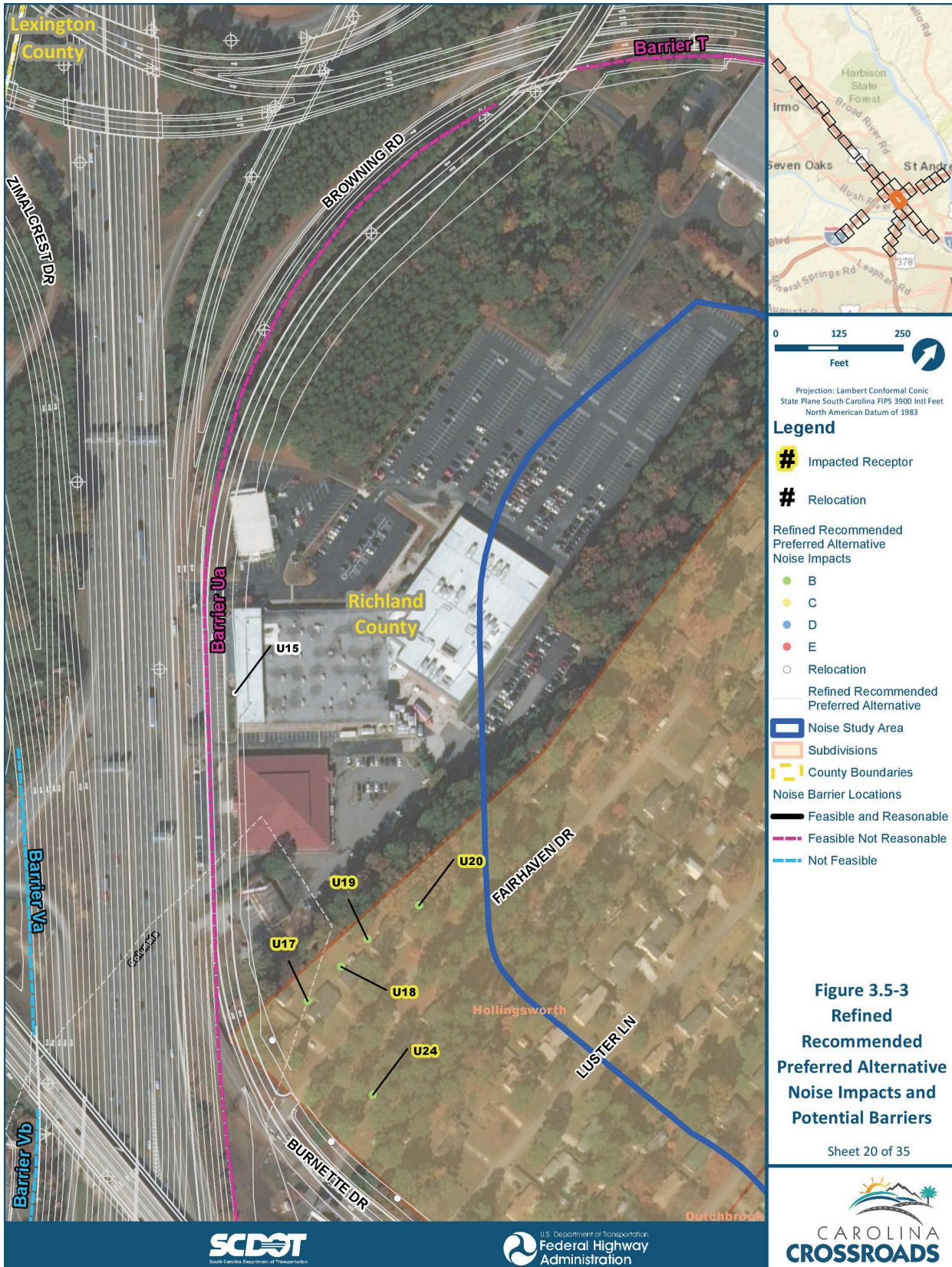
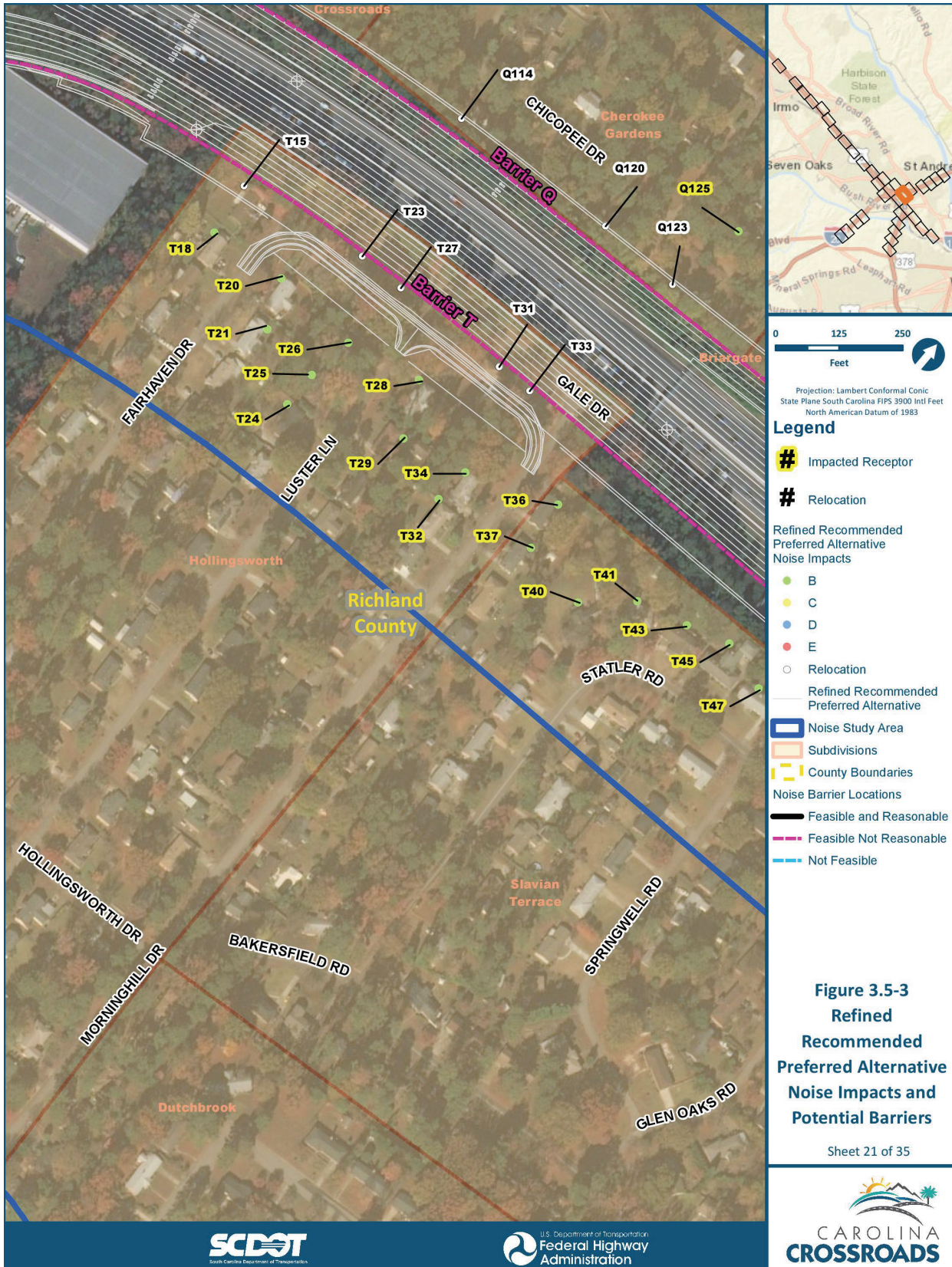


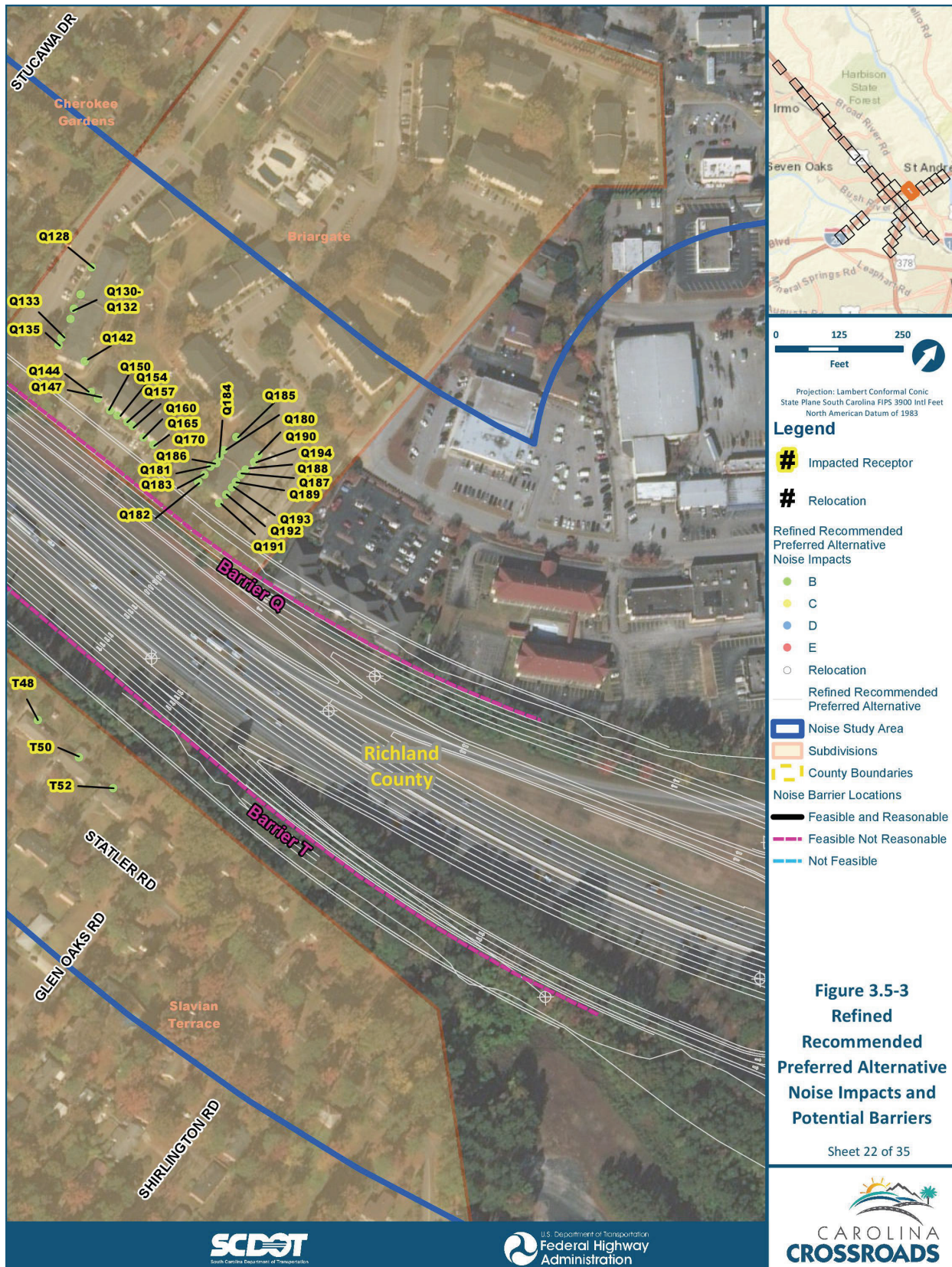
3. Existing Conditions and Environmental Consequences



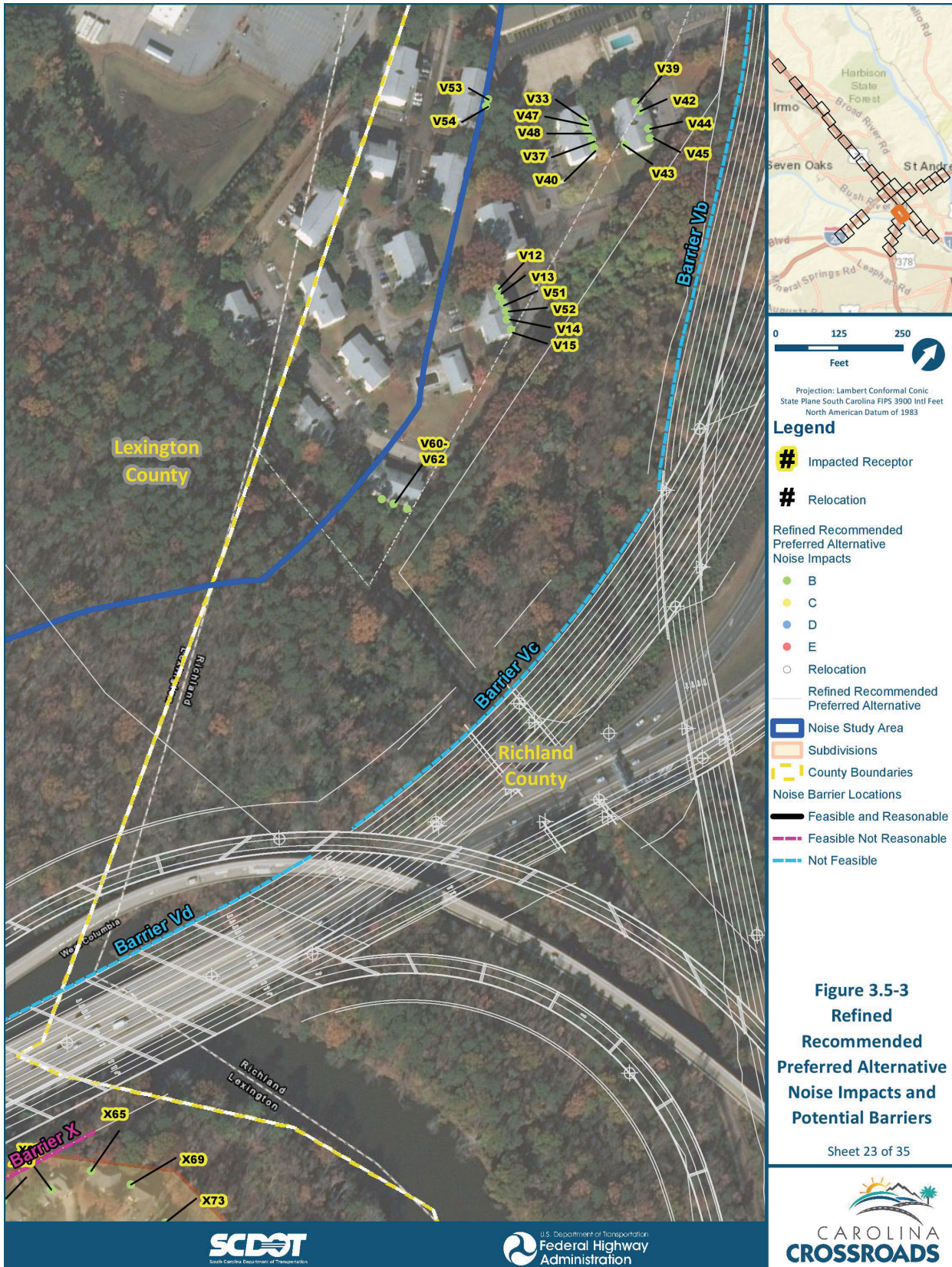
3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



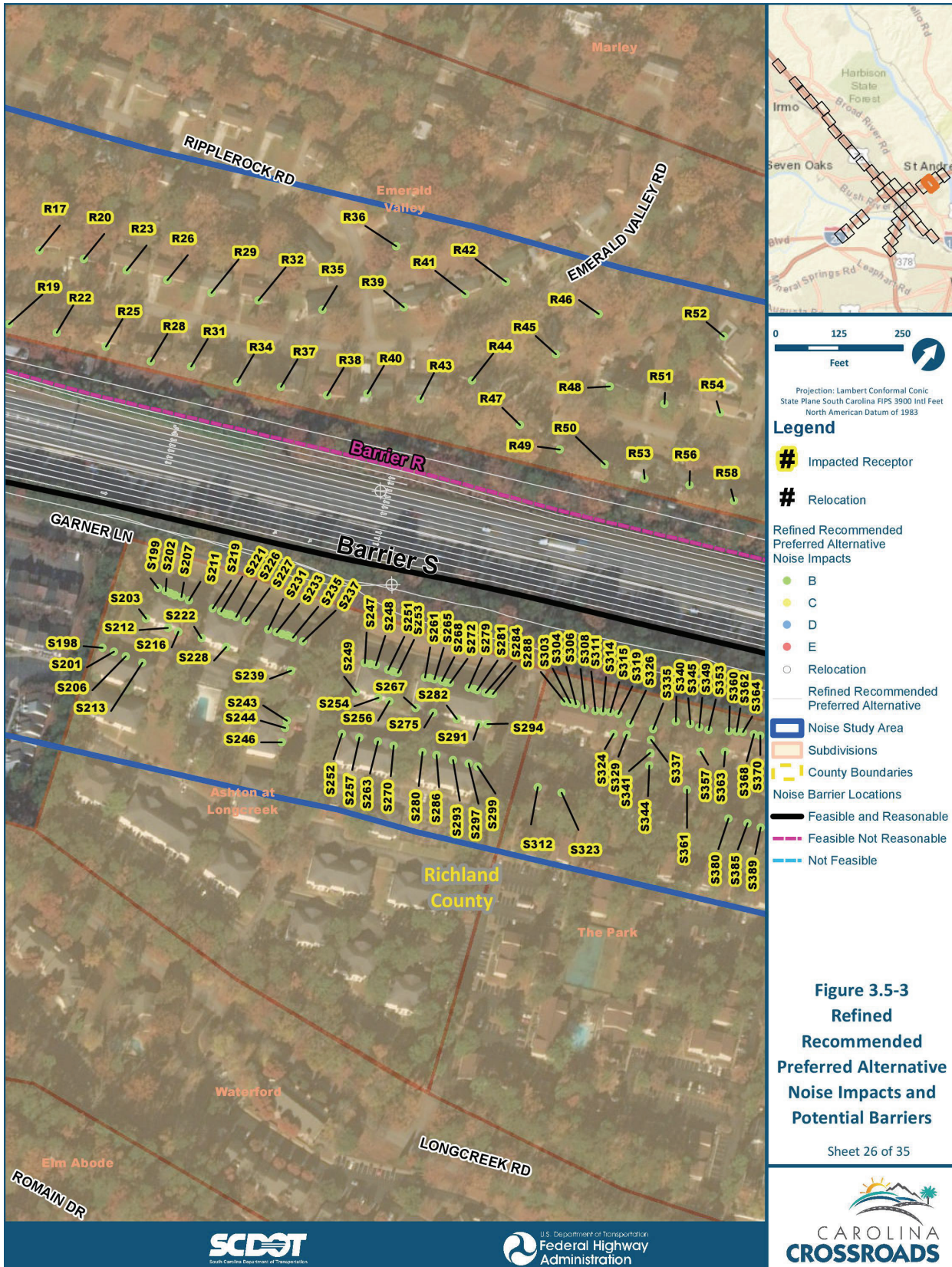
3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



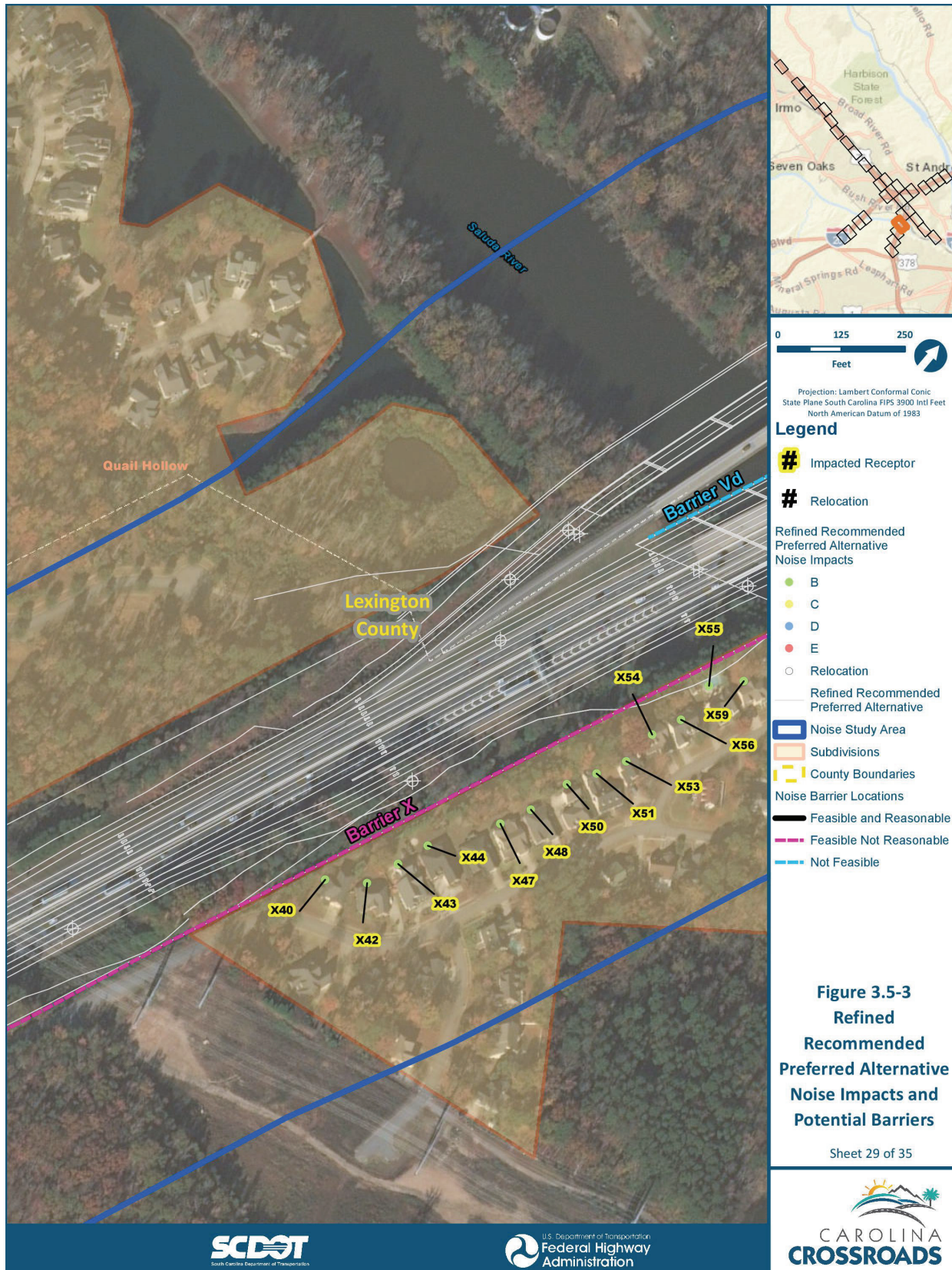
3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



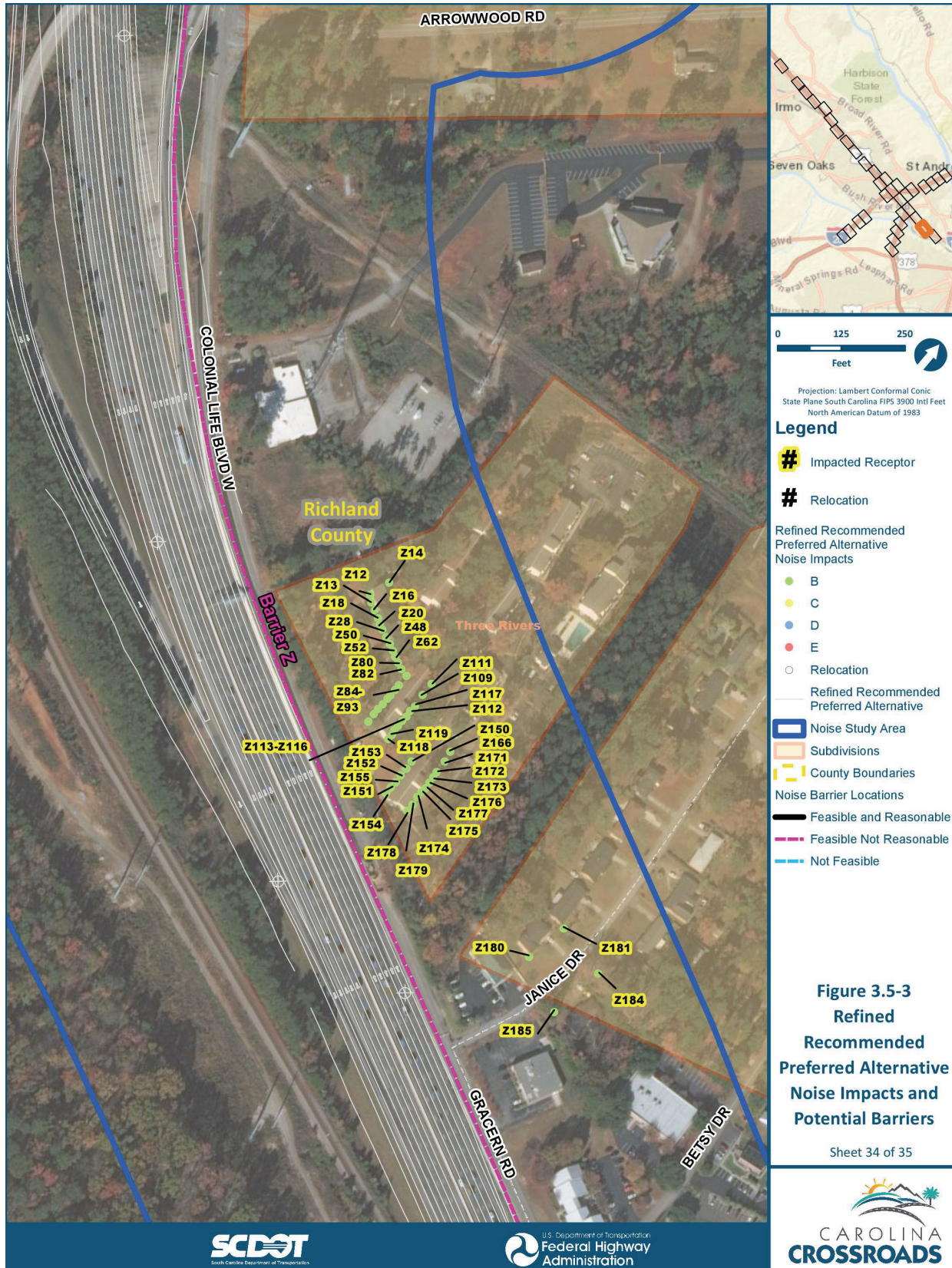
3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences



3. Existing Conditions and Environmental Consequences

Relative to the Saluda Riverwalk Extension, under the detailed noise study for the Refined RPA, no noise impacts were found for three receptor locations that were analyzed.

3.5.7 HOW WERE NOISE BARRIERS ASSESSED FOR MITIGATION?

The use of structural barriers (freestanding walls) was considered for impacted receivers. There are feasibility and reasonableness criteria that must be met for construction of noise walls. Noise walls are assessed under the feasibility criteria first, and if all conditions are met are then considered for reasonableness.

There are two feasibility criteria. Per SCDOT policy, acoustic feasibility means that a noise reduction of at least 5 dBA must be achieved for 75% of impacted receivers. There are also seven engineering and design considerations that must be achieved to meet the engineering feasibility criteria. These considerations include topography, safety, drainage, utilities, maintenance, access, and wall height which was determined using the FHWA Traffic Noise Model. In addition, noise barriers must undergo a constructability review by engineers to ensure that they can be constructed in the locations in which they are proposed.

As with feasibility, there are several reasonableness criteria that must be met. These include:

- Noise Reduction Design Goal – It is SCDOT’s policy that a noise reduction of at least 8 dBA must be achieved for 80% of those receivers determined to be in the first two building rows and considered benefited.
- Cost Effectiveness - The allowable cost of the abatement is based on \$35.00 per square foot. This allowable cost is based on the cost effectiveness criteria found in SCDOT’s Traffic Noise Abatement Policy (2014)⁸. This construction cost will be divided by the number of benefited receptors. If the cost per benefited receptor is less than \$30,000 then the barrier is determined to be cost effective.
- Property Owners and Residents - SCDOT will solicit the viewpoints of all the residents and owners of all receivers benefitted by feasible and reasonable noise abatement measures and document a decision on either desiring or not desiring the measure. A noise wall will be constructed unless a majority (greater than 50% of the benefited receptors) of votes is received not desiring noise abatement (p. 24 of SCDOT’s Traffic Noise Abatement Policy). This third criterion is only considered if the noise wall meets the first two criteria.

The three mandatory reasonable factors must be collectively achieved in order for a noise abatement measure to be deemed reasonable. Failure to achieve any one of the reasonable factors will result in the noise abatement measure being deemed not reasonable. **Error! Reference source not found.** summarizes the feasibility and reasonableness criteria used to assess traffic noise mitigation measures.

⁸ “Traffic Noise Abatement Policy”, South Carolina Department of Transportation, September 1, 2014.

3. Existing Conditions and Environmental Consequences

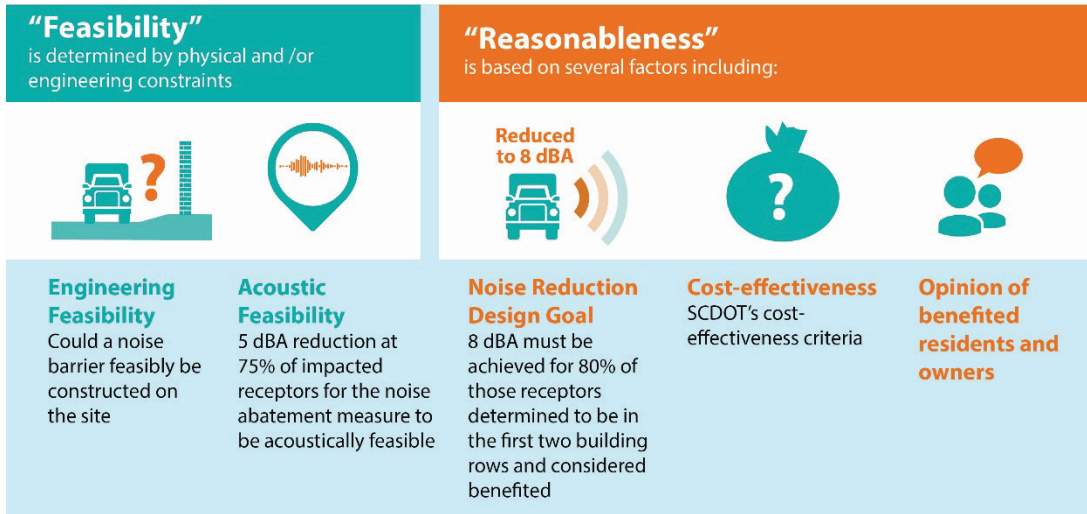


Figure 3.5-4 Feasibility and Reasonableness Criteria

SCDOT’s policy requires completion of a “Feasibility and Reasonableness Worksheet” for each barrier evaluated. These worksheets can be found in Appendix B of the Noise Technical Report located in Appendix J of this document.

3.5.7.1 What were the results of the feasibility and reasonableness considerations for the Refined Recommended Preferred Alternative?

A summary of the results of the detailed evaluation of feasibility and reasonableness for barriers identified under the Refined Recommended Preferred Alternative can be found in Table 3.5-6. **Error! Reference source not found..**

Table 3.5-6 Summary of Detailed Noise Mitigation Analysis, Refined Recommended Preferred Alternative

Barrier	Dimensions (length x avg. height, feet)	Cost ⁹	Feasible	Reasonable	Proposed
A	1,860 x 19.4	\$1,274,665	Yes	No	No
B	1,659 x 20	\$1,161,265	Yes	No	No
C	539 x 15	\$283,080	Yes	No	No
E	480 x 19	\$319,060	Yes	No	No
F	4,080 x 18.6	\$2,673,020	Yes	No	No
G	3,071 x 25	N/A	Yes	No	No
H	3,900 x 25	N/A	Yes	No	No
I1	1,860 x 25	N/A	Yes	No	No
I2	3,777 x 25	N/A	Yes	No	No
J1	3,114 x 25	N/A	Yes	No	No

⁹ Note: Cost is marked N/A if the Noise Reduction Design Goal portion of the reasonableness assessment was not met. Instances where the noise wall cost does not exactly equal to the wall area multiplied by \$35/sq ft. are due to rounding that occurs during barrier dimension calculations performed by TNM.

3. Existing Conditions and Environmental Consequences

Barrier	Dimensions (length x avg. height, feet)	Cost ⁹	Feasible	Reasonable	Proposed
J2	2,520 x 25	N/A	Yes	No	No
K	1,937 x 25	N/A	Yes	No	No
La/Lb	1,501 x 25	N/A	Yes	No	No
N1	2,100 x 25	N/A	Yes	No	No
N2	1,860 x 17.1	\$1,110,865	Yes	No	No
O	2,301 x 15.4	\$1,269,660	Yes	Yes	Yes
Q	3,360 x 25	N/A	Yes	No	No
R	4,320 x 17.2	\$2,843,120	Yes	No	No
S	4,380 x 25	\$3,832,430	Yes	Yes	Yes
T	3,660 x 25	N/A	Yes	No	No
U	3,201 x 25	N/A	Yes	No	No
Va/b/c/d	3,573 x 25	N/A	No	N/A	No
W	2,822 x 25	N/A	Yes	No	No
X	5,697 x 25	N/A	Yes	No	No
Y	2,760 x 25	N/A	Yes	No	No
Z	3,769 x 20.1	\$7,028,030	Yes	No	No

Based on the detailed noise analysis of the Refined RPA, 23 barriers were determined to be feasible but not reasonable; two barriers were determined to be feasible and reasonable; and one barrier was determined to not be feasible (and therefore no reasonableness assessment occurred). The locations of the proposed noise walls are shown on Figure 3.5-3. Refer to Section 5.3 and Appendix B of the Noise Analysis Technical Report (Appendix J of the FEIS) for more detailed analysis and information including the worksheets for the barrier determinations under each alternative.

After completion of the detailed noise study, ballots were sent to the residents and owners of each of the receivers benefited by the barriers that were found to be feasible and reasonable (Barriers O and S) to solicit their opinion on the construction of those barriers. Barrier O received 65% of possible votes in favor of the wall and 0% opposing. Barrier S received 24% of possible votes in favor of the wall, and less than 1% opposing. Neither of the barriers received a majority of ballots expressing opposition to the barrier, so both barriers are considered feasible and reasonable. A detailed discussion of the voting is in the Noise Technical Report (Appendix J of the FEIS), with the ballots in Appendix G of that report.

Based on the studies thus far accomplished, SCDOT intends to install highway traffic noise abatement measures in the form of a barrier on the south side of I-20 from the Saluda River extending approximately 2,300 feet west with an average height of 15.4 feet (Barrier O), and a barrier on the south side of I-20 from the Broad River Road exit extending approximately 4,380 feet east towards the Broad River with an average height of 25 feet (Barrier S). These indications of likely abatement measures are based upon detailed design and a barrier cost of \$35.00 per square foot, and will reduce the noise level by 6-11 dB(A) (Barrier O) or 5-16 dB(A) (Barrier S) for benefited

3. Existing Conditions and Environmental Consequences



residences. Since there are residences located on the opposite side of the interstate adjacent to Barriers O and S, sound absorption materials would be added to the highway side of the barriers to minimize noise reflected towards residences on the opposite side of the interstate. If it subsequently develops during final design that these conditions have substantially changed, the abatement measures might not be provided. A final decision on the installation of the abatement measures would be made upon completion of the project's design and the public involvement processes.

3.5.8 WILL THERE BE NOISE DURING CONSTRUCTION?

Temporary increases in noise levels would occur during the time period that construction takes place. Noise levels due to construction, although temporary, can impact areas adjacent to the project. The major noise sources from construction would be the heavy equipment operated at the site. However, other construction site noise sources would include hand tools and trucks supplying and removing materials.

Typical noise levels generated by different types of construction equipment are presented in Appendix C of the Noise Technical Report (Appendix J of the FEIS). Construction operations are typically broken down into several phases including clearing and grubbing, earthwork, erection, paving and finishing. Although these phases can overlap, each has their own noise characteristics and objective.

SCDOT's "2007 Standard Specifications for Highway Construction" includes various references to construction noise, including Sections 107.6-paragraph 3, 606.3.1.6.3-paragraph 1, 607.3.1.6.3-paragraph 1, 607.3.2.6.3-paragraph 1, and 702.4.15-paragraph 3. The SCDOT specifications cited above are generalized for nuisance noise avoidance. Detailed specifications suggested for consideration for inclusion in the project's construction documents may consist of the following:

- Construction equipment powered by an internal combustion engine shall be equipped with a properly maintained muffler.
- Air compressors shall meet current US EPA noise emission exhaust standards.
- Air powered equipment shall be fitted with pneumatic exhaust silencers.
- Stationary equipment powered by an internal combustion engine shall not be operated within 150 feet of noise sensitive areas without portable noise barriers placed between the equipment and noise sensitive sites. Noise sensitive sites include residential buildings, motels, hotels, schools, churches, hospitals, nursing homes, libraries and public recreation areas.
- Portable noise barriers shall be constructed of plywood or tongue and groove boards with a noise absorbent treatment on the interior surface (facing the equipment).
- Powered construction equipment shall not be operated during the traditional evening and/or sleeping hours within 150 feet of a noise sensitive site, to be decided either by local ordinances and/or agreement with the SCDOT.

3.5.9 WHAT COORDINATION OCCURRED WITH LOCAL OFFICIALS?

SCDOT has no authority over local land use planning and development. SCDOT can only encourage local officials and developers to consider highway traffic noise in the planning, zoning and development of property near existing and proposed highway corridors. The lack of consideration of highway traffic noise in land use planning

3. Existing Conditions and Environmental Consequences

at the local level has added to the highway traffic noise problem which will continue to grow as development continues adjacent to major highways long after these highways were proposed and/or constructed.

In order to help local officials and developers consider highway traffic noise in the vicinity of a proposed Type I project, SCDOT will inform them of the predicted future noise levels and the required distance from such projects needed to ensure that noise levels remain below the NAC for each type of land use per 23 CFR §772.17. The contour distances to the 66 and 71 dBA sound levels are presented in the Noise Technical Report (Appendix J of the FEIS). Please note that the values in the table do not represent predicted levels at every location at a particular distance back from the roadway. Sound levels will vary with changes in terrain and will be affected by the shielding of objects such as buildings and tree zones.

3.5.10 HOW WAS THE PUBLIC INVOLVED?

Through a call for volunteers at project information and public input meetings, the project team identified neighborhood contacts to serve on a Noise Advisory Board (NAB). The purpose of the NAB is to involve representatives from each subdivision/community within the project study area. NAB members, who represented a variety of non-governmental and civic organizations, were invited to participate in meetings designed to provide the project team with specific feedback related to noise concerns. NAB representatives were requested to share information with the community at-large.

At the onset of the project, it was determined that members of the NAB were volunteers from subdivisions and neighborhoods that fall within the noise study area boundary. This boundary is a 500-foot buffer outside of the project study area boundary and consists of 49 identified subdivisions and neighborhoods. During the Community Kickoff and Public Input meetings, a station was set up to explain the NAB and its purpose. If a person was interested in serving on the NAB, he or she could express their interest by leaving their name and contact information on the sign-in sheet that was located at the station. Between the two meetings, 17 individuals expressed an interest in being part of this advisory board. Of the 17 individuals, nine live within, or just outside of, the noise study area boundary. Those nine individuals are primarily located near the I-20/26 interchange. The other eight were members of the public that lived slightly farther outside of the noise study area, but expressed interest in noise concerns after attending the meetings.

In order to identify additional potential board members for greater geographic coverage within the noise study area, information was drawn from the public involvement database to determine active participants in the project. Active participants were identified as having attended the Community Kickoff Meeting, Public Input Meeting, and/or submitted a comment via online, email, in-person comment form, or hotline voicemail. Approximately 230 individuals were identified, with an approximately 54 of them being located within or just outside of the noise study area boundary.

Following the identification of potential members, a letter/postcard was distributed with information regarding the NAB, the anticipated commitment, and a request for an alternative candidate if they were uninterested. Social media outlets were used to solicit participation as well. Content was posted on Facebook, Twitter and

3. Existing Conditions and Environmental Consequences

Instagram requesting that interested parties contact the project hotline or project email with their information and interest in volunteering on the NAB.

An initial NAB meeting was held on March 15, 2016 to review the proposed project, the goals and objectives of the NAB, and to provide greater understanding of the noise evaluation process. Meeting materials and minutes from the initial NAB meeting were provided prior to and after, respectively, the NAB meeting. It is important to note, NAB participants were made aware during outreach and meetings that the function of the NAB was not to vote on noise abatement, rather to inform the analysis process. SCDOT follows its Traffic Noise Abatement Policy on every project to determine impacts, and whether abatement is warranted or not. The next NAB meeting was held on January 24, 2019 to review the findings of the detailed noise analysis prior to the issuance of the FEIS. An update on the noise analysis and potential locations of noise barriers was sent out via email to property owners and residents of benefited receptors and posted to the project website on February 5, 2019.

Additionally, it should be noted that questions and comments about the environmental process, and specifically potential noise impacts, led the project team to post a video describing the noise analysis process. This video may be accessed at <http://www.scdotcarolinacrossroads.com/> under "Project Resources".

3. Existing Conditions and Environmental Consequences



This page intentionally left blank.