Comparison of Traffic Noise Impacts

North Spokane Corridor

Spokane River to Wellesley Avenue

Technical Memorandum

Spokane County, Washington

Prepared by
Washington State Department of Transportation
Eastern Region

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Washington State Department of Transportation

North Spokane Corridor, Spokane River to Wellesley Avenue
Noise Comparison Technical Memorandum

This memorandum compares noise impacts from the most current NSC design, the "Redesign," to the year 2000 design, the "FSEIS design."

The noise analysis for the FSEIS design, "Noise Discipline Report for the North Spokane Corridor Project," was completed in April 2000. Revised horizontal and vertical alignments between the Spokane River and Wellesley Avenue on the NSC triggered a re-analysis of traffic noise impacts, which was completed in April 2011. The full re-analysis, "US Route 395 – North Spokane Corridor MP 159 to MP 162, Noise Technical Report," is attached to the 2012 NEPA Re-evaluation.

It was necessary to update the traffic noise analysis for the FSEIS before it could be compared to the analysis of the Redesign alignment for the following reasons:

- Model updates – the Stamina model used for the original was replaced by the Federal Highway Administration's (FHWA) Traffic Noise Model (TNM) version 2.5.
- Traffic updates –analysis for the 2000 FSEIS used year 1997 traffic to represent existing traffic and year 2020 for the design year. The current analysis used year 2004 traffic for the existing year and year 2030 for the design year.
- Number of receivers – traffic noise modeling has advanced since the original FSEIS and many more noise sensitive locations, or "receivers," were included in the current analysis to more accurately represent noise levels.

The original FSEIS noise study was updated to use the same noise model, traffic, and receivers as the Redesign noise study. The updated noise levels for the FSEIS alignment were then compared to noise levels with the Redesign alignment. The result of the comparison is outlined below, and a full table of results for this comparison is attached. Receivers are described by their location relative to the NSC.

West Side – Summary Results
On the west side of the NSC, noise levels be generally lower for the Redesign than for the FSEIS in this area, since the revised alignment shifts the roadway further away from the west side residential area.

The following is a comparison of the recommended noise walls on the west side:

- Grace Avenue to Courtland Avenue – a noise wall exceeds allowable cost ("reasonableness") so no noise walls are recommended for either alignment.
- Upriver Drive to Grace Avenue - a noise wall meets WSDOT criteria for both alignments.
    - FSEIS - 10' to 14' tall noise wall

- Redesign - 6’to 8’ tall noise wall

The following is a comparison of the results on the west side, with noise walls:

- For both designs, noise levels are similar to the “existing” condition, and none exceed 68 dBA.
- Redesign noise levels would be generally lower than with the FSEIS design because the new alignment will shift the roadway further from many West Side residents.
- Most receivers will be +/- 0- 2 dBA between the Redesign and the FSEIS design. 3 dBA is considered the minimum audible sound level change.
- One receiver (B55-2, representing 2 homes) will have noise levels 3 dBA higher with the Redesign than with the FSEIS design.
- Two receivers (B63-3 and B63-2, representing 6 homes total) will be at least 3 dBA quieter with the Redesign than with the FSEIS design.
- With the FSEIS design, five receivers would be at, or above, the Noise Abatement Criteria (NAC) of 66 dBA in the design year. With the Redesign, four locations exceed the NAC.
- The Redesign noise wall will be about 5,600 ft^2 smaller and cost $300,000 less than the noise wall for the FSEIS design.

East Side – Summary Results

On the east side of the NSC, noise levels will be higher for the Redesign than for the FSEIS. The revised alignment raises the elevation of the roadway and shifts the roadway east towards the residential area.

The following is a comparison of the recommended noise walls on the east side:

- The Spokane River to Grace Avenue – a noise wall meets WSDOT criteria for both alignments.
    - FSEIS - 10’ to 14’ tall noise wall between the Spokane River and Grace Avenue.
    - Redesign - 6’to 8’ tall noise wall from the Spokane River to the end of the residential area at Empire Avenue.

The following is a comparison of the results on the east side:

- Redesign noise levels noise levels on the east side are higher because the new alignment brings the NSC closer to many of the East Side receivers. With noise walls as proposed.
- All locations are at least 3 dBA higher with the Redesign, and average 5 dBA higher.
- 18 (69%) of receivers with the Redesign would have noise levels at least 10 dBA higher than existing conditions, as compared to 8 (31%) with the FSEIS design. The highest noise level increase with the Redesign is 22 dBA (2 locations), as compared to 18 dBA (one location) with the FSEIS design.

- One receiver (M18, representing 3 homes) would have noise levels 10 dBA higher with the Redesign than with the FSEIS design.
- One receiver location would remain above the 66 dBA NAC with the Redesign, compared to no receivers remaining above NAC with the FSEIS design.
- The Redesign noise wall is almost 16,600 ft^2 larger (lower but longer) and $890,000 more expensive than the noise wall for the FSEIS design.

East Side Noise Wall Options

Two noise wall options were evaluated for the Redesign alignment, as described below. Once final design of the roadway is nearer to completion, the Project Office will engage the public in this area to understand their preferences. The Project Office will consider these preferences when determining the final noise wall design.

1. The 6'-8' tall noise wall for the Redesign meets the minimum requirements defined in the WSDOT traffic noise policy (2006), but is not as effective as the noise wall in the FSEIS and results in more noise impacts remaining after mitigation.

2. A taller wall was evaluated along the full length of the east side alignment. 14' was the maximum height allowed by design standards for a noise wall built on top of a retaining wall. This wall can reduce the number of noise impacts to levels close to the FSEIS.

Following are the results with this higher wall on the east side, as compared to the FSEIS:

- Six receiver locations are ≥3 dBA higher with the Redesign, with an average increase of 2 dBA.
- 14 (54%) of receivers with the Redesign would have noise levels ≥10 dBA higher than existing conditions compared to 8 (31%) in the FSEIS.
- The highest noise level increase with the Redesign is 19 dBA (2 locations) compared to 18 dBA (one location) with the FSEIS. 10 dBA is considered a substantial increase in noise.
- No receiver would have noise levels more than 6 dBA higher with the Redesign than with the FSEIS design.
- No receiver would remain above the 66 dBA NAC with the Redesign, matching the FSEIS design.
- The Redesign noise wall is almost 58,000 ft^2 larger and $3M more expensive than the noise wall for the FSEIS design.

The results were reviewed and confirmed by Tim Sexton, WSDOT Air, Noise, and Energy Policy Manager, on April 12, 2012.