

Challenges and Pitfalls in the Acoustical Design of Noise Barriers for P3 Projects

**Christopher Menge
Harris Miller Miller & Hanson Inc.
Burlington, Massachusetts**

**Transportation Research Board
ADC40 Committee Summer Session
July 2009**

What is P3?

P3 = Public-Private Partnership

www.hmmh.com

- In Virginia, the Public-Private Transportation Act (PPTA) of 1995 allows private entities to enter into agreements to finance, construct, improve, maintain and operate transportation facilities
- A means to finance & build programmed road projects
 - other states also pursuing similar approaches
- Tolls are the means of financing
- HOT Lanes – High-Occupancy Toll lanes
 - High-occupancy vehicles – no tolls
 - Other vehicles pay tolls
 - Toll pricing based on demand – to keep travel times short, even during peak periods
 - You can go fast if you're willing to pay!

Outline

www.hmmh.com

- **New working relationships and responsibilities in large public projects**
- **Time is money and money is critical**
- **Contractual requirements vs. unwritten DOT policies**
- **Speeding up neighborhood approval**
- **Efficiency: engineering vs. acoustical design & review**
- **Closing thoughts**

New Public-Private Working Relationships

www.hmmh.com

- **Shared responsibilities for:**
 - Communication with the public
 - Ensuring compliance with DOT standards and requirements
 - Review and approval of final noise barrier design plans/profiles
 - Paying for unforeseen circumstances or oversights
→ Whose fault was it?
- **Frequent communication among all parties is crucial**



Time is Money and Money is Critical

www.hmmh.com

- **Barriers are very expensive - \$30 m for recent project**
- **Preliminary design and final costing is needed before “financial close” of project**
 - Must be done quickly – before roadway design is done
 - Also, must be done accurately – later cost increases not good
- **After close, enormous pressure to complete final acoustical design of many barriers in record time**
- **The Challenge: Financial effect is potentially large if**
 - DOT later approves barrier for recreation facility not included in pricing
 - Cost-effectiveness changes for large barrier near threshold
 - Approval date of subdivision is disputed and modified
 - Mis-identified land use requires additional barrier

Contractual requirements vs. unwritten DOT policies

www.hmmh.com

- **All written policies will be accounted for in the DOT-developer contract**
 - Different interpretations of written policies
 - Political pressure can influence DOT policy
- **Unwritten policies or standard practices the DOT insists be followed**
 - For example, barriers continued beyond project limits for “community continuity”
 - Inevitable conflicts over what is required and who should pay
- **Acoustical consultant charged as interpreter of DOT noise abatement policies for developer and negotiator with DOT staff – facilitating the “Partnership” in P3**



Speeding up Neighborhood Approval

www.hmmh.com

- Strong desire to get speedy neighborhood approval
- Traditional DOT approach – time-consuming follow-up
- New approach suggested because:
 1. Major interstate widening project with high noise levels
 2. Barriers are highly desired by residents
- Letters to residents state: **The barrier will be built unless residents reply in the negative within 30 days**
- DOT approved the approach
- Reduced the approval time for each barrier by several months
- No barriers rejected: 15 negatives out of 1162 letters

Efficiency: Engineering Design vs. Acoustical Design & Review

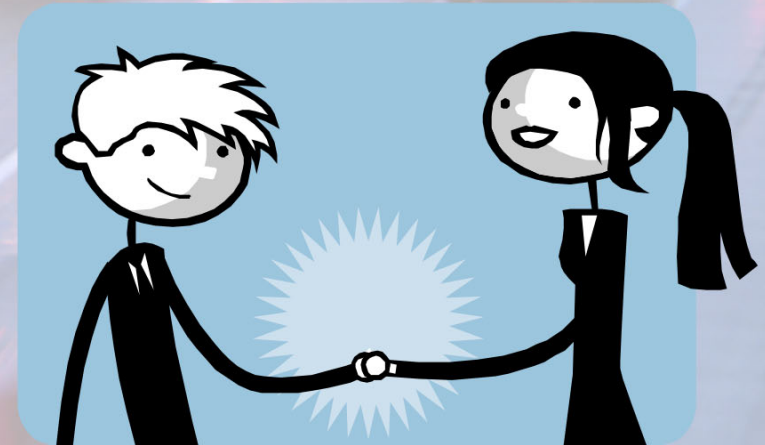
www.hmmh.com

- Acoustical designer must account for barrier as a whole
- Engineering designer may separate a barrier into several sections due to different:
 - Roadway design sections
 - Sections of barrier on fill vs. retaining wall
 - Sections of barrier along cross streets
- Review & approval of pieces of barriers needed, so final design and construction can start
- Roadway and barrier changes in one section affect others not finalized yet, or final and already approved
- Organizational challenge for all changes/reviews:
→ Which barrier is the “final” one?

Closing Thoughts

www.hmmh.com

- **Caution the developer to include a healthy financial contingency for potentially costly noise barrier changes or additions**
- **Plan ahead to expect many iterations and changes, and develop solid filing protocols for traceability**
- **Insist on enough time to do each design carefully**
- **Review engineering plans and profiles very carefully**
- **Be patient, and the project will succeed!**



www.hmmh.com