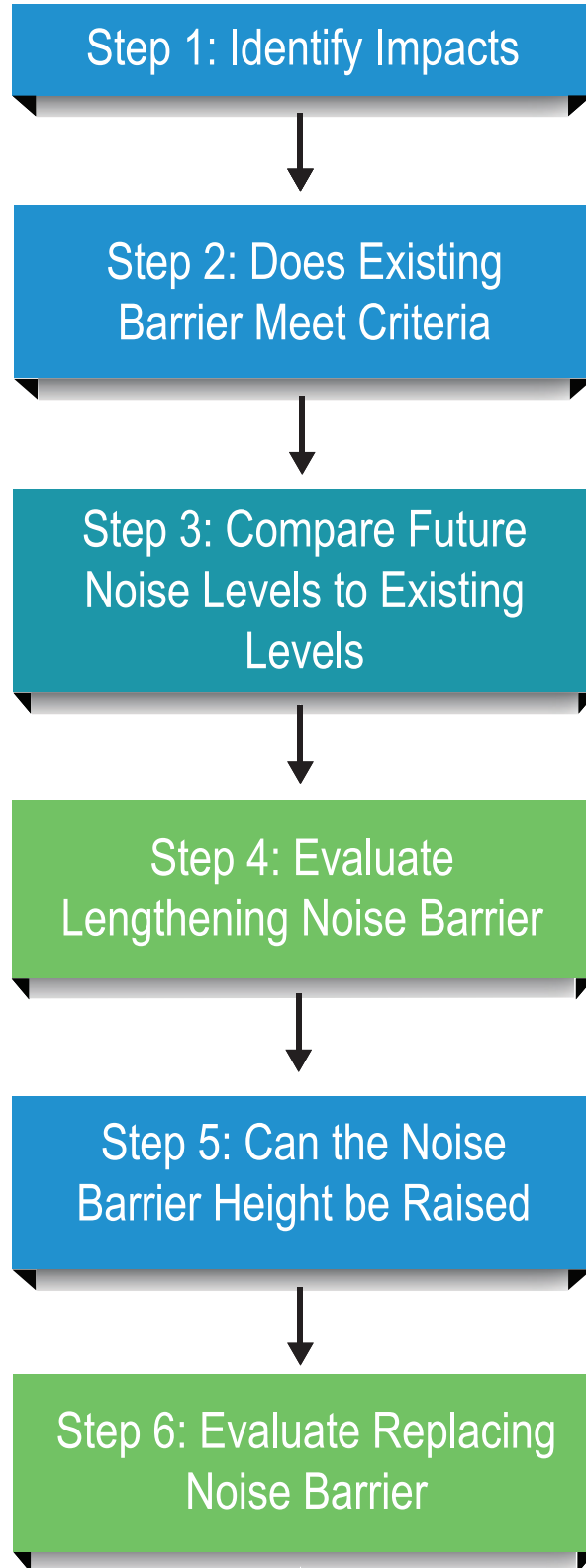


Existing Noise Barrier Methodology*

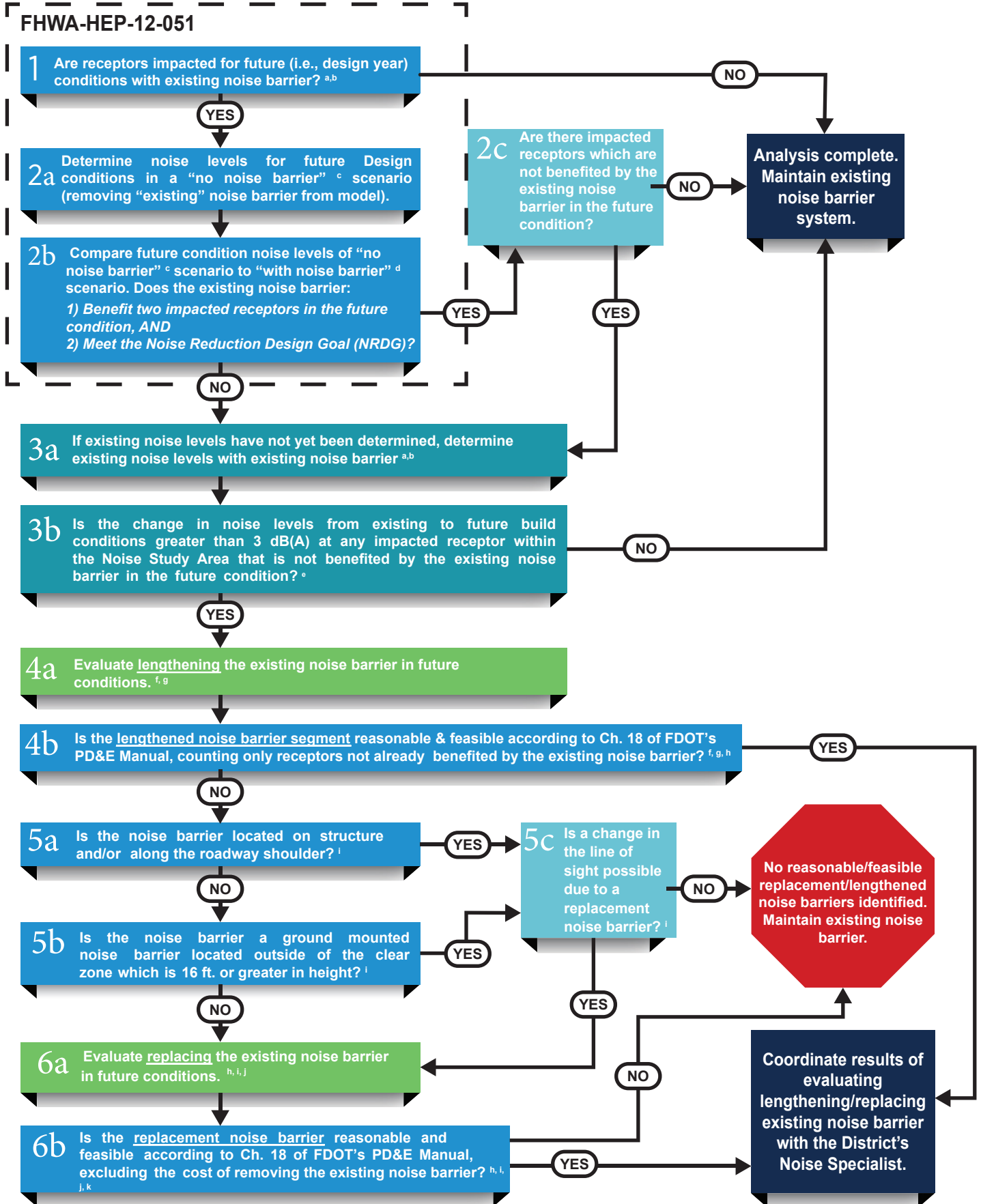
**To be used for evaluating existing noise barriers that are not in conflict with the proposed roadway Design.
For noise barriers which are in conflict with the proposed roadway Design, consult FDOT.*



Existing Noise Barrier Methodology*

*To be used for evaluating existing noise barriers that are not in conflict with the proposed roadway Design.
For noise barriers which are in conflict with the proposed roadway Design, consult FDOT.

Overview: If impacts exist behind/in proximity to an existing noise barrier that meet the Date of Public Knowledge, there are two options to evaluate:
1) Lengthening an existing shoulder mounted or Right-of-Way (ROW) mounted noise barrier and
2) Replacing an existing ROW noise barrier with a higher noise barrier.



For specific situations that are not addressed by this methodology contact the District's Noise Specialist.

FIGURE 2 FOOTNOTES:

- a) Using the latest FDOT approved version of Federal Highway Administration's (FHWA) Traffic Noise Model (TNM).
- b) To obtain accurate design year noise levels behind an existing noise barrier, accurate elevation data for the top and bottom wall elevations is required. If available, the as-built noise barrier plans should be used in the modeling to assess impacted sites. If elevation data is not available, design survey of the top and bottom wall elevations should be obtained and used during the design phase noise study.
- c) The "no noise barrier" scenario is the evaluation of the future year build condition which excludes the influence of the existing noise barrier(s) on the future noise environment. (FHWA-HEP-12-051 *Consideration of Existing Noise Barriers in a Type I Noise Analysis*).
- d) The "with noise barrier" scenario is the evaluation of the future year build condition which includes the influence of the existing noise barrier system on the noise environment. (FHWA-HEP-12-051)
- e) If the existing noise barrier meets the reasonable and feasible criteria according to Ch. 18 of FDOT's PD&E Manual but has impacted receptors not benefitting from the existing noise barrier, it is recommended that lengthening/replacing the existing noise barrier be evaluated.
- f) **LENGTHENING:** To calculate a receptor's noise reduction, compare the "lengthened noise barrier" scenario to a "no noise barrier" scenario. This allows for a more achievable noise reduction, as the existing noise barrier already provides a reduction in noise levels. However, when counting the number of benefitted receptors which receive a 5 dB(A) noise reduction to identify cost reasonableness, the receptors which already receive a 5 dB(A) benefit from the existing noise barrier must be disregarded (i.e., comparing "existing noise barrier" to the "no noise barrier" scenario), as the lengthened portion of the noise barrier is not being built for them. Additionally, when calculating the cost reasonableness, only the lengthened portion of the noise barrier should be included in the calculation. Follow reasonable/feasible criteria outlined in Chapter 18 of FDOT's PD&E Manual and consult with the District Noise Specialist.
- g) Additional length should be evaluated for reasonable/feasible requirements without regard to the existing noise barrier height. Any difference in height between the existing noise barrier and proposed lengthened noise barrier must follow FDOT Standard Plans Index (SPI) 534-200 requiring panel steps to be 6" – 1 ft. 6" difference in height between panels. Steps can be incorporated by replacing the existing barrier panels with the steps.
- h) **Feasible:** At least two impacted receptors which were not previously benefited by the existing noise barrier must be provided a noise reduction of 5 dB(A) or more to be considered feasible. Design, construction, safety, access, Right-of-way, maintenance, drainage and utility factors should also be assessed if the project is in the Design phase. **Reasonable:** A noise barrier must attain the Noise Reduction Design Goal (NRDG) at a receptor not previously receiving a 7 dB(A) reduction, which states that a minimum noise reduction of 7 dB(A) for at least one benefitted receptor must be achieved. Additionally, the cost of the noise barrier should not exceed \$42,000 per benefitted receptor. Viewpoints of the benefitted receptors should also be assessed if the project is in the Design phase and noted in PD&E studies.
- i) **In order to be eligible for replacement, the replacement noise barrier must be greater than 6 feet higher than the existing noise barrier, unless a change in the line of sight from any receptor to the roadway occurs.**
 1. Noise barriers which are located along the shoulder or mounted on structure are not eligible to be replaced, unless a change in the line of sight from any receptor to the roadway occurs. Replacing an 8 ft. noise barrier with a 14 ft. noise barrier (i.e., a 6 ft. increase in height) results in a minimally perceptible difference in noise. Additionally, a structure mounted noise barrier is limited to 8 ft. and can not be replaced by a higher noise barrier. However, if a design variation can be obtained to allow a 14 ft. noise barrier on structure, a replacement noise barrier should be evaluated.
 2. If the existing ground mounted ROW noise barrier is 16 ft. or greater in height, coordination with the District Noise Specialist is required to discuss the viability of replacing an existing noise barrier with a noise barrier less than 6 ft. higher. According to FHWA guidance (FHWA *Noise Barrier Design Handbook*, Section 3.5.1), an additional 6 ft. in height (i.e., replacing a 16 ft. high noise barrier with a 22 ft. high noise barrier) equates to an approximately 3 dB(A) decrease (assuming the line of sight is blocked), which is the lowest perceptible difference in noise reduction. Replacing an 18 ft. noise barrier with a 22 ft. noise barrier is only an increase of 4 feet, which would equate to a less than 3 dB(A) insertion loss, unless the line of sight was altered.
 3. The effective height of a noise barrier should be considered when making this determination.
 4. The replacement barrier should be built at the highest allowable limit (i.e., replacing shoulder mounted barriers with 14 ft., and replacing ROW mounted noise barriers at 22 ft.), pending District approval.
 5. Consultation with the District Noise Specialist may be required to determine if a noise barrier is eligible for replacement.
- j) **REPLACING:**
 1. To calculate a receptor's noise reduction, compare the "replacement noise barrier" scenario to a "no noise barrier" scenario. This allows for a more achievable noise reduction, as the existing noise barrier already provides a reduction in noise levels. Include all benefitted receptors and the entire length/height of the replacement noise barrier in the cost reasonable calculation (note: if a noise barrier is being lengthened and partially replaced, follow the methodology for lengthening a noise barrier to calculate cost reasonableness).
 2. To calculate cost reasonableness, only the receptors which are not already benefited by the existing noise barrier should be counted. For example, if the existing noise barrier provides a benefit to 10 out of the 20 receptors, and the replacement noise barrier provides a benefit to 15 of the 20 receptors, only 5 of the receptors should be included in the calculation of cost reasonableness.
- k) The cost of removing the existing noise barrier should not be included in the cost analysis.

Additional Notes:

- When a proposed Design conflicts with an existing noise barrier such that a partial or in-kind replacement is warranted, possible replacement scenarios should be discussed with the District's Noise Specialist. Coordination with FHWA may be necessary.
- This guidance only addresses lengthening a shoulder mounted or ROW mounted noise barrier and/or replacing a ROW mounted noise barrier with a higher ROW mounted noise barrier. If a shoulder mounted noise barrier needs to be supplemented by a ROW mounted noise barrier (or vice versa), the District Noise Specialist should be consulted.