Traffic Noise Frequently Asked Questions

This document provides responses to the frequently asked questions pertaining to traffic noise and the proposed potential noise wall adjacent to the Thorngate Subdivision associated with the Phase I Engineering Study of Deerfield Road from Milwaukee Avenue to Saunders/Riverwoods Road. Project information, including information shared at the 2019 Noise Forum Meeting and Traffic Noise Report, can be found on the project website www.deerfieldroadcorridor.com. A separate Frequently Asked Questions document was prepared for the overall project. Please review this information, as it will help inform you of the traffic noise process and results. This document is posted on the project website.

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DEERFIELD Road
MILWAUKEE AVENUE TO SAUNDERS/RIVERWOODS ROAD

1. Why was a Traffic Noise Study completed?

A traffic noise assessment was required to comply with State and Federal regulations because Federal funds are being used for this project and due to the project scope. The scope of this project includes proposed roadway reconstruction with the addition of through traffic lanes at Milwaukee Avenue and the addition of a center turn lane throughout the length of the Deerfield Road corridor. If any part of the project meets the requirements for a noise analysis, the entire project must be evaluated for traffic noise according to the IDOT Highway Traffic Noise Assessment Manual (2017). A copy of the manual is located on the project website (Information Center/Project Reports). The entire project area was evaluated for traffic noise and based on the analysis, only one location warranted noise abatement (i.e., noise wall) per the IDOT Noise Policy.

2. What is the proposed improvement for Deerfield Road between the Des Plaines River and Saunders/Riverwoods Road?

The proposed improvement for this section of Deerfield Road consists of a 3-lane roadway that includes a center bi-directional turn lane, curb and gutter, and 8 foot multi-use path (south side up to Portwine Road; north side up to Saunders/Riverwoods Road). As Deerfield Road approaches the Saunders/Riverwoods Road intersection, the same number of lanes will be provided on Deerfield as currently exists today (5). In this area, there will be some modifications that will require the existing south curb line to move between 4 and 11 feet to the south. The reason for this is to accommodate a lengthening of the eastbound right turn lane by 60 feet to meet intersection design standards, provide a 3 foot “bike friendly” shoulder, and 2.5 foot wide curb and gutter.

3. What is the proposed improvement for Saunders Road?

The proposed improvement on Saunders Road includes a new northbound right turn lane and 6 foot sidewalk along the west side of Saunders Road directly behind the existing curb. The Saunders Road intersection will be modernized with new signal equipment and cross walks on all legs of the intersection. The proposed sidewalk will extend south to the Thorngate HOA Park.

4. What are the criteria that must be met for noise mitigation to be considered for a project?

A noise barrier may be proposed when a traffic noise impact occurs, and a noise barrier is determined to be feasible and reasonable.

Based on the IDOT Noise Policy, for a residential area, a traffic noise impact occurs when the design year (2050) build condition traffic noise levels are predicted to be 66dB(A) or greater. A traffic noise impact also occurs if the design year (2050) build condition traffic noise levels are predicted to substantially increase (15 dB(A) or greater) over existing conditions. Traffic noise levels are determined by computer modeling.

A noise barrier is determined to be feasible if it achieves at least a 5 dB(A) traffic noise reduction for at least two impacted receptors. A traffic noise reduction of ±5 dB(A) is a readily perceivable change in noise.

A noise barrier must also be reasonable, which includes the following three criteria:

- It must meet the noise reduction design goal of achieving at least an 8 dB(A) reduction for at least one benefited receptor. A benefited receptor is the recipient of an abatement measure that receives a noise reduction of 5 dB(A) or greater. A benefited receptor does not need to be an impacted receptor.
- The estimated build cost per benefited receptor must be less than or equal to the allowable cost per benefited receptor. The base allowable cost is $30,000 per benefited receptor. The allowable cost may be adjusted based on a number of factors. Refer to the IDOT Highway Traffic Noise Assessment Manual (2017) for additional information.

  For example, if a noise barrier will benefit 10 residences, and the total cost of the noise barrier is $270,000, then the cost per benefited receptor would be $27,000 (which is less than the allowable cost of $30,000 per benefited receptor) and the noise barrier would be considered economically reasonable.
- If noise abatement measures are determined to be feasible and achieve the first two reasonableness criteria, the benefited receptor viewpoints must be considered. If the majority of the viewpoints are in favor of the noise barrier, then the noise barrier would be considered "likely to be implemented."

If a noise barrier is not considered feasible or reasonable for an area, the noise barrier abatement measure will not be implemented as part of the project.

5. Can a berm be used instead of a noise wall?

Earth berms can be considered for noise abatement. However, the use of berms depends on the space available. For maintenance reasons, the slope of the berm should not be steeper than 3(H):1(V). For this project, there is limited available space to build a berm that would achieve the necessary noise reduction. The potential noise wall for this project would be 15 feet tall. Comparatively, a 10-15 feet tall berm would be about 60-90 feet wide. The available area for noise abatement would need to accommodate this base width.

6. Can vegetation be used as noise mitigation?

Landscaping (vegetation) is not recognized by the FHWA as a traffic noise abatement measure. However, landscaping can provide traffic noise reductions if it is sufficiently wide, dense (e.g., evergreen trees), and tall such that it cannot be seen through or over. Generally, the vegetation needs to be between 100 and 200 feet in width, 16 to 18 feet tall, and with dense understory growth to obtain a perceivable noise reduction of 5 dB(A). Vegetation/trees can potentially help screen the traffic from view, but it is generally not feasible to plant this number of trees or have available sufficient right-of-way for this to be a prudent abatement measure.

7. What property would be needed for the potential noise wall adjacent to the Thorngate Subdivision?

If the noise wall is included with this project, additional property acquisition will be required. The noise wall would be installed on property that is owned by Lake County. Permanent and Temporary Easements would be required for construction and future maintenance of the noise wall. All property acquisition would be from the Thorngate HOA property adjacent to the Deerfield Road and Saunders Road right-of-way. There is one exception (781 Links Court) where acquisition would be required directly from the property owner. Refer to the proposed improvement exhibit on the project website showing the potential noise wall location and associated property acquisition.

A summary of the proposed property acquisition is provided below. If the noise wall is not included with the project, the property acquisition associated with the noise wall can be eliminated.

- Along Deerfield Road, 5 feet of right-of-way will be needed adjacent to the eastbound right turn lane; a 5 foot permanent easement would be needed along the entire Thorngate Subdivision for future maintenance of the wall; a 5 foot temporary construction easement would be needed to construct the wall (predominantly for clearing vegetation/trees and grading).
- Along Saunders Road, a 10 foot temporary construction easement would be needed to construct the wall (predominantly for clearing vegetation/trees and grading).

Deerfield Road cannot be shifted to the north to avoid property acquisition to the Thorngate Subdivision.

8. How is property that is needed for the project acquired?

This project is using federal funds and therefore a certain process must be followed for property acquisition, which includes preparation of a plat of highway, appraisal, review appraisal, an offer made, and a negotiation with the property owner. Compensation is provided for permanent and temporary acquisition based on the appraisals and any other damages to the remainder of the property. This process is anticipated to begin when Phase II Engineering commences in mid 2020.

9. Where is my property line?

Property lines are shown on the detailed proposed improvement exhibits and noise wall exhibit. The roadway right-of-way, which is owned by Lake County, is depicted as a thick dashed red line style and is approximately 13 feet (adjacent to the eastbound right turn lane) to 25 feet (west of the right turn lane) from the existing roadway curb. The existing power lines and existing wire fence are located within the Lake County roadway right-of-way. Beyond the roadway right-of-way, is HOA property, which is a minimum of 22 feet (and is higher closer to Saunders/Riverwoods Road intersection) from the roadway right-of-way to private property parcels. Many residents adjacent to Deerfield Road and Saunders Road currently have landscaped this area or located other items such as playgrounds within the HOA property. The parcel lines are typically shown as black, solid lines on the project exhibits.

10. Will there be any additional costs for property owners or the HOA to construct the noise wall?

No. All costs for land acquisition and construction of the noise wall will be paid for by Lake County as part of the project.

11. Where would the potential noise wall be located?

The potential noise wall would be located approximately 17 feet (adjacent to eastbound right turn lane) to 23 feet (west of eastbound right turn lane) from the existing roadway curb along Deerfield Road and approximately 17 feet from the existing roadway curb along Saunders Road. The approximate location is shown on the noise wall exhibit. Another reference point is the existing wire fence located near the rear of the residential lots. Along Deerfield Road, the potential noise wall would be located approximately 6 feet from the wire fence to the south

(towards the homes); along Saunders Road, the potential noise wall would be located approximately between the two wire fences.

12. What would the potential the noise wall look like?

The potential noise wall would have a form liner that would look like natural stone. An example picture is included in the Noise Forum Meeting PowerPoint presentation located on the project website (Information Center/Meeting Materials). The potential noise wall would be 15 feet tall.

13. How was the height of the wall determined?

As part of the traffic noise analysis, a computer noise model was used to evaluate different wall heights. As part of the analysis, many iterations are run to determine a noise wall height that meets the feasibility and reasonableness requirements mentioned above. Based on the analysis completed for this project, the potential noise wall would be 15 feet tall. A lower wall did not meet the feasibility and reasonableness requirements.

14. How were the receptor locations selected? Why are some twice as far away from the road compared to others? There are several properties on the north side that are close to the road as well.

The location of R11 is at common noise environment where the noise wall is planned to go. We normally place the receptors at an exterior area frequently human used. R11 was located at a playset that's very close to the road. In other locations along the corridor, we looked for areas of frequent human use in people's yards, whether it be a front yard, rear yard etc., and then we placed a receptor at those locations. So that's why the locations varied with respect to distance from the edge of the roadway all along the corridor. After collecting the baseline condition data, we use a standard computerized model to project what the noise levels will be under built condition for 2050 traffic. We calibrate that computer model with existing conditions and then we use that model to look at what's going to happen when we build our project. And that's when we start looking at where there are noise impacts. We must follow a federal process that is laid out and that's how noise walls get chosen. Is the design of the wall effective? Does it provide noise reduction? If it doesn't, it's not added into the project even though there might be a noise impact.

15. Would additional field monitoring at R11 (Thorngate receptor point) affect the traffic noise model?

Additional field monitoring is not necessary. Per the IDOT Noise Policy, monitoring is only required at 25-50% of representative receptors. FHWA generally suggests sampling periods that range from 8-15 minutes. As part of our study, noise monitoring was completed at 47% of the representative receptor locations. We sampled each monitoring location for 12 minutes.

Noise measurements are normally taken at exterior areas of frequent human use. The receptor/monitoring location referenced above was placed adjacent to a playset. The monitoring locations for this project were reviewed by IDOT. Receptor locations followed the guidance in the IDOT Highway Traffic Noise Assessment Manual (2017). Appropriate placement of the R11 receptor location was also confirmed with FHWA.

The monitoring results were compared to the existing conditions TNM results to validate the TNM model. In general, noise monitoring results should be within ±3 dB(A) of the TNM generated results for the model to be considered validated. Since our monitored noise levels were within 3 dB(A) of the TNM predicted noise levels for existing conditions, our TNM model was considered "validated".

16. What will happen to the existing vegetation and landscaping between the roadway and residential homes?

If the noise wall is constructed, it would require the removal of many of the existing trees and other vegetation currently located between the roadway and the residential homes. The noise wall would be 15 feet tall and would also require trimming of tree branches that extend towards the wall. A rendering of what the potential noise wall would look like from a back yard perspective is provided in the Noise Forum meeting PowerPoint presentation located on the project website. Landscaping behind the noise wall will not be provided as part of this project. Since the property directly behind the noise wall is owned by the HOA, any plantings immediately adjacent to the noise wall would be HOA responsibility. Grass would be planted between the noise wall and the roadway. Detailed landscaping will be determined during Phase II Engineering.

17. How much noise reduction would be achieved with the noise wall?

Based on computer modeling, the vast majority of the 37 benefited receptors would receive a noise reduction of between 5 and 11 dB(A) in the 2050 future build condition with the implementation of a noise wall. More than half of these benefited receptors would be on the lower end of that range (i.e., between 5 and 7 dB(A)). Three of the receptors would receive a slightly higher than 11 dB(A) noise reduction due to the receptor location/area of frequent outdoor activity, such as a playset, being located immediately adjacent to the potential noise wall.

Please note that based on computer modeling (and confirmed by field monitoring), the worst case receptor for the Thorngate Subdivision has an existing traffic noise level of 66 dB(A), which would be considered an impact in the build condition. Based on computer modeling, under the 2050 future build condition, the worst case receptor for the Thorngate Subdivision has a predicted noise level of 69 dB(A). This is a difference of 3 dB(A) from existing to build condition. A change of ±3 dB(A) is a barely perceivable change in noise.

18. What is the noise wall vote for?

The vote you are casting is only for the potential noise wall to be recommended for implementation as part of the project. The roadway project will proceed regardless of the vote results.

19. Who is allowed to vote?

Only benefited receptors of the noise wall are allowed to vote. For this potential noise wall, there are 37 benefited receptors. The benefited receptor locations are depicted on the Noise Wall Exhibit. To be a benefited receptor, a noise reduction of at least 5 dB(A) must be obtained with the proposed noise wall under future 2050 traffic conditions. Benefited receptors include property owners and renters/leasers residing on the benefited property. In the case of rental properties, both the property owner and renter are allowed to vote.

20. Can the plans to build the noise wall at Thorngate change?

The proposed noise wall has met the state/federal criteria for being included as part of the project and will be advanced into the next phase of engineering. More than likely, the noise wall will remain as part of the project and it's unlikely to be removed from the project following the traffic noise analysis process completed during Phase I Engineering. If significant roadway design changes occurred during the next phase of engineering, the traffic noise report would need to be updated and the noise wall re-evaluated. It is very unlikely that such a significant change would occur at this location given the minimal changes at the Saunders/Riverwoods Road intersection.

21. What is the main source of noise generated from vehicles?

Noise from vehicles occurs from tire interaction with the pavement and is characterized as the “whine” of traffic noise. Propulsion noise (engine, exhaust, and intake) is typically the dominant noise source when a vehicle is traveling at low speeds. Tire-pavement noise typically becomes the dominant noise source when a vehicle travels at higher speeds. Tire-pavement noise will still exist with electric vehicles.

We discussed the issue of electric vehicles with FHWA. FHWA knows that Traffic Noise Model has limitations. FHWA is evaluating priorities and will continue to improve TNM as funding allows.

22.Can pavement type affect traffic noise from vehicles?

“Quieter pavements” have been identified by some states as a way to reduce traffic noise up to 3 to 4 dB(A). FHWA only recognizes this measure as eligible for federal funding if the state has an approved Quiet Pavement Research Program. IDOT does not currently have an approved Quiet Pavement Research Program. Quieter pavements can be used on federal-aid projects, but the pavement cannot be classified as a noise abatement measure. We followed FHWA guidance and the IDOT Noise Policy regarding pavement type in our analysis.

It should also be noted that as pavement texture varies with time, the performance of this measure is difficult to predict for noise abatement. For example, asphalt pavement breaks apart, while concrete textures wear down over time. Winter conditions and snowplows exacerbate pavement wear. In addition, noise created at the tire and pavement interface is only one of several traffic noise sources that include engine, exhaust, and auto body vibrations. In summary, altering the pavement material does not result in substantial noise reductions over a long-term period.

23.Why can't a speed reduction be a solution for increased noise level?

Reduction of speed has the potential to reduce traffic noise levels. Generally, a reduction of 20 mph would be needed to reduce the traffic noise level by 5 dB(A). Speed reductions of this magnitude may have adverse impacts on the ability to achieve the purpose of the project. Speed limits must adhere to established design guidelines and policies. We ran two modified speed limit scenarios in Traffic Noise Model for the Build condition: one at 35 mph along Deerfield Road and one at 30 mph along Deerfield Road. Both scenarios resulted in lower predicted noise levels. However, each scenario resulted in a traffic noise impact (i.e., at least 66 dB(A)) at the R11 receptor location. The 30 mph model was just over the threshold for an impact. Also see Response 10.

LCDOT policy is to evaluate the speed via a speed study following completion of the project. Per the LCDOT ordinance, if the speed study results with speed limit drop, the lowest they could go is 35 mph. Here is a link to more information on the LCDOT speed study: https://www.lakecountyil.gov/3984/Speed-Studies . LCDOT anticipates that the speed study will likely result with the speed limit staying 40 mph, but that will be confirmed. Speed limit changes must be approved by the Lake County Board.

The reason the speed limit is lower east of I-94 is due to the density of access points along Deerfield Road, which classifies this portion of Deerfield Road an "Urban District". This designation allows the speed limit to be reduced to 30 mph. The portion of Deerfield Road through Riverwoods does not meet the density requirement for the "Urban District" designation.

24. Have you considered spending money on replacing windows in homes which border Deerfield Road instead of a noise wall, like what was done near O'Hare airport?

Replacing windows is not a mitigation strategy considered for a roadway improvement project. Typically, this is the standard procedure is used if you are evaluating areas of interior use. Analysis for this project is based on exterior use. The funds that are utilized must be for improvements within the permanent right-of-way or easements. What was done as part of O'Hare was highly unique, not typically done as part of highway improvement projects.

25. Have real estate appraisers been consulted to determine the impact of the noise wall on property values in Riverwoods?

No, the appraised value to the affected properties is somewhat subjective and it's hard to answer. Out of the responses from people, 88% voted in favor of the wall. So, folks that want the wall see it as a benefit to them. For them maybe it's an improvement to their property. But as far as the financial effects, we do not investigate those as part of a roadway improvement project.

26. Will the wall reflect noise?

There is the potential that some noise reflection could happen with the noise wall. However, the distance that the noise would travel is longer therefore once it bounces, the noise levels decrease. The amount that it would bounce back is typically not perceivable because it's only a couple decibels.

27. How will a noise wall benefit the adjacent homeowners?

The noise wall is meant to address the noise impact from the proposed roadway. The rest of the community, unfortunately, is not factored into the decision of whether a noise wall gets installed. We look to see who is impacted by the roadway under build conditions and then we evaluate the wall from a feasibility perspective.