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16. Abstract The Federal Highway Administration (FHWA) prescribes a three-part approach for addressing roadway noise including source controls and quiet vehicles, reduction measures within highway construction, and developing land adjacent to highways in a way that is compatible with highway noise. Communities, planners, and engineers often chose the highway construction response and focus on building noise barriers. Departments of transportation and local communities would greatly benefit by increased attention to the third method, focusing on land use and adjacent roadway compatibility—Noise Compatible Land Use Planning (NCLUP). FHWA sponsored a series of workshops designed to increase the application of noise compatible strategies as a part of highway planning. An expected outcome of the workshops is better long term planning and reduced spending on noise barriers for mitigation. Planners and elected officials are encouraged to place specific language on legal documents and foster shared responsibility for noise abatement between the public and private sector developers.			
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U.S. Department of Transportation
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**NOISE COMPATIBLE WORKSHOP PROCEEDINGS
FINAL REPORT**

**CONDUCTED FOR THE
FEDERAL HIGHWAY ADMINISTRATION**

BY

**THE CENTER FOR TRANSPORTATION TRAINING
AND RESEARCH
TEXAS SOUTHERN UNIVERSITY**

November 2006

ABSTRACT

The Federal Highway Administration (FHWA) prescribes a three-part approach for addressing roadway noise including source controls and quiet vehicles, reduction measures within highway construction, and developing land adjacent to highways in a way that is compatible with highway noise. Communities, planners, and engineers often chose the highway construction response and focus on building noise barriers. Departments of transportation and local communities would greatly benefit by increased attention to the third method, focusing on land use and adjacent roadway compatibility—Noise Compatible Planning (NCP). FHWA sponsored a series of workshops designed to increase the application of noise compatible strategies as a part of highway planning. An expected outcome of the workshops is better long term planning and reduced spending on noise barriers for mitigation. Planners and elected officials are encouraged to place specific language on legal documents and foster shared responsibility for noise abatement between the public and private sector developers.

EXECUTIVE SUMMARY

Highway traffic noise is an important issue for communities across America. The Federal Highway Administration (FHWA) delineates three approaches to ameliorating roadway noise: 1) implementing source control and quieting vehicles at the source, 2) incorporating noise mitigation in highway construction projects, and 3) noise compatible land use planning (NCP). Noise compatible planning eliminates or reduces the undesirable effects of highway traffic noise by encouraging uses near highways that are less sensitive to noise. The strategies may also promote open space or utilize special building construction techniques to minimize noise effects. FHWA sponsored a series of workshops at strategic locations around the country to describe the merits of noise compatible planning. Specifically, the workshops were designed to:

- Educate and increase the use of noise compatible land use strategies by communities,
- Build the resources (video, reports, course curriculum) to better educate communities, and
- Lead to less frequent utilization of noise barriers.

The half-day workshop began with a plenary session, which provided an overview of noise compatible land use planning, the status of local activities, and examples of implementation of noise compatible land use strategies from around the country. Then participants separated into breakout sessions to discuss application of the noise compatible principles for their community. The workshop showed land use planners and elected officials how they can influence neighborhoods affected by highway noise utilizing local ordinances and zoning tools. Open-space techniques that greatly reduce interior noise penetration include buffer zones between the roadway and the development, possibly focusing garages and rear yards adjacent to the roadway, and providing landscaping and recreational features such as earthen berms or recreational trails.

Encouraging or requiring commercial, retail or office uses next to a major roadway buffers residential areas. Additionally, understanding basics about noise propagation mediums can also help avoid future sound problems. Planners and officials are asked to consider where residential developments may occur in the future. Advanced planning includes allowing provisions for roadway expansions when considering setbacks, so if roadway widening occurs noise increases on neighborhoods can be minimized

Building codes and design standards are an option for ensuring development that accommodates noise. Builders may provide improved insulation, apply acoustical materials, and design residential units without windows on the roadway side. When windows are installed on the roadway side, double paned glass and floor plans with bedrooms or other sensitive uses furthest from the roadway diminish the effect of the noise on residential units. One-story units experience less noise than two-story structures, where a noise or developer wall already exist.

Workshop participants were asked to convince others in their communities to more aggressively pursue noise compatible land use methods resulting in a reduced need for noise barriers.

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DISCLAIMER

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ACKNOWLEDGMENT

The authors recognize the United States Department of Transportation, Federal Highway Administration, Office of Natural and Human Environment, for support and guidance in the conduct of this workshop series.

Overview

Appropriately accommodating highway noise is a critical component of project planning and implementation for engineers across the nation. The Federal Highway Administration (FHWA) prescribes a three part approach for addressing roadway noise including source controls and quiet vehicles, reduction measures within highway construction, and developing land adjacent to highways in a way that is compatible with highway noise. Most often, communities, planners, and engineers chose the second approach, which involves highway construction responses. The most common is the building of noise barriers. Departments of transportation and local communities would greatly benefit by increased attention to the third method, focusing on land use and adjacent roadway compatibility—Noise Compatible Planning (NCP). Noise compatible planning eliminates or reduces the undesirable effects of highway traffic noise by encouraging uses near highways that are less sensitive to noise, by promoting open space, or by utilizing special building construction techniques to minimize noise effects. In 2002, the Federal Highway Administration commissioned a brochure titled, *Entering the Quiet Zone* (FHWA, 2002) that provided information to planners and decision makers with the intent of encouraging more highway-compatible land use decisions for properties proximate to highways. FHWA sponsored a series of workshops as a next step and presented the brochure recommendations at strategic locations around the US. This document is a companion to video summaries of each workshop highlighting discussions and designed to increase the application of noise compatible strategies as a part of highway planning. An outcome of the workshops should be better long term planning and reduced spending on noise barriers for mitigation.

Workshops sites and dates are as follows:

- **Austin, Texas, April 15, 2005**
- **Phoenix, Arizona, April 25, 2005**
- **Seattle, Washington, August, 16, 2005**
- **Columbus, Ohio, August 22, 2005**
- **Orlando, Florida, September 9, 2005**

The workshops were designed to contribute to a three pronged purpose:

- To educate and increase the use of noise compatible land use strategies by communities
- Build the resources (video, reports, course curriculum) to better educate communities
- Lead to less frequent utilization of noise barriers

Workshop organizers solicited attendees through national and local chapters of the Urban Land Institute, the state department of transportations' lists of interested parties, city officials and planners, engineering firms, and American Planning Association chapters. The half-day workshop began with a plenary session, which provided an overview of noise compatible land use planning, the status of local activities, and examples of implementation of noise compatible land use strategies from around the country. Then participants separated into breakout groups to discuss 4 questions, which may have varied somewhat based on the locale. A synopsis of the 5 workshops follows; detailed responses from each workshop are included in Appendix A.

Opening and Workshop Purpose

There are multiple approaches to increase compatibility of highway noise within communities. One approach is to reserve open space next to highways. The greater the distance between the roadway and development, the less noise will be experienced. For a number of communities, leaving land undeveloped is not an option. Where development is inevitable, commercial, retail and some office uses accommodate roadway noise better than residential properties. In many locales, residential properties must exist proximate to roadways. The types of construction materials utilized and building orientation can reduce the effects of roadway noise for residential areas. The workshop goals were to better understand these strategies; attendees were encouraged to seek opportunities to advise others and apply the methods, as well as encourage local governments and developers to adopt compatibility strategies.

Workshop Participants

Initial correspondence and invitations to the workshops were distributed via state department of transportation stakeholder mailing lists, through professional trade associations and through local government. The workshop was intended to attract a range of professionals including municipal and state planners and engineers, private sector consultants, elected officials, and citizens. Workshop organizers especially targeted those who have responsibility to enact ordinance and statutory provisions leading to increased application of noise compatible strategies. Figure 1 shows the representation of attendees at the workshops.

Figure 1. Attendees: All Workshops

Location	Federal	Municipal	State DOT	Private Consultant	Professional Planner/Academic	Citizen--Neighborhood	Total
Austin	2	6	11	1	1	0	21
Columbus	1	11	5	2	1	0	20
Seattle	2	4	11	1	0	0	18
Phoenix	0	17	70	15	0	12	114
Orlando	0	6	2	1	6	0	15
Total	5	44	99	20	8	12	188

Overview and Importance of Noise Compatible Planning

Workshop participants received the simple definition of noise as “unwanted sound.” The desired end of federal and state noise programs is a reduction in the noise levels experienced by people proximate to roadways. Highway traffic noise is unwanted sound from vehicles, especially engines, tires and exhausts, as perceived by residents living near the highway. Noise is affected by the area and surface between the source and receiver, referred to as propagation medium. Surfaces may reflect, transmit, absorb or further project the original sound. Open space is effective because sound dissipates as the distance increases between the source and receiver. A number of people believe vegetation will reduce noise, but FHWA does not consider vegetation an abatement measure, unless it is evergreen, dense enough that it cannot be seen through and offers coverage from the ground to the canopy. Vegetation often provides a psychological advantage by serving as a visual barrier to the roadway noise sources. Noise is affected by topography. Elevated or depressed roadways cause sound waves to advance differently than flat surfaces.

Land use planners can influence how neighborhoods are affected by highway noise utilizing local ordinances and zoning tools. Encouraging or requiring commercial, retail or office uses next to a major roadway buffers residential areas. Additionally, understanding basics about noise propagation mediums can also help avoid future sound problems. For example, water does not absorb sound; therefore constructing ponds or lakes between roadways and homes will increase the noise levels experienced by residents. Planners and officials are asked to consider where residential developments may occur in the future. Advanced planning includes considering provisions for roadway expansions to determine roadway setbacks. This can reduce the chances of future noise levels increasing. Building codes and design standards are an option for ensuring development that accommodates noise.

FHWA Perspective of Noise Compatible Planning

Highway traffic noise has become a contentious point for many highway construction projects around the nation. Highways encompass large areas of land and are closer to neighborhoods in many locales. Federal regulation *23 CFR Part 772* outlines procedures for abatement and establishes requirements for information given to local officials in planning and designing highways. Section 772.5 of the regulation sets forth two types of projects. Type I are new roadways or modifications of existing highways and Type II covers noise abatement for an existing highways. Later sections note that Type II projects are at the option of the state department of transportation and are not mandatory. Noise abatement projects are eligible for federal funding under certain conditions described in the regulation. An especially important provision addresses estimating future noise levels on undeveloped land in order to help prevent future traffic noise impacts (Please add text on 23 CFR, Part 772.13(b). Measures that can attenuate highway noise impacts include roadway alignment and terrain, speed, operational aspects such as speed, as well as design responses.

Among the most frequently applied responses are noise barriers. Approximately 108 miles of barriers have been constructed with monies other than Federal-aid funds across the United States. As of the workshop dates, noise barriers are in 44 states and Puerto Rico at a cost of more than \$2.5 billion (2001 dollars.) Prudent direction by local governments can assist in reducing the impact of highway generated noise on developed

activities and better plan for compatible uses on undeveloped land. This section should concentrate on presenting the total miles and total cost of Type I noise barriers as well as total miles and total cost of Type II noise barriers. If in addition to this you want to state the non Federal-aid barriers, that is fine.

Application of Noise Compatible Planning Principles from around the Nation

Noise compatible land use principles are employed in communities around the nation on a regular basis. Zoning ordinances, plat notations and construction techniques commonly contribute to improved auditory conditions for properties proximate to roadways. Builders provide improved insulation, apply acoustical materials, and design residential units without windows on the roadway side. When windows are installed on the roadway side, double paned glass and floor plans with bedrooms or other sensitive uses furthest from the roadway diminish the effect of the noise on residential units. One story units experience less noise than two story structures. Open space techniques that greatly reduce interior noise penetration include buffer zones between roadway and development, possibly focusing rear yards adjacent to the roadway, and providing landscaping & recreational feature such as earthen berms or recreational trails.

Planners and elected officials are encouraged to place specific language on legal documents and plats, thereby adopting land use compatible standards into city codes. For instance, one city includes a plat notation on property adjacent to freeways that reads, "Developer shall be responsible for adequate setback and/or sound abatement measures.. City codes also can promote or require nonresidential uses proximate to roadways. Also, buffer zones, increased setbacks and additional landscaping can be a part of city standards and statutes. Several states have noise compatible land use requirements including Montana, Pennsylvania and Arizona. Cities with noise compatible statutes are San Antonio, Texas, Huntington Beach, California, and Gilbert, Arizona. Tables 1, 2 and 3 show the types of guidelines included in those cities.

Table 1. Example of Prototypical City Guidelines for Neighborhood Environmental Design Analysis

- | |
|---|
| <ul style="list-style-type: none">• Site and building design strategies minimize interior and exterior noise levels.• General description of construction techniques and materials must be provided.• Technical noise report using Traffic Noise Model (TNM)• Zoning approved prior to ordinance's approval may be subject to these standards. |
|---|

Table 2. Prototypical City Guidelines for Development Standards

- Building height 1-story within 150' of ROW, if you have a noise or developer wall.
- Barrier height produces 5 dBA noise reduction and meets state standards.
- Interior noise at or below 45 dBA and meets HUD standards
- Site plan must show that building orientation and open space minimize the impact of freeway noise.

Table 3. Prototypical City Guidelines for Notification Requirements

- Plat note: “This property could experience noise from the freeway”.
- Public report: “Barrier height produces 5 dBA noise reduction and meets state standards.
- Notice to potential buyers: “This subdivision is located within the overlay district and contact state DOT.”

Recommendations for city government include engaging in frequent dialog with city commissioners and other decision makers to move toward more statutory requirements regarding land next to existing or potential roadways. Modifying comprehensive plans, instituting performance zoning, or transferring development rights (TDR) are opportunities for communities to incorporate more aggressive preparation for compatibility between roadways and adjacent land uses.

Implementing Noise Compatible Planning Concepts

A breakout session at each workshop enabled attendees to discuss elements of how their community might implement noise compatible land use. Four questions guided discussion groups asking about potential benefits, disadvantages and strategies that would facilitate noise compatible implementation. Synthesis responses from the 5 workshop break sessions are described below. Individual workshop responses are described in Appendix A.

Benefits of Noise Compatible Planning

Attendees at the workshops saw numerous positive benefits to advocating greater noise and land use compatibility. Noise compatible planning positions communities for proactive compared to reactive planning to address noise issues. The outcome is a better quality of life for adjacent landowners and residents. Improved compatibility of land uses will reduce the number of complaints from residents. Careful planning provides future cost savings as the need for barriers are diminished. The workshop participants suggested that noise compatible land use planning can potentially contribute to increases in property values. Increased attention to planning for highway noise and land use promotes shared responsibility between the public and private sector for accommodating highway noise.

Improved knowledge about noise compatible options encourages developers to leave open space and reorient less sensitive uses away from the roadway.

Disadvantages or Hindrances of Noise Compatible Planning

A number of details can impede implementation of noise compatible land use strategies according to workshop attendees. Developers may perceive that NCLUP is cost prohibitive and discourage officials and policy makers, who wish to be more proactive. Since most urban areas are comprised of multiple counties and municipalities, if adoption of policies is not widespread across a region, intergovernmental conflicts are possible. A community with noise compatible land use policies might feel as if development could be suppressed compared to neighboring jurisdictions that do not have compatibility standards. Attendees mentioned a potential for noise compatible statutes to conflict with zoning and other ordinances. Another shortcoming is that setbacks and open space reduce the amount of usable property for development. Combined with anticipated implementation cost, selling the idea of NCLUP to developers and elected officials may prove difficult. Communities wishing to collect data to show costs and benefits of noise compatible land use planning may find an inadequate supply of information to produce calculations.

A common point discussed at each session was the matter of property rights and a potential for lawsuits that might result if some noise compatible strategies were perceived as stringent. One land use considered to be compatible with highway noise is industrial; workshop participants noted that industrial use may be viewed as unpleasant along city corridors.

Implementation of noise compatible strategies would benefit from a well-respected person speaking on behalf of noise and land use compatibility. Participants anticipated finding a “champion” to lead the cause might prove difficult.

Tools Or Strategies That Are Most Suitable For Application In My Community

In urban areas, buffers, setbacks and zoning represent solid strategies for implementing noise compatible uses near highways. Rural area officials are encouraged to place requirements on plats. Officials may utilize overlays to demonstrate noise sensitive areas on planning maps. Placing a note on site plans regarding developer responsibility for compatibility of their project is an option. Planners may apply a performance based approach, which sets maximum noise levels instead of defining fixed setbacks. Workshop participants suggested requiring a noise analysis for each project when development is in a highway corridor. Based on outcomes of the analysis, communities may request improved construction techniques, including improved insulation and window panes, which better accommodate noise. Other suggestions are to orient buildings so that sensitive areas are further from the noise source.

Suggestions to Implement Noise Compatible Planning Strategies

Workshop sponsors encouraged making NCLUP a priority and a normal course of business when developing comprehensive plans. It is important to demonstrate health and quality of life benefits that result when land use and highways are compatible. Local officials and planners should recognize noise walls are only one of many responses to noise mitigation. Creativity and innovation can stimulate the application of noise

compatible strategies. If zoning and ordinances are enacted, enforcement is critical. Accumulate examples of successful projects to fuel the continued implementation of noise and land use planning. Urge coordination of adjacent communities across a region, so that strategies are uniformly applied.

The Contrasting Opinion

Many people find highway noise unpleasant and choose not to live where highway noise exists, if there is an option. For others, though, the highway noise offers an opportunity to have a larger house than might otherwise be affordable. In some areas where housing costs are extremely expensive, some owners will compromise privacy and accept highway noise for lower cost housing. In the San Diego area, “houses by the freeway sell for 5 percent to 10 percent less than comparable homes” (San Diego Union Tribune, July 24, 2005.)

Closing and Challenge to Participants

Research spanned the US and yielded the examples of noise compatible land use shown in the booklet, “Entering the Quiet Zone.” Recognize that DOT’s have no legal authority in land use matters, but exercise varying degrees of influence. Therefore, local officials and planners hold the tools to enact more noise compatible strategies. Develop brochures and information pieces to convince and educate the public about the advantages of proactively considering land use proximate to highways.

This series of workshops will only be effective if attendees commit to implementing strategies discussed in the general sessions and breakout groups. Ambassadors are needed to convince others in their communities to more aggressively pursue methods that would reduce the need for noise barriers. A noise compatible land use curriculum for university level students or practicing professionals is a companion to these proceedings. Additional information that would assist entities in implementing noise compatible strategies is available on the FHWA website as follows:
<<http://www.fhwa.dot.gov/environment/audible/al5.htm>>
<<http://www.fhwa.dot.gov/environment/noise/index.htm>>

Video Presentation of Workshop Series

The workshop series is accompanied by a CD set containing one 2-hour and one 1-hour consensus representation of the workshops for each of the five locations. Also a one hour syntheses from each workshop location is available.

REFERENCES

Gilbert Arizona, Guidelines <www.ci.gilbert.az.us/general/sitemap.cfm?name=menu3
(Look under General Plan and All Maps)

Federal Highway Administration, FHWA, Noise Compatible Land Use Planning,
<http://www.fhwa.dot.gov/environment/audible/al5.htm>
<http://www.fhwa.dot.gov/environment/noise/index.htm>

Federal Highway Administration, FHWA, (2002) Entering the Quiet Zone: Noise
Compatible Land Use Planning www.fhwa.dot.gov/environment/noise/quietzon/qz2.htm

San Diego Union Tribune, Noisy Neighbor; Some San Diego County residents find
owning a home abutting a freeway lets the live the American dream—at reduced price,
July 24, 2005.

Appendix A
Attendee Responses from Breakout Sessions

AUSTIN, TEXAS

Apply the following to all the workshop write-ups: date of the workshop and if there was any media coverage at the workshop (I know at Austin there was)

Attendance and Audience

The City of Austin's Public Works Department hosted the NCLUP Workshop at their office. Over 21 people attended the workshop as shown below:

- 8 City of Austin employees (Public Works, Planning & Engineering, and Environmental Depts.)
- 11 TXDOT employees (representing the various districts office throughout Texas)
- 1 Private engineering firm
- 1 Professional planner

Small group discussion notes

Attendees considered 4 questions based on their perspective of their community and the potential to implement noise compatible concepts. Responses to each question are listed below.

Question 1: List the potential benefits of Noise Compatibility Land Use Planning if it is implemented in your community

- Public awareness for potential homeowners
- Increased property values
- Efficient use of finances – no retrofitting highways/roadways
- Spend money to build highways
- Prevents developers from building up to the ROW
- Decreases the loss of hearing
- Promotes trees and greenery
- Places noise limits on plats
- Improved Quality of Life
- Operating from a land use center
- Increased economic value
- Leaves locations more desirable
- Proactive planning vs. reactive planning
- More opportunities to use cluster development & gain open space
- Practicing good zoning principles
- Improved interagency cooperation

Question 2: List the potential disadvantages/hindrances your community may experience if Noise Compatibility Land Use Planning is implemented in your community

- Developers will perceive that NCLUP is cost prohibitive
- Interagency/intergovernmental conflicts
- Conflicts with zoning and other ordinances
- Potential control access issues
- Reduces the amount of usable property for development due to setbacks, open space requirements
- Expensive purchasing property

- Building materials expensive
- People can't reach consensus on alternatives
- New Urbanist principles conflict with NCLUP (e.g. buildings closer to roads)
- Added costs to mitigate noise to developer
- Inconsistency with guidelines
- Removes/limits land from being developed
- Added delays in the development process-another layer to development

Question 3: List the Noise Compatible Land Use Planning tools & strategies that are most suitable for your community.

- In urban areas, utilize setbacks, zoning, etc.
- In rural areas, place requirements on plats, use buffers and setbacks
- Try different pavement types
- Place a note on site plans that noise cannot exceed 66 dba
- Obtain noise contours from TXDOT
- Require a noise analysis for each project
- Enforce noise compatibility on plats
- Use ordinances that provide restrictions on noise, but offer incentives for placing those restrictions
- Use building codes
- Utilize building materials that are recycled, provide color, offer sound reduction
- Joint planning is needed between developers and development agencies
- Notification of neighborhoods that are impacted by noise
- Use multiple techniques for noise reduction
- Implement a "Truck bypass" policy

Question 4: In order to implement Noise Compatible Land Use Planning Strategies, my community needs to...

- Coordinate between various governmental groups
- Set up work group
- Incorporate ideas into Comprehensive Plan
- Adopt better noise & zoning ordinances
- Conduct noise analysis studies
- Get commitment to implement from appropriate officials
- Notify real estate agencies, neighborhood organizations, and citizen groups to help identify problems

PHOENIX, ARIZONA

Attendance and Audience

The Arizona Department of Transportation (ADOT) held the NCLUP Workshop at their training facility. The meeting was a combined effort of the Federal Highway Administration, Arizona Department of Transportation, and Texas Southern University – Center for Transportation Training and Research. Workshop registration information was sent to the ADOT district employees, Urban Land Institute, Arizona American Planning Association and its local chapters, various councils of governments, and city planning departments. These invitees were asked to share the registration with local developers, engineering firms, and community leaders. Over 115 people registered for the workshop and 91 people attended. Workshop participants included the following:

- 17 federal/municipal employees, elected officials, MPOs (representing Public Works, Planning Depts.)
- 70 ADOT employees (representing the various districts office throughout Arizona)
- 15 Private engineering firm
- 12 Private citizen or neighborhood/community leaders

Small group discussion notes

In small groups, attendees were asked four questions. The questions and responses are listed below.

Question 1: List the potential benefits of Noise Compatible Land Use Planning if it is implemented in your community

- Gives clout to community to force developers to comply with noise regulation
- Protection for zoning
- Foresight can beat the development
- Costs Saved- if done right the first time, no retrofitting is needed
- Planning reduces complaints from citizens
- Increased property taxes
- Inter-departmental (inter-governmental) liaisons that take a pro-active approach to solving noise issues
- Property/resale values
- Less complaints and better public awareness
- Public land use along roadway corridor (trails etc)

Question 2: List the potential disadvantages/hindrances your community may experience after implementing Noise Compatible Land Use Planning

- ADOT is at a loss with enforcement
- Cities don't have any ordinances
- High costs of retrofitting freeways
- The burden is on each city to help their neighborhoods.
- Lacking the political weight to implement mitigation plan
- Resistance from developers
- Additional work for staff

- Rules/regulations are written as advantage/disadvantage. Needs more work to make regulations useful.

Question 3: List the Noise Compatible Land Use Planning tools & strategies that are working well for your community.

- Rubberized asphalt reduces maintenance costs, and compacts.
- Overlay zones
- General plan in Avondale
- Avondale does not allow two-story houses along collector streets
- Coupling projects
- Depressed freeways
- Scottsdale art and infrastructure program paying attention to aesthetic value, combining art and function.

Question 4: In order to more fully implement Noise Compatible Land Use Planning Strategies, my community needs to...

- Plan ahead
- Share information as soon as available. Improve notification.
- Participate in better communication
- Gain enforcement capacity for notifying adjacent jurisdictions
- Cities and counties can establish a framework for enforcement (ordinances and legislation.) Build the enforcement into the system level, not the occurrence level.
- Educate elected officials and general public
- Cooperate with adjacent communities to eliminate unfair conditions.
- Require development/communities/agencies to publish maps at future roadway alignments.
- Require disclosure statements or sign-off that potential noise will be encountered.
- More pro-active approach from entities to publish future plans.
- Plan ahead to I-17 corridor (rezone, clean-up) develop specific area plans
- Public art and infrastructure programs to “pretty up” noise abatement.

SEATTLE, WASHINGTON

Attendance and Audience

The Washington Department of Transportation (WS-DOT) held the NCLUP Workshop at the Seattle Port Authority (SEA-TAC). The meeting was a combined effort of the Federal Highway Administration, Washington Department of Transportation, and Texas Southern University – Center for Transportation Training and Research. Workshop registration information was sent to the WS-DOT district employees, Urban Land Institute, Washington American Planning Association and its local chapters, various councils of governments, and city planning departments. These invitees were asked to share the registration with local developers, engineering firms, and community leaders. Over 20 people registered for the workshop and 18 people attended. Workshop participants included the following:

- 6 federal/municipal employees, elected officials, MPOs (representing Public Works, Planning Depts.)
- 11 WSDOT employees (representing the various districts office throughout Washington)
- 1 Private engineering firm
- 0 Private citizen or neighborhood/community leaders

Small Group Discussion Notes

In small groups, attendees were asked four questions. The questions and responses are listed below.

Question 1: List the potential benefits of Noise Compatible Land Use Planning is implemented in your community

- Cost Savings
- Increased property values.
- Increased open space while mitigating noise
- Fewer complaints
- Private dollars used for noise mitigation and more money for safety.
- More guidelines
- Use WSDOT staff to review noise ordinances of cities

Question 2: List the potential disadvantages/hindrances your community may experience after implementing Noise Compatible Land Use Planning

- There would be very few disadvantages/hindrances.
- Resistance from developers
- Very land consumptive
- Return on Investment for developers (ruining land values)
- Inequity between communities
- Commercial/Industrial not pleasant as introduction to cities and corridors
- Balance is necessary between residential and commercial usage along freeway corridors (trip reduction and walkable communities)
- Increase of trips due to setback, minimal but adds up

Question 3: List the Noise Compatible Land Use Planning tools & strategies that are working well for your community.

- Codes
- Flexible design standards

Question 4: In order to more fully implement Noise Compatibility Land Use Planning Strategies, my community needs to...

- Make NCLU planning a priority
- Make NCLU planning a normal course of business when developing
- Demonstrate health/quality of life benefits
- Express energy benefits
- Noise walls are not the only answer to noise mitigation
- Use performance based approach as opposed to fixed setbacks. Be creative/innovative.
- Enforcement must happen.
- Review policies and regulations.
- Buffering standards.
- Building orientation
- Get local agency support. Not enough support/involvement by local agencies/governments.
- More dialogue is needed.

COLUMBUS, OHIO

Attendance and Audience

The Ohio Department of Transportation (ODOT) held the NCLUP Workshop at their training facilities. The meeting was a combined effort of the Federal Highway Administration, Ohio Department of Transportation, and Texas Southern University – Center for Transportation Training and Research. Workshop registration information was sent to the ODOT district employees, Urban Land Institute, Ohio American Planning Association and its local chapters, various councils of governments, and city planning departments. These invitees were asked to share the registration with local developers, engineering firms, and community leaders. Over 25 people registered for the workshop and 20 people attended. Workshop participants included the following:

- 12 federal/municipal employees, elected officials, MPOs (representing Public Works, Planning Depts.)
- 5 ODOT employees (representing the various districts office throughout Ohio)
- 2 Private engineering firm
- 1 Private citizen or neighborhood/community leaders

Small Group Discussion Notes

In small groups, attendees were asked four questions. The questions and responses are listed below.

Question 1: List the potential benefits of Noise Compatible Land Use Planning is implemented in your community

- Fewer complaints from residents
- Future cost savings
- Quality of Life
- Gain of open space
- Desirable neighborhoods
- Increased land values –adjacent properties
- Future development should accommodate the adjacent freeway
- Rezone properties adjacent to highways as land becomes available
- Fewer complaints to ODOT
- Reduces noise impacts
- Less phone calls to public officials
- Long term – lower (noise) barrier costs
- Healthier community
- Avoid future noise walls

Question 2: List the potential disadvantages/hindrances your community may experience after implementing Noise Compatibility Land Use Planning

- Education of property owners-public information for public officials
- Selling to (the idea of NCLUP) to developers and elected officials
- Affordability
- Personal perception to different ears
- Variation in decimal boundaries
- Safety of setback space- less “eyes” on area

- Pressure of opposition (by developers)
- Getting good legal review of changes
- Government ability to create supporting regulations (legislation)
- Maintenance of property and ability to turn over maintenance to someone who can maintain
- Convenience of elected officials to “buy into” and enact legislation.
- Find a “champion” to lead the cause.
- Education – adequate materials to show costs & benefits. How much is a berm? How much is maintenance? What is the effect on property values?
- Retrofit costs
- Limited choices
- Property owner rights – fear of lawsuits
- Inconsistency of regulations between jurisdictions concern or loss of economic development to other (cities)
- Isolating noise sources

Question 3: List the Noise Compatibility Land Use Planning tools & strategies that are working well for your community.

- Adopting a land use plan that requires open space along the freeway
- Cooperation among agencies – compatible regulations
- Allow higher densities in exchange for more open space through conservation zoning.
- Look at intangible costs, not just tangible costs.
- Have an updated land use plan and comprehensive plan.
- Public involvement (passing information to public through noise studies, deed descriptions)
- Jurisdiction ordinances (i.e. subdivision regulation, building design flexibility and standards).
- Building regulation review and revisions
- Zoning overlay
- Buffers
- Beams
- Barrier wall
- Building insulation and windows
- Building orientation
- Overlay to demonstrate noise sensitive areas
- Land use studies adjacent to interstate
- Open space and earthen berms/landscape

Question 4: In order to more fully implement Noise Compatible Land Use Planning Strategies, my community needs to...

- Have every developer do a noise compatibility analysis before subdivision can be approved.
- Get more funding.

- Work with adjacent communities, particularly along corridors.
- Work more with ODOT.
- Public Education
- Regulations in place
- Have more examples of successful projects to fuel the continued implementation of noise use planning
- Raise awareness of impacts of noise/included in the planning process

ORLANDO, FLORIDA

Attendance/audience

The Florida Department of Transportation (FDOT) held the NCLUP Workshop at the University of Central Florida. The meeting was a combined effort of the Federal Highway Administration, Florida Department of Transportation, University of Central Florida, and Texas Southern University – Center for Transportation Training and Research. Workshop registration information was sent to the FDOT district employees, Urban Land Institute, Florida American Planning Association and its local chapters, various councils of governments, and city planning departments. These invitees were asked to share the registration with local developers, engineering firms, and community leaders. Over 15 people registered for the workshop and 15 people attended. Workshop participants included the following:

- 6 federal/municipal employees, elected officials, MPOs (representing Public Works, Planning Depts.)
- 2 FDOT employee (representing the various districts office throughout Florida)
- 1 Private engineering firm
- 6 University staff/students

Small Group Discussion Notes

In small groups, attendees were asked four questions. The questions and responses are listed below.

Question 1: List the potential benefits of Noise Compatible Land Use Planning if it is implemented in your community

- The public and potential homeowners will have prior knowledge of potential noise impacts
- Place responsibility of noise abatement on the developer
- Quality of life can be improved
- Developers can be regulated and abatement can be controlled
- Improved health, safety and welfare of the public
- Eliminate the need for barriers
- Less components for the DOTs to handle
- Outreach through local government, Federal Department of Transportation, MPOs and Planning Associations will occur

Question 2: List the potential disadvantages/hindrances your community may experience after implementing Noise Compatibility Land Use Planning

- Cost will increase and will be passed on to the consumers
- Aesthetics of noise wall in the community
- Local government have difficulty keeping up to date on roadway projects
- Getting information into local ordinances
- Property Cost- Rights
- Developers Rights – Loss of Money

- Potential conflicts between state and local government

Question 3: List the Noise Compatible Land Use Planning tools & strategies that are working well for your community.

- DOTs and counties need to communicate better
- Environmental design is requirement
- Better public involvement
- Adopt and implement building regulations and control
- Substantial setbacks between roadway & sources (Central/South Central Florida)
- Vegetative barriers
- Planning with respect to type of facility i.e. hospitals, schools, churches, etc.

Question 4: In order to more fully implement Noise Compatible Land Use Planning Strategies, my community needs to...

- Educate local officials as to need
- Get regulations adopted for land use
- Increase awareness
- Get more community involvement
- Implement Policies with NCLU strategies