Session 10
Construction Noise and Vibration and Pre-Construction Evaluation

- Facilitator: Cora Helm, Montana DOT
- Participants:
  - Cora Helm, Montana DOT
  - Marilyn Jordahl-Larson, Minnesota DOT
  - Darlene Reiter, Bowlby & Associates, Inc. (Caltrans manual)
- Discussant: Mariano Berrios, Florida DOT
NOISE AND WILDLIFE

Challenges in Analysis, Assessment, Monitoring and Mitigation

Cora Helm
Affected Wildlife

T&E species
- Grizzly bear
- Sage Grouse
- Bald & Golden Eagle
- Bull Trout
- Sturgeon
- Sprague's Pipit
- Least Tern

MDT - Cora Helm
Biological Assessment

- Threatened & Endangered Species
  - Adversely Effect
  - Potential Adverse Effect
  - Formal Consultation 60 days
  - Informal Consultation 30 days

Avoid, Minimize, Mitigate
Avoid - Bull Trout Ex

- Avoid - use of timing restrictions

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- overwintering
- juvenile downstream migration
- adult upstream migration

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- noise restriction (no pile driving unless sound attenuation measures are in place)

Notice that USFWS timing restrictions do not align with habitat/behavior. MDT needs to drive pile in winter and pave in summer.
Minimize

- Upfront design to avoid in-stream work – like clear-spanning
- Building a work bridge without pile driving
- Use of drilled shafts instead of pile driving
Mitigate

- Bubble curtains
- Excel Calculator
- Use vibrating pile driver and finish with hammer for fewer strikes.

Photo: 2007, Illingworth & Rodkin, Compendium of Pile Driving Sound Data
We already have timing restrictions for other T&E such as Eagles.

USFWS is requiring all states to meet this noise criteria – based on studies in much different environments and on different species.

Behavior studies – what do the fish do?
Night Construction Special Provision & Online Training

Noise Practitioners Summit October 21–22, 2015

Marilyn Jordahl Larson, P.E.
MnDOT

We all have a stake in A→B
Today’s Presentation:

- Review of the Special Provision
- Online training highlights
- Questions
Overview

In this e-Learning session you will learn about the Night Construction provision including the Night Construction definition and the requirements for performing Night Construction activities.

The following topics will be discussed in this e-Learning.

- Topic 1 - Introduction
- Topic 2 - MnDOT Special Provision 1803
- Assessment
Night Construction Noise Impacts

To maintain a good relationship with the public and ensure public support for highway projects among the local communities, it is critical that the owner and the contractors make every effort to minimize the adverse effects of Night Construction. This can be accomplished through relatively minor measures being taken by the contractor and the owner.
Night Construction Defined

In order to get a clear understanding of Night Construction, let's take a look at the definition.

Click on the highlighted area for more information. Click again to minimize.

Night Construction shall be defined as construction between the hours of 6:00 p.m. to 7:00 a.m. where the work will occur within 500 feet of any sensitive areas such as hospitals, homes for the aging, private residences, apartments, businesses, and hotels/motels.

The work location is important. The contractor shall identify work within 500 feet of any sensitive area(s). It is important for the contractors to identify the appropriate hours for which a project will take place. Night Construction is not defined by the lightness or darkness of the sky. This is important because construction activities in the summer months could occur at 6:00 p.m. when it is still light outside or 7:00 a.m. when the sun is rising.

Click the Next button to continue.
Typical Prohibited Activities

*Special Provision 1803 Night Construction* defines prohibited activities unless otherwise specifically allowed in the contract.

Be sure to refer to the specific prohibited activities contained in the Night Construction special provision for each project(s).

Distances, timeframes and prohibited activities may change depending on your contract for a specific project. Be sure to refer to the specific requirements.

For Night Construction, the contractor shall be prohibited from performing the following activities: pile driving/removal, concrete pavement demolition, sawing for pavement removal, crushing operations, and jack-hammering. Any deviation from the hours that these activities are prohibited from occurring must be approved by the Engineer.
Requirements and Procedures

Notify all sensitive areas within 500 feet of the proposed Night Construction. Notification of the type, location, and duration of the work shall be made in writing no later than five calendar days prior to beginning the work.

Sensitive areas may include:
- Hospitals
- Homes for the aging
- Private residences
- Apartments
- Businesses
- Hotels/motels

Click on the next puzzle piece.
Additional Measures for Mitigating Noise During Night Construction

Contractors should take additional steps, such as the following, to mitigate noise during night construction.

- Keep staging areas away from sensitive areas.
- Use rubber gaskets on the boxes of tailgates to reduce/eliminate loud noises from slamming tailgates.
- Use belly dumps in lieu of end dumps.
- Turn off equipment during non use.
MnDOT Noise Mitigation for Night Construction Training:
www.dot.state.mn.us/onlinelearning/construction/noisemitigation

Questions?

Thank You!
Caltrans

Transportation and Construction Vibration

Developed over almost two decades – based on early work by Rudy Hendriks
Contributors

- Bruce Rymer, Caltrans: contract technical manager
- David M. Buehler, P.E., ICF International: primary author and editor
- Wesley L. Bender, Wesley L. Bender & Associates: blasting
- Harjodh Gill, PhD., Shor Acoustical Consultants: construction vibration impact assessment and reduction
- Rudy Hendriks, Caltrans: technical review
- Jim Andrews, P.E., Caltrans: technical review
- Chris Small, ICF International: editing and document preparation
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   11.5.3 Step 3. Inform the Public about the Project and Potential Blasting-Related Consequences
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   11.6 Blasting Specifications

Chapter 12 References and Additional Reading

Appendix A. Technical Advisory TAV-02-01-R9601
Appendix B. Sample Vibration screening procedure and Vibration Complaint Form
Appendix C. Sample Vibration Specifications
Appendix D. Sample Blasting Vibration Specifications
Upcoming Publications

- New *Technical Guidance for the Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish*: A 500+ page reference for assisting biologists and engineers in assessing hydroacoustic impacts of pile driving work on fish for the permitting process.


- New *Technical Guidance for the Assessment and Mitigation of the Effects of Traffic Noise and Road Construction Noise on Bats*.

- Expected by end of November, downloadable and available to the other DOTs.
Session 10 - Questions

- Hanf, MI: Are there any planned revisions or updates to the Construction Noise Handbook?
- Burcham, MO: Has noise impacts on Section 6(f) land that has hunting as one of its uses been an issue?
- Use of TNM for biological noise purposes. Is anyone using TNM results in impact determinations to animals? Is the A-weighting and height a problem?
Moch, ND: NDDOT has dealt with terrestrial and aquatic species in regard to noise analysis requirements. Sharptail grouse leks were identified within ½ mile of project and noise analysis proved a negligible increase in noise levels. Pallid Sturgeon (endangered species) noise monitoring was required for bridge pier placement as commitment in Environmental Assessment.

NDDOT would like to hear ideas for modeling this in project development.

Alcala, OH: What triggers the requirement for construction noise and vibration studies?
Session 10 - Questions

- Newvine, OR: What kind of effort are DOTs giving to review of vibration impact documents?
- Vibration Effects on structures, including historic and sensitive manufacturing
- Construction noise:
  - Level of effort for analysis
  - Discussion in reports
  - Types of mitigation
  - Implementation of mitigation measures