



**AVIATION ADVISORY BOARD
FORT LAUDERDALE EXECUTIVE AIRPORT
ADMINISTRATIVE OFFICE - MULTIPURPOSE ROOM
6000 NW 21 AVENUE, FORT LAUDERDALE, FL
THURSDAY, JANUARY 27, 2011 1:30 P.M.**

Board Members	Attendance	Cumulative Attendance	
		7/10 through 6/11 Present	Absent
Bunney Brenneman, Chair	P	5	0
Bruce Larkin, Vice Chair	P	3	2
Lee Alexander	P	4	1
Gloria Brown	P	3	1
Avery Dial [1:35]	P	1	0
Linda Iversen	P	3	2
Jackie Kaht	P	5	0
Patrick Kerney	P	5	0
Stephen Stella	P	4	0
Pamela Bushnell, Vice Mayor, City of Tamarac [non-voting]	P	5	0
Jeff Helyer, City of Oakland Park [non-voting]	P	5	0

Airport/City Staff

Clara Bennett, Airport Manager
 Mark J. Cervasio, Assistant Airport Manager
 Florence Straugh, Noise Abatement Officer
 Rufus A. James, Airport Operations Supervisor
 Cate McCaffrey, Director, Business Enterprises
 Sharon Miller, Assistant City Attorney
 Vicki Minard, Assistant City Attorney
 Sharon Dreesen, Administrative Aide
 Leslie Carhart, Administrative Assistant
 J. Opperlee, Recording Secretary, Prototype Services

Communications to the City Commission

None



Call to Order

Chair Brenneman called the meeting to order at 1:30 p.m.

1. Approve Minutes of December 2010 Meeting

Motion made by Mr. Kerney, seconded by Mr. Larkin, to approve the minutes of the Board's December 2010 meeting. In a voice vote, motion passed unanimously.

Mr. Dial arrived at 1:35.

2. Amendment to Zeley Aviation, Inc. Lease for Executive Airport Parcel 2

Ms. Bennett explained that Zeley Aviation, Inc. leases Parcel 2 on the southeast corner of the Airport. Parcel 2 consisted of 12.53 acres of property and the current rent is \$110,463.83, which was adjusted annually in accordance with the Consumer Price Index.

Ms. Bennett said the property had been improved in stages with the construction of two conventional hangars and 22 T-hangars totaling approximately 49,242 square feet built in 1975, two conventional hangars built in 1980 and two additional hangars built in 1999. The sublessees on the parcel were Banyan Air Services, Inc. and Sheltair Aviation Facilities, Inc.

Ms. Bennett informed the Board that Zeley Aviation had presented a redevelopment plan for the older portion of the property, on which some code issues existed. New construction would include three new aircraft storage hangars totaling 52,800 square feet with 7,440 square feet of office space. There would be an additional 3,558 square feet of hangar available on the parcel. The redevelopment would require a minimum capital investment of \$7.5 million and would allow a change to the property dimensions to align it with properties to the south and accommodate a 45' ramp to the northwest.

In consideration for the redevelopment and improvements, Zeley Aviation had requested that the lease for Parcel 2 be amended to extend its remaining term by an additional 18 years for a new 30-year term, which Ms. Bennett recommended. Zeley Aviation had agreed to an increase in the rent to \$0.30 per square foot and the new annual rent for the Parcel would be \$172,275.44. This represented an increase of \$61,811.61 with annual CPI adjustments and market adjustments at years 10 and 20.

Ms. Bennett stated this proposal would bring additional revenue to Airport operation and much-needed redevelopment of older facilities.

Staff Recommendation

Staff recommends execution of an Amended and Restated Lease for Parcel 2 allowing for a new 30-year term and an increase in the rent to \$172,275.44 per year with market adjustments at years 10 and 20.

Mr. Bob Lettman, Zeley Aviation, explained that they hoped to begin as soon as possible, but must wait for two tenants to move. He hoped construction would be complete in 18 months.

In response to questions from Dr. Alexander and Chair Brenneman, Ms. Bennett explained that leases since 2004/2005 included a performance requirement that would terminate the lease if construction was not complete within a certain amount of time, typically 36 months. Ms. Minard said the City Attorney's Office was already working with the Airport on the lease and she foresaw no problems. Ms. Bennett added the new rent would begin in 18 months.

Mr. Lettman stated the financing would come from Sheltair; they would build the new hangars and they would be leased back to Banyan. He explained they would reconfigure the internal boundaries of the property to have one nicer parcel.

Mr. Lettman referred to aerial photos of the property depicting current hangars on the site and said the original hangars were built in the 1950s, had no plumbing and were an eyesore. The other hangars were built in the early 1970s and were slightly larger. They had determined that combining the two lots would allow them to increase entry area. The redevelopment also solved maintenance issues with the old buildings. Ms. Bennett clarified that the two parcels were Zeley property with one master lease and two sublessees.

Mr. Lettman explained to Dr. Alexander that the Sheltair sublease boundary would be moved back to include the site of the two T-hangars. The three new buildings would be leased to Banyan Air Services. This amounted to a square foot adjustment between the two subleases so all the new buildings would fit under the Sheltair sublease. This would help Sheltair with their financing because it was difficult to get a mortgage on someone else's property.

Mr. Campion stated the tenants in the concrete hangars were not aware yet that they would be losing their hangars but there were many other T-hangars to which these tenants would be transferred.

Motion made by Mr. Kerney, seconded by Ms. Brown, to approve the staff recommendation. In a voice vote, motion passed unanimously.

Mr. Dial introduced himself and said he had lived in Fort Lauderdale since 2002. He was previously Chair of the Community Services Advisory Board.

3. Termination of Lease - Southern Facilities Parcels B, C, and D

Ms. Bennett reminded the Board that staff had recommended entering into amended and restated leases for parcels B, C and D. She remarked the properties had been the subject of an option agreement between the City and Southern Facilities Development (SFD) in 1997, with leases executed in a 5-year cycle starting in 1998. The original agreement included five parcels. Two of these had been improved and the leases were in full force and effect. Parcels B, C and D had some environmental designations from Broward County.

Ms. Bennett continued that SFD and the City had applied for permits with the County to develop the properties and County staff had expressed concern about building on these properties. The most important issue that arose was that on parcels C and D, violations had occurred as a result of clearing areas without a permit. These had been relatively simple violations to address, but the developers' goal was to pursue the permit and perform environmental mitigation off-site. The violations were uncured to date.

Ms. Bennett stated the 5-year permits to redevelop the parcels had been issued in 2007 and included the requirement to execute a conservation easement on parcels B and D. Parcel C would be mitigated on and off-site and a tri-party agreement would include mitigation of approximately 11 acres of property at Mills Pond Park. There was also a schedule attached to the permits.

Ms. Bennett explained that staff had begun negotiating amended and restated leases with SFD, which included some mitigation credits for work that had already been done and would be done. This would allow them to collect rent and to recoup some of the abated rent for that period. Staff and the County felt this was a good solution.

Ms. Bennett said in March, the presentation to the City Commission included allowing 90 days for SFD to work out all of the agreements and permits. The June 16 deadline had not been met and staff had then begun a cycle with SFD of staff sending what they believed to be the correct leases with the correct exhibits and SFD returning improperly executed leases to which they had attached their own attachments and schedule that the County had not approved for the mitigation plan. In October, the County scheduled a hearing regarding the violations and issued a final order, which required on-site mitigation for the violations on parcels C and D, neither of which had been complied.

Ms. Bennett explained that in December, staff had sent a notice of default suggesting two ways to bring the lease into compliance with the final order. SFD could cure the old leases by paying the rent that was owed plus the new rent going forward, or they could comply with the terms that were outlined to the City Commission regarding the correct attachment, exhibits and schedule. The notice had been dated December 13 and on January 12, a letter had been received from Mr. Abele stating SFD believed they were not in default and Mr. Abele was out of the country and would return on January 27.

Ms. Bennett said staff believed they had acted in an abundance of good faith for five years. The City was responsible regarding the violations and the County's final order and must be in a position to cure them. The best course of action was to terminate the violations and comply with the permit requirements so the permits would not be lost.

Staff Recommendation

The staff recommends that the City notify Southern Facilities Development LLC and Southern Development Inc. that the Leases are terminated in accordance with Paragraph 15 of the original Leases now in effect.

Mr. Stella asked how much rent had been paid on the leases. Ms. Bennett stated approximately \$1 million in rent had been paid and taxes had been paid. But when SFD had problems with the County, they had issued an administrative action against the County and this was when progress had ceased. Ms. Bennett stated SFD was now in arrears for taxes.

Mr. Larkin recalled being concerned about concessions the City had been making to try to resolve the issues with SFD, but the SFD representative had made representations that cause him to go along with it. Mr. Larkin said it appeared they were now "working with a party who's not acting in good faith at this time, and all these shenanigans about the leases and this bureaucratic subterfuge that's gone forth here in order to stall and delay just... reinforces that notion..."

Motion made by Mr. Larkin, seconded by Ms. Brown, to approve the staff recommendation.

Ms. Bennett stated the fine was approximately \$44,000. She said the County staff had acted in "immense good faith" and opted not to assess the daily damages that could have been applied. Ms. Bennett noted that the most onerous portion of the final order was that parcel C's wetlands must be restored to their previous condition and the condition they should have been if the violations had never occurred. She noted this would be very expensive to remedy. Ms. Bennett said staff had contracted with the City's environmental consultant to provide a schedule and an explanation of fees.

Ms. Kaht agreed with Mr. Larkin, and remarked that if SFD wanted to work this out, they could have sent a representative to this meeting to negotiate in good faith.

Ms. Bushnell asked if the fine was against SFD or the property. Ms. Bennett explained that there were three defendants: the City, SFD and Land Trucking, the bulldozer operator. She said staff would propose a plan to the County and hope for leniency regarding the fine.

Staff informed Mr. Helyer that taxes of approximately \$500,000 were owed on the property. Ms. Miller could not state who would be responsible for the taxes if the lease were dissolved. They would try to collect from the lessee.

Dr. Alexander asked if the City would be able to take advantage of the permit from the County that would expire in 2012 or if the City would restore the property to the condition it had been in. Ms. Bennett said it was their goal to take advantage of the permit and they would address this with County staff.

In a voice vote, **motion** passed unanimously.

Ms. Brown left the meeting at 2:26.

UPDATE ITEMS

A. Noise Compatibility Program & HMMH Presentation

"Noise 101" Presentation by Harris Miller Miller & Hanson, Inc. (HMMH)

Ms. Straugh stated Mr. Ted Baldwin from Harris Miller Miller and Hanson would give a presentation on the basics of decibels and aircraft noise terminology. Mr. Baldwin gave a Power Point presentation, a copy of which is attached to these minutes for the public record.

Mr. Helyer believed that helicopters seemed louder because they flew lower than planes. He remarked on significant old twin-engine air traffic over Oakland Park Boulevard that generated a significant amount of noise. He felt these planes were positioning to the runway. Mr. Baldwin agreed that was likely, and said he assumed they were either turning base to final or downwind to base, depending on the runway in use. Higher performance aircraft tend to use longer, straight-in finals. He explained the tower liked to separate high- and low-performance aircraft for safety reasons.

Aircraft Owners & Pilots Association (AOPA) - Pilot Safety Seminar

Ms. Straugh announced that on April 9 from noon to 5 PM, the Airport would host FXE Aviation Safety Expo, which will be advertised and promoted at the pilot safety seminar next month, hosted by the City and the Airport at the War Memorial Auditorium on Monday, February 7, 2011 from 7:00 p.m.-9:00 p.m. The Aircraft Owners & Pilots Association (AOPA) will present "Close Calls: Lessons Learned", and expects 200 pilots to attend.

Nighttime and I-95 Turn

For November 2010, there was one jet over 80 dB at night between 10:00 p.m. and 7:00 a.m.

For November 2010, thirty-nine (39) jets flew the I-95 Turn at night and one (1) of those jets was a stage-two aircraft.

Noise Cooperative Effort

Noise and Operations statistics for November 2010 were included in the Board's packet. Ms. Straugh stated that for several days in December 2010 there were many jets that departed Runway 26 due to winds from the west. The data for December 2010 is being verified and the statistics for that month will be reported at the next meeting.

Ms. Iversen left the meeting at 3:31.

B. Development and Construction Airport Projects In Development

Runway 8-26 Pavement Marking Rehabilitation Project #11452

Mr. James reminded the Board that at their October 28, 2010 meeting, they had endorsed a staff recommendation to award the Runway 8-26 Pavement Rehabilitation Project to Hi-Lite Markings, Inc. Staff had met with the contractor to discuss scheduling the work to be completed.

Mr. James stated the Scope of work would include rubber removal, update new markings, outline all markings in black for increased visibility, and remove obsolete markings. Work was scheduled to begin in February and was scheduled be completed in ten days. During the project, Runway 8-26 would be closed but Runway 13-31 would be opened. Staff would issue Notices and NOTAM's in advance of the Runway 8-26 closure to minimize the impact to operations. They would also send notices to homeowners associations. Mr. James agreed to provide the Board with an update at the completion of the project.

Operations statistics were included in the Board's packet.

C. Arrearages

Rent

Ms. Bennett reported two tenants were in arrears:
Performance Trading, Parcel 8D
KSR, LLC, Parcel 8G

Fuel Flowage

There were no fuel flowage arrearages for the month of November 2010.

Ms. Iversen left the meeting at 3:31.

D. Communications to the City Commission

None

E. FLL Update

None

F. FXE Aviation Safety Expo

Ms. Bennett said they continued to be plagued with runway incursion issues and they felt a responsibility to install a safety culture for pilots. She drew the Board's attention to the flyer that had been distributed. Ms. Bennett said the FXE Aviation Safety Expo event would take place in and around the new maintenance building.

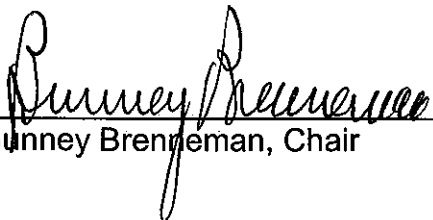
Other Items and Information

Mr. Don Champion, Banyan Air, announced that Challenge Air would be held on 1/29/11 at Banyan. Twenty pilots would be present to provide flights to handicapped kids.

Mr. Kerney stated he had been involved in the bird strike noted in the operations statistics. He remarked that staff had done an excellent job responding.

There being no further business before the Board, the meeting adjourned at 3:48 p.m.

- Next scheduled meeting date: Thursday – February 24, 2011 – 1:30 PM



Bunney Breneman, Chair

PLEASE NOTE:

If any persons decide to appeal any decision made with respect to any matter considered at this public meeting or hearing, he/she will need a record of the proceedings and, for such purpose, he/she may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based.

“Noise 101”

Basic Aircraft Noise Terminology



Presented to:
Fort Lauderdale Executive
Airport Advisory Board

January 27, 2011

Ted Baldwin



HARRIS MILLER MILLER & HANSON INC.

Topics

- **What are “Sound” and “Noise”?**
 - Sound Pressure Level
 - Decibel
 - A-Weighted Decibel
- **Single Event Metrics**
 - Maximum A-Weighted Sound Level, L_{max}
 - Sound Exposure Level, SEL
- **Cumulative Exposure Metrics**
 - Equivalent Sound Level, L_{eq}
 - Day-Night Average Sound Level, DNL
- **Other Issues**
 - What metrics are we required to use?
 - What are typical levels? How do we perceive changes in level?
 - How do distance and weather conditions affect levels?

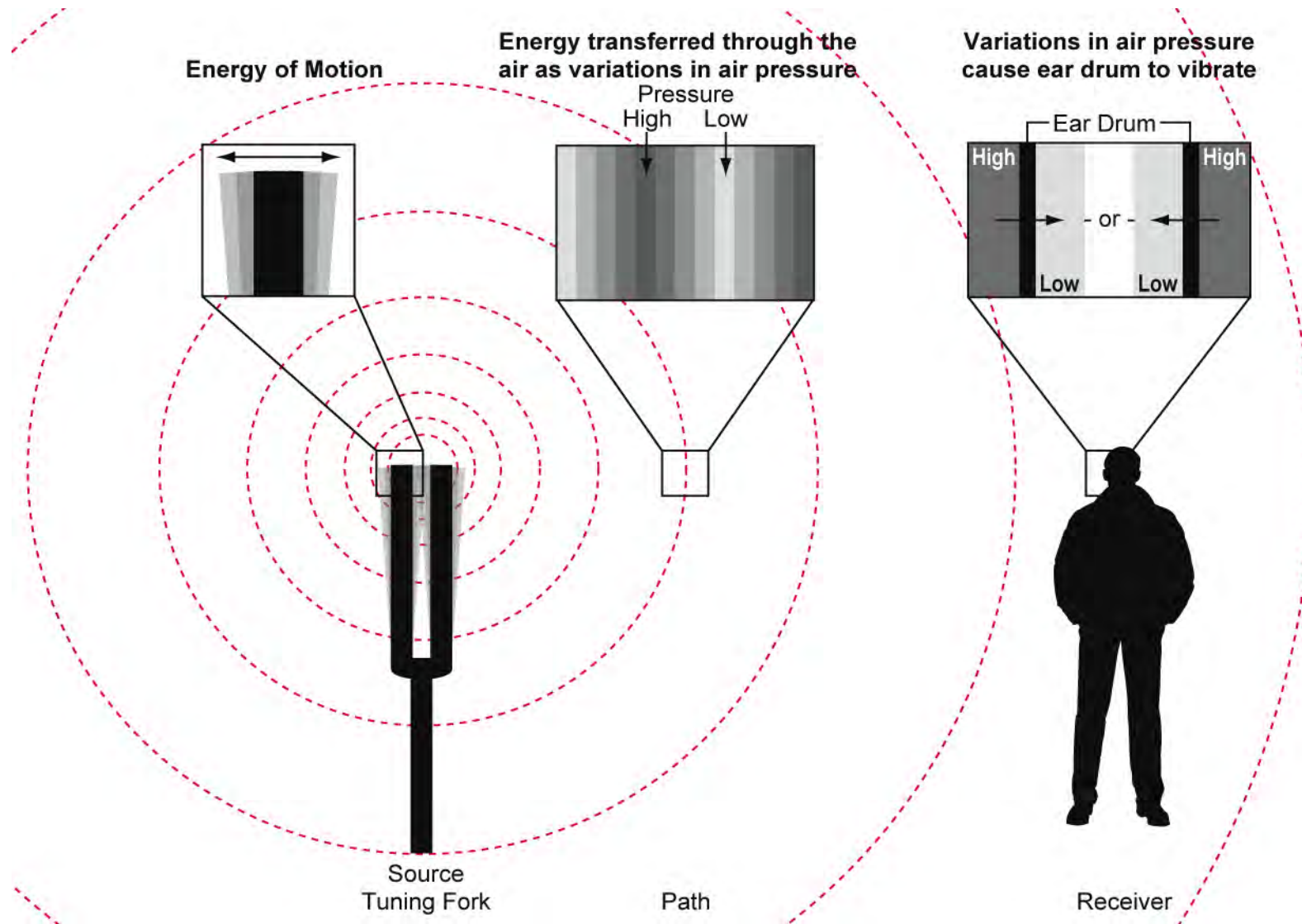
What is “Noise”?

- **Noise is “unwanted sound”**
 - *A subjective quantity*
- **Sound is pressure variation a human ear can detect**
 - *An objective quantity*
- **We relate sound and noise by considering *effects***
 - Annoyance
 - Speech interference
 - Sleep disruption
 - Health effects
- **Noise effects are a topic for another session**

Sound Pressure:

Variations in air pressure that travel from source to receiver

www.hmmh.com



The Decibel Scale

- We use a *logarithmic* scale – *decibels, or dB* – to express sound levels and noise levels
 - *Why?*
- We can hear sound pressures over a **HUGE** range
 - 0.000000003 to 0.003 pounds per square inch (psi) – the threshold of hearing to the threshold of pain
- The decibel compresses this to a smaller range
 - 0 to 140 dB
- The decibel scale matches the way our ear and brain “auditory system” interprets sound pressures
 - We “hear” in decibels.


Decibel Changes – Some “Rules of Thumb”


www.hmmh.com

- In a laboratory with a direct A:B comparison we can detect about a 1 dB change in sound level
- In a normal environment, a 3 dB change is generally the threshold of detectability to a careful listener
 - Why? Noise fluctuates; distinct A:B comparisons are rare
 - A 3 dB increase represents two times the sound energy
- A change of 6 dB is clearly perceptible in most day-to-day situations
 - A 6 dB increase requires four times the sound energy
- A change of 10 dB is required before the sound seems twice as loud
 - A 10 dB increase requires ten times the sound energy

Decibels and “Energy”

“Energy”	dBA	Common sounds
100,000,000,000,000	140	Near a jet engine at start of takeoff
10,000,000,000,000	130	Threshold of pain
1,000,000,000,000	120	On stage at a loud rock concert
100,000,000,000	110	
10,000,000,000	100	Jack hammer at 6 feet
1,000,000,000	90	
100,000,000	80	Vacuum cleaner at user’s ear
10,000,000	70	Vacuum cleaner at 10 feet
1,000,000	60	Normal speech
100,000	50	
10,000	40	Quiet residential area
1,000	30	
100	20	Whisper
10	10	
1	0	Threshold of hearing
0.1	-10	

Rise/fall
 1dB 5dB 10dB


Wobble
 1dB 5dB 10dB


Decibel Addition: It's not ordinary math!

www.hmmh.com

- Decibels are a logarithmic quantity, so...
- Two equal sources:
 - $60 \text{ dB} + 60 \text{ dB} =$ ~~120 dB~~ 63 dB
 - Like your stereo speakers
- Four equal sources:
 - $60 \text{ dB} + 60 \text{ dB} + 60 \text{ dB} + 60 \text{ dB} = 66 \text{ dB}$
- Ten equal sources:
 - $60 \text{ dB} + 60 \text{ dB} + 60 \text{ dB} + 60 \text{ dB} + 60 \text{ dB} +$
 $60 \text{ dB} + 60 \text{ dB} + 60 \text{ dB} + 60 \text{ dB} + 60 \text{ dB} = 70 \text{ dB}$
- The logarithmic way we hear means that we are more sensitive to small changes in level and less sensitive to large changes.

Decibels alone don't do the job...

www.hmmh.com

- **Sound *quality* matters**
 - Sources with the same overall dB level may “sound” different



Decibels alone don't do the job...

www.hmmh.com

- ***Duration of exposure matters***
 - Longer durations increase our overall exposure, even for sources with the same dB level



Decibels alone don't do the job...

www.hmmh.com

- *Time of day matters*



Decibels alone don't do the job...

www.hmmh.com

- *How often matters*



These (and other) variables require that we use a “family” of noise metrics

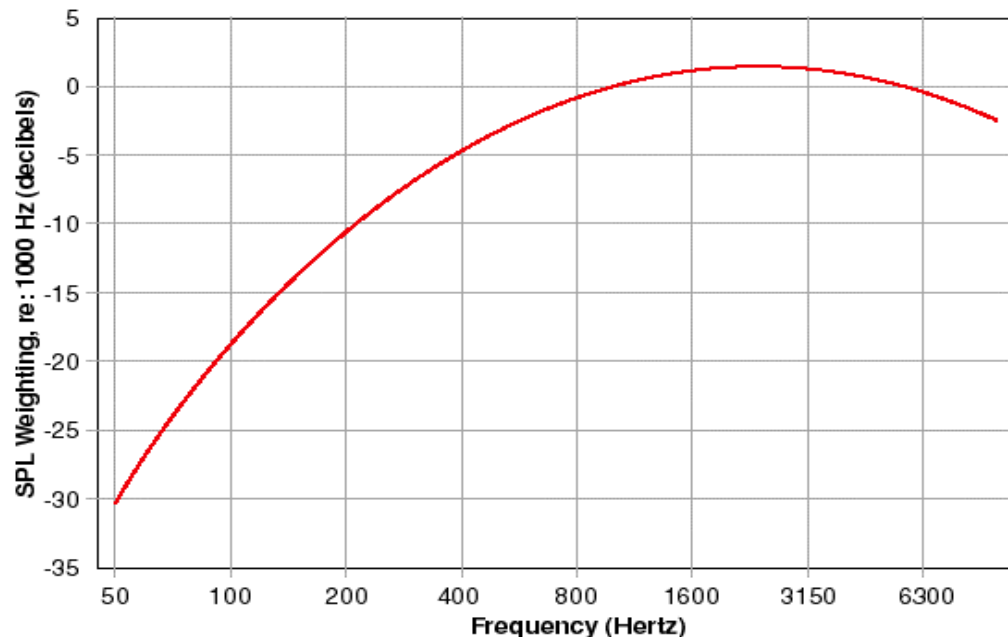
www.hmmh.com

- **FAA requires that we use the “A-weighted” (dBA) family**
 - Maximum level (Lmax)
 - Sound Exposure Level (SEL)
 - Equivalent Level (Leq)
 - Day-Night Average Sound Level (Ldn or DNL)
- **This requirement is set forth in Part 150 “Airport Noise Compatibility Planning”**
 - It is based on EPA guidance
- **Every local, state, and federal government agency in the U.S. (and almost all of the rest of the world) requires use of A-weighted metrics to address environmental noise – *including all forms of transportation noise.***

What is the A-Weighted Sound Level (dBA)?

www.hmmh.com

- The human auditory system is not equally sensitive to all frequencies
- To be a useful environmental analysis tool we need a way to measure sound the way the ear “hears” it
- The A-weighted level achieves this goal

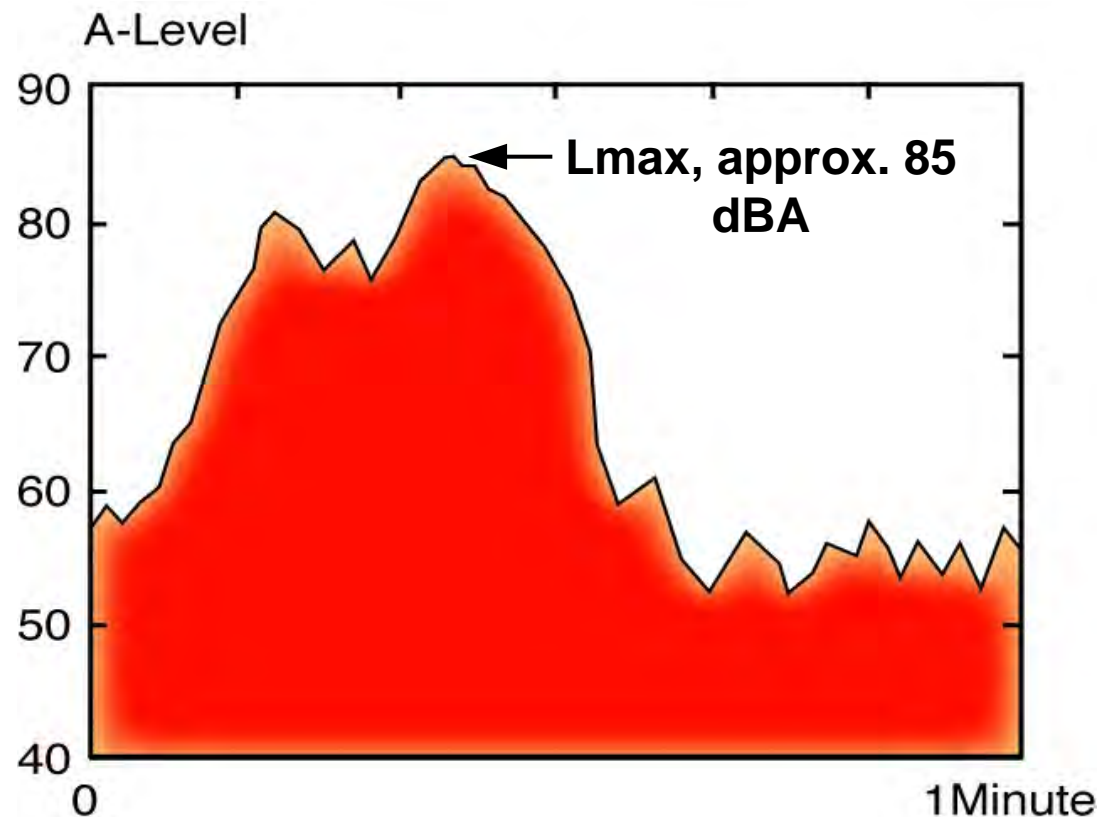


Consistent with EPA's recommendation in the 1974 "Levels Document," federal, state, and local agencies use the A-weighted level for environmental noise analyses.

Single Event Noise Metrics: Maximum Sound Level (Lmax)

www.hmmh.com

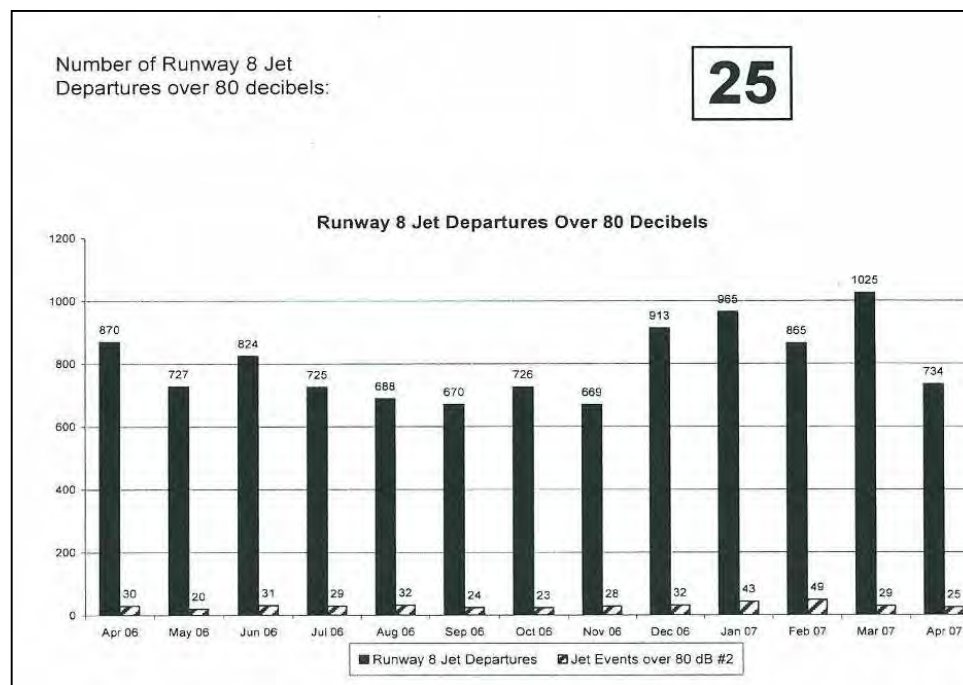
- The simplest way to describe a discrete noise “event” is its maximum sound level, Lmax
- Accounts only for sound amplitude (dBA)



Single Event Noise Metrics: FXE uses maximum noise level in AAB reports

www.hmmh.com

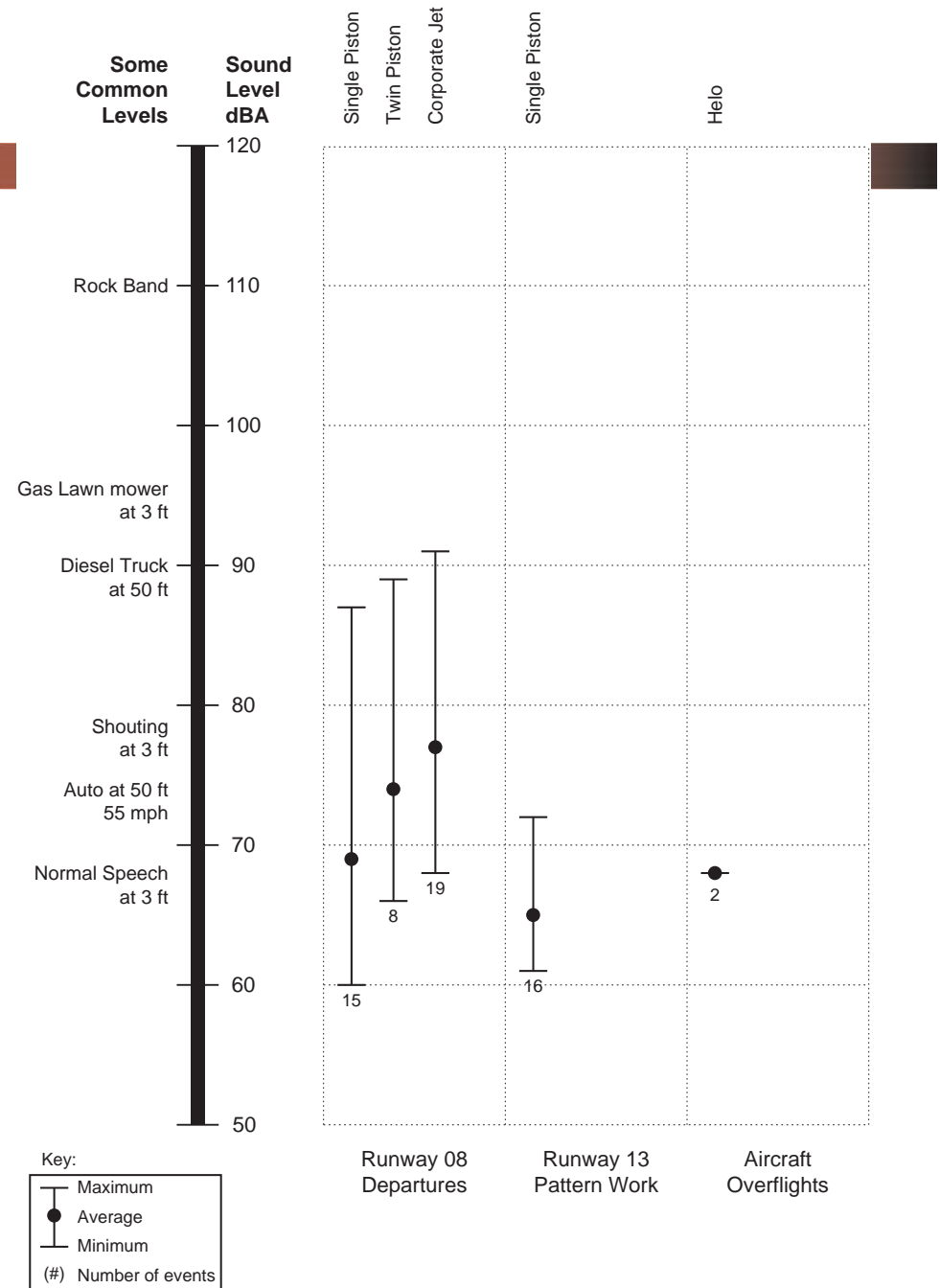
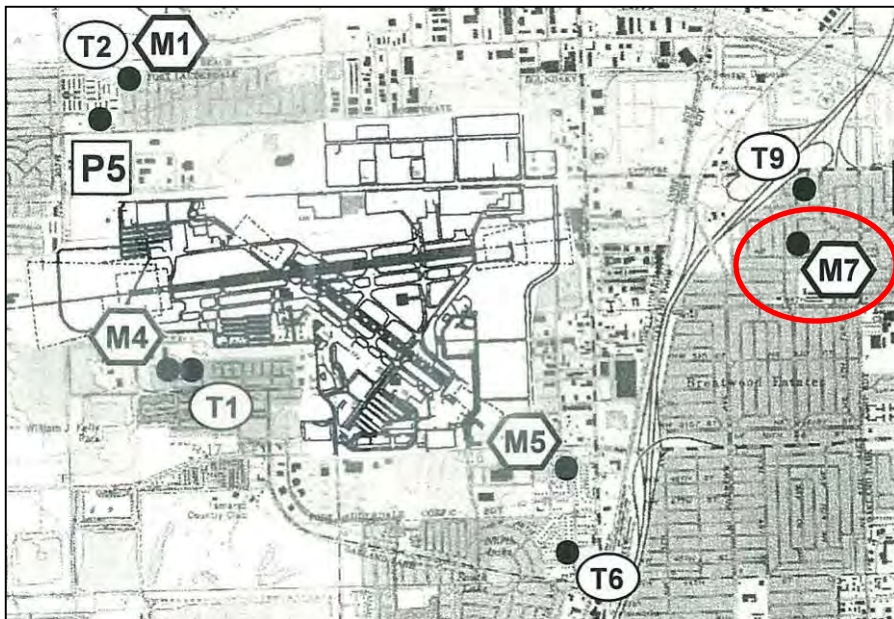
- Counts of events exceeding a threshold
 - Sometimes called “Number of Events Above Threshold” (“NA”)
- Counts of events in a decibel range
- By aircraft type
- By monitor



Monitor # 2	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07
Noise Reports per Noise Level													
over 95.1dB	0	0	0	0	0	0	0	0	0	0	0	0	0
90.1dB - 95dB	8	4	11	5	38	2	0	0	8	4	33	1	12
85.1dB - 90dB	84	17	28	24	44	22	0	29	77	68	70	40	53
80dB - 85dB	32	32	24	22	42	30	0	25	42	56	90	65	46
75dB - 79.9dB	34	32	17	17	45	25	0	33	46	15	50	33	32
67dB - 74.9dB	40	28	30	28	48	36	0	20	6	20	78	58	65
FLL OVERFLIGHTS	0	7	0	1	12	1	0	3	11	7	8	9	5
Miscellaneous Activity*	165	87	81	58	112	128	0	284	126	79	139	153	185
Total Noise Reports	363	207	191	155	341	244	272	394	316	249	476	359	398

Single Event Noise Metrics: FXE Lmax Measurements

- Example for measurement site 7 from 2002 Part 150 study
- Report includes measurements conducted in May 2001
- Lmax data by type of aircraft and operation, and runway end



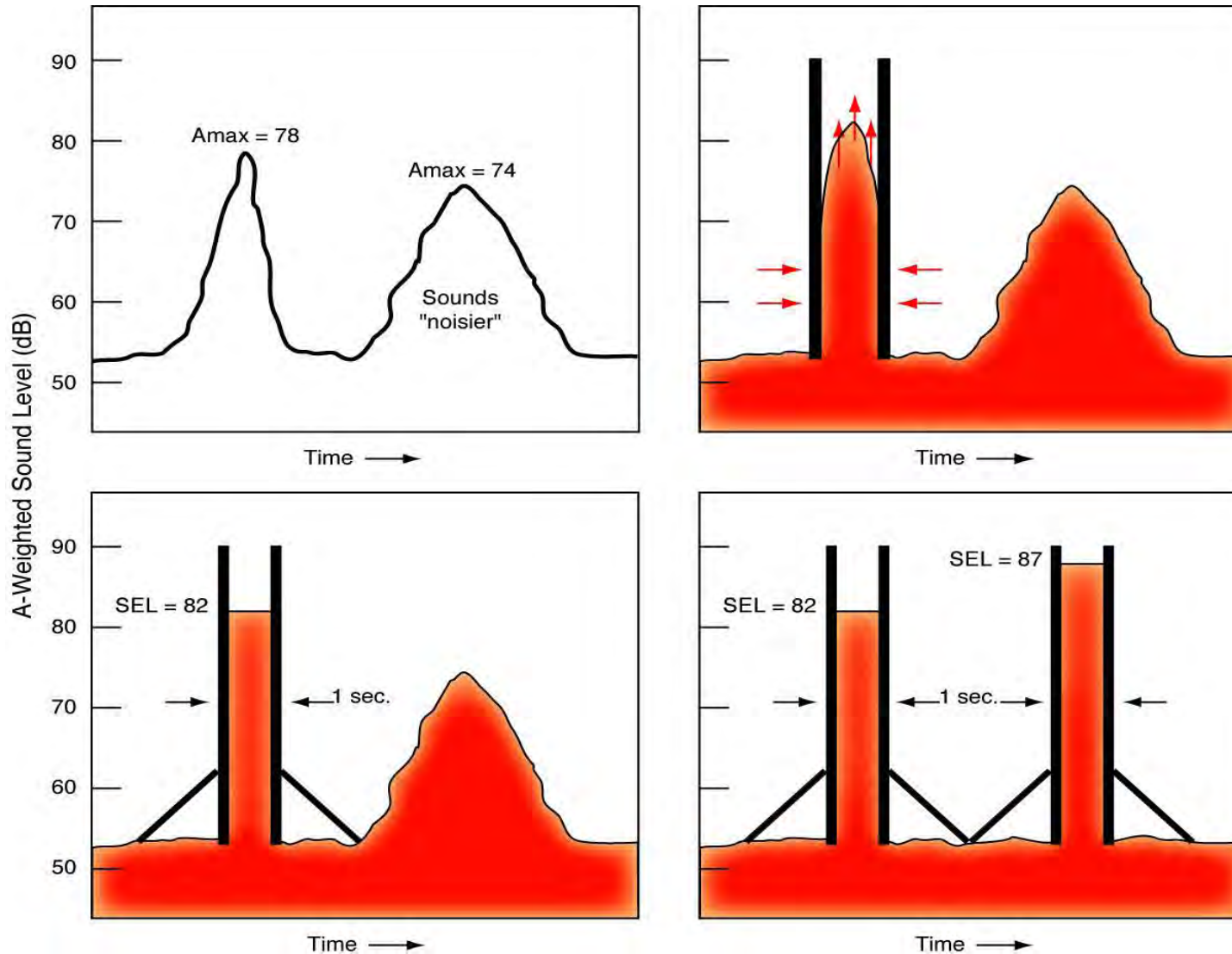
Single Event Noise Metrics: Sound Exposure Level

www.hmmh.com

- Two events may have the same L_{max} , but very different overall noise exposures, because of duration
 - An event with a higher L_{max} may result in less overall exposure and seem “quieter” if it is shorter
- Sound Exposure Level (SEL) measures the total “noisiness” of an event, by taking duration into account
 - The one-second long steady level that contains as much energy as the varying level over full event
- *A picture or two can help explain this...*

Single Event Noise Metrics: So what exactly does SEL represent?

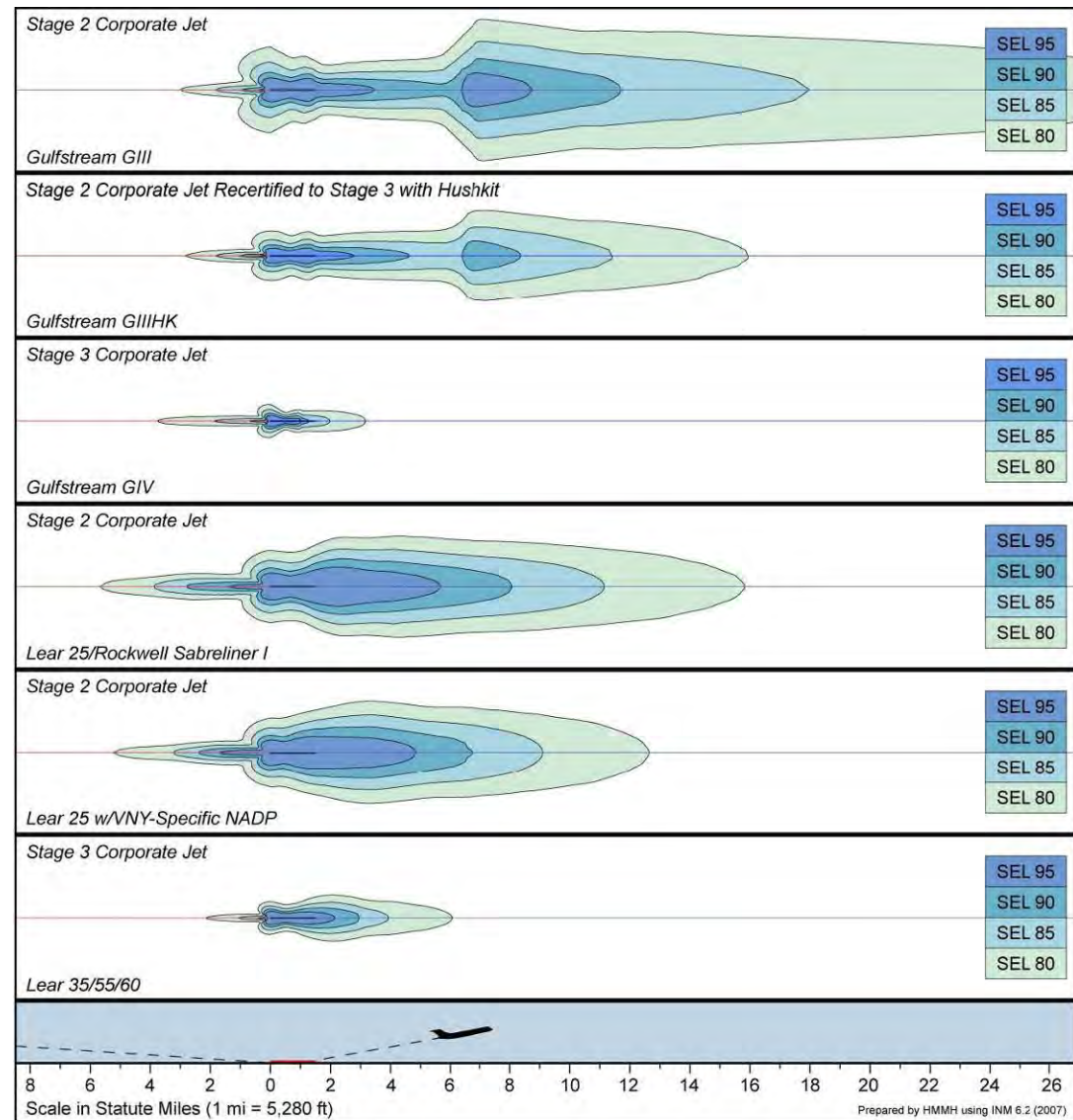
www.hmmh.com



Single Event Noise Metrics: How do we use SEL in airport studies?

www.hmmh.com

- To describe the total exposure of an aircraft “event”
- To compare different events
- For example
 - Older and newer versions of the same basic aircraft
 - Gulfstreams
 - Lears



Single Event Noise Metrics: SEL Contours from 2002 FXE Part 150 Study

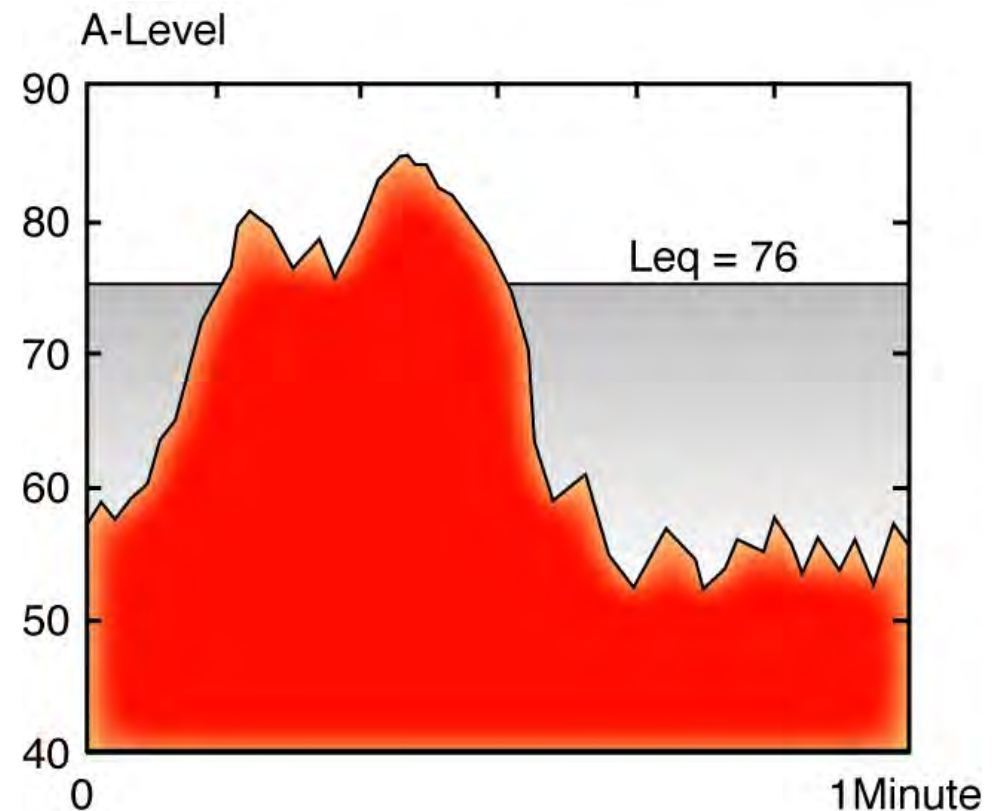
www.hmmh.com



Cumulative Exposure over Time: Equivalent Sound Level (Leq)

www.hmmh.com

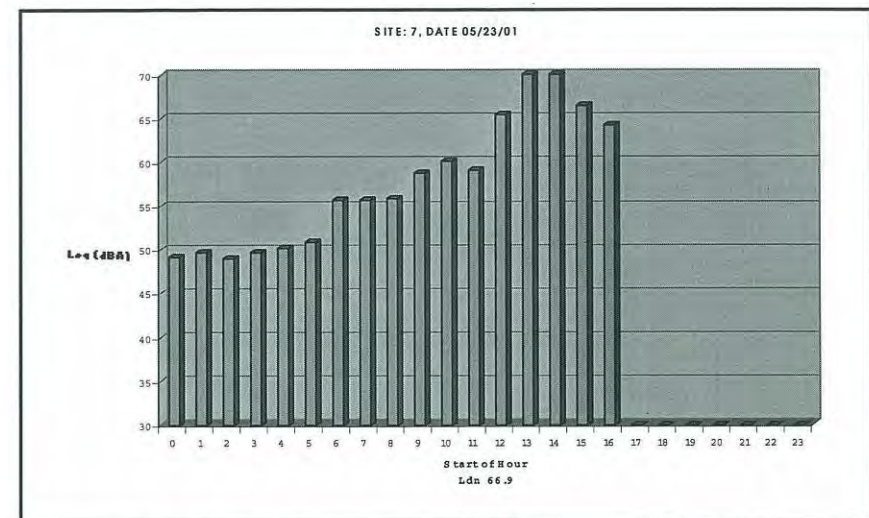
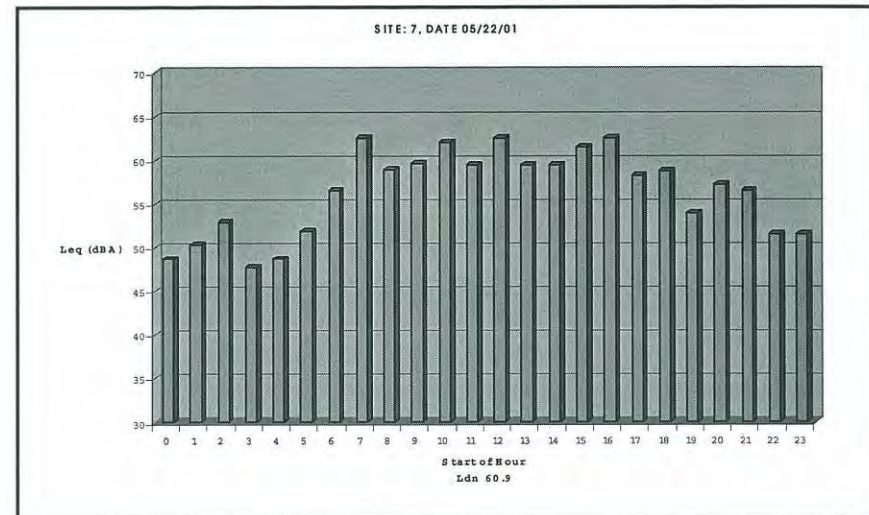
- Leq is the constant sound level that contains the same amount of energy as the time-varying sound level over the same time period
- Unlike SEL, Leq is not “squeezed” into one second
- Leq represents the energy “averaged” level
- Leq can be expressed for any time interval



Cumulative Exposure over Time: Equivalent Sound Level (Leq)

www.hmmh.com

- Example for measurement site 7 from 2002 Part 150
- Hourly Leqs shown for one full and one partial day (midnight to midnight)
- Pattern over full day shows typical rise and fall consistent with normal human activity
- Strong thunderstorm started during last five hours of second day

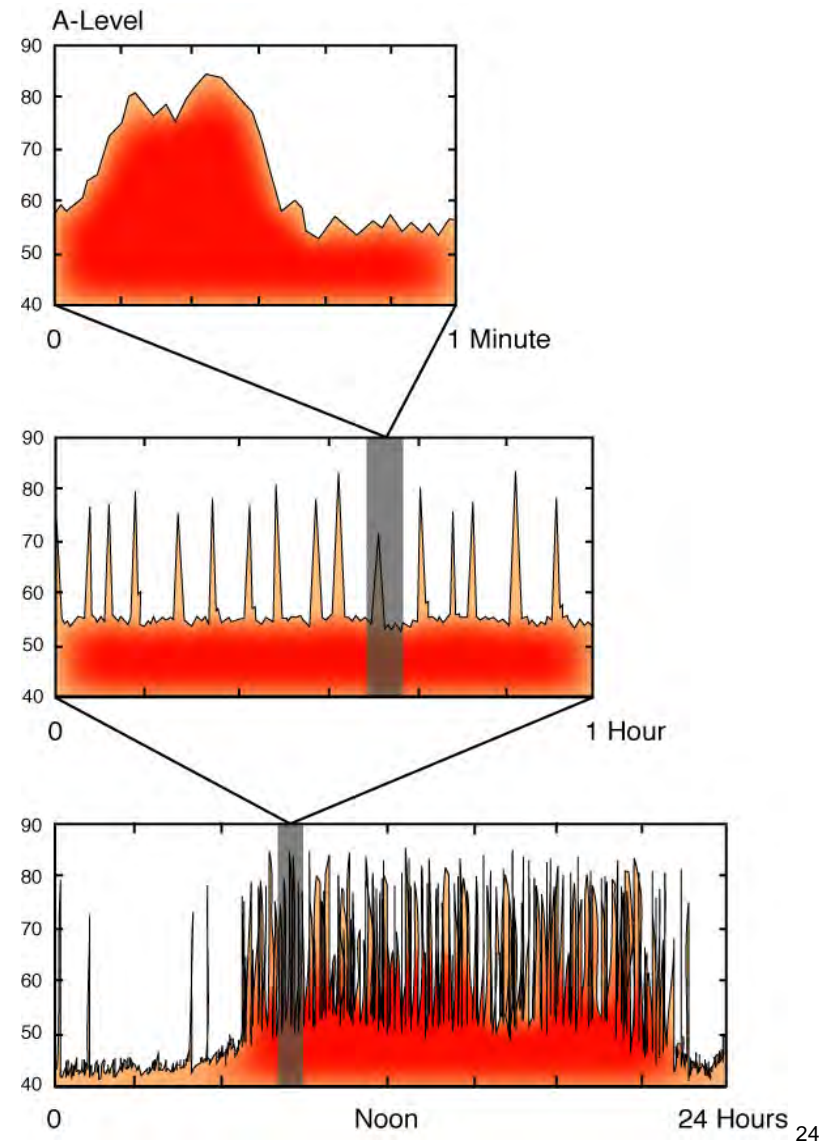


Note: Strong thunderstorm started at 12:00 noon on May 23rd

Cumulative Exposure over Time: Day-Night Average Sound Level (DNL)

www.hmmh.com

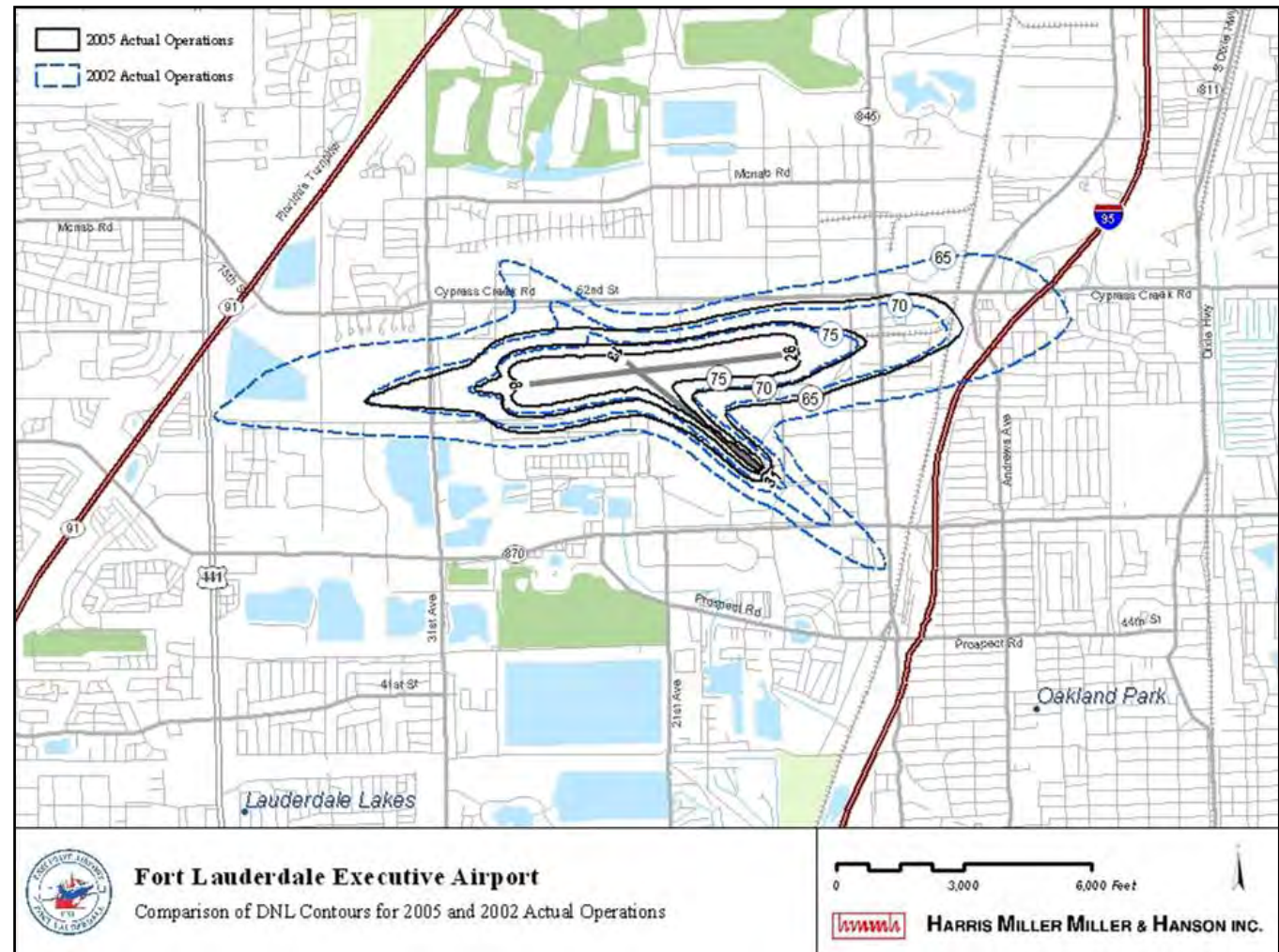
- Describes 24-hour exposure
- Noise from 10 pm to 7 am is factored up by 10 dB
- The night “penalty” is equivalent to counting each night aircraft event 10 times
- EPA recommends use of DNL for environmental studies
 - FICON (1992) reconfirmed there is no preferable metric
- Also abbreviated “Ldn”



Cumulative Exposure over Time: 2002 and 2005 FXE DNL

www.hmmh.com

- FAA considers all land uses compatible outside 65 DNL
- Essentially all land uses inside FXE's 2005 DNL 65 contour are commercial or aviation



Interpreting changes in DNL

www.hmmh.com

- **0 - 2 dB change in level**
 - May be noticeable
 - Abatement may be beneficial
- **2 - 5 dB change in level**
 - Generally noticeable
 - Abatement should be beneficial
- **Over 5 dB change in level**
 - A change in community reaction is likely
 - Abatement definitely beneficial
- **FAA considers 1.5 dB the minimum *significant* change where cumulative exposure is above 65 DNL**

A given DNL can come from many different combinations of noise events

Identical DNL Levels

1 Event/Day SEL 114.4 dBA = DNL 65



10 Events/Day SEL 104.4 dBA = DNL 65

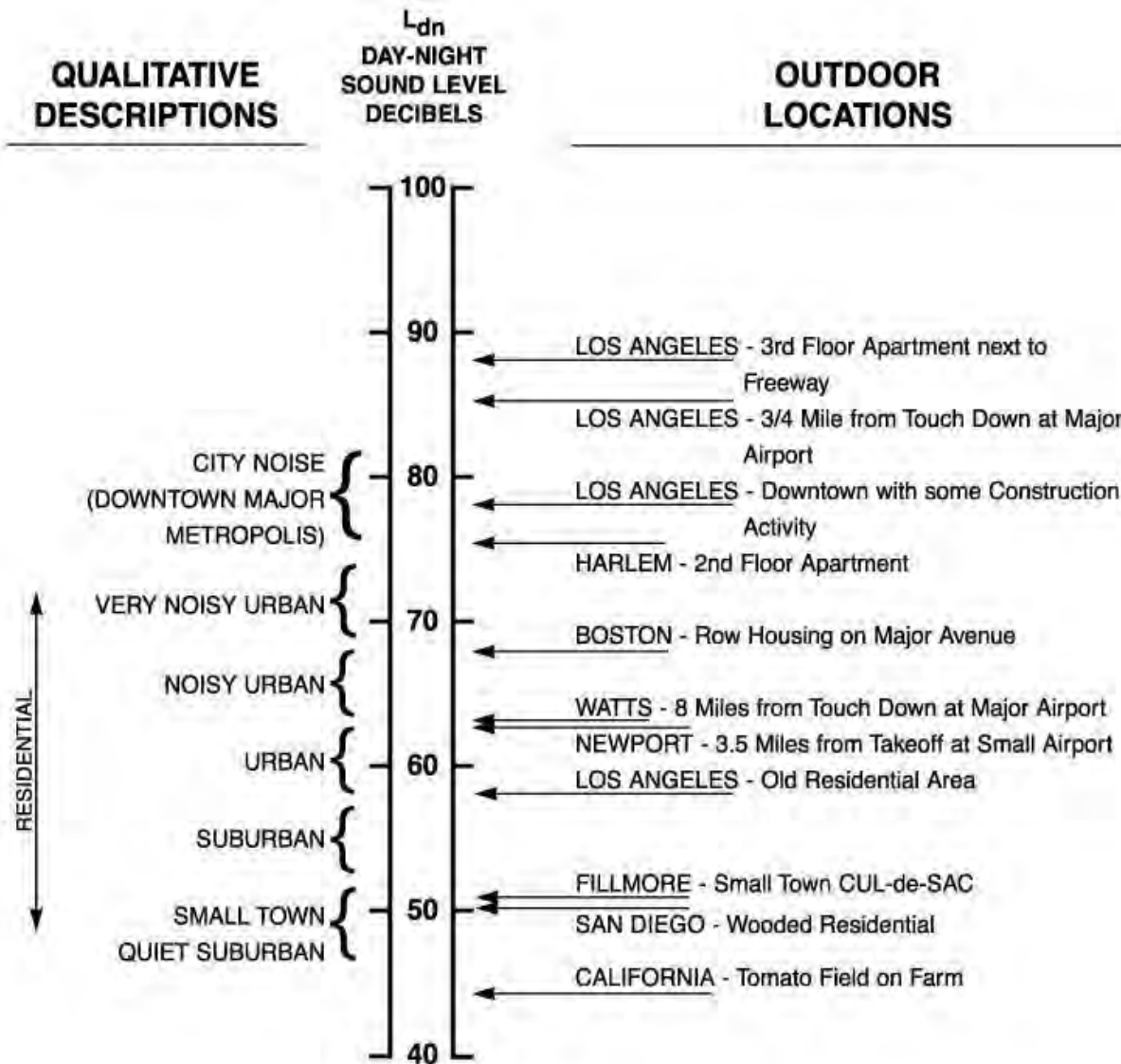


100 Events/Day SEL 94.4 dBA = DNL 65



Examples of Day-Night Average Sound Levels, DNL

www.hmmh.com



Source: United States Environmental Protection Agency, Information on Levels Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974, p. 14.

How do distances and meteorology affect sound level? *In complex and sometimes counterintuitive ways.*

www.hmmh.com

- **Considering the “spherical spreading of sound” only:**
 - L_{max} is reduced by approximately 6 dB per doubling of distance
 - SEL is reduced by approximately 3 dB per doubling of distance
- **“Atmospheric absorption” can add 1 to 3 dB +/- more attenuation for 1,000’ to 3,000’ distances, for typical Florida weather conditions**
 - Atmospheric absorption increases with humidity
- **Overall, increasing distance from 2,000’ to 3,000’ could produce:**
 - 4 to 5 dB reduction in instantaneous level or maximum level
 - 2 to 4 dB reduction in SEL
- **Wind and weather can increase or decrease these effects**
 - Wind blowing from the source to the receiver can *increase* levels
 - Wind blowing from the receiver to the source can *decrease* levels
 - Temperature *inversions* can increase sound levels
 - Otherwise temperature by itself has no significant effect
 - Clouds have no significant effect

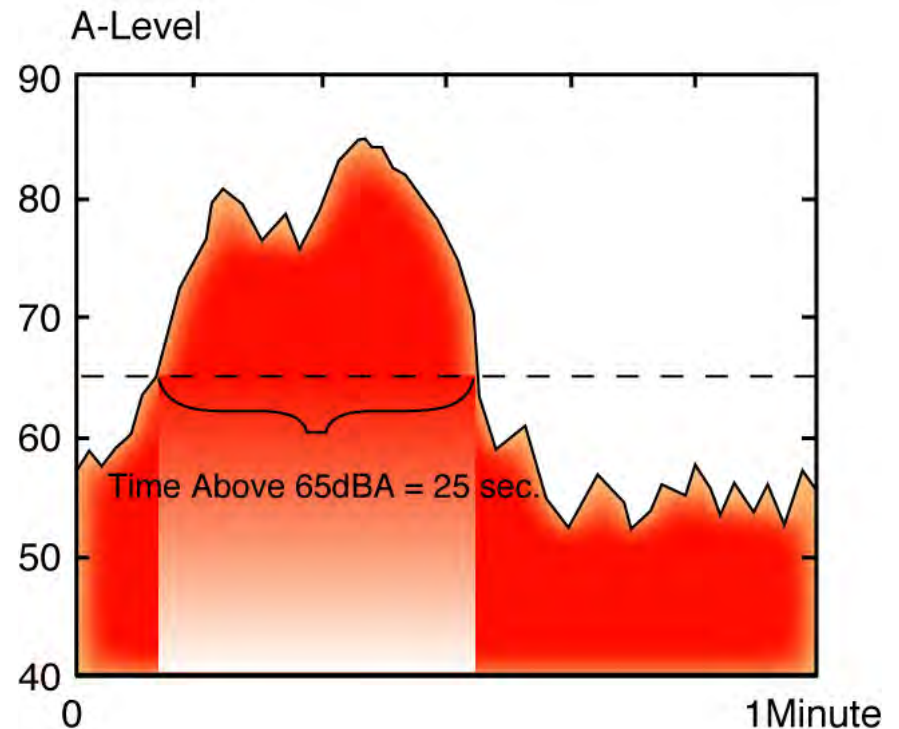
Time Above a Threshold Level (TA)

www.hmmh.com

- The amount of time the sound level exceeds a threshold of interest (such as outdoor speech interference)
 - For a noise event
 - For a time interval
 - So it is a single event *and* a cumulative metric

- **Weaknesses:**

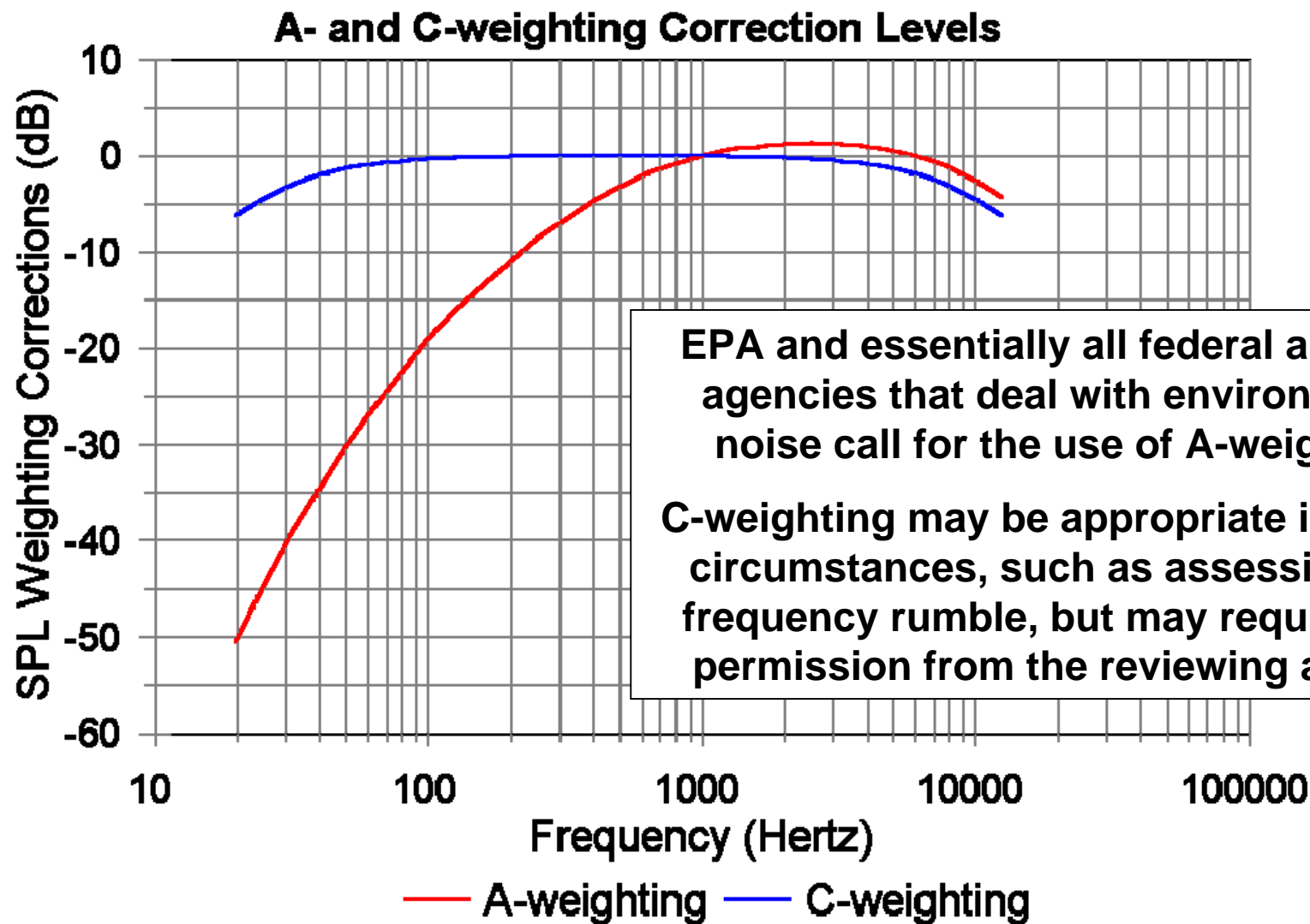
- Accounts only for duration – does not consider level
- Events with the same TA can have very different Lmax or SEL
- TA is an unreliable means for assessing human reaction, because the noise level is important to us



Alternative Frequency Weighting

C- versus A-Weighting (dBC vs. dBA)

www.hmmh.com



EPA and essentially all federal and state agencies that deal with environmental noise call for the use of A-weighting.

C-weighting may be appropriate in special circumstances, such as assessing low-frequency rumble, but may require prior permission from the reviewing agency.

Some Useful References

www.hmmh.com

- **FXE Part 150 Noise Compatibility Planning Study Update, Dec. 2002**
 - Chapter 2 includes “Introduction to Noise Evaluation,” including “Acoustics and Noise Terminology,” “Effects of Noise on People,” “Annoyance,” and “Land Use Compatibility Guidelines”
- **US EPA, “Information on Levels of Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety,” March 1974 (“Levels Document”)**
- **US FAA website: www.faa.gov/airports/environmental/airport_noise**
- **US FAA, 14 CFR Part 150, “Airport Noise Compatibility Planning” (on FAA’s airport noise website)**
- **Federal Interagency Committee on Noise (FICON) “Federal Agency Review of Selected Airport Noise Issues,” August 1992**
- **Federal Interagency Committee on Aviation Noise (FICAN) website: www.fican.org**

Fort Lauderdale Executive Part 150 Update Permanent and Portable Measurement Locations

www.hmmh.com

