PUBLIC WORKSHOP #3
January 24, 2012

Noise Barrier Analysis

NYS Route 390 / I-490 / NYS Route 31 Interchange

Chili Avenue to Lexington Ave
Howard Road to Erie Canal
PIN 4390.13
TOWN OF GATES, NY / MONROE COUNTY
Meeting Agenda

- Project Update
- Purpose of Meeting
- Ground Rules of Meeting
- Feasible Design Alternative
- Results of Noise Analysis
- Noise Abatement Recommendations
- Next Steps
- Question and Answer
- Closing Remarks
Feasible Design Alternative A2
Feasible Design Alternative A2
Feasible Design Alternative A2

Improves weave by diverting majority of NY 390 SB through traffic to new 2-lane roadway and converting to 1-lane weave for NY 31 EB to I-490 EB traffic.
Feasible Design Alternative A2

CONVERTS HIGHER VOLUME RAMP TO A LANE DROP
Feasible Design Alternative A2
Noise Analysis
Purpose of Presentation

- Inform public of noise analysis and abatement recommendations

- Open discussion and get responses from impacted and potential benefited residents regarding desirability of abatement measures
Vicinity Map

Project Area
Highway Noise Procedural Requirements:

- Code of Federal Regulations (23 CFR 772)
- NYSDOT – The Environmental Manual (TEM) 4.4.18 Noise Analysis Policy and Procedures
Type I Project Definition

Type I project

- on a new location
- significantly changes horizontal and/or vertical alignment
- includes the addition of one or more through travel lanes.

This project consists of significant horizontal and vertical changes. Therefore, this project is considered a Type I project and a noise study is required.
Noise Fundamentals
Definitions

- **Sound** – A mechanical wave composed of frequencies within the range of hearing and of a level sufficiently strong enough to be heard.

- **Noise** – Disturbing/unwanted sound. (plants vs. weeds)

- **Traffic Noise** – Disturbing noise from motor vehicle traffic (automobiles, trucks, motorcycles and busses / motor, exhaust and tires)
Definitions

- **Decibel (dB)** – A measure of sound energy.

- **“A” frequency range (dBA)** – A measure of sound energy that closely represents human hearing.

- **Hourly weighted sound (dBA –Leq)** – A measure of sound energy “averaged” over one hour.
Definitions

- **Receptor** – A distinct recipient of traffic noise for each noise sensitive land use.

- **Impacted Receptor** – The recipient of a traffic noise impact (e.g. A noise level above 66 dBA – Leq or a noise level increase of 6 dBA - Leq for residential receptors).

- **Benefitted Receptor** – A recipient of traffic noise that experiences at least a 5 dBA – Leq noise level reduction due to noise abatement measures.
Noise Principles (Rules of Thumb)

- A 3 dBA increase is a doubling of sound energy.
- A 3 dBA change of sound is generally not perceptible to most people.
- A 5 dBA change of sound is considered perceptible to most people.
- A 10 dBA change is perceived as a doubling of the sound level by most people.
Noise Levels of Various Noise Sources

Noise Levels of Various Noise Sources

<table>
<thead>
<tr>
<th>Noise Level (dBA)</th>
<th>Common Indoor/Outdoor Noise Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>Jet Flyover at 1000 ft.</td>
</tr>
<tr>
<td>100</td>
<td>Diesel Truck at 50 ft.</td>
</tr>
<tr>
<td>90</td>
<td>Noisy Urban Daytime</td>
</tr>
<tr>
<td>80</td>
<td>Normal Speech at 3 ft. 65 dBA</td>
</tr>
<tr>
<td>70</td>
<td>Heavy Traffic at 300 ft.</td>
</tr>
<tr>
<td>60</td>
<td>Quiet Urban Daytime</td>
</tr>
<tr>
<td>50</td>
<td>Bedroom at Night</td>
</tr>
<tr>
<td>40</td>
<td>Threshold of Hearing</td>
</tr>
<tr>
<td>30</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
# 23 CFR Part 772, Noise Abatement Criteria (NAC)

## Hourly A-Weighted Sound Level - decibels (dBA)

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Activity Criteria</th>
<th>Evaluation Location</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>57 / 60</td>
<td>(Exterior)</td>
<td>Lands on which serenity and quiet are of extraordinary significance and serve and important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.</td>
</tr>
<tr>
<td>B</td>
<td>67 / 70</td>
<td>(Exterior)</td>
<td>Residential</td>
</tr>
<tr>
<td>C</td>
<td>67 / 70</td>
<td>(Exterior)</td>
<td>Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.</td>
</tr>
</tbody>
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### 23 CFR Part 772, Noise Abatement Criteria (NAC)

#### Hourly A-Weighted Sound Level - decibels (dBA)

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</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>52 / 55</td>
<td>(Interior)</td>
<td>Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.</td>
</tr>
<tr>
<td>E</td>
<td>72 / 75</td>
<td>(Exterior)</td>
<td>Hotels, motels, offices, restaurants/bars and other developed lands, properties or activities not included in A-D or F.</td>
</tr>
<tr>
<td>F</td>
<td>-- / --</td>
<td>--</td>
<td>Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.</td>
</tr>
<tr>
<td>G</td>
<td>-- / --</td>
<td>--</td>
<td>Undeveloped lands that are not permitted</td>
</tr>
</tbody>
</table>
Noise Analysis Process
Noise Analysis Process

- Identify Land Use
- Record Existing Noise Levels
- Traffic Noise Model (TNM), Existing / Future Conditions
- Impact Assessment (Exceed NAC / 6 dBA increase)
- NO Impacts, Noise Evaluation is complete
- YES Impacts, Continue Noise Evaluation
- Run TNM to Evaluate Abatement (Noise Barrier)
- Check if Abatement is Feasible and Reasonable
- **Community Acceptance of Noise Barriers**
- Final Design of Noise Barriers
Exterior Activity Identified at Residences and Offices within Project Area
Residential Neighborhoods
NW of 390 / 33A (Timpat, Dolman, Hamlet Ct)
SE of 390 / 490 (Dearcop Dr)
SW of 390 / 490 (Landau Dr)
NW of 390 / 490 (Kencrest Dr)
NW & NE of 390 / 31 (Beechwood Dr, Evelyn St)
Noise Level Determination / Impact Assessment

Greatest Measured Level in Each Noise Study Area; and
TNM Model Levels: Existing and Future

<table>
<thead>
<tr>
<th>Location</th>
<th>SW 390/33A</th>
<th>SE 390/490</th>
<th>SW 390/490</th>
<th>NW 390/490</th>
<th>NW 390/31</th>
<th>NE 390/31</th>
<th>SE 390/31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured (dBA)</td>
<td>68</td>
<td>68</td>
<td>71</td>
<td>70</td>
<td>68</td>
<td>68</td>
<td>62</td>
</tr>
<tr>
<td>Existing (dBA)</td>
<td>53 to 68</td>
<td>56 to 69</td>
<td>55 to 70</td>
<td>58 to 73</td>
<td>51 to 69</td>
<td>60 to 71</td>
<td>63</td>
</tr>
<tr>
<td>Future (dBA)</td>
<td>53 to 69</td>
<td>58 to 69</td>
<td>57 to 70</td>
<td>58 to 73</td>
<td>51 to 70</td>
<td>60 to 71</td>
<td>68</td>
</tr>
</tbody>
</table>

Impact exists if noise levels approach or exceed NAC (66 dBA for Residences) or if future levels are 6 dBA or more than existing levels.
Noise Abatement Measures

- Traffic Management Measures
- Alteration of Highway Alignment
- Acquisition of Unimproved Property as a Buffer
- Noise Insulation of Public Schools
- Construction of Noise Barriers
Noise Abatement Using Noise Barriers

Proposed Noise Barrier

Sensitive Outdoor Receptor

Reflected Noise Path

Diffracted Noise Path

Straight Noise Path
Noise Abatement Measures

Feasibility Test

- Can the measure be built when considering engineering criteria?
  - Safety
  - Access
  - Drainage
  - Maintenance Requirements

- Does the proposed measure provide a reduction of at least 5 dBA to a majority of the impacted receptors?
Noise Abatement Measures

Reasonableness Test

- Cost Index – Is the proposed barrier less than 2,000 square feet per benefited receptor?

- Do a majority of the benefited receptors achieve the Noise Reduction Design (NRD) Goal of 7 dB(A)?

- Were responses obtained from at least half of the benefited property owners and residents?

- Do a majority of the responses favor construction of noise barriers?
Noise Abatement - Barrier Evaluation NW 390 / Rt33A

NW 390/RT 33A
Barrier Evaluation
Noise Abatement - Hamlet Ct., Timpat Dr., Dolman Dr.

- Noise Abatement - Hamlet Ct., Timpat Dr., Dolman Dr.
- Predicted 2035 Traffic Noise Level (WITHOUT Barrier / WITH Barrier) dBA
- Orange Font Indicates Noise Level Impact
- Green Font Indicates Benefited Receptor
- M Site = Noise Measurement Location

- Hamlet Court
- Timpat Drive
- NW I-390 / Rt 33A Barrier Evaluation

- M Site - 66 dBA
- 69 / 61
- 66 / 60
- 67 / 59
- 62 / 61
- 59 / 56
- 61 / 56
- M Site - 66 dBA
- M Site - 69 dBA
- I-390 SB
Noise Abatement - Hamlet Ct., Timpat Dr., Dolman Dr.

- **Cost Index** – 660 square feet per benefited receptor
- **Benefits** – 42 Total
Noise Abatement - Barrier Evaluation 390 / 490 Interchange

- NW 390/490 Barrier Evaluation
- SW 390/490 Barrier Evaluation
- SE 390/490 Barrier Evaluation
Noise Abatement - Dearcop Drive

Predicted 2035 Traffic Noise Level (WITHOUT Barrier / WITH Barrier) dBA

Orange Font Indicates Noise Level Impact
Green Font Indicates Benefited Receptor

M Site = Noise Measurement Location

SE I-390 / I-490 Barrier Evaluation

I-390 SB

I-390 NB

Dearcop Drive

Buffalo Road
Noise Abatement - Dearcop Drive

◆ Cost Index – 1,240 square feet per benefited receptor
◆ Benefits – 30 Total
Noise Abatement - Existing Photo Dearcop Drive
Noise Abatement - Photo-Simulation Dearcop Drive
Noise Abatement - Howard Rd., Landau Drive

Predicted 2035 Traffic Noise Level (WITHOUT Barrier / WITH Barrier) dBA

Orange Font Indicates Noise Level Impact
Green Font Indicates Benefited Receptor
Noise Abatement - Howard Rd., Landau Drive

- Cost Index – 1,210 square feet per benefited receptor
- Benefits – 27 Total
Noise Abatement - Howard Rd., Jennie Cir., Kencrest Dr.
Noise Abatement - Howard Rd., Jennie Cir., Kencrest Dr.

- Cost Index – 1285 square feet per benefited receptor
- Benefits – 42 Total
Noise Abatement - Barrier Evaluation NW & NE 390 / Rt 31

NW 390/RT 31 Barrier Evaluation

NE 390/RT 31 Barrier Evaluation
Noise Abatement - Beechwood Ave., Eugene St.

M Site = Noise Measurement Location
Predicted 2035 Traffic Noise Level (WITHOUT Barrier / WITH Barrier) dBA

Orange Font Indicates Noise Level Impact
Green Font Indicates Benefited Receptor

NW Rt 390 / Rt 31 Barrier Evaluation
Cost Index – 1165 square feet per benefited receptor

Benefits – 27 Total
Noise Abatement - Existing Photo Beechwood Drive
Noise Abatement - Photo-Simulation Beechwood Drive
Noise Abatement - Evelyn Street

M Site = Noise Measurement Location
Predicted 2035 Traffic Noise Level (WITHOUT Barrier / WITH Barrier) dBA
Orange Font Indicates Noise Level Impact
Green Font Indicates Benefited Receptor
Noise Abatement - Evelyn Street

- Cost Index – 1830 square feet per benefited receptor
- Benefits – 18 Total
Example Surface Treatments – NYSDOT Region 4

I-590
Example Surface Treatments – NYSDOT Region 4

I-490
Example Surface Treatments – NYSDOT Region 4

I-490
Example Surface Treatments – NYSDOT Region 4

Rt 441
Example Surface Treatments – NYSDOT Region 4

Rt 332
Sample Benefited Response Analysis:

Noise Barrier SE 390 / 490 (Dearcop Drive)
Design Development – NEXT STEPS

- Decision process considers desires of the benefited property owners and residents; and requires responses of benefited property owners and residents.
- Ballots to be mailed to benefited households on January 25th
- Responses to DOT by February 7th 2012
- Results to be posted on project web site www.dot.ny.us/390lyell by March 1st 2012.
Design Development – NEXT STEPS

- Detailed Design of Noise Barriers – Will proceed with the detailed design of adjacent mainline highway sections as they are developed.
- No projects are currently programmed for mainline highway sections.
Sample Ballot

Ballot
Regarding the construction of noise barriers in your neighborhood
January 26 – February 7, 2012

1. Name

2. Do you Rent or Own the Property? (Circle One) Rent  Own

3. Property Address

4. Mailing Address
   (if different than above)

5. Are you in favor and support the construction of a noise barrier? (Circle one) YES  NO

Comments

Please return ballot in prepaid envelope
Prior to Tuesday, February 7, 2012
Questions and Comments?
Closing Remarks