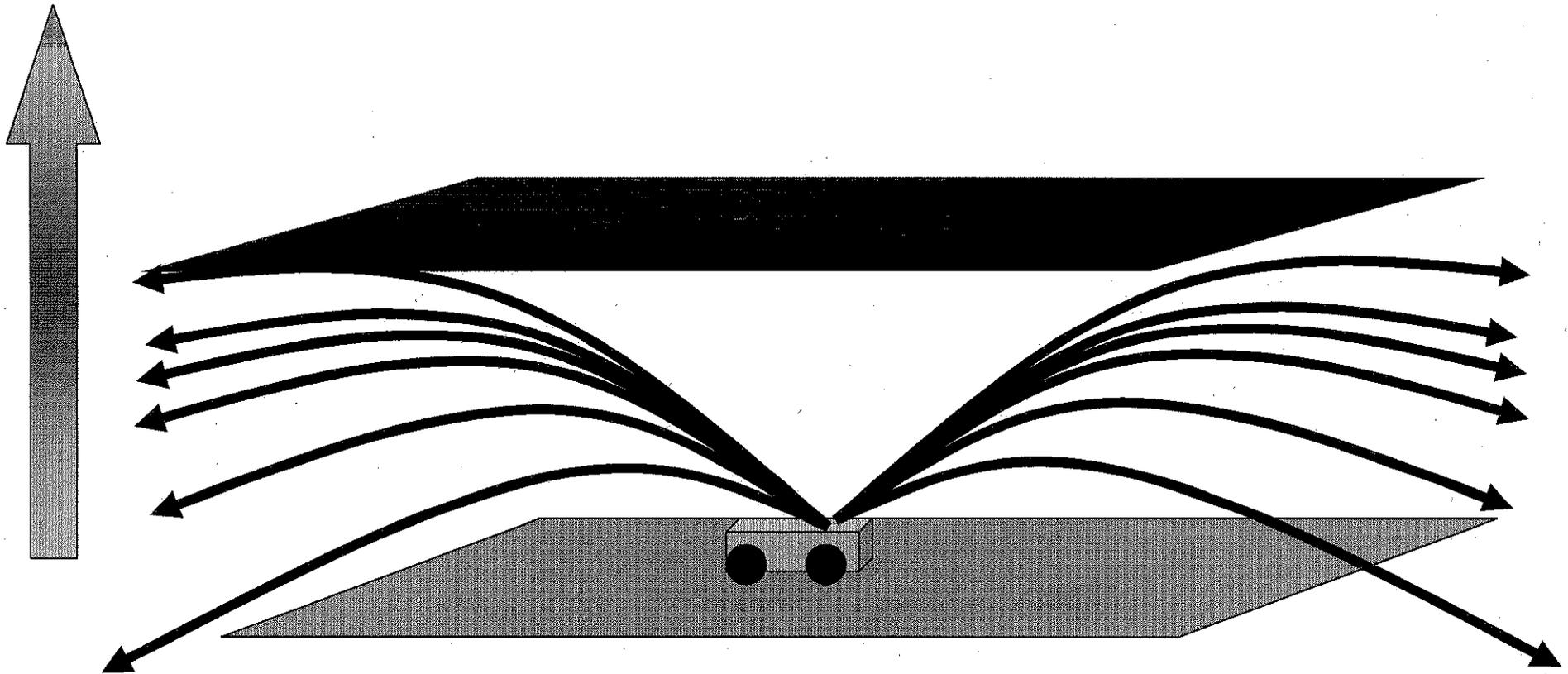
SOUND PROPAGATION OUTDOORS. Part I

Under **normal** temperature conditions



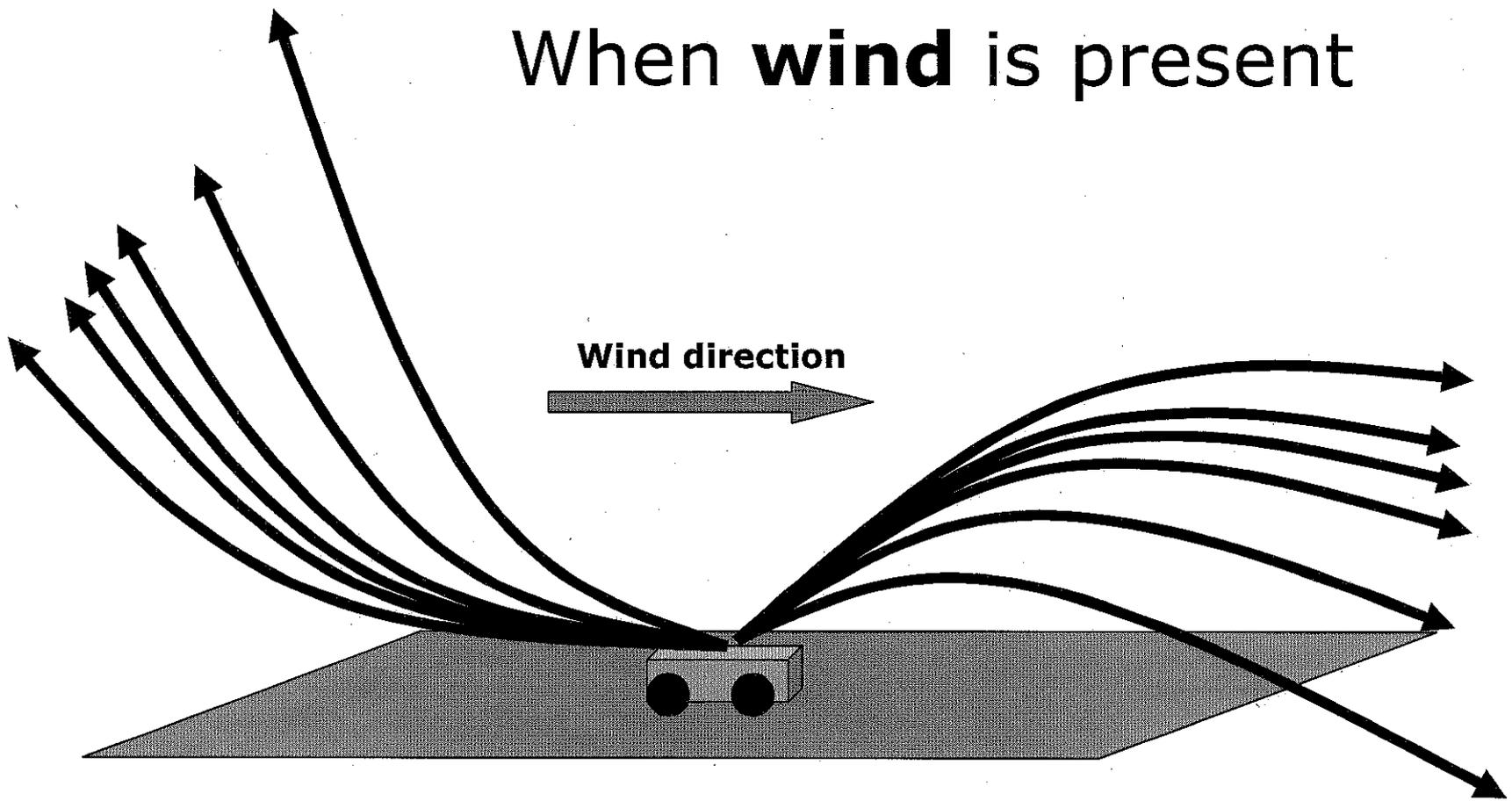
SOUND PROPAGATION OUTDOORS. Part II

Under temperature **inversion** conditions

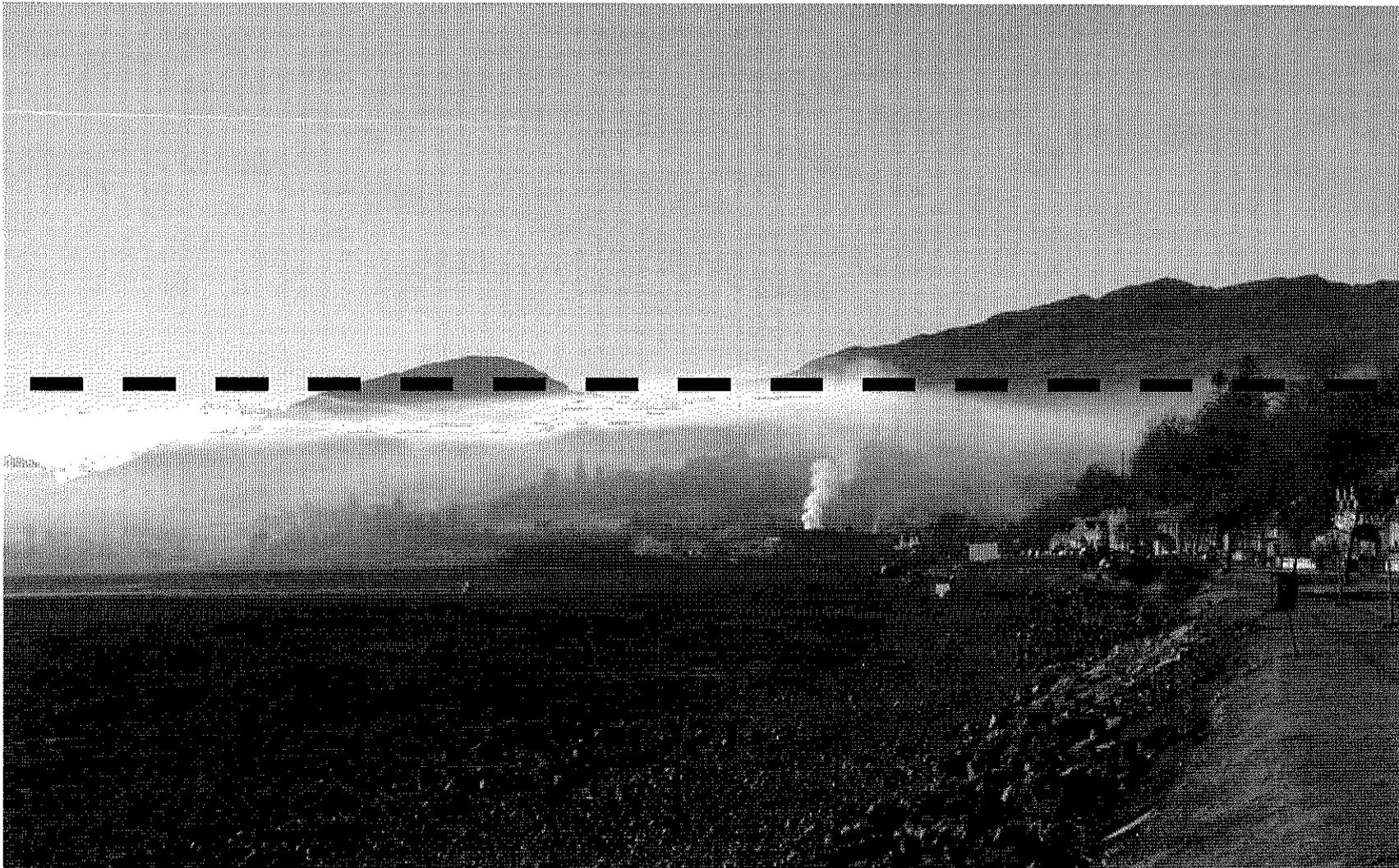


SOUND PROPAGATION OUTDOORS. Part III

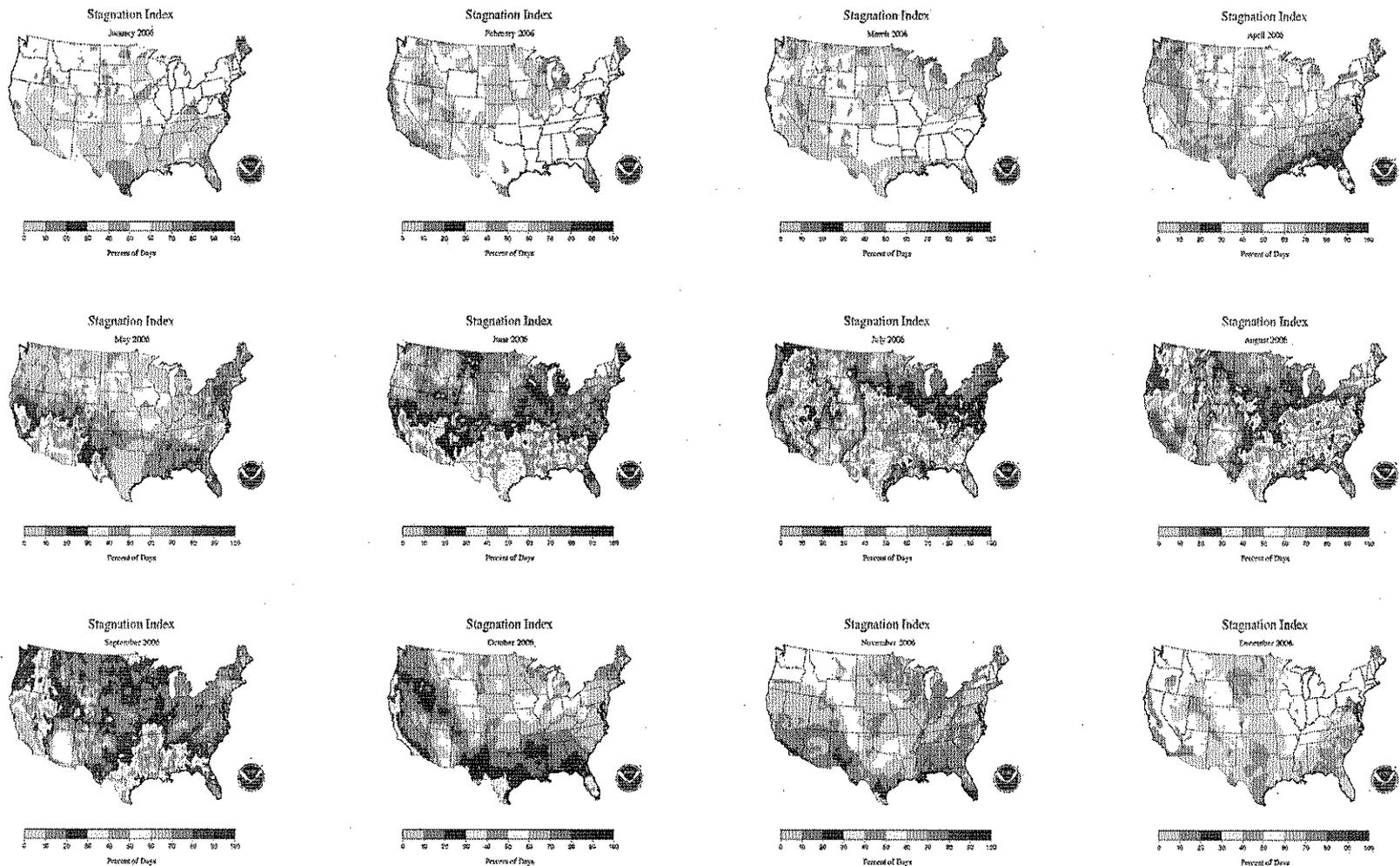
When **wind** is present



AN EXAMPLE OF INVERSION



WHERE & WHEN DO INVERSIONS OCCUR?

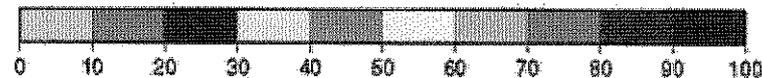
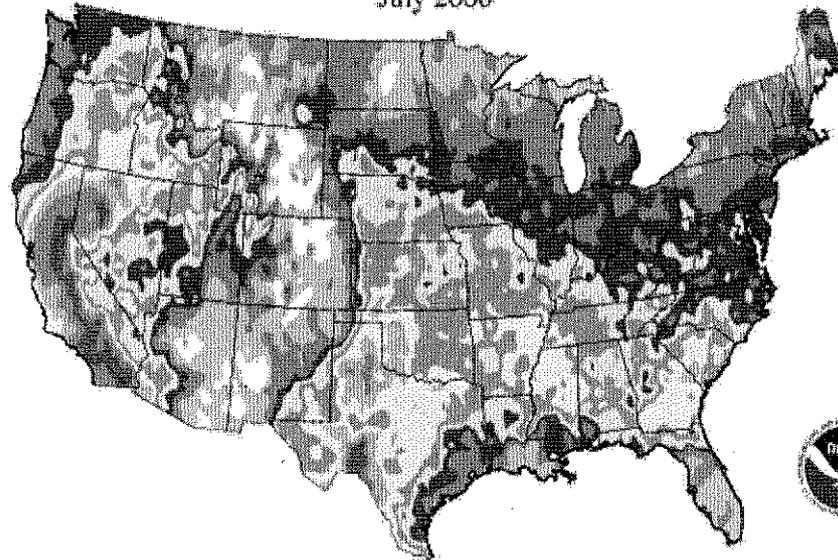


A SPECIFIC SCENARIO

(July 2006 data)

Stagnation Index

July 2006



Percent of Days

TEMPERATURE & HUMIDITY EFFECTS. Part I

The attenuation of sound by the atmosphere is strongly dependent on the **frequency** of the sound and on the **relative humidity** in the air



When predicting sound propagation outdoors, the weather is a critical factor, and the predictions for one type of noise may not apply to other noises

TEMPERATURE & HUMIDITY EFFECTS. Part II

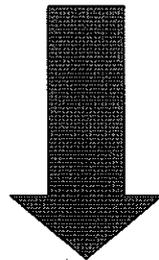
Under *normal* conditions, and for a given temperature, dry air provides more sound absorption than humid air



Sound will **propagate farther** during hot and humid days than it will during cool and dry days

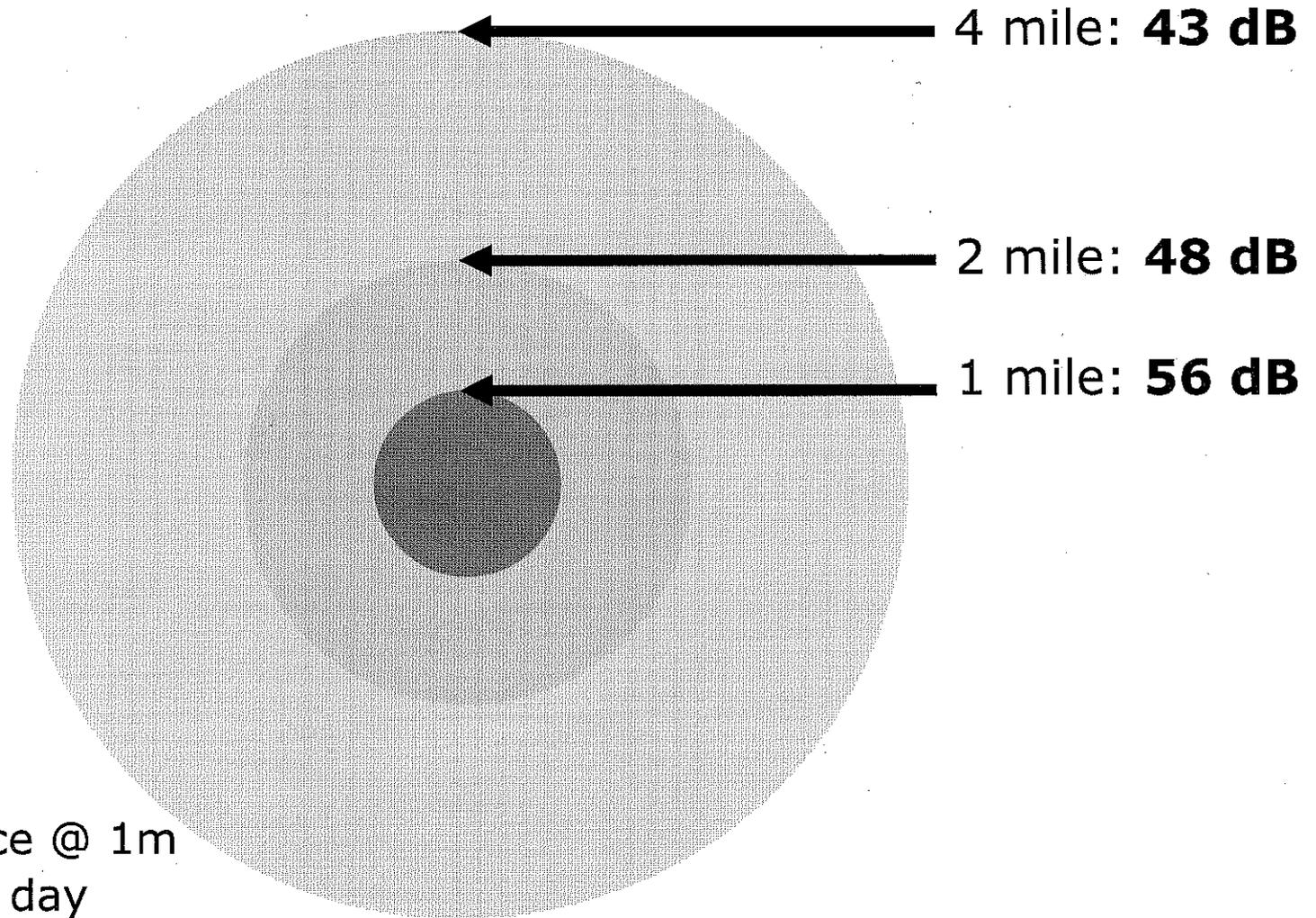
TEMPERATURE & HUMIDITY EFFECTS. Part III

For a given temperature and humidity scenario, high frequencies get attenuated much faster than low frequencies.



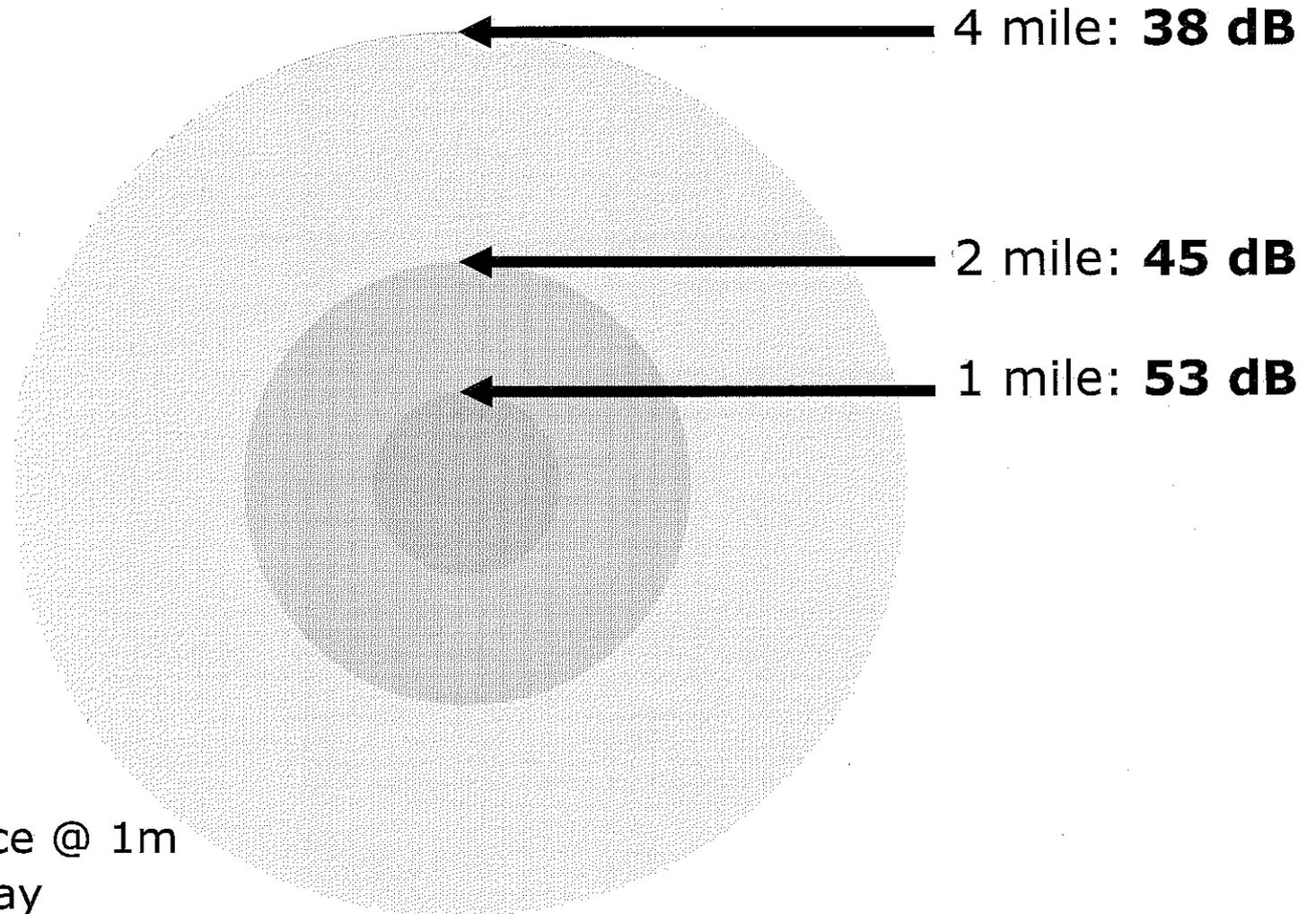
“Rumble and bass” sounds will always travel **farther** than high-pitched sounds under identical temperature & humidity scenarios.

PROPAGATION EXAMPLE #1



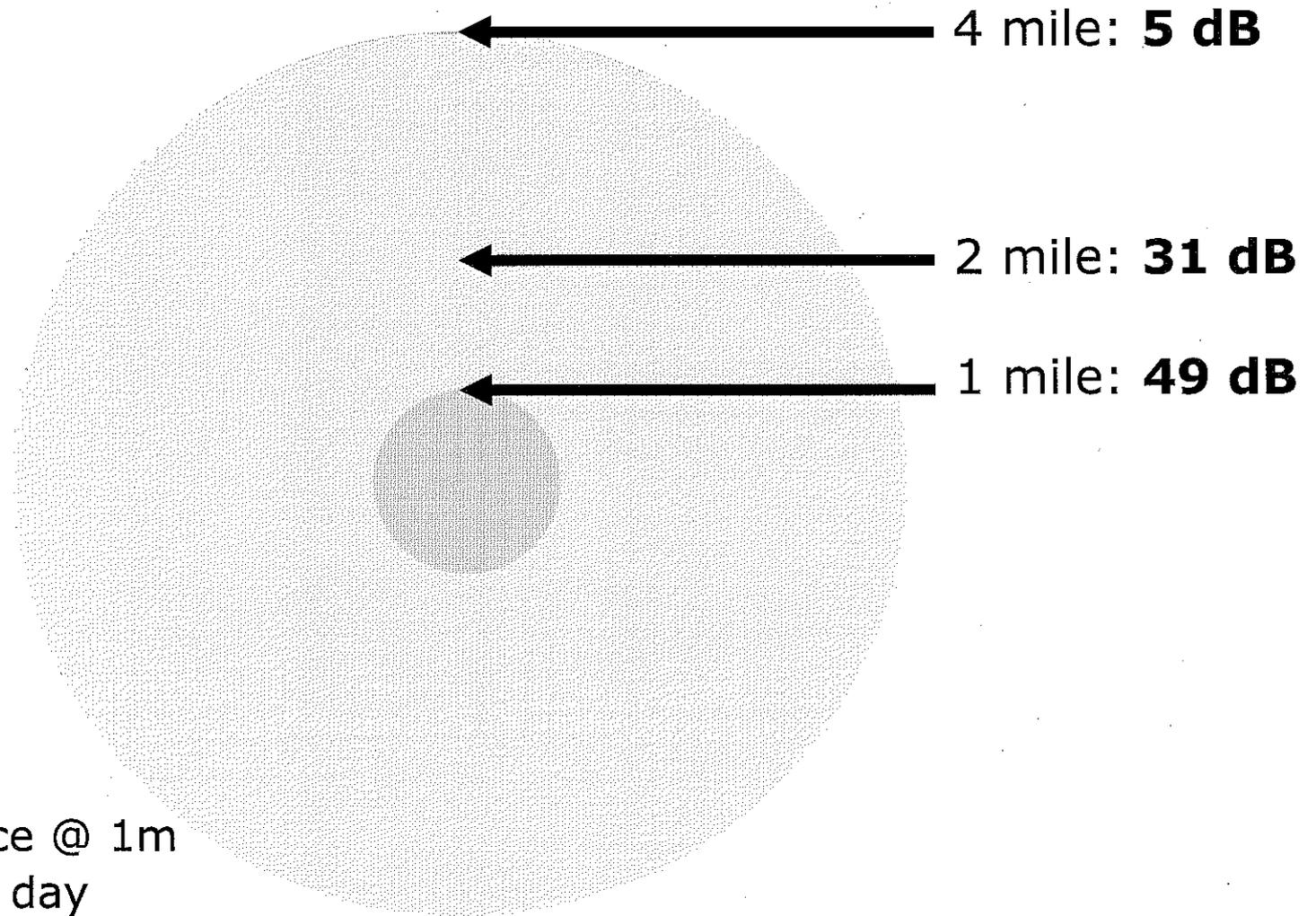
- 115 dB source @ 1m
- Hot & humid day
- Favorable propagation conditions (ISO 9613)
- Most frequencies < 200 Hz (bass & rumble)

PROPAGATION EXAMPLE #2



- 115 dB source @ 1m
- Cool & dry day
- Favorable propagation conditions (ISO 9613)
- Most frequencies < 200 Hz (bass & rumble)

PROPAGATION EXAMPLE #3



- 115 dB source @ 1m
- Hot & humid day
- Favorable propagation conditions (ISO 9613)
- Few frequencies < 200 Hz (mostly midrange & high)

OTHER FACTORS

- Ground absorption
 - Thick grass and soft ground provide effective sound attenuation at high frequencies
 - Trees and vegetation provide very little sound attenuation at low frequencies
 - Ground effects are complex to model accurately
- Berms and barriers
 - Must be placed close to the source
 - Must be very tall to be effective at low frequencies

A FINAL EXAMPLE



- 1 mile away
- 6 miles away
- 12 miles away
- 38 miles away

“Today, more than 100 years after its arrival in Stanley Park [...] the Nine O’Clock Gun booms out its nightly message—a message heard at **Granville and Hastings** five seconds after nine o’clock, in **Marpole** 30 seconds after that, in **New Westminster** a full minute after nine and in **Mission** (it’s been heard there more than once) more than three minutes after nine.”

ASSESSING NOISE

- Three fundamental factors to consider when dealing with noise in general
 - The **LEVEL** of the noise (**HOW MUCH**)
 - The **SPECTRUM** of the noise (**WHAT**)
 - The **DURATION** of the noise (**HOW LONG**)

- Three fundamental factors to consider when dealing with environmental noise
 - **WHERE** to measure
 - **WHEN** to measure
 - **HOW** to measure

RECOMMENDATIONS

- Consider **TESTING** the proposed site(s)
 - Generate (in a realistic fashion) sounds that are representative of the events being planned
 - Use weather conditions that are favorable to the propagation of sound (inversion)
 - Measure the noise at sensitive locations
- Consider on-site **MONITORING** during events
 - Levels
 - Duration
 - Use metrics that are tailored to the activity

Thank You

