

**Please Help Us to Hear in the Sunport**

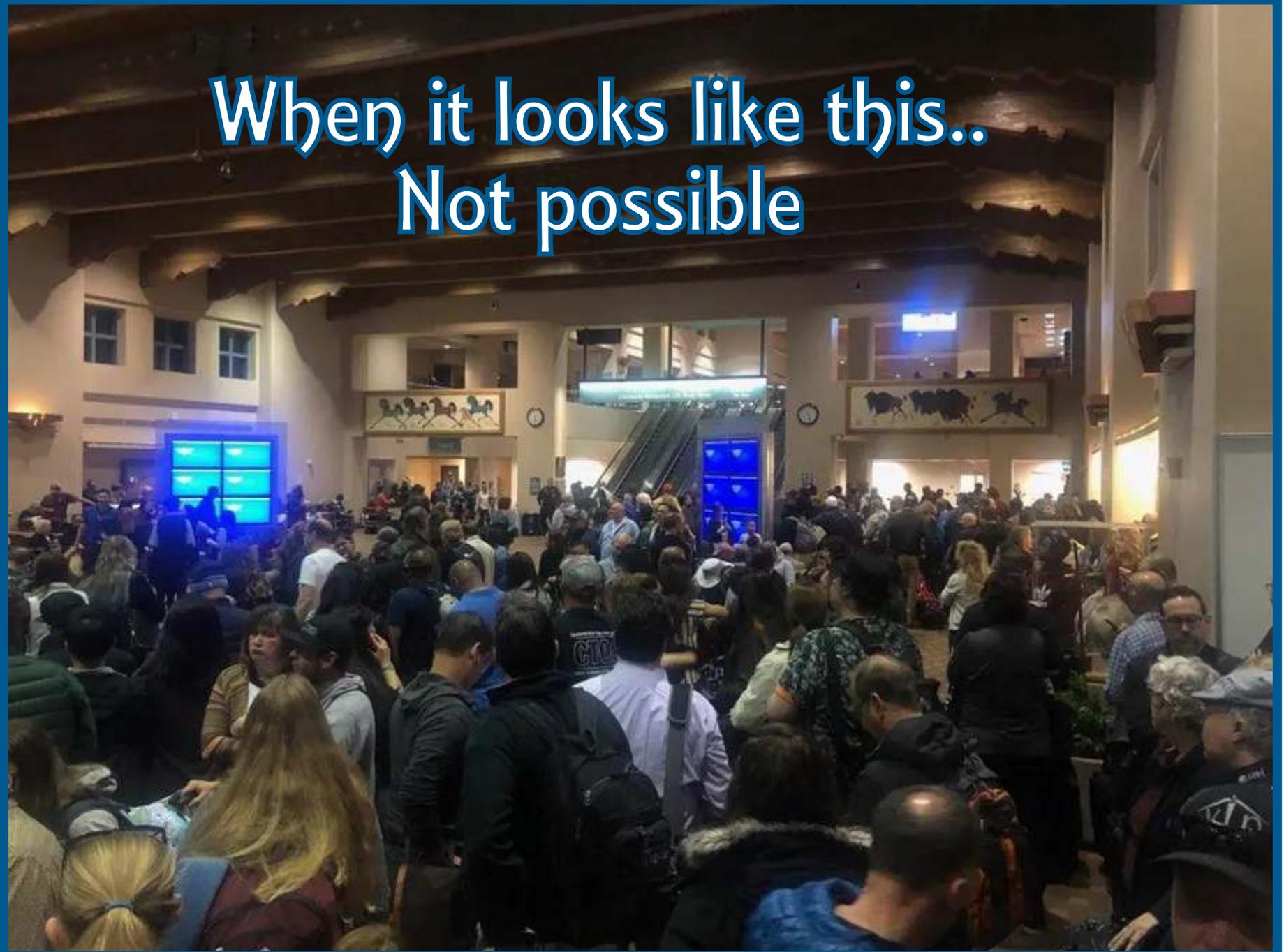


**Make Our Dreams of Flight Come True**

Only when it looks like this  
can people with hearing loss  
hear well in the Sunport



When it looks like this..  
Not possible



# AIRPORT ACOUSTICS

High ceilings,  
hard surfaces,  
open space,



SUNPORT FOOD COURT

along with no  
sound barriers  
add up to

## Mucho Background Noise

# AIRPORT NOISE



Recorded Announcements

A/C Hum

Flight Announcements

Luggage Wheels

People Talking

Children Playing

Ringing Phones

Escalator Sounds

# FIVE FACTS about HEARING LOSS

1. 20% in US are HoH
2. 30% 65 and older
3. 50% 75 and older
4. 20% Teens
5. 65% Under the age of 65

# The Speech to Noise Ratio

Background noise can cover speech.

Only by increasing the strength of speech sounds and not background sounds can we hear.

Hearing aids don't help as they increase both speech and noise.



# ABOUT HEARING AID PERFORMANCE

- Limited effective range: 6-10 feet
- Make both speech and background noise louder
- Sense of sound direction sometimes lost
- Noise suppression programs may turn down volume or otherwise limit access to sound

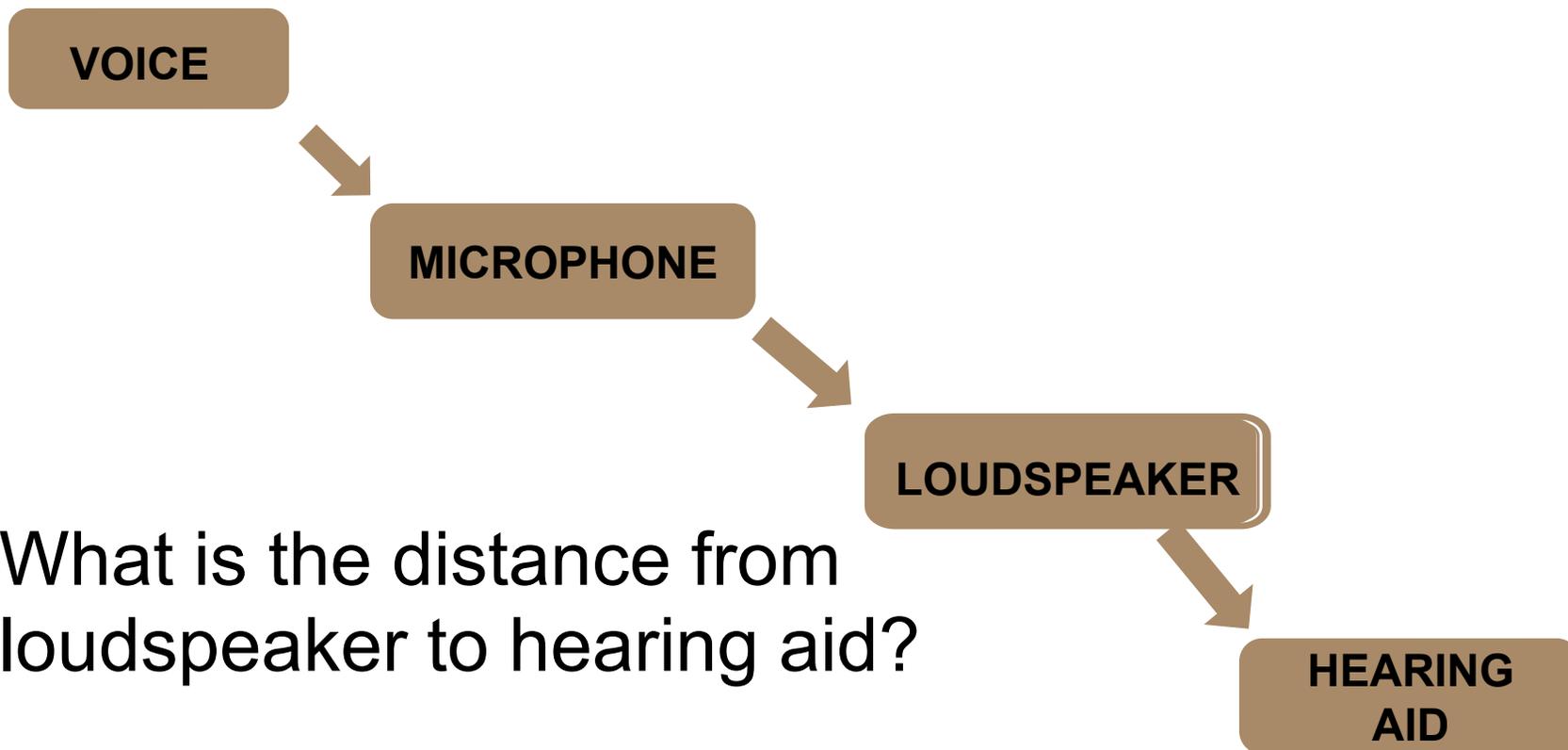


# OTHER PROBLEMS FACING THE HARD OF HEARING

- Ability to focus on one voice impaired  
Cocktail party effect
- Temporal processing slower for seniors
- May turn off hearing aids to escape noise



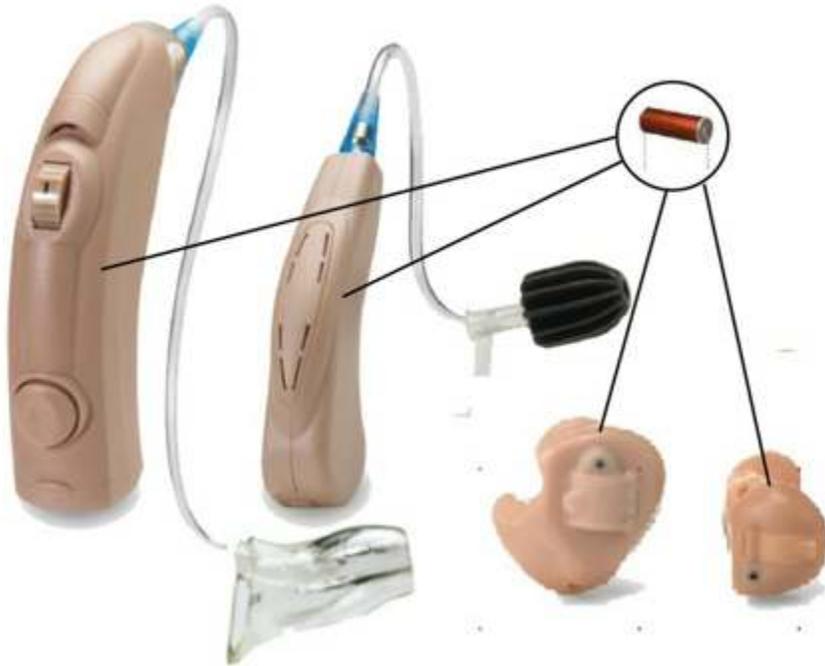
# TYPICAL HEARING DEVICE PROCESS



- What is the distance from loudspeaker to hearing aid?
- How much background noise will be encountered?

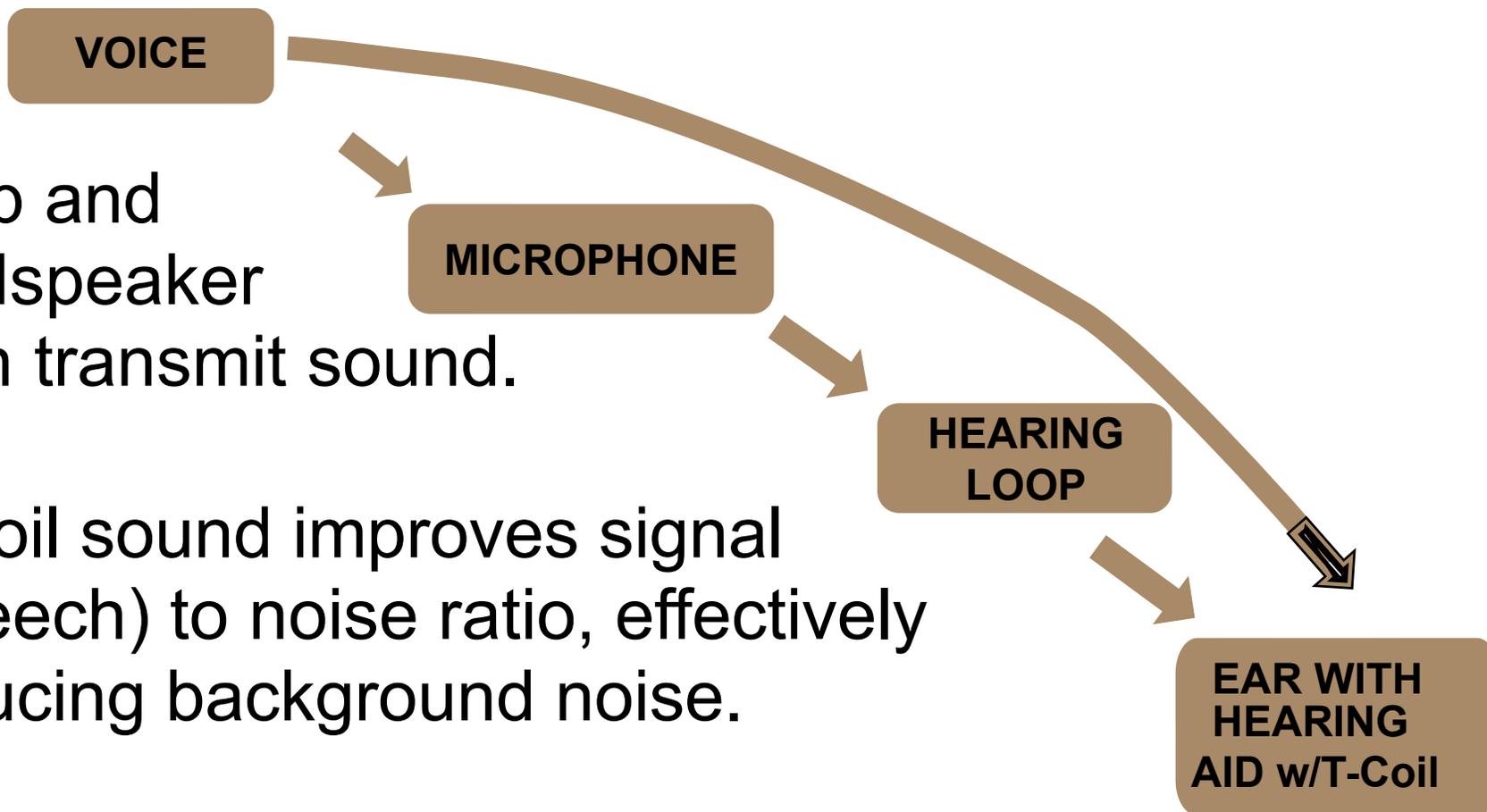
# Solution: T-COIL HEARING AIDS

- ▶ 70% of hearing aids have (or can be fitted with) telecoils.
- ▶ All cochlear implant processors today have T-coils.



- ▶ Hearing Loss Association of America reports that 84% of members have T-coils.
- ▶ 95% of hearing aids have T-coils in UK.

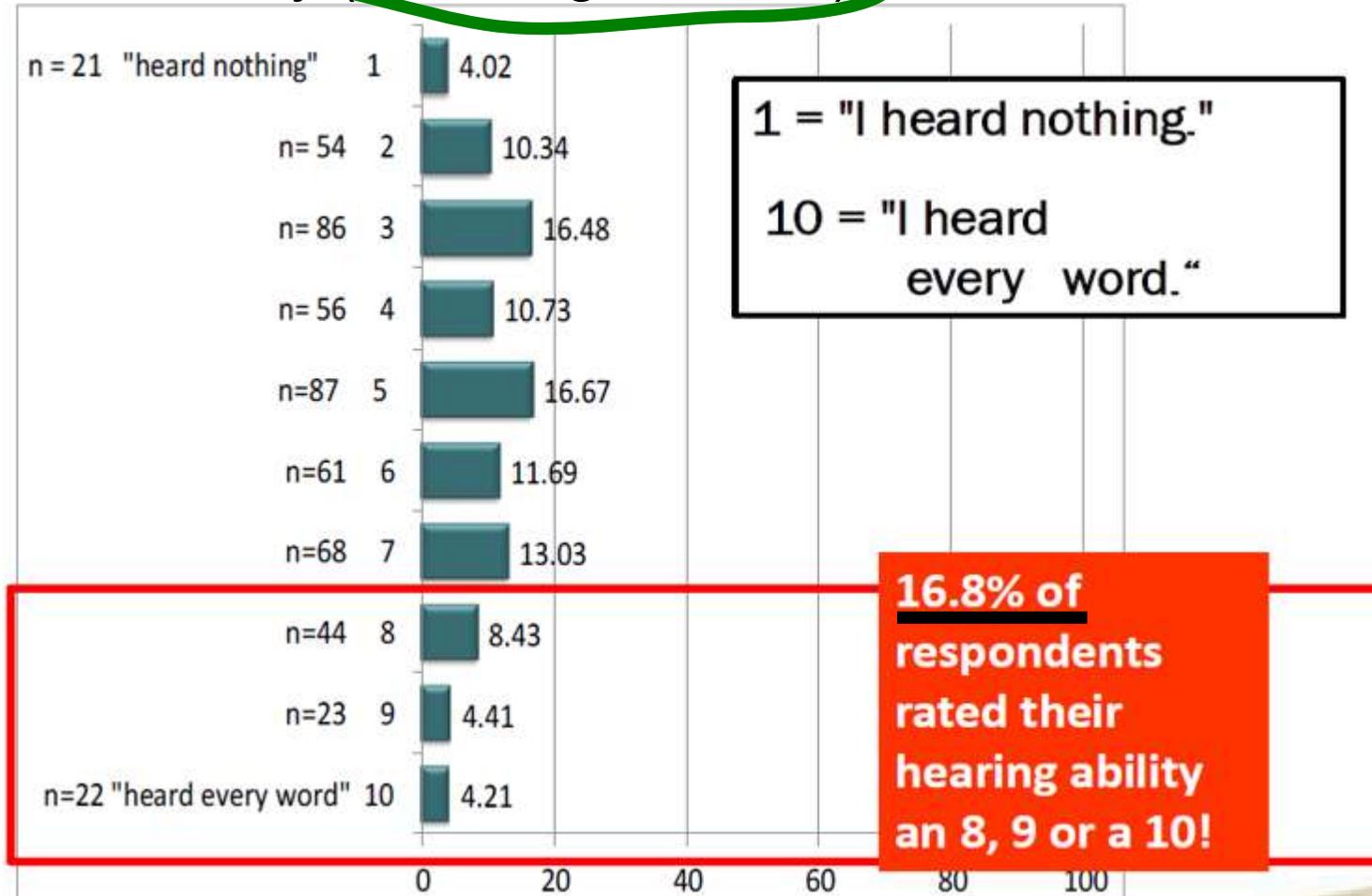
# T-Coil HEARING DEVICE PROCESS



- Loop and loudspeaker both transmit sound.
- T-Coil sound improves signal (speech) to noise ratio, effectively reducing background noise.
- Airport environmental noise further reduced if HA mics turned off.

# Solution: HEARING LOOPS

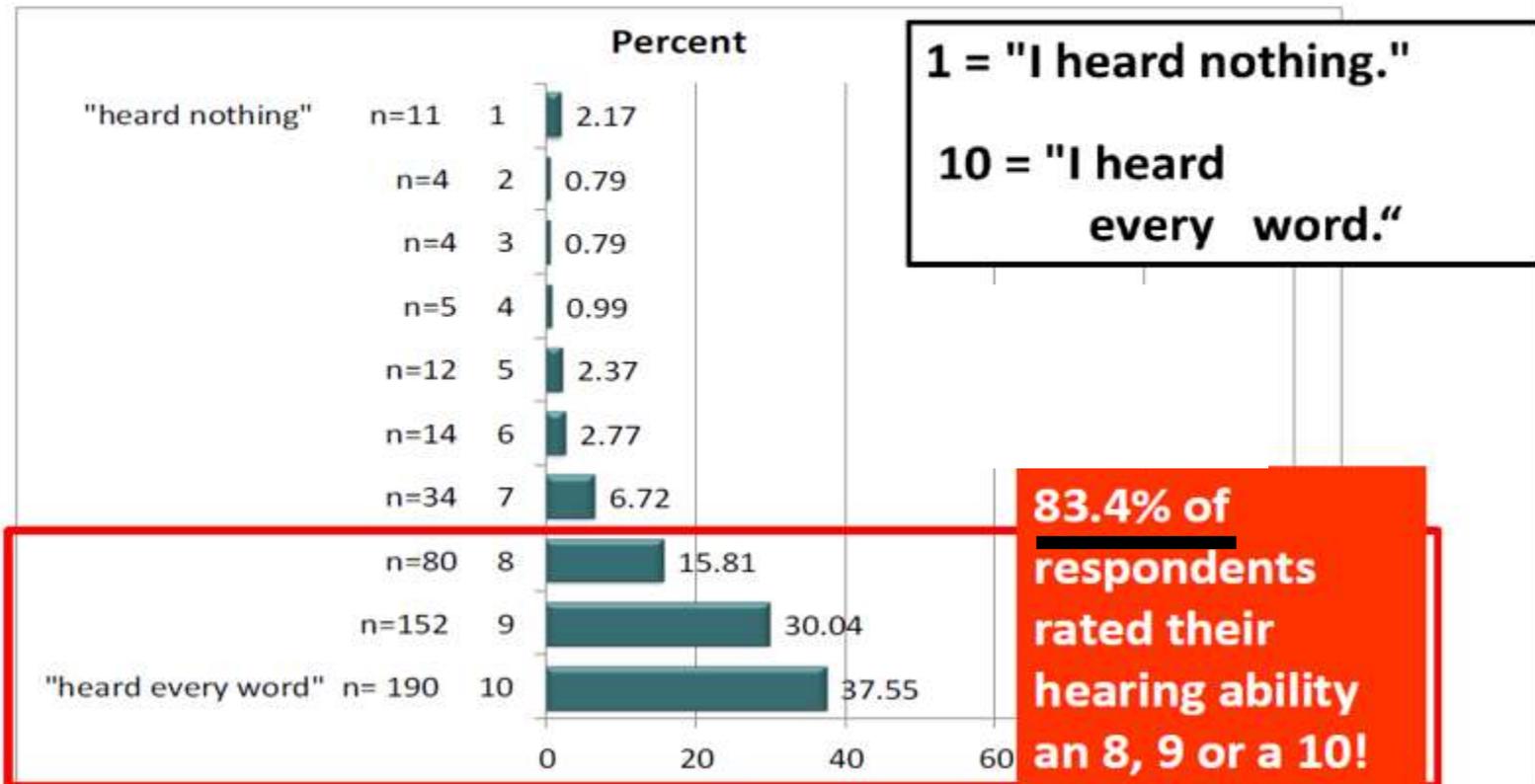
How well did you hear in the venue using your hearing devices only (not using telecoils)? n=522



Hearing Loop Survey – Juliette Sterkens, AuD

# Solution: HEARING LOOPS

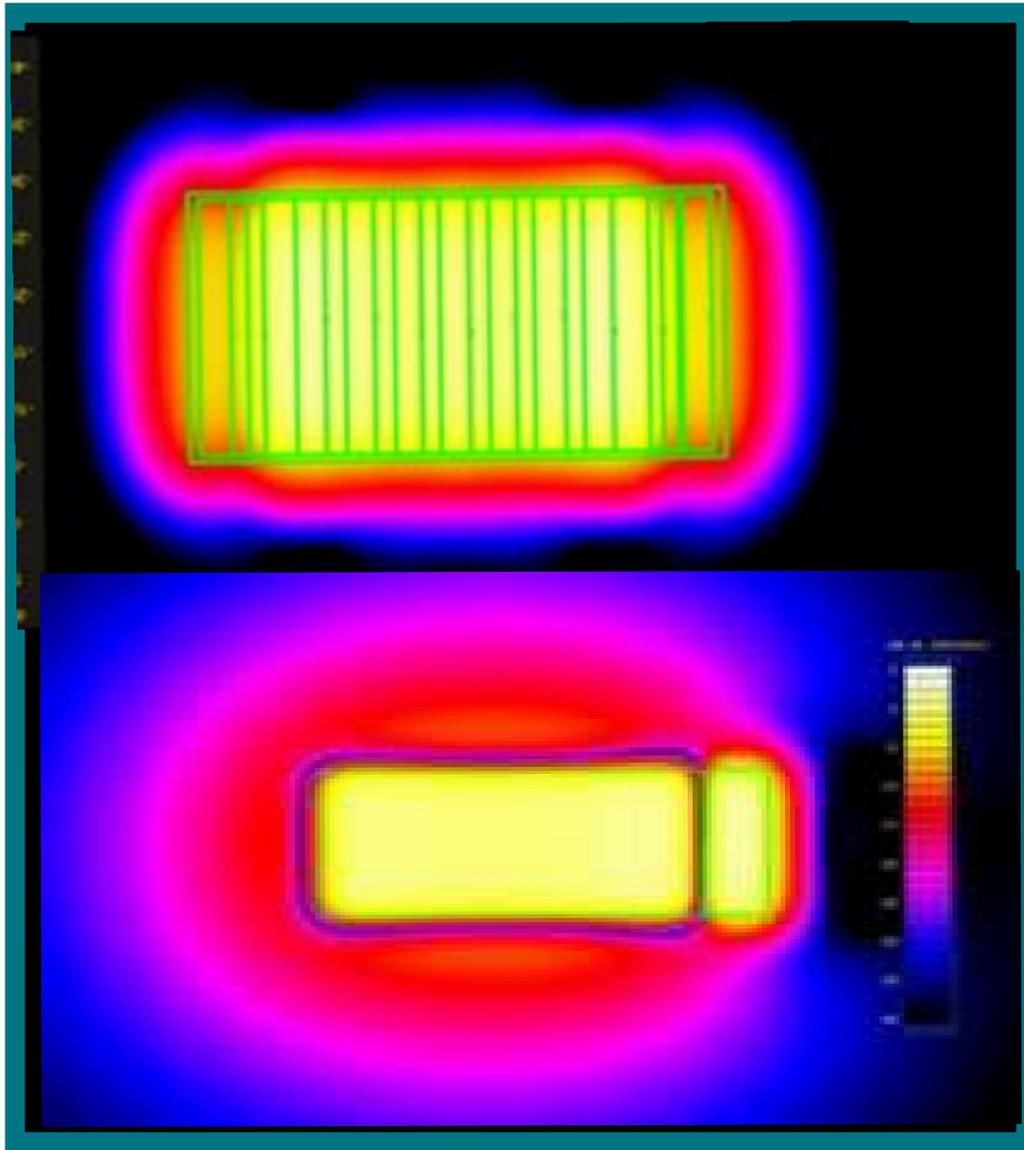
How well did you hear in venues using your hearing aids/CIs in the hearing loop (using telecoils or a loop listener) n=506



Hearing Loop Survey – Juliette Sterkens, AuD



# Solution: HEARING LOOPS

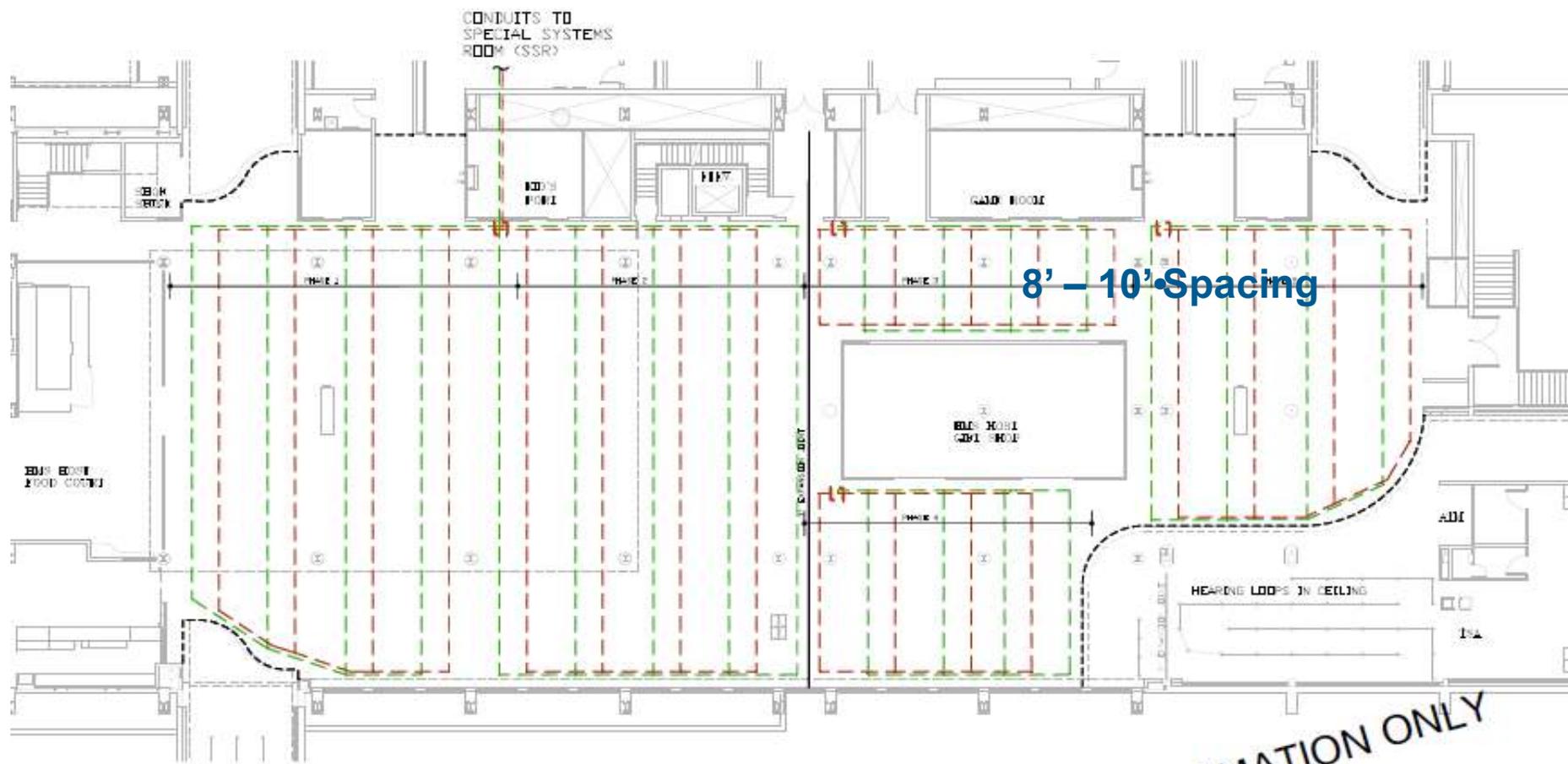


## 2 types of loops

Phased array - little spill.  
Used at gates etc.

Perimeter loops - lots of  
spill. Used at food  
court, waiting areas etc.

# Solution: HEARING LOOPS

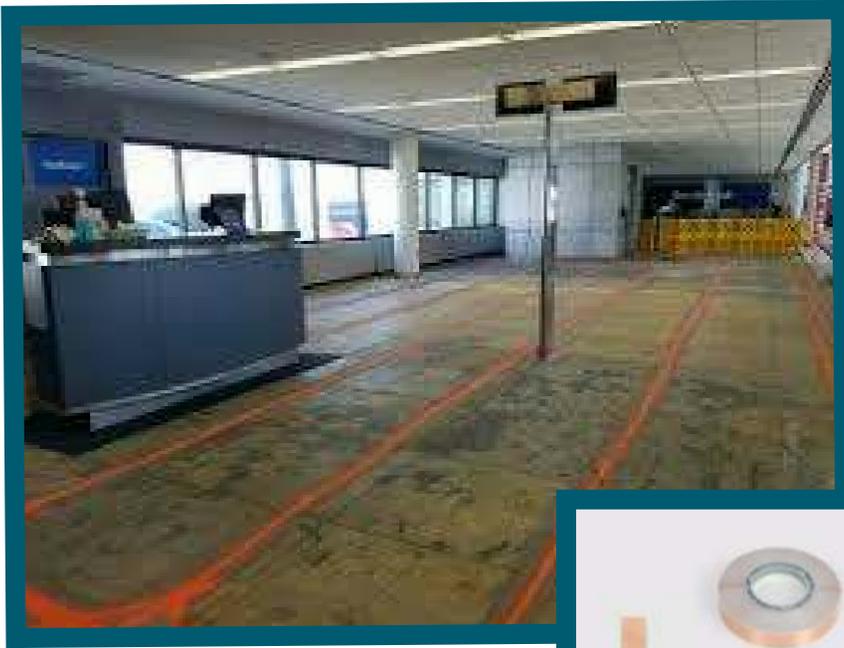


Hearing Loop Installation Phasing

SCALE 1/8" = 1'-0"

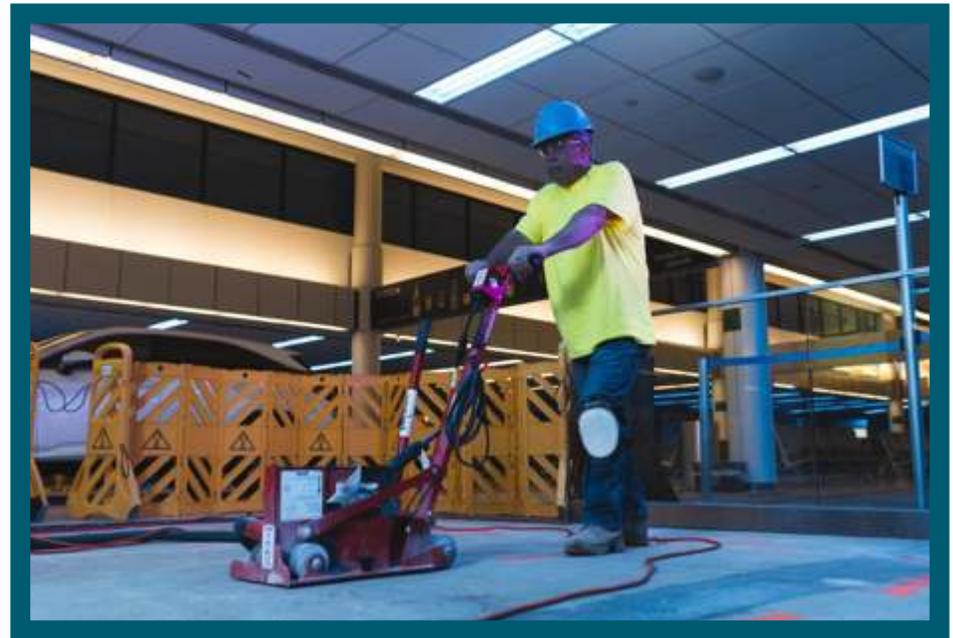
INFORMATION ONLY

# Solution: HEARING LOOPS



Copper tape  
under carpet

Copper loop wire in  
scored concrete

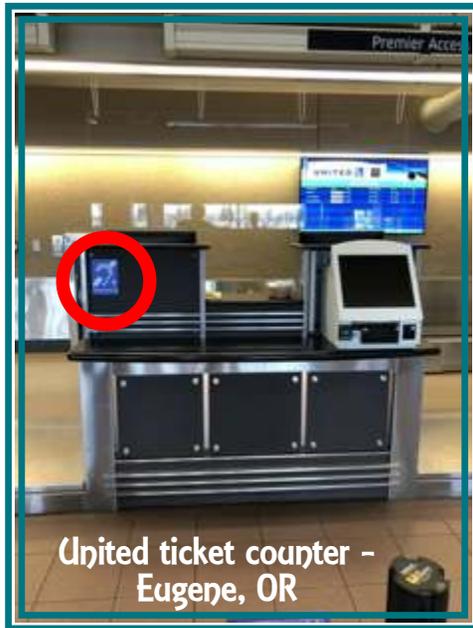


# Solution: HEARING LOOPS

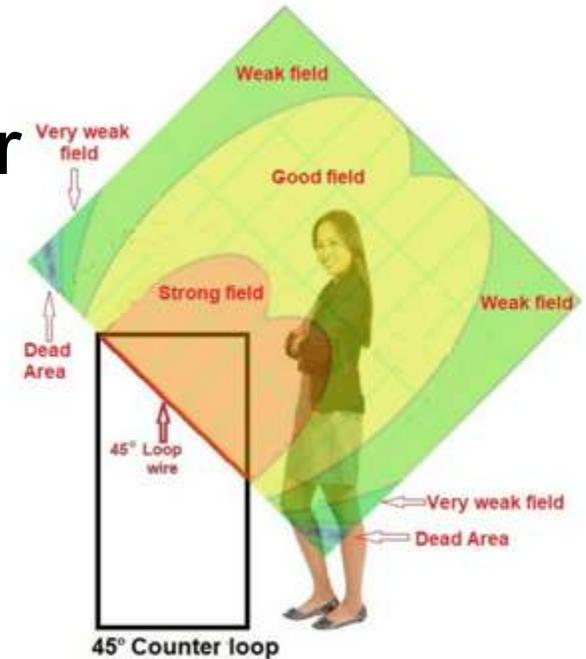
Scored grout in brick/tile floors



# ANOTHER FORM OF LOOPS



At the Rochester, NY and some other airports they have also used counter loops at ticket, information and other counters, in



security and various other locations where travelers interact with airport or vendor personnel.

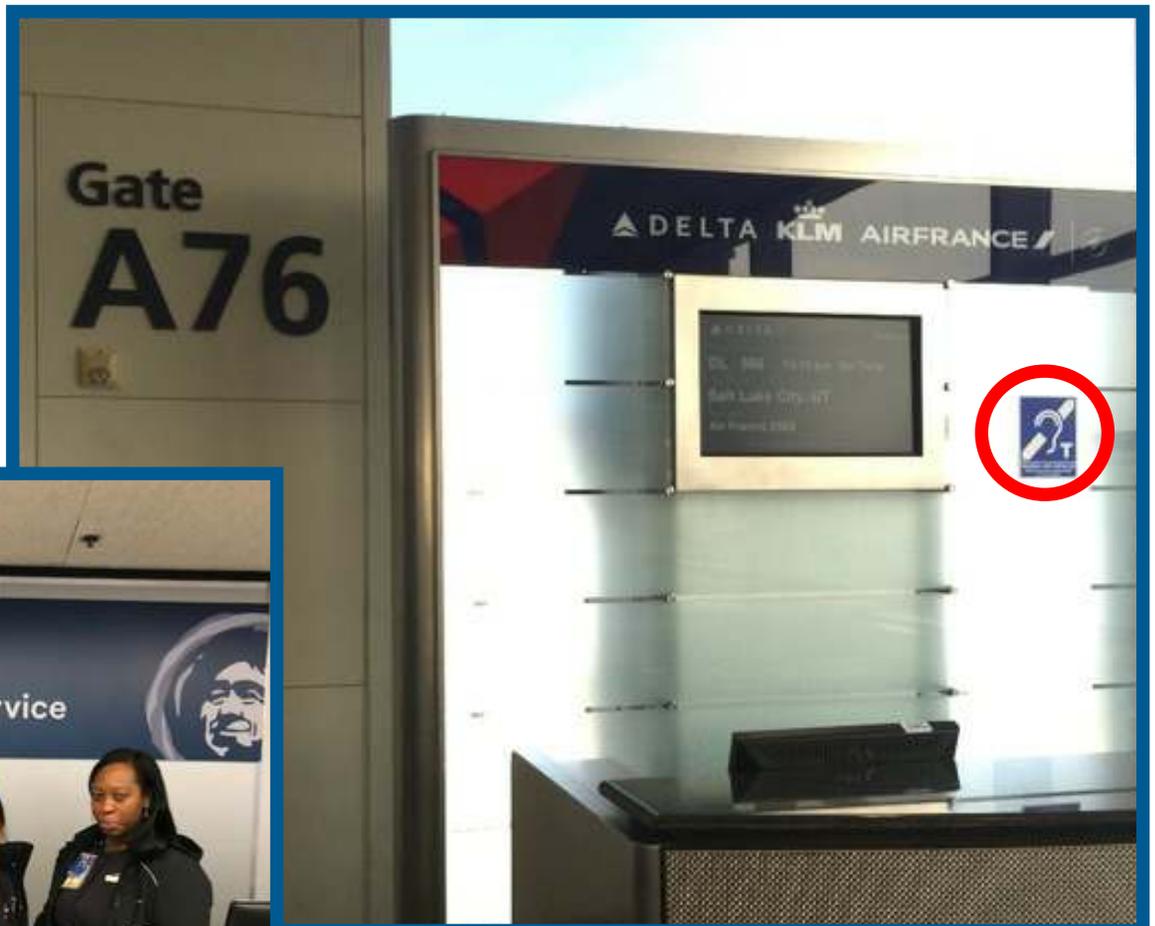
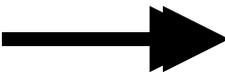
# Solution: HEARING LOOPS



Delta counter  
in Atlanta



Alaska Air  
baggage claim in  
Seattle



Delta Airlines gate in Detroit

# PRIORITY ANNOUNCEMENTS

FLIGHT, SECURITY, PAGE  
ANNOUNCEMENTS

PUBLIC ADDRESS SYSTEM-  
AMPLIFIER

HEARING LOOP

HEARING AIDS  
WITH T-Coils

- Pre-recorded and “live” announcements would go through the public address system amplifier.

# GATE ANNOUNCEMENTS

BOARDING, PAGE PASSENGER  
FLIGHT DELAY, GATE CHANGE

GATE SYSTEM AMPLIFIER

HEARING LOOP

HEARING AID  
WITH T-Coil

- Announcements pertaining only to passengers at that gate would go through the system exclusive to it.

# Solution: HEARING LOOPS

Superior communication access



# HEARING LOOPS - COST

Cost for various phases of installation  
Gerald Ford International - Grand Rapids, MI

- ▶ Phase I – 2008 - \$3.18/s.f.
  - Installed above ceiling
  - Approx. 43,000 s.f.
- ▶ Phase II – 2011 - \$7.72/s.f.
  - Installed prior to carpet replacement
  - Saw cut concrete floor; epoxy filler
  - Night work
  - Approx. 14,200 s.f.
- ▶ Phase III – 2014 - \$2.74/s.f.
  - Installed above ceiling
  - Approx. 12,000 s.f.



# HEARING LOOPS - COST

Cost per gate for recent installations:

\$10,000 to \$30,000 depending on variables

Richard Mckinley - Contacta Inc.

\$18,000 average per gate

Tim Vander Meer, Hearing Loop Solutions

\$440,000 possible cost to loop Sunport gates

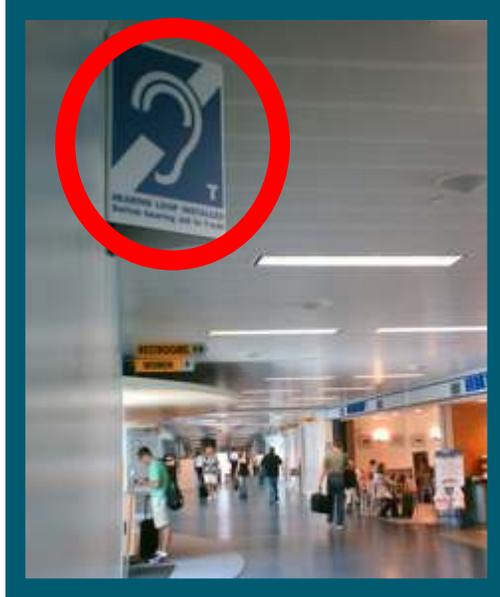
22 gates at an average cost of \$20,000 per gate



# HEARING LOOPS - SIGNAGE

Good signage critical to ensure use.

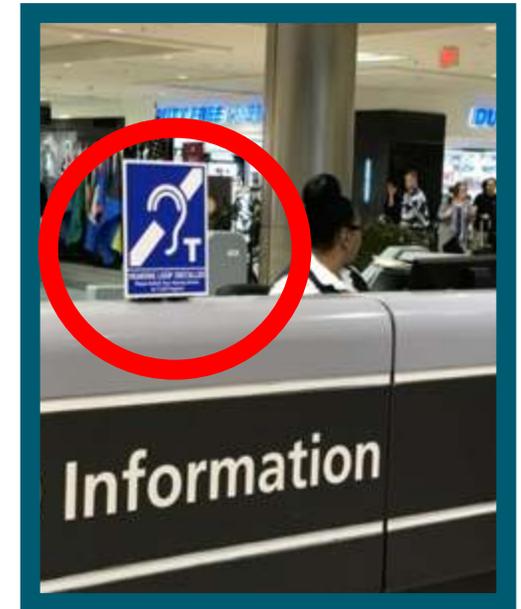
Loop symbol used in all promotional material.



A concourse at Gerald Ford airport, Grand Rapids, MI



Delta Airlines gate at Detroit Metropolitan Wayne County



Information counter at Hartsfield-Jackson Atlanta

# US AIRPORTS USING HEARING LOOPS

ATLANTA, GA

KALAMAZOO, MI

PHOENIX, AZ

AUSTIN, TX

LAS ANGELES, CA

ROCHESTER, NY

BILLINGS, MT

MEMPHIS, TN

SARASOTA, FL

DETROIT, MI

MINNEAPOLIS, MN

SEATTLE, WA

EUGENE, OR

MUSKEGAN, MI

SOUTH BEND, IN

FORT WAYNE, IN

NEW YORK, NY

SOUTH BEND, IN

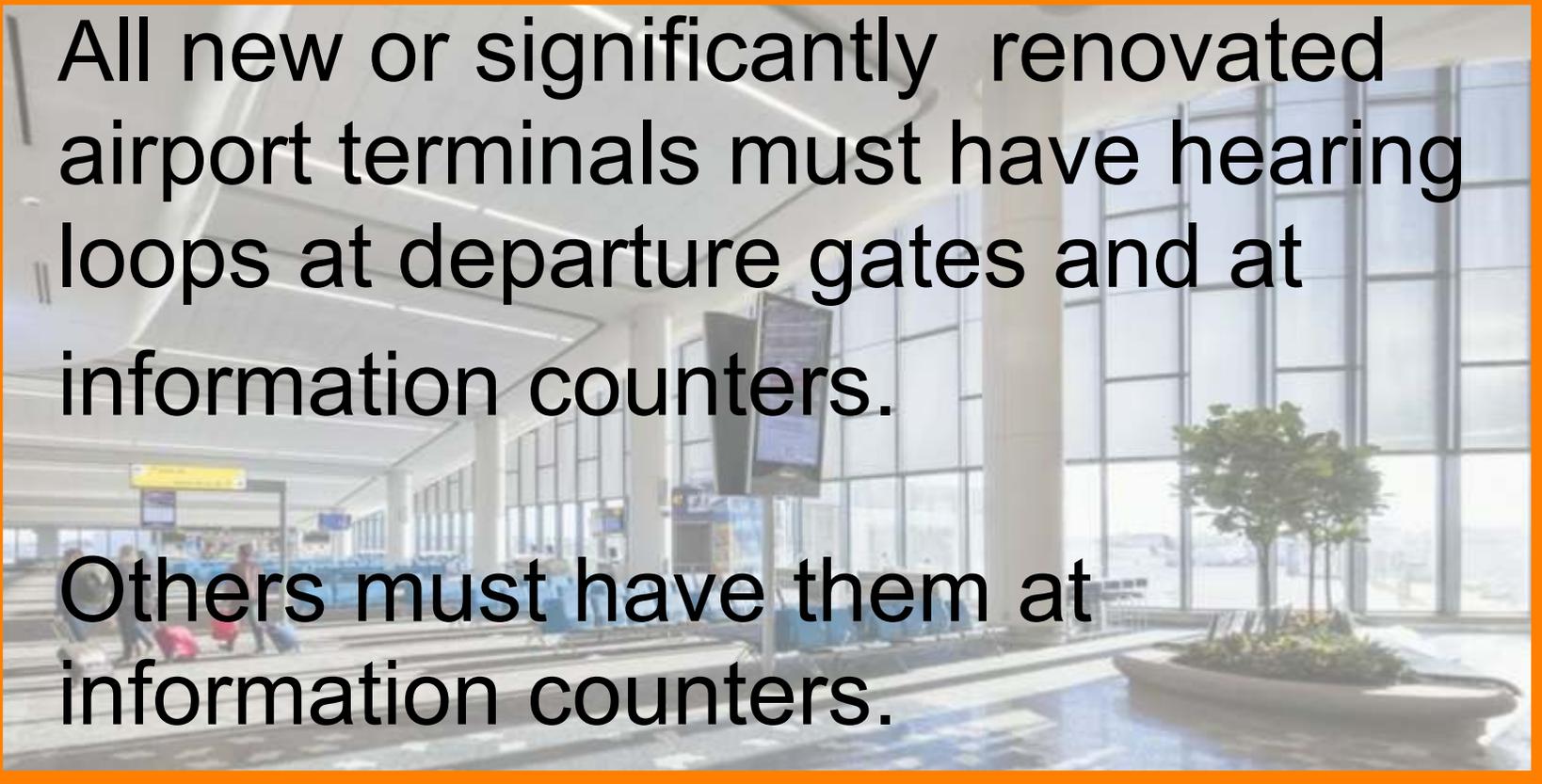
GRAND RAPIDS, MI

OSHKOSH, WI

SYRACUSE, NY



# NEW Accessibility Requirements



All new or significantly renovated airport terminals must have hearing loops at departure gates and at information counters.

Others must have them at information counters.

# Looped Amtrak Trains



83 “trainsets” (500 cars) on order with option for 800 more cars - all with loops





# New York City MTA

1000 looped  
subway cars



Testing on



# New York City Taxicabs

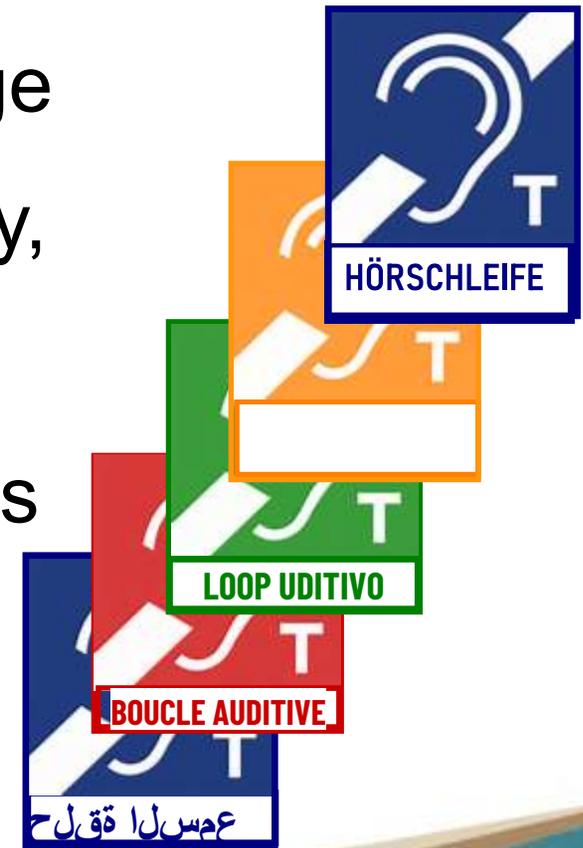


By law...all new NYC taxis must be hearing loop equipped

# HEARING LOOPS - AN INTERNATIONAL TECHNOLOGY



In any language  
and any country,  
these signs say  
that your telecoils  
will work here.





**Incheon Airport, Seoul, South Korea**



**Domodedovo airport, Moscow**



**Stockholm, Sweden**



**Dublin airport in Ireland**



**Christchurch, New Zealand Airport**





YOU CAN MAKE OUR DREAMS OF FLIGHT COME TRUE...

