LINK HOUSTON

March 15, 2019

Mr. Quincy Allen, P.E.
Houston District Engineer
Texas Department of Transportation
P.O. Box 1386, Houston, Texas 77251

RE: North Houston Highway Improvement Project [NHHIP] – CSJ 0912-00-146 – Draft Noise Technical Report, February 2019

Dear Mr. Allen,

The following are LINK Houston's comments regarding TxDOT's recent release of the Draft Traffic Noise Technical Report of the North Houston Highway Improvement Project (NHHIP). LINK Houston advocates for a robust and equitable transportation network so that all people can reach opportunity. Traffic noise levels have a profound impact on community quality of life and affect people's ability and choice to safely travel affordably by walking and biking.

This letter summarizes LINK Houston's concerns about the NHHIP regarding the NEPA process, traffic noise impacts, and planned mitigative actions. Attached to this letter is a detailed technical memorandum by CSTI Acoustics Inc. We secured CSTI's services to ensure our community-focused comments were accompanied by comprehensive technical comments from industry experts. LINK Houston provides these comments as a member of and in direct support of the Make I-45 Better Coalition.

NEPA Procedural Abnormalities

The Make I-45 Better Coalition has previously expressed the opinion that releasing individual technical appendices for public review after the public comment period for the Draft Environmental Impact Statement (DEIS) is passed is highly irregular. Comments and discussion to that effect were detailed in the Irvine Connor letter dated July 20, 2018. Every technical report should have been completed and included in the public review process with the NHHIP DEIS. Understanding the visual and noise impacts of major highway projects is fundamental. Had the information been provided as part of the DEIS, it would have greatly influenced the ability of the public to understand both general project impacts and impacts at specific locations of concern to communities, individuals, organizations, and business owners.

LINK Houston takes the position that the DEIS comment period should remain open until all technical reports are released and that a supplemental complete DEIS be provided at the completion of all technical reports so that the comprehensive impacts of the NHHIP can be fully examined and commented upon by the public. We understand such a course of action will require additional time and resources. The additional time and resources are an investment in an important process and opportunity. The current IH-45 North facility has existed for approximately 50 years and the NHHIP represents a once-in-generations opportunity to improve the greater Houston metropolitan area's image and mobility while mitigating past impacts.

Traffic Noise Impacts on People and Communities

LINK Houston will focus its comments on two areas: (1) summarizing our concerns about traffic noise impacts and (2) further mitigation of said impacts along the NHHIP.

Concerns About Traffic Noise Impacts

- Most residential areas within 350 ft of highway main lanes were evaluated, but some were not modeled and should have been. For example:
    - The residences east of I-45 between W. Mount Houston and W. Gulf Bank shown on Exhibit 2, Page 5 are not modeled. They are set back about 350 ft from the nearest main lane of the future highway, where a noise impact is certainly possible, especially near the W. Mount Houston overpass and W. Gulf Bank overpass.
    - The residences west of I-45 from a little north of W. Mount Houston to a little south of W. Gulf Bank shown on Exhibit 2, Page 5 are not modeled. They are set back about 370 ft from the nearest main lane of the future highway, where a noise impact is certainly possible, especially near the W. Mount Houston overpass and W. Gulf Bank overpass.
    - Note: In some locations, such as the commercial property between residential areas and the highway right of way, building a barrier may not be feasible. These are locations where justification for treatments to quiet the pavement at the source and/or 6'-8' barriers between main lanes and frontage roads are justified.
- The report finds in several locations that the NHHIP will be closer to land uses, but there is somehow a reduction in sound level without mitigation. Such an outcome is highly unlikely, and we suspect further analysis is required and mitigation warranted. For example:
    - Segment 3 R7 and R8 (Hogg Park and Leonel Castillo Community Center)
    - Segment 1 R42 to R47A (-2 to +4 dBA difference from existing to predicted). How does it get 2 dBA quieter at R43 with the highway getting busier and closer?
- The report was not clear about a few key points that would have enabled more effective review of the modeled impacts and proposed mitigations. For example:
    - The speed of the traffic that was modeled is not indicated in the report.
    - Knowing predicted sound levels without mitigating elements/barriers would have been useful to understand how much reduction the barriers provide (see Table 3.2 and Exhibit 2).
    - In Exhibit 2 it appears that sites can be marked green (benefited) even if sound levels are projected to increase with the construction of the project. An additional color should be used to indicate sites where sound levels will be higher than current but lower than they would be without the proposed treatments.
- When a noise impact is found, barriers are proposed only when they are found to be feasible and cost effective, but at some locations that would seem to justify a barrier one is not planned. For example:
    - Segment 1 R42-R47A neighborhood is like many others where barriers are proposed. The report says that only 8 residences are benefitted, but it appears that the barrier would benefit more residences and should be found cost-effective.

Recommended Further Mitigation of Traffic Noise Impacts

- ***Changing the location of noise walls to between main lanes and frontage roads can be advantageous***.
  Noise barriers about 16-ft tall are proposed for the east side of I-69 where it is below grade just east of downtown. The proposed location for the barriers is just east of the frontage road and Chartres. This will effectively reduce noise but also block views of downtown from the first and second floors of buildings to the east. Changing the barrier location to between the main lanes of I-69 and the frontage road would still reduce sound levels from the main lanes and would allow for a better view of downtown, especially if the wall could be reduced in height, possibly to 10 to 12 ft. This applies from Gray St to Holman or Alabama St.
- ***Placing noise barriers between main lanes and frontage roads is desirable and can be effective***.
  Section 5.0 of the original Traffic Noise Technical Report for the project stated that noise barriers would be located along the outside of the frontage road within right-of-way where barriers could be continuous and that noise barriers could also be located between main lanes and frontage roads. However, the recent draft report does not provide any recommendations for barriers between the main lanes and feeder roads, and there is also no indication that these were evaluated or even considered for locations where they might be effective. For some projects, noise barriers that are only 6-ft to 8-ft tall have been built at the edge of the main lanes instead of at the edge of the frontage roads. TxDOT implemented such barriers on I-610 West

Loop through Bellaire and found them beneficial. These types of barriers should be considered in several locations as per the CSTI Acoustics memorandum of comments on the NHHIP.

- ***Pavement technologies should be used to reduce noise at the point between tire and road surface***. Different types of pavement provide different levels of sound propagation. How the surface of pavement is finished affects sound propagation. The noise report states that "Best management Practices (BMPs) that will be implemented to reduce noise levels of the project include but are not limited to the use of tined pavement. Potential noise reductions from the use of longitudinally-tined pavement, which is quieter than traditional concrete pavement, have not been quantified for this project." It is very unclear if this is a commitment to use tined pavement everywhere, only at some locations, or only if some sort of evaluation shows it to be effective. The text says it "will be implemented". TxDOT should explicitly describe what factors will affect the decisions to use or not use quiet pavement and what guidelines will be used to determine their use.

The NHHIP is a total reconstruction – as presently proposed – and there is ample opportunity to design support structures and roadway surfaces to support quiet pavement technologies, 6'-8' barriers between main lanes and frontage roads or on elevated structures, and to relocate taller noise barriers that would block views from adjacent properties to downtown (which may reduce the required height of the barrier and reduce cost and calm frontage road speeds).

Conclusion

This letter summarized LINK Houston's concerns about the NHHIP regarding the NEPA process, traffic noise impacts and TxDOT's planned mitigative actions. We have provided the attached technical review by CSTI Acoustics which is to be received as our additional comments. LINK Houston provides these comments as a member of the Make I-45 Better Coalition. We believe every major infrastructure project using taxpayer dollars should be s an opportunity to improve the quality of life in the surrounding neighborhoods, rather than simply mitigating negative impacts. Transportation infrastructure will continue to influence access to opportunity and quality of life, including health and wellness in Harris County. The existing IH-45 North facility has existed for approximately 50 years. The NHHIP is a once-in-a-generation opportunity to improve the greater Houston metropolitan area's image and mobility and must mitigate past impacts and improve quality of life for people in immediate neighborhoods.

Sincerely,

Jonathan P. Brooks

Jonathan P. Brooks
Director of Policy and Planning
LINK Houston

15 March 2019

MEMORANDUM No. M-1058-0
CSTI Job No. 6648

To: Ms. Oni Blair, Executive Director, LINK Houston
From: Arno Bommer, CSTI acoustics

Subject: CSTI Review of Houston North Highway Improvement Project
Draft Traffic Noise Technical Report

Dear Ms. Blair,

The Texas Department of Transportation (TxDOT) has issued a Draft Noise Technical Report for North Houston Highway Improvement project. The proposed project will consist of improvements to I-45 from North Beltway 8 south to the intersections with I-10 and I-69. In this Memorandum, CSTI acoustics presents our review of the noise technical report and our concerns and recommendations for the noise issues related to this project.

1. Clarity of Report

The speed of the traffic that was modeled is not indicated. This should be the expected maximum speed of the majority of traffic, not the posted speed limit or an expected speed that may increase in the future. 23 C.F.R. § 772.9 states: "In predicting noise levels and assessing noise impacts, traffic characteristics that would yield the worst traffic noise impact for the design year shall be used."

For Table 3.2 and Exhibit 2, I think the "Predicted" levels already include the proposed noise barriers. I don't think that the sound levels calculated without proposed barriers are included in the report. This is not a problem, but it would have been useful to see how much reduction the barriers will provide.

In Exhibit 2, receiver sites are color coded as "Benefited" in green, "Impacted" in red, and "Non impacted" in black. I think that sites can be marked green (benefited) even if sound levels are projected to increase with the construction of the project. When there is a proposed noise barrier, the green, benefited rating is for the site with the noise barrier compared to the site without a noise barrier. There may still be an increase in sound levels above the noise criterion, so the use of the term "benefitted" is misleading. Perhaps an additional color should be added (purple?) that indicates sites where sound levels will be higher than they are currently but lower than they would be without the proposed treatments.

2. Properties That Were Not Evaluated

Segment 1 Site R5 is shown about 250 ft from nearest edge of the main lanes and has a predicted sound level of 74 dBA (Table 3.2). Segment 1 Site R49 is shown about 375 ft from the nearest edge of the main lanes and has a predicted sound level of 66 dBA (Table 3.2). These calculations indicate that for Segment 1, noise impacts are possible at about 375 ft from the nearest main lanes and possibly even further away.

Not all of the residential areas within 350 ft of the highway main lanes have been evaluated. For example (starting at the north end of the project and going south):

- The residences ***east*** of I-45 between W. Mount Houston and W. Gulf Bank shown on Exhibit 2, Page 5, which are set back about 350 ft from the nearest main lane of the future highway. A noise impact is certainly possible, especially near the W. Mount Houston overpass and W. Gulf Bank overpass.

- The residences ***west*** of I-45 from a little north of W. Mount Houston to a little south of W. Gulf Bank shown on Exhibit 2, Page 5, which are set back about 370 ft from the nearest main lane of the future highway. A noise impact is certainly possible, especially near the W. Mount Houston overpass and W. Gulf Bank overpass.

- Rittenhouse Village neighborhood east of I45 and just north of Rittenhouse St., which is about 300 ft from the main lanes of I45.

- Homes east of I45 just north of W. Twickerham Trail, which are less than 200 ft from the main lanes of I45. A barrier is proposed for the block just south of this, but it is not clear if the analysis considered the blocks to the north where no receivers were designated.

- Homes east of I45 on W. Wellington St and W. Brenda St. Trail, which are less than 250 ft from the main lanes of I45. A barrier is proposed for the block just south of this, but it is not clear if the analysis considered the blocks to the north where no receivers were designated. The Villa Nueva Apartments just south of the homes are about 200 ft from the main lanes and also have not been evaluated.

- Homes and a motel east of I45 on Werner St., E. Witcher Ln., and Foxglove Ln. The homes are about 300 ft from the main lanes and the motel is about 100 ft from the main lanes.

- Homes and apartments east of I45 on Marble Dr. south of Bizerte St. The homes are about 250 ft from the main lanes of I45, and the apartments are directly adjacent to the highway and may have to be totally or partially demolished. A barrier is proposed for the block just north of this, but it is not clear if the analysis considered the blocks to the south where no receivers were designated.

- Homes on Amasa St. south of Stokes St. and east of I45. This is a section where the highway and ramp connections to 610 expand much closer to the neighborhood. Although a barrier is proposed for the south half of this street (where homes are taken for the highway expansion), the barrier ends about halfway up the block. A barrier on the west side of Amasa would shield the homes on the east side of Amasa, and the commercial land west of Amasa is currently accessed from Stokes (a small gap could be left in the barrier if necessary for a driveway).

- Homes on Reid St. north of 610 and east of Fulton, which are about 250 ft from the main lanes of 610. A barrier could be built on the south side of Reid, possibly with some gaps for driveways to the businesses to the south of Fulton, though these have access from the frontage road.

- Neighborhood east of I45 south of Eichwurzel, which are less than 200 ft from expanded main lanes and connecting ramps to 610. A barrier is proposed for the

block just north of this, but it is not clear if the analysis considered the blocks to the south down to Link Rd. where no receivers were designated. At the Link Rd. overpass, a low barrier on the edge of the main lanes might be most appropriate.

- Homes on Bristol St. east of I45 and south of Cavalcade, which are less than 250 ft from the main lanes of I45. A barrier could be built on the west side of Bristol, possibly with some gaps for driveways to the businesses to the west of Bristol, though these have access from the frontage road.

- There are probably several other residentially properties not identified above that also have not been evaluated.

For a few of these sites, there is commercial property between the residential areas and the highway right of way, and it might be difficult to build a noise barrier even if there was a noise impact. TxDOT's policy is to build barriers only on their own right of way. Even for the residential sites not directly adjacent to the highway right of way, the possible noise impact should be determined especially if this would help justify a treatment such as quiet pavement.

3. Evaluated Properties Where No Impact Was Determined

The following are examples of locations where no noise impact has been assessed, but this analysis seems unlikely due to the site conditions.

- Segment 3-I10 Sites R7 and R8 are the Hogg Park and the Castillo Community Center. The TxDOT noise modeling shows sound levels of 60 to 65 dBA, with no noise impact with no recommended treatments. In fact, they show a 2 to 3 dBA reduction from current sound levels. As shown in Exhibit 2 Pages 17 & 18, this location is at the northeast corner of the intersection of I-10 and I45 and is about 300 ft from major ramps. It seems very unlikely that there would be no noise impact at this location. Noise barriers at grade would probably be ineffective due to the topography with the highway and ramps elevated well above grade, but 6-ft barriers at the edge of the ramps and main lanes could be very effective.

- Segment 1 Site R33 is an apartment complex that is shown to be about 300 ft west of the proposed main lanes of I45 just north of the E. Tidwell overpass. The predicted sound level of 64 dBA seems unlikely as well as the increase of only 4 dBA with the highway moving much closer to this site.

- Segment 3-I10 Site R18 is a University of Houston Downtown facility directly adjacent to the realigned, combined I-10 and I-45. An increase of 10 dBA is predicted indoors, but this is still 1 dBA below the defined relative impact. A double highway will be built within 100 ft of a school where none existed before at a facade that is currently shielded from noise from the existing highway, and yet, no noise impact is assessed. This seems unlikely.

4. Questionable Results

For some sites, the study determined little or no increase in sound levels even with the freeway being relocated much closer. For example:

- At the neighborhood east of I45 and south of E. Crosstimbers (Segment 1 R42 to R47A) the predicted change in sound level from existing to predicted is -2 to +4 dBA despite the increase in traffic and the highway getting much closer to the neighborhood. How does it get 2-dBA quieter at R43 without any treatments?

- At Bruce Elementary School (Segment 3-I10 Site R34) there is only a 1 dBA increase in sound levels despite the significant increase in traffic volume and the main lanes and ramps getting closer to the school. This does not seem reasonable. This is a location where barriers at the edge of the main lanes and ramps would be beneficial.

5. Barrier Evaluations

When a noise impact is found, barriers are proposed only when they are found to be feasible (providing good reduction in noise) and cost effective (costing no more than $52,500 per benefitted receiver). At the following locations, it would seem that a barrier would be acceptable, but it wasn't.

- No barrier is proposed for the neighborhood at Segment 1 sites R42-R47A even though this neighborhood is very similar to many others where barriers are proposed. The analysis says that only 8 residences are benefitted, but it seems that the barrier would benefit more residences than this. If more residences were benefited, the barrier could be found to be cost-effective. As discussed in the following section, the gaps in the barrier for roads may be the problem.

6. Gaps in Noise Barriers

I believe that the policy of TxDOT is to maintain all road rights-of-way where the local road intersects the frontage road. The disadvantage of this is that gaps in noise barriers are needed for intersecting roads, and this may make the noise barrier either ineffective (not feasible or cost effective by TxDOT requirements) or not as effective as it could be, though still meeting the TxDOT requirements.

The City of Houston may have a policy where streets could be closed, probably involving consultation with local homeowners. This could result in a better noise barrier or a barrier that meets the TxDOT noise requirements for feasibility and cost effectiveness that are not met when there are gaps in the barrier.

At the following location, a barrier currently has not been found to be acceptable but might be acceptable if the barrier extended across the road where it meets the frontage road:

- Exhibit 2. Page 11 - Westfield St. and possibly Oddo St. and Theron St. on the east side of I-45.

At the following locations, a segmented barrier currently ***has*** been found to be acceptable and might be even more effective if the barrier extended across (and closed) the following roads where they meet the frontage road. The costs and benefits of closings should be looked into, possibly by the City of Houston. In some cases, such a closure might be worthwhile for the added noise reduction if the effects on traffic are not too detrimental

- Exhibit 2. Pages 7 and 8. East side of I45. W. Riverwood Dr., W. Rocky Creek Rd.
- Exhibit 2. Page 8. East side of I45. Obion Rd and Troy Rd. if they connect with Northline Dr. at their east end.

- Exhibit 2. Page 8. West side of I45. W. Obion Rd, W. Troy Rd.
- Exhibit 2. Page 13. Norland St. at the northeast corner of I-45 and 610.
- Exhibit 2. Page 14. The gaps at Delaney St. and Leon St. could be removed if the west end of Delaney could be curved to conned to Leon just inside the proposed noise barrier. This might require acquiring one more house lot near the southeast corner of Delaney and Leon to accommodate the connecting road.
- Exhibit 2. Page 14. At the southwest corner of I45 and 610, a continuous barrier from Sylvester Rd extending south just past Robert Lee Rd would best protect this neighborhood (and future bike route) from noise but would require making Robert Lee, Eichwurzel, and Enid into dead-end streets.
- Exhibit 2. Page 16. Near northwest corner of I45 and I10, extending the barrier to block either Wrightwood or Quitman.
- Exhibit 2. Pages 22 & 23. Syndor St., Bayou St., Grove Ct., and Cage St. just south of I-10 and east of 59/69.
- Exhibit 2. Page 28. East side of I69. McIlhanney St., Dennis St., and Drew St.
- Exhibit 2. Page 31. East and west sides of 288 at cross streets that do not extend under 288.

7. Views of Downtown Across Sunken I-69

Noise barriers about 16-ft tall are proposed for the east side of I69 where it is below grade just east of downtown. The proposed location for the barriers is just east of the frontage road/Chartres. Although this will effectively reduce noise, it will also block views of downtown from the first and second floors of buildings to the east. Changing the barrier location to between the main lanes of I69 and the frontage road would still reduce sound levels from the main lanes (though not the frontage road) and would allow for a better view of downtown, especially if the wall could be reduced in height, possibly to 10 to 12 ft. This applies from Gray St. to Holman or Alabama St.

8. Combined I-10 and I-45

Traffic from I-10 and I-45 will be combined just north of downtown, and part of this route will also be realigned. Because of this significant change, noise control should be applied wherever possible. This may be an ideal location for partial-height barriers at the edges of the main lanes (as discussed later in this memorandum), as they work well for elevated highways (the west part of this segment) and below-grade highways (the eat part). For example:

- At the University of Houston Downtown, an increase of 10 dBA is predicted, which is just 1 dBA below the relative criterion. A double highway will be built within 100 ft of a school where none existed before, and yet, no noise impact is assessed and no noise control is proposed.

- The area adjacent to North Main just north of the proposed highway alignment is being developed as a residential and mixed-use area. There is a light rail stop within a few hundred feet of the proposed alignment. Noise from the highway will certainly impact whatever is developed in this area.

- Further east, the combined traffic will be funneled into the same right of way currently used for just I-10. The only barrier currently planned is on the north side of Providence St. at Hennessy/St. Arnold Park. A better option would be to have the barrier on the south side of Providence St. This would be directly adjacent to the

below-grade main lanes, which is an ideal location for a barrier. Perhaps the barrier could be lower, effectively blocking noise while still allowing a view of downtown. Ideally, such a wall would extend on both sides of this combined highway section north of downtown

9. Barriers at Edge of Main Lanes

Section 5.0 of the original Traffic Noise Technical Report for the project stated:

- Traffic noise barriers would be located along the outside of the frontage road/ROW where barriers could be continuous, without gaps for driveways or streets.
- Traffic noise barriers could also be located in between main lanes and frontage roads.

However, the recent draft report does not provide any recommendations for barriers between the main lanes and feeder roads, and there is also not indication that these were evaluated or even considered for locations where they might be effective. For some projects, noise barriers that are only 6-ft to 8-ft tall rather than 16-ft tall have been built at the edge of the main lanes instead of at the edge of the frontage roads. The following applies to these:

- They reduce noise from the main lanes and from the opposite frontage road but not from the nearest frontage road.
- They are allowable only where there are no commercial businesses that need visibility from the main lanes (unless more-expensive transparent barriers are used).
- They do not reduce noise from tall exhaust stacks on trucks.
- They are especially effective when the main lanes are elevated above the elevation of the adjacent housing since the base of the barriers are also elevated.
- They can be effective on ramps, elevated special lanes, and overpasses, though the added weight and wind loads must be designed for.
- They were implemented on the 610 West Loop through Bellaire and were found to be beneficial there. This barrier is shown in the photograph below.

For the following locations, a moderate-height noise barrier at the edge of the main lanes and/or ramps may be warranted:

- Exhibit 2. Page 11. West side of I45 by sites R1-R6 to protect the neighborhood and the land around Little White Oak Bayou where a possible hike/bike trail is planned.
- Exhibit 2. Page 12. North side of 610 between Airline and N. Main to protect a neighborhood to the north where a barrier is not possible due residential driveways directly on the feeder road.
- Exhibit 2. Pages 14 & 15. West side of I45 adjacent to bike path along Little White Oak Bayou (which may have to be relocated to the other side of the bayou due to the highway construction). Such a barrier could also protect the neighborhood with Segment 2 Residences R43 to R47.
- Exhibit 2. Page 15. West side of I45 north and south of Patton St. overpass to protect neighborhood to the west (Segment 2, R43 - R50).
- Exhibit 2. Pages 16 and 17. Northeast corner of I45 and I10 to protect neighborhood on either side of Quitman, the Castillo Community Center, and Hogg Park.
- Exhibit 2. Page 18. Northwest corner of I45 and I10 to protect White Oak Park. Barrier at edge of ramp from I45 South to I-10 west may be most beneficial.
- Exhibit 2. Page 31. Currently, noise barriers are proposed for the east and west sides of 288 from about Southmore to Alabama. The barriers are at grade, and the effectiveness is hindered by the highway being elevated and by the necessary gaps for intersecting roads and for garages. It would be more effective to locate the barriers on the east and west edges of the main lanes. The barrier height could probably be reduced to 8 ft. Barriers at these locations would not protect the neighborhoods from traffic noise of the frontage road, but that is minor compared to the highway noise. It would be beneficial if the barrier included the section on the east side between Barbee and Cleburne where a senior housing project and community center are currently being planned.

10. Quiet Pavement

I could find only one reference in the report to “quiet” pavement. This is because the use of quiet pavement is not an acceptable option according to FHWA procedures. Different types of quiet pavement provide different levels of sound reduction. Porous asphalt treatments may lose effectiveness over time and are not as durable as concrete.

TxDOT did utilize diamond grinding and longitudinal tining on the I-10 Katy Freeway from 610 to Beltway 8 (except for the overpasses which were not sufficiently thick to allow the treatment). This was done with financial contributions from the adjacent communities. We understand that this treatment was effective and does not have any adverse effects on safety or durability.

The noise report states that “Best management Practices (BMPs) that will be implemented to reduce noise levels of the project include but are not limited to the use of tined pavement. Potential noise reductions from the use of longitudinally-tined pavement, which is quieter than traditional concrete pavement, have not been quantified for this project.” I do not know if this is a commitment to use tined pavement everywhere, only at some locations, or only if some sort of evaluation shows it to be effective. The text says it “will be implemented”. This should be verified.

I highly recommend the use of quiet pavement for the following reasons:

- It reduces the sound generation at the source, which is always better than treating the sound propagation path.
- It reduces noise inside and outside of the vehicle.
- It reduces traffic noise everywhere, even at distant locations. Noise barriers are effective only in the area close behind them.
- Although quiet pavement reduces only tire noise and not engine noise, the trend towards increased use of electric motors should reduce engine significantly over the lifetime of this highway.

TxDOT should explicitly describe what factors will affect their decisions to use or not use quiet pavement. The following alternate guidelines could be utilized for determining when quiet pavement is used:

- For all pavement of the project including main lanes, ramps, and frontage road.
- For all main lanes and ramps.
- On the main lanes, ramps, and frontage roads of any half-mile-long section of highway where the highway easement is within 500 ft of at least one school, at least five acres of public parkland, or at least twenty-five residential units. These specific numbers would, of course, be up for debate but may be reasonable.

I expect that TxDOT either has now or can soon have some documentation on the effectiveness of the Katy Freeway project, and this should be useful for justifying the use.

Let us know if you have any questions.

Sincerely,

COLLABORATION IN SCIENCE AND TECHNOLOGY INC.

Arno S. Bommer