TRAFFIC NOISE TECHNICAL MEMORANDUM

ADDENDUM #2

For

ADMINISTRATIVE ACTION

ENVIRONMENTAL IMPACT STATEMENT

Gaston East-West Connector (Garden Parkway)
Gaston and Mecklenburg Counties
STIP Project No. U-3321

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1. Project History

In April 2009, a Draft Environmental Impact Statement (Draft EIS) was published for the Gaston East-West Connector project located in Gaston and Mecklenburg counties. A traffic noise study was prepared for all of the Detailed Study Alternatives (DSA) as part of the Draft EIS, as documented in *Traffic Noise Technical Memorandum for Administrative Action Environmental Impact Statement Gaston East-West Connector* (July 2008), referred to here as the *July 2008 Traffic Noise Technical Memorandum*.

Following publication of the Draft EIS, a Preferred Alternative was identified, which was Detailed Study Alternative 9. An addendum to the traffic noise study was prepared for the Preferred Alternative, as documented in *Traffic Noise Technical Memorandum Addendum for Administrative Action Environmental Impact Statement Gaston East-West Connector* (April 29, 2010), referred to here as the *April 2010 Traffic Noise Addendum #1*. The results of the *April 2010 Traffic Noise Addendum #1* are summarized in the Final EIS for the project (December 2010).

Publication of the Record of Decision (ROD) is anticipated in the fall/winter of 2011. This date is after the July 13, 2011 effective date of FHWA's updated noise standard (23 CFR Part 772) and NCDOT's updated *Traffic Noise Abatement Policy* (described below in **Chapter 2**).

2. FHWA Noise Standard and NCDOT Traffic Noise Abatement Policy

The Federal Highway Administration (FHWA) developed *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 CFR Part 772) to provide procedures for noise studies and noise abatement measures to help protect the public's health, welfare and livability, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways approved pursuant to Title 23 of the Code of Federal Regulations (23 CFR). The latest final rule updating 23 CFR Part 772 is effective July 13, 2011. This latest noise standard includes updates to the FHWA Noise Abatement Criteria (NAC) Activity Categories, which are presented in **Table 1**. The FHWA also updated their noise guidance document, titled *Highway Traffic Noise: Analysis and Abatement Guidance* (January 2011).

The FHWA noise standard calls for each state highway agency to develop their own set of guidelines that satisfy the requirements of 23 CFR 772. The NCDOT revised its year 2004 *Traffic Noise Abatement Policy* to comply with these federal requirements. The adopted policy becomes effective July 13, 2011, and is included as **Appendix A**.

In accordance with the standards and policies, noise abatement measures must be considered when future noise levels either approach or exceed the Activity Category criteria levels, or if there are substantial increases over the ambient noise levels. NCDOT definitions for "substantial increases" are presented in **Table 2**. These definitions have not changed between the 2004 and 2011 versions of the NCDOT *Traffic Noise Abatement Policy*.

Table 1. FHWA Noise Abatement Criteria

Activity Category	Activity Criteria[1] Leq (h)[2]	Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67 (exterior)	Residential.
C[3]	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (interior)	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[3]	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

Source: 23 CFR Part 772.11

1. The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
2. The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq.
3. Includes undeveloped lands permitted for this activity category. Permitted means "a definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of a building permit." (23 CFR 772.5)

Table 2. NCDOT Definition of Substantial Increase in Noise Levels

Existing Average Noise Level dBA Leq(hour)	Increase (in decibels) from Existing Noise Levels to Future Noise Levels Defined as a Substantial Increase
≤ 50	15 or more
51	14 or more
52	13 or more
53	12 or more
54	11 or more
≥ 55	10 or more

Source: NCDOT *Traffic Noise Abatement Policy*, 2011.

The feasibility and reasonableness criteria included in the 2011 *NCDOT Traffic Noise Abatement Policy* are reproduced below:

Feasibility

The combination of acoustical and engineering factors considered in the evaluation of a noise abatement measure.

(a) Any receptor that receives a minimum noise level reduction of five dB(A) due to noise abatement measures shall be considered a benefited receptor. Noise reduction of five dB(A) must be achieved for at least one impacted receptor.

(b) Engineering feasibility of the noise abatement measure(s) shall consider adverse impacts created by or upon property access, drainage, topography, utilities, safety, and maintenance requirements.

Reasonableness

The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure.

(a) Viewpoints of the property owners and residents of all benefited receptors shall be solicited. One owner ballot and one resident ballot shall be solicited for each benefited receptor. Points per ballot shall be distributed in the following weighted manner:

- 3 points/ballot for benefited front row property owners
- 1 point/ballot for all other benefited property owners
- 1 point/ballot vote for all residents

Consideration of the noise abatement measure will continue unless a simple majority of all distributed points are returned that indicates the balloted voters do not want the abatement measure.

(b) The maximum allowable base quantity of noise walls and/or earthen berms per benefited receptor shall not exceed 2,500 ft^2 and 7,000 yd^3, respectively. Additionally, an incremental increase of 35 ft^2 for noise walls and 100 yd^3 for earthen berms shall be added to the base quantity per the average increase in dB(A) between existing and predicted exterior noise levels of all impacted receptors within each noise sensitive area, which is defined as a group of receptors that are exposed to similar noise sources. A base dollar value of $37,500 plus an incremental increase of $525 (as defined above) shall be used to determine reasonableness of buffer zones and noise insulation.

(c) A noise reduction design goal of at least 7 dB(A) must be evaluated for all front row receptors. At least one benefited front row receptor must achieve the noise reduction design goal of 7 dB(A) to indicate the noise abatement measure effectively reduces traffic noise.

The *2011 NCDOT Traffic Noise Abatement Policy* also adopts a concept called Quantity Averaging when considering the reasonableness of noise abatement measures. The policy states:

> NCDOT will utilize abatement measure quantity averaging among all noise sensitive areas within the same Activity Category in Table 1 that are exposed to a common noise environment, i.e., similar noise sources and levels, traffic volumes, traffic mix, speed and topographic features, if:
>
> (a) No single common noise environment exceeds two times the base quantity reasonableness criteria (2,500 sf); and,
>
> (b) Collectively, all common noise environments being averaged do not exceed the base quantity reasonableness criteria.

3. Purpose of Addendum #2

The purpose of this *Traffic Noise Technical Memorandum Addendum #2* is to evaluate the noise analyses completed to date in light of the new 2011 FHWA standard and 2011 NCDOT *Traffic Noise Abatement Policy* and to determine if changes in the standard and policy would affect the decision on the Preferred Alternative. The Preferred Alternative is shown in **Figure 1**.

The following steps were completed, as summarized in this addendum.

- Review land use classifications (activity categories) of the receptors in the Preferred Alternative corridor and update as applicable.
    - Note: Most receptors are residential, and remain as Activity Category B. All six businesses previously labeled as Category C are now Category F. There is one church (Broomfield United Methodist) and two sports areas (Garrison Stables and Duke Power/Belmont Optimist Club Recreation Fields) now Category C.
- Review the receptor locations labeled as "undeveloped" lots, and update permitting status as applicable.
    - Note: No lots previously identified as "undeveloped" have been issued a building permit.
- Update information found in Final EIS Table 2-7 (2035 Noise Contours and Impact Summary – Preferred Alternative) for the Preferred Alternative with the new Activity Categories.
- Update information found in Final EIS Table 2-8 (Preliminary Feasible and Reasonable Noise Barriers for the Preferred Alternative) based on a reevaluation of detailed noise model results considering the 2011 NCDOT *Traffic Noise Abatement Policy* feasibility criteria (a) and (b), reasonableness criteria (b) and (c) and, where applicable, quantity averaging. Feasibility criterion (b) is considered on a general basis in this evaluation. More detailed evaluation of feasibility criterion (b) will be conducted during the Final Design Noise Study when drainage plans, utilities, and other detailed information from the final design becomes available. Reasonableness criterion (a), which deals with viewpoints of benefited receptors, will be considered during the Final Design Noise Study. The detailed noise model results were developed as documented in the previous noise studies using FHWA's Traffic Noise Model® (TNM), Version 2.5.

- Identify land uses or activities that may be affected by noise from construction of the project, as specified in the 2011 NCDOT *Traffic Noise Abatement Policy*.
- Determine if updated traffic noise analysis results would affect the decision on the Preferred Alternative.

Additionally, a Final Design Noise Study is planned to be completed for the final design of the Selected Alternative. The ROD will include the following project commitment that is also included in the Final EIS: "A Design Noise Study will be prepared to update the noise analysis based upon the most recent FHWA regulations and NCDOT noise policies, traffic forecasts, and the final design."

4. Updated Activity Categories and Potential Noise Impacts

In the *April 2010 Traffic Noise Addendum #1*, updated 2035 traffic noise contours were developed using TNM. The update was developed due to increased forecasted traffic volumes, changes in typical section, and alignment shifts compared to the traffic noise contours developed in the *July 2008 Traffic Noise Technical Memorandum*. The *April 2010 Traffic Noise Addendum #1* provides details on the methodology used to develop the noise contours.

None of these traffic noise contour modeling parameters changed for this addendum. These 2035 traffic noise contours for the Preferred Alternative are included as **Appendix B**. The 60 dBA Leq contour lines represent the boundary of the noise study area. This area encompasses the receptors that potentially would be impacted by traffic noise exceeding the NAC and/or by substantial increases in noise (as defined by NCDOT).

Appendix C includes the noise contour summary spreadsheets listing the sensitive receptors labeled on the noise contour figures in **Appendix B,** along with the updated Activity Category for each receptor**.** Receptors included in **Appendix C** labeled as 'undeveloped' in the previous traffic noise studies were reviewed in June 2011 using the Gaston County on-line GIS system (www.co.gaston.nc.us) to determine their current building permit status. All of the residential lots previously identified as 'undeveloped' remain 'undeveloped' (i.e. still have no approved building permit) and are reclassified as Activity Category G.

Table 3 shows the maximum extent of the 72 and 67 dBA Leq 2035 peak hour traffic noise level contours for the Preferred Alternative, along with the approximate numbers of potentially impacted receptors based on the 2035 noise contours and the updated Activity Categories. It should be noted when reviewing this table that the right-of-way width of a typical section for the Preferred Alternative is approximately 280 feet, so receptors closer than 140 feet to the roadway centerline would be taken by the project, and this was accounted for in reporting potential impacts. The values in **Table 3** were used as a screening tool to compare Detailed Study Alternatives.

As shown in **Table 3**, there are approximately 275 Category B receptors (residences) potentially impacted by project-generated traffic noise, and six Category C receptors (one church, one equestrian stable, and the Belmont Optimist Club recreation fields (privately owned and equivalent to 4 receptors)). Undeveloped residential lots are listed in **Appendix C**, but were not included in the totals presented in **Table 3**.

Table 3. 2035 Noise Contours and Impact Summary for the Preferred Alternative

Mainline Segment	Leq Noise Levels (dBA)[1]			Maximum Contour Distances (ft)[2]		Approximate Number of Potentially Impacted Receptors By Activity Category[3]				
	50 ft	100 ft	200 ft	72 dBA	67 dBA	A	B	C	E	F
I-85 to US 29-74	75	72	67	130	245	0	45	1[4]	0	0
US 29-74 to Linwood Rd	76	73	69	150	270	0	11	0	0	0
Linwood Rd to US 321	75	72	68	140	260	0	52	0	0	0
US 321 to Robinson Rd	77	74	70	170	290	0	38	1[5]	0	0
Robinson Rd to NC 274	78	75	71	190	305	0	30	0	0	0
NC 274 to NC 279	77	74	70	180	300	0	6	0	0	0
NC 279 to NC 273	78	76	71	215	330	0	51	0	0	0
NC 273 to Dixie River Rd	80	77	73	260	400	0	41	4[6]	0	0
Dixie River Rd to I-485	80	77	73	260	390	0	1	0	0	0
East of I-485	76	73	68	145	260	0	0	0	0	0
					TOTALS	0	275	6	0	0

1 – Distance from center of nearest travel lanes.
2 – Distance from the roadway centerline.
3 – Definitions of Activity Categories are provided in Table 1.
4 – Broomfield United Methodist Church, Shannon Bradley Rd, Gastonia
5 – Garrison Stables at 4177 Gordon Rd, Gastonia
6 – Duke Power/Optimist Club Sports Fields (privately owned), Boat Club Rd, Belmont. Equal to 4 equivalent receptors.

There are some small differences in the numbers of impacted receptors reported in **Table 3** compared to Final EIS Table 2-7 - 2035 Noise Contours and Impact Summary – Preferred Alternative. Final EIS Table 2-7 lists 279 potentially impacted Category B receptors and four potentially impacted Category C receptors. The differences are as follows:

- One church (Receptor W426) reclassified from Category B to Category C under the new FHWA noise standards.
- Receptor E229 (Category B) determined to be within right of way, so removed from the total count in **Table 3**.
- The Duke Power/Belmont Optimist Club receptors (E410 and E411) reclassified from Category B to Category C and counted as four equivalent receptors. In Final EIS Table 2-7, they were incorrectly counted as a total of 2 receptors.
- Three businesses previously counted in Category C (W268, M212/213, and E78) are industrial uses and were reclassified as Category F.

As discussed in the *July 2008 Traffic Noise Technical Memorandum* and the *April 2010 Traffic Noise Addendum #1,* the information in **Table 3** should assist local authorities in exercising land use control over the remaining undeveloped lands adjacent to the roadway within the local jurisdiction. For example, with proper information on noise, the local authorities can prevent further development of incompatible activities and land uses with the predicted noise levels of an adjacent highway.

If other Detailed Study Alternatives were updated with new Activity Categories for nearby receptors, noise contours based on updated 2035 traffic forecasts, and a refined preliminary design, the results would be similar and relative comparisons between the alternatives would not appreciably change. Almost all of the potentially impacted noise-sensitive receptors along the Detailed Study Alternatives are residences, with scattered other land uses. The Activity Category for residences (Activity Category B) did not change with the updates to the FHWA standards. Therefore changes in total counts of potentially impacted receptors due to changes in the definitions of Activity Categories would be small and similar for each DSA and would involve reclassification of non-residential uses, of which there are few in any of the DSAs.

The 2035 forecast volumes along the Gaston East-West Connector Preferred Alternative were updated from 2030 based on the use of a different version of the Metrolina Regional Model (Version MRM06v1.1), updated socio-economic data, and the additional five years of traffic growth. The 2035 volumes are projected to be higher than the previously forecasted 2030 toll scenario volumes. The new model version, socio-economic data and additional five years of growth would be the same regardless of which DSA was selected as the Preferred Alternative. Therefore, changes in forecasted volumes from 2030 to 2035 would be the same for each DSA. Any resulting changes in noise contours would be the same for each DSA, which keeps the relative differences between the DSAs generally constant.

In addition, as stated in the Final EIS Section 2.2 – Reasons for Selecting DSA 9 as the Preferred Alternative, it is expected that design refinements for each DSA would be similar to those incorporated into the Preferred Alternative (see Final EIS Section 2.3.1), particularly since various corridor segments are common to multiple DSAs. For example, all DSAs would include the same 20-foot median reduction and revised typical section, all DSAs would eliminate the Bud Wilson Road interchange, and all DSAs would have included various modifications to avoid and reduce impacts similar to those applied to the Preferred Alternative.

5. Reevaluation of Detailed TNM Model Results

The noise sensitive receptors predicted to be potentially impacted based on the 2035 traffic noise contours (along the Preferred Alternative (DSA 9) that were not considered isolated sites (generally areas with three or less receptors) were modeled in detail using FHWA's most recent traffic noise model, Traffic Noise Model® (TNM), Version 2.5, released 2004, and the refined preliminary design for the Preferred Alternative. The results are documented in the *July 2008 Traffic Noise Technical Memorandum,* with updates documented in the *April 2010 Traffic Noise Addendum #1.*

The areas where detailed TNM models were developed are called Barrier Evaluation Areas (BEAs). The BEAs along the Preferred Alternative are shown in **Figure 2(a-b)**. They include BEAs 1, 4, 7, 12, 17, 20, 22, 22A, 24, 27, 29, 31, and 33. Where the detailed TNM models indicated there would be receptors impacted by future traffic noise, noise barriers were

developed. Barriers were optimized in locations, heights, and lengths to achieve as much or more than the noise reduction requirements and goals for as many receptors as practicable.

The reasonableness of barriers within each BEA was originally evaluated using the criteria in the 2004 NCDOT *Traffic Noise Abatement Policy*. The reasonableness criteria have been updated in the 2011 NCDOT *Traffic Noise Abatement Policy*. The outputs of the detailed TNM models for each BEA are reevaluated in this *Addendum #2* using the new reasonableness criteria (b) and (c), and where applicable, quantity averaging (BEAs 12 and 29).

Appendix D includes spreadsheets for each BEA that present the calculations used to determine reasonableness based on the *2011 Traffic Noise Abatement Policy* criteria. **Appendix E** (available electronically only) includes the TNM input and output files.

The reevaluation for each BEA is discussed below. In summary, the updated reevaluation did not result in changes to the preliminary recommendations for feasible and reasonable noise barriers documented in the project's Final EIS (December 2010). **Figure 3(a-b)** shows the barriers reevaluated for each BEA and whether they were determined reasonable or not using the new criteria and the previously prepared TNM model output and the preliminary design. Note that in the discussions below, the term "noise impact" refers to receptors that would experience predicted noise levels that approach or exceed the NAC or that would experience a substantial increase in noise levels compared to existing noise levels (as defined in **Table 2**). Also, although undeveloped lots are mentioned where they occur, they were not included in the calculations of reasonableness for any noise barrier. Additional details regarding the model results for each preliminarily feasible and reasonable barrier are also provided in **Chapter 6** of this document.

Barrier Evaluation Area 1

This area is located along Corridor Segment H2A between I-85 and US 29-74. The alignment passes between Colebrook Road on the west and Belfast Drive on the east. Modeled receptors include rows of existing single-family houses in the subdivisions west of Shannon Bradley Road and also the Broomfield United Methodist Church. Only one modeled receptor (W249 – 601 Colebrook Dr) is currently an undeveloped lot.

The detailed three-dimensional TNM model showed that receptors to the west of the mainline along Colebrook Road would not experience noise impacts. Therefore, a barrier was not modeled for the west side of the mainline.

For the receptors to the east, a barrier was found to be preliminarily feasible and reasonable along the east side of the mainline (Barrier 1-1). **Figure 4** shows Barrier 1-1. This optimized barrier is 2,640 feet long and 12 feet high.

Barrier Evaluation Area 4

This area is located along Corridor Segment H3 in the Lakewood subdivision south of existing Linwood Road and east of the mainline. Modeled receptors in this BEA are located on roads that include Castle Hill Road, Penn Circle, and Lakewood Drive. Three of the sixteen modeled receptors are on undeveloped residential lots (W6 – Lakewood Drive, W7 – Providence Drive, and W12 – Castle Hill Road).

A barrier was found to be preliminarily feasible and reasonable for this BEA (Barrier 4-1), excluding the three undeveloped parcels. Barrier 4-1 is shown in **Figure 5.** This optimized barrier is 1,605 feet long and 20 feet high.

Barrier Evaluation Area 7

This area is located along Corridor Segment H3 well south of Linwood Road. The 26 modeled receptors are spread out east and west of the mainline, in the Stablegate Farms area west of Davis Road. Modeled receptors are existing homes located on Grassy Court, Cricket Lane, Skyland Drive, Penny Park Drive, and Stablegate Drive. Of the 26 modeled receptors, two are undeveloped residential parcels; Receptor W74 – 3030 Stablegate Drive, and Receptor W354 – 2433 Cricket Lane.

There were five clusters of homes in this BEA. From north to south, the first cluster is receptors W59, W427, W60, W61, and W354 on Cricket Lane and Grassy Court west of the mainline. The detailed modeled results (without barriers) showed that W59, W60 and W61 would experience noise increases but would not result in noise impacts.

The second cluster consists of eleven homes on Cricket Lane and Skyland Drive east of the mainline (W58, W62-71). An optimized 16-foot barrier 1,500 feet long was determined preliminarily feasible and reasonable for these receptors (Barrier 7-1). Barrier 7-1 is shown in **Figure 6**.

The third cluster consists of two homes north of Penny Park Drive and west of the mainline (W72 and W78). Detailed modeling showed that neither would experience noise impacts.

The fourth cluster consists of four homes on Penny Park Drive east of the mainline (W79-W82). Detailed modeling showed that only one of these homes would experience a noise impact. Since it was an isolated receptor, a barrier was not modeled for this area.

The fifth cluster consists of five homes on Stablegate Drive west of the mainline (W73-77). Detailed modeling showed that none of these homes would experience a noise impact, so no barriers were modeled.

Barrier Evaluation Area 12

This area is located along Corridor Segment J4a north of Crowders Creek Road. The modeled receptors are on both sides of the mainline, located in a subdivision north of Crowders Creek Road on New Haven Drive and in a mobile home park off Crowders Creek Road (Fox Court, Northwestern Drive, Accent Lane, and Angler Way). All modeled receptors are existing residences. There are 29 receptors west of the mainline and 12 receptors east of the mainline.

West of the mainline, the topography provides enough shielding such that there are only two receptors (Receptors M166 and M167 on New Haven Drive) that would be impacted by noise in this area. A 25-foot barrier (Barrier 12-3) was modeled, and was found to be not reasonable because the square footage of barrier per benefited receptor is greater than the allowable square footage.

In the *July 2008 Traffic Noise Technical Memorandum*, two barriers were modeled on the east side of the mainline: Barrier 12-1 and Barrier 12-2. These preliminarily feasible and reasonable barriers were separate because, at the time, New Haven Drive was proposed to be bridged over the mainline and these barriers were located on either side of the grade separation. As a result

of the service road study prepared for the Preferred Alternative (*Gaston East-West Connector Service Road Study*, PBS&J, May 2010), this grade separation was eliminated from the Preferred Alternative refined preliminary design.

For this Addendum #2, the two barriers were joined and TNM was rerun (TNM input and output is included in **Appendix E**). Combined Barrier 12-1&2 along the east side of the mainline was found to be preliminarily feasible and reasonable. This optimized 10-12 foot barrier, which is 2,375 feet long, is shown in **Figure 7**.

The east and west sides of the mainline in BEA 12 also were considered together as a common noise environment in accordance with the new 2011 *NCDOT Traffic Noise Abatement Policy* (**Appendix A**). These two locations were considered to be in a common noise environment because they are part of the same neighborhood along New Haven Drive (with similar residences) that would be split by the proposed project. Both sides of the road would be exposed to similar traffic volumes/mix/speed from the proposed project. Both have similar rolling topography.

According to the quantity averaging criteria included in the 2011 NCDOT *Traffic Noise Abatement Policy* (described in **Chapter 2**), the following criteria shall be considered when evaluating the reasonableness of noise abatement for the common noise environment area:

(a) No single common noise environment exceeds two times the base quantity reasonableness criteria (two times 2,500 sf); and,

(b) Collectively, all common noise environments being averaged do not exceed the base quantity reasonableness criteria.

For BEA 12, the receptors in the area west of the mainline (behind Barrier 12-3) would exceed criterion (a) above, with the square footage per benefited receptor being 20,200 square feet per benefited receptor (compared to a maximum allowable of 5,000 square feet). Therefore, even when considering BEA 12 as a common noise environment, Barrier 12-3 remains not reasonable.

Barrier Evaluation Area 17

This BEA includes several neighborhoods along Corridor Segment (J4a/J4b/J2c/J2d) between US 321 and Robinson Road. These neighborhood areas are described from west to east.

a. Five existing residences in the Charleston neighborhood on April Drive and Plaza Road (M215-219) north of the mainline. Six existing residences in the Amy Acres subdivision on Longbriar Drive (M179-184) north of the mainline as well. A barrier (Barrier 17-1) 12-14 feet high and 1,092 feet long for this neighborhood and Amy Acres was found to be preliminarily feasible and reasonable. The optimized Barrier 17-1 is shown in **Figure 8**.

b. Two existing homes on Benfield Road (M226-M227) north of the mainline and one on Benfield Road south of the mainline (M228). These residences are isolated and not included in a detailed noise model.

c. Twelve existing residences (M232-243, M237-M243) and two undeveloped lots (M231 and M236) in Forbes Cove off Greenpack Parkway north of the mainline. An optimized 10-16 foot high barrier 1,558 feet long was found to be preliminarily feasible and reasonable (Barrier 17-2). This barrier is feasible and reasonable. Barrier 17-2 is shown in **Figure 9**.

d. Seven residences in Verde View on Verde View Drive (M229, M248-M254) south of the mainline. The detailed TNM model results indicated these receptors would not experience noise impacts.

e. Six residences off McCarver Road (M244-247, M257-258) north of the mainline. Sixteen existing residences (M259-M264, M266-M274) and one undeveloped residential lot (M265) in the Wesley Acres subdivision on Wesley Drive and Ferncliff Drive north of the mainline. An optimized 10-14 foot high barrier 2,306 feet long for the McCarver Road neighborhood and Wesley Acres was found to be preliminarily feasible and reasonable (Barrier 17-3). Barrier 17-3 is shown in **Figure 10**.

f. Twenty-two residences in the Pam Drive neighborhood on Pam Drive (M3-23, M159) south of the mainline. An optimized barrier 10-14 feet high and 1,950 feet long was found to be preliminarily feasible and reasonable (Barrier 17-4). Barrier 17-4 is shown in **Figure 11**.

Barrier Evaluation Area 20

This area is located along Corridor Segments J2d-JX4 in the vicinity of Patrick Road. There are three clusters of receptors included in this BEA, as described below.

a. Four existing residences (M42, M44, M161, M162) and one existing business (M157) just west of Patrick Road north of the mainline were modeled. An optimized barrier 24 feet in height was modeled (Barrier 20-2) but was determined not reasonable because the square footage of barrier per benefited receptor is greater than the allowable square footage.

b. Seven existing residences in the White Oaks neighborhood on Dorchester Road south of the mainline were modeled (M79, M80, M86, M87, M89, M90, M91). An optimized barrier 10-16 feet high was modeled (Barrier 20-1) and found to be not reasonable because the square footage of barrier per benefited receptor is greater than the allowable square footage.

c. Six existing residences on Double Oaks Road (M103-106, M160, M298) were modeled. These residences are north of the mainline. None of these receptors would be impacted based on the detailed model.

The receptors behind Barrier 20-1 and Barrier 20-2 were not considered to be in a common noise environment. These areas are not similar to each other, although traffic volumes on the proposed project would be the same in both areas. The existing residences on Patrick Road receive noise from Patrick Road as well as from the proposed project, while the residences on Dorchester Road are farther from Patrick Road. Topography is flatter at the residences on Patrick Road.

Barrier Evaluation Area 22

This area is located along Corridor Segment JX4 in the vicinity of Patrick Road, southeast of BEA 20. Six existing residences/mobile homes were modeled in the Gatewood neighborhood on Gatewood Drive (M126-130, M107).

Based on the detailed model, none of the modeled receptors would be impacted by noise.

Barrier Evaluation Area 22A

This BEA is located along Corridor Segment J1e west of Wilson Farm Road. It includes existing homes in the Forest Point subdivision on Stone Pine Drive and White Cedar Drive (M111-M113, M119-M122, M142-M148) and three undeveloped residential lots (M122, M142, and M163).

Only receptor M111 was predicted to experience noise impacts (substantial increase impact) based on the detailed model, so noise barriers were not modeled.

Barrier Evaluation Area 24

This BEA is located along Corridor Segment K1A on Rufus Ratchford Road. The BEA includes seven residences on either side of Rufus Ratchford Road (E250-254, E257-258) south of the mainline. An optimized 18-foot high barrier (Barrier 24-1) was modeled and found to be not reasonable because the square footage of barrier per benefited receptor is greater than the allowable square footage.

Barrier Evaluation Area 27

This BEA is located along Corridor Segment K3A on either side of South Fork Catawba River, just south of BEA 26. This BEA includes residences on the west and east banks of South Fork Catawba River. On the west bank, existing residences and undeveloped residential lots are located on Lake Wylie Road north of the mainline (Existing E216 and E217) and in the Paradise Point subdivision (riverfront and non-riverfront) on Edgewater Road (Existing: E195, E196-E202, E204-E209, E215, and Undeveloped: E197 and E203) south of the mainline. On the east bank, existing residences and undeveloped residential lots are located on Gaither Road north and south of the mainline (E212 and undeveloped E227 north of the mainline and E213 and E214 south of the mainline).

There were too few developed impacted receptors north of the mainline on the westbound side (two on the west bank and one on the east bank) for a barrier to be reasonable. An optimized barrier modeled south of the mainline on the eastbound side (Barrier 27-1) was 10-18 feet high and was found to be not reasonable because the square footage of barrier per benefited receptor is greater than the allowable square footage.

Barrier Evaluation Area 29

This BEA is located at the project's interchange with NC 273 (Southpoint Road). This BEA includes areas in the northwest, northeast, and southeast quadrants of the interchange. The southwest quadrant contains three isolated receptors (E229-E231) that did not warrant a detailed noise model.

The northwest quadrant of the NC 273 (Southpoint Road) interchange includes 31 existing residences in the Brook Forest subdivision on Brook Forest Drive and South Forest Lane (E79-E98, E101-E106, E413-419) and two undeveloped residential lots (E99 and E100). The area also includes eight additional existing residences on Tucker Road (E420, E421, and E424-429).

The northeast quadrant of the NC 273 (Southpoint Road) interchange includes twelve residences on Boat Club Road (E107-110, E118-122, E354-355, and E382), eight residences on Drennan Horne Drive (E75-77, E347-348, E431, and E436-437), one industrial business on Drennan Horne Drive (E78), and seven residences in the Joye Mobile Home Park on Joye Lane (E111-117).

The southeast quadrant of the NC 273 (Southpoint Road) interchange includes seven existing residences and two undeveloped residential lots in the Wilson/Allen neighborhood on Allison Street and Sunderland Road (Existing: E232-E234, E384, E388-389, E430, and Undeveloped: E235 and E346), four existing residences on Boat Club Road (E236-238, E387), and a private recreation area owned by Duke Power that includes a baseball field (E410 – 2 equivalent receptors) and a recreation field (E411 – 2 equivalent receptors).

Barriers were preliminarily found to be feasible and reasonable in the northwest quadrant (Barrier 29-1), and for the northeast quadrant (Barrier 29-2). Optimized Barrier 29-1, 14-20 feet high and 3,760 feet long, is shown in **Figure 12**, and optimized Barrier 29-2, 18-20 feet high and 2,460 feet long, is shown in **Figure 13**.

For the area east of NC 273 and south of the mainline, an optimized 12-14 foot high barrier (Barrier 29-3) was modeled for the residences on Boat Club Road and the Duke Power recreation fields. The barrier was determined to be not reasonable because the square footage of barrier per benefited receptor is greater than the allowable square footage.

For BEA 29, the northeast and southeast quadrants of the interchange also were evaluated as a common noise environment in accordance with the new 2011 *NCDOT Traffic Noise Abatement Policy* (**Appendix A**). These two locations were considered to be in a common noise environment because both quadrants are part of the same neighborhood along Boat Club Road that would be split by the proposed project. Both quadrants would be exposed to similar traffic volumes/mixes/speeds from the proposed project. Both have similar rolling topography.

According to the quantity averaging criteria included in the 2011 NCDOT *Traffic Noise Abatement Policy* (described in **Chapter 2**), the following criteria must be considered when evaluating the reasonableness of noise abatement for the common noise environment:

(a) No single common noise environment exceeds two times the base quantity reasonableness criteria (two times 2,500 sf); and,
(b) Collectively, all common noise environments being averaged do not exceed the base quantity reasonableness criteria.

The northeast and southeast quadrant areas each meet criterion (a). The square footage per benefited receptor in the northeast quadrant (behind Barrier 29-2) is 2,235 square feet. The square footage per benefited receptor in the southeast quadrant (behind Barrier 29-3) is 3,968 square feet.

However, collectively, the common noise environment does not meet criterion (b). The square footage per benefited receptor for the northeast and southeast quadrants combined is 2,737 square feet, which exceeds the base quantity of 2,500 square feet per benefited receptor.

Therefore, even when considering the southeast quadrant as part of a common noise environment, Barrier 29-3 remains not reasonable.

Barrier Evaluation Area 31

This BEA is located along Corridor Segment K3C on both banks of the Catawba River. On the west bank of the Catawba River are two existing residences (E240, E351) on Oakcrest Trail. East of the Catawba River, on and near the bank, nine existing residences and thirteen undeveloped residential lots were modeled on Tuffy Lane and Lochfoot Drive (Existing: E2-E5, E7, E8, E13. E14, E25, and Undeveloped: E6, E9, E10, E15-24).

An optimized 14-foot high barrier (Barrier 31-1) was modeled for impacted receptors north of the mainline on the west bank. This barrier was found to be not reasonable because there were only two receptors (E240 and E351) and consequently the square footage of barrier per benefited receptor is greater than the allowable square footage.

An optimized 14-foot high barrier (Barrier 31-2) was modeled for the receptors east of the Catawba River and found to be not reasonable.

Barrier Evaluation Area 33

This BEA is located south of the mainline just west of I-485. This BEA includes 20 residences in the Garrison Road community south of the mainline (E28-33, E58-62, E65, E66, E422, E432-E435, E438, and E439).

The detailed noise model results showed that only one receptor (E422) would be impacted by noise. Therefore, no noise barrier was modeled in BEA 33.

6. Preliminary Noise Barriers for the Preferred Alternative

Ten barriers (Barrier 12-1 was combined with Barrier 12-2) with a total length of 21,245 feet have been identified as preliminarily feasible and reasonable for the Preferred Alternative. These barriers are projected to benefit a total of 167 Category B receptors (this count excludes undeveloped lots). In Final EIS Table 2-8 – Preliminary Feasible and Reasonable Noise Barriers for the Preferred Alternative, seven undeveloped lots and an industrial business mistakenly labeled a residence were inadvertently included for a total of 175 benefited receptors. The correct total is 167 benefited receptors. The correct totals of benefited receptors did not change as a result of this noise update.

Table 4 lists the preliminary feasible and reasonable noise barriers for the Preferred Alternative based on the refined preliminary design. **Figure 3(a-b)** shows an overview of the preliminary feasible and reasonable noise barriers, and **Figures 4-13** show details of each noise barrier. The barriers listed in **Table 4** are the noise abatement measures likely to be installed for their corresponding adjacent noise sensitive area. **Figure 3(a-b)** also shows barriers preliminarily determined to be not reasonable. These noise abatement measures are not likely to be installed for their corresponding adjacent noise sensitive area.

The term "likely" does not mean a firm commitment for each noise sensitive area identified. A Design Noise Report will be prepared during final design of the Selected Alternative. The Design Noise Study will include the final design of the Selected Alternative and more detailed evaluation of feasibility and reasonableness. The recommendations included in **Table 4** may change. It is anticipated that both vertical and horizontal alignment adjustments will occur during final design of the Selected Alternative. In addition, more information will be available at the final design stage on drainage designs, utilities, and other elements that will be taken into

account when evaluating feasibility and reasonableness. The final decision on the installation of abatement measures shall be made upon completion of the project design, the public involvement process, concurrence with the NCDOT *Traffic Noise Abatement Policy*, and FHWA approval.

7. Construction Noise

Regarding construction noise, the 2011 NCDOT *Traffic Noise Abatement Policy* specifies that NCDOT shall:

(a) Identify land uses or activities that may be affected by noise from construction of the project.

(b) Determine the measures that are needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community. This determination shall consider the benefits achieved and the overall adverse social, economic, and environmental effects and costs of the abatement measures.

(c) Consider construction techniques and scheduling to reduce construction noise impacts to nearby receptors and incorporate the needed abatement measures in the project plans and specifications.

Construction noise was addressed in the *July 2008 Traffic Noise Technical Memorandum*. This discussion is expanded in this section to address the requirements of the 2011 NCDOT *Traffic Noise Abatement Policy*.

The major construction elements of this project are expected to be earth removal, hauling, grading, bridge construction, and paving. During daytime hours, general construction noise impacts, such as temporary speech interference for passersby and those individuals living or working near the project, can be expected, particularly from paving operations, from the earth moving equipment during grading operations, and from pile driving activities for the bridge crossings. During evening and nighttime hours, steady-state construction noise such as from paving operations may be audible and may cause impacts to activities such as sleep. Sporadic evening and nighttime construction equipment noise such as from backup alarms, lift gate closures ("slamming" of dump truck gates), and very loud construction activities such as pile-drivers and impact hammers, etc, will be perceived as distinctly louder that the steady-state acoustic environment, and may cause impacts in noise-sensitive areas.

For this project, noise-sensitive areas that may experience construction noise that could temporarily interfere with daily activities include the residences in the noise-sensitive Barrier Evaluation Areas shown on **Figure 2(a-b)**. In particular, pile-driving activities at the major bridge crossings over the South Fork Catawba River and Catawba River may impact residents in the low-density residential developments along these rivers.

However, overall, construction noise impacts are expected to be minimal, since the construction noise would be relatively short in duration at any given location. Furthermore, the transmission loss characteristics of surrounding wooded areas and other natural topographic and man-made features are considered sufficient to moderate many of the effects of intrusive construction noise. In localized areas where construction impacts may occur, construction noise control measures can be evaluated for feasibility and cost-effectiveness during the Final Design Noise Study or during construction activities. Potential localized measures that can be evaluated for inclusion in the plans and specifications include, but are not limited to, equipment exhaust muffler

requirements, haul-road locations, elimination of "tail gate banging", ambient-sensitive backup alarms, construction noise complaint mechanisms/procedures, and community communication/outreach.

8. Conclusion Regarding Preferred Alternative

The results of the noise analysis update described in this *Addendum #2* were considered to determine if these results would affect the decision on the Preferred Alternative (DSA 9). As discussed below, the updated results documented in this traffic noise analysis update do not affect the selection of the Preferred Alternative.

The updated results did not substantially change the numbers of potentially impacted receptors, the barriers determined to be preliminarily feasible and reasonable, or the numbers of benefited receptors documented for the Preferred Alternative. As discussed in **Section 4**, the updates to the FHWA Activity Categories and some minor corrections resulted in a change of two in the number of potentially impacted receptors (from 283 receptors in the Final EIS to 281 receptors). The updated reevaluation did not result in changes to the preliminary recommendations for feasible and reasonable noise barriers documented for the Preferred Alternative in the project's Final EIS (December 2010) or in the numbers of benefited receptors (167). Between the Draft EIS and Final EIS, one preliminarily feasible and reasonable noise barrier for DSA 9 was removed from recommendation. This barrier, Barrier 33-1 at the I-485 interchange area, was determined no longer necessary when design refinements shifted the project alignment and interchange ramps northward, which resulted in reduced noise impacts to receptors in BEA 33. This design change would have been incorporated into all DSAs that included Barrier 33-1 (DSAs 4, 9, 22, 27, 58, 68, 76, and 81).

As discussed in **Section 4**, if other Detailed Study Alternatives were updated with new Activity Categories for nearby receptors, noise contours based on updated 2035 traffic forecasts, and a refined preliminary design, the results would be similar and relative comparisons between the alternatives would not appreciably change.

Noise impacts did not play a major role in the selection of the Preferred Alternative. No DSA was eliminated from consideration as a result of noise impacts. Noise-sensitive land uses along all the DSAs are similar, with each DSA passing through rural, low-density residential areas as well as near and through denser suburban housing developments. As discussed in Final EIS Section 2-2 - Reasons for Selecting DSA 9 as the Preferred Alternative, DSA 9 is in the middle range of estimated numbers of receptors impacted by traffic noise when compared with other DSAs.

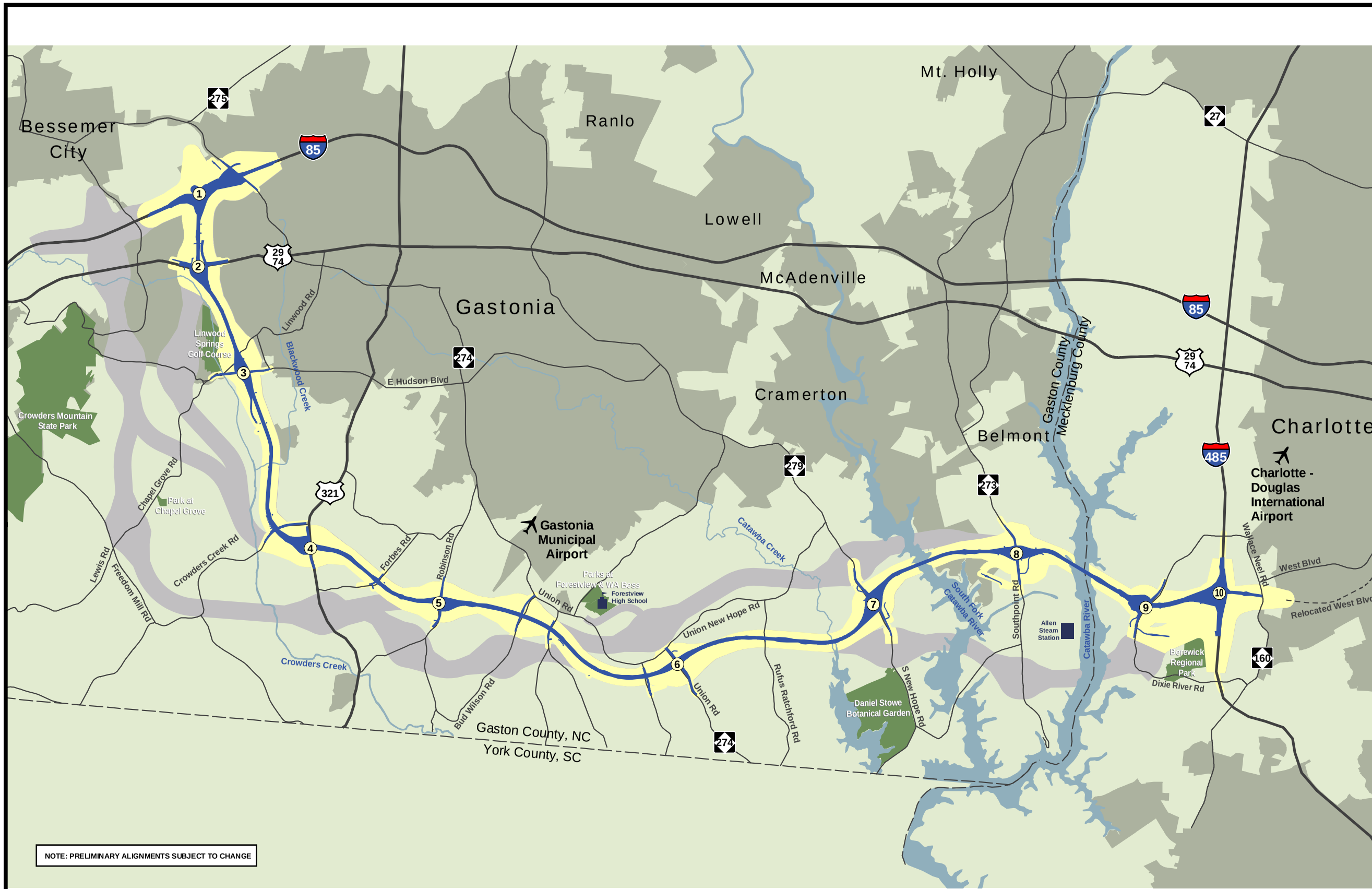
Table 4: Preliminary Feasible and Reasonable Noise Barriers for the Preferred Alternative

Prelim Barriers[2]	Segment	Description	Modeled Receptor #'s	Number of Impacted Receptors in BEA[1]		Average dBA Reduction for Benefited Impacted Receptors[3]	Total # Benefited Receptors	Barrier Length (ft)	Barrier Height (ft)	Barrier Area (sq ft)	Sq Ft Per Receptor / Allowable Sq Ft per Receptor[4]
				Without Barrier	With Barrier						
BEA 1 Barrier 1-1	H2A	North of US29-74, westbound side of the alignment.	W1 to W3, W20 to W51, W426	22	0	9	34	2,640	12	31,680	932/ 3,130
BEA 4 Barrier 4-1	H3	East of Linwood Springs Golf Course, at Linwood Rd, on westbound side of the alignment.	W4-W19	8	0	10	13	1,605	20	32,100	2,469/ 3,130
BEA 7 Barrier 7-1	H3	East of Stable Gate Farms neighborhood, south of Linwood Rd on the westbound side of the alignment.	W58, W62-W71	8	0	8	11	1,500	16	24,000	2,182/ 3,165
BEA 12 Barrier 12-1&2	J4A	North of Crowder's Creek Rd, Falls Estates neighborhood, westbound side of the alignment.	M171, M172-M178, M202-M205	9	0	8	11	2,375	10/12	28,098	2,810/ 3,095
BEA 17 Barrier 17-1	J4A	East of US321, westbound side of the alignment.	M179-M184, M215-M219	4	1	7	8	1,092	12/14	14,984	1,873/ 3,095
BEA 17 Barrier 17-2	J2C	East of US321, westbound side of the alignment.	M230-M243	4	0	8	8	1,558	10/12/ 16/14	21,124	2,641/ 3,200

Table 4: Preliminary Feasible and Reasonable Noise Barriers for the Preferred Alternative

Prelim Barriers[2]	Segment	Description	Modeled Receptor #'s	Number of Impacted Receptors in BEA[1]		Average dBA Reduction for Benefited Impacted Receptors[3]	Total # Benefited Receptors	Barrier Length (ft)	Barrier Height (ft)	Barrier Area (sq ft)	Sq Ft Per Receptor / Allowable Sq Ft per Receptor[4]
				Without Barrier	With Barrier						
BEA 17 Barrier 17-3	J2C	East of US321, westbound side of the alignment.	M247-M274, M286	12	1	7	15	2,306	12/14/ 12/10	26,240	1,749/ 3,165
BEA 17 Barrier 17-4	J2C	West of Robinson Rd, eastbound side of the alignment.	M3-M23, M159	15	0	7	16	1,949	10/12/ 14/12	24,552	1,535/ 3,095
BEA 29 Barrier 29-1	K3A/ K3B	Westbound side of mainline. West of Southpoint Rd. (NC 273)	E79-E106, E413-E421, E424-E429	16	1	6 (8 receptors ≥ 7)	31	3,760	14/16/ 18/20/ 18/16/ 14	59,534	1,920/ 3,165
BEA 29 Barrier 29-2	K3A/ K3B	Westbound side of mainline. East of Southpoint Rd. (NC 273)	E107-E122, E354, E355, E382, E75-E78, E347, E348, E382, E437, E437	23	3	7	20	2,460	20/18	44,892	2,245/ 3,165

1. Excludes undeveloped lots.
2. Barriers also were modeled in the following BEAs but these barriers were determined not reasonable: BEA 12 (Barrier 12-3), BEA 20 (Barriers 20-1 and 20-2), BEA 24 (Barrier 24-1), BEA 27 (Barrier 27-1), BEA 29 (Barrier 29-3), and BEA 31 (Barrier 31-2). Detailed models for BEAs 22A and 33 predicted no impacted receptors in these areas, so evaluation of noise abatement was not required for receptors in these BEAs.
3. All preliminary feasible and reasonable barriers achieve a minimum of 7 dBA reduction for at least one benefited front row receptor.
4. Allowable square footage based on reasonableness criteria in the 2011 NCDOT *Traffic Noise Abatement Policy*



POTENTIAL INTERCHANGE LOCATIONS

1. I-85
2. US 29-74
3. Linwood Road
4. US 321
5. Robinson Road
6. NC 274 (Union Road)
7. NC 279 (S. New Hope Rd)
8. NC 273 (Southpoint Road)
9. Dixie River Road
10. I-485

Legend

- Preferred Alternative Right of Way
- Preferred Alternative Study Corridor
- Other Detailed Study Corridors
- Parks and Recreation Areas
- Municipal Areas
- Rivers and Streams

Source: Gaston County and Mecklenburg County GIS
Map printed June 2011

N

0 0.5 1 Miles

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Gaston County and Mecklenburg County

GASTON EAST-WEST CONNECTOR

PREFERRED ALTERNATIVE DSA 9

Figure 1

NoiseAdd2_Fig1_PreferredAlternativeDSA9.ai AKH 07.06.2011

Note: Noise barriers shown on this map are preliminary. The feasibility and reasonableness of potential noise barriers will be reassessed for the Preferred Alternative during final design.

Legend

- Neighborhood Study Area
- Preferred Alternative Refined Centerline
- SegmentBreaks
- Preferred Alternative Refined DSA Corridor
- West Blvd Realignment (Construction by Others)
- Schools
- County Line
- State Line
- Buildings
- Streets
- Hydrology
- Parks
- Private Recreation Facilities and Attractions
- K3A Segment Name

Source: Gaston County and Mecklenburg County
Map printed July 2011.

0 0.375 0.75
Miles

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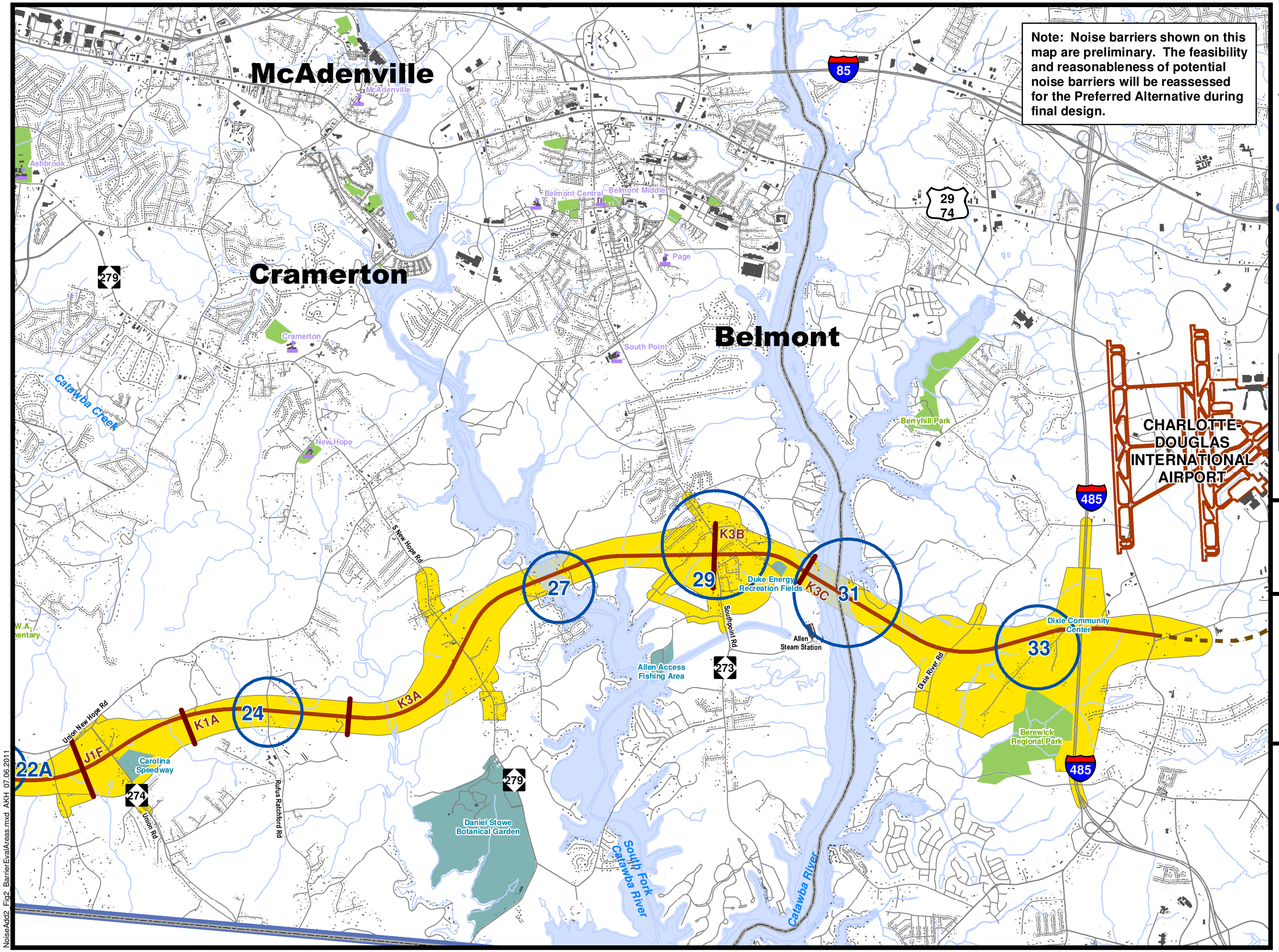
Mecklenburg County

GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREAS

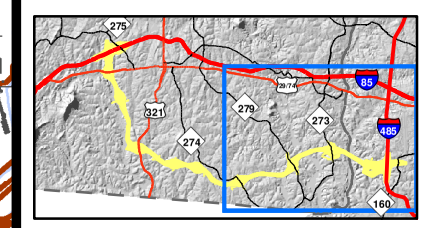
Figure 2a

NoiseAdd2_Fig2_BarrierEvalAreas.mxd AKH 07.06.2011



Legend

- Neighborhood Study Area
- Preferred Alternative Refined Centerline
- SegmentBreaks
- Preferred Alternative Refined DSA Corridor
- West Blvd Realignment (Construction by Others)
- Schools
- County Line
- State Line
- Buildings
- Streets
- Hydrology
- Parks
- Private Recreation Facilities and Attractions
- K3A Segment Name



Source: Gaston County and Mecklenburg County
Map printed July 2011.

N

0 0.375 0.75
Miles

NORTH CAROLINA Turnpike Authority

STIP PROJECT NO. U-3321

Gaston County and Mecklenburg County

GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREAS

Figure 2b

NoiseAdd2_Fig2_BarrierEvalAreas.mxd AKH 07.06.2011

Note: Noise barriers shown on this map are preliminary. The feasibility and reasonableness of potential noise barriers will be reassessed during final design.

BARRIER 1-1
BARRIER 4-1
BARRIER 7-1
BARRIER 12-3
BARRIER 12-1&2
BARRIER 17-1
BARRIER 17-2
BARRIER 17-3
BARRIER 17-4
BARRIER 20-1
BARRIER 20-2

H3
J4A
J4B
J2C
J2D
JX4
J1E
J1F
K1A

Gastonia
Gastonia Municipal Airport
Gaston Country Club
Crowders Mountain Golf Course
Crowders Mountain State Park
Camp Rotary Girl Scout Camp
Linwood Springs Golf Course
Gastonia Municipal Golf Course
Carolina Speedway
Crowders Creek
Catawba Creek
New Haven Dr
Robinson Rd
Union Rd
Union New Hope Rd
Bud Wilson Rd

Legend
- Preliminary Noise Barriers - Reasonable
- Preliminary Noise Barriers - Not Reasonable
- Preferred Alternative Refined Centerline
- Segment Breaks
- Preferred Alternative Refined DSA Corridor
- West Blvd Realignment (Construction by Others)
- Schools
- County Line
- Buildings
- Streets
- Hydrology
- Parks
- Private Recreation Facilities and Attractions
- K3A Segment Name

Source: Gaston County and Mecklenburg County
Map printed July 2011

N

0 0.375 0.75
Miles

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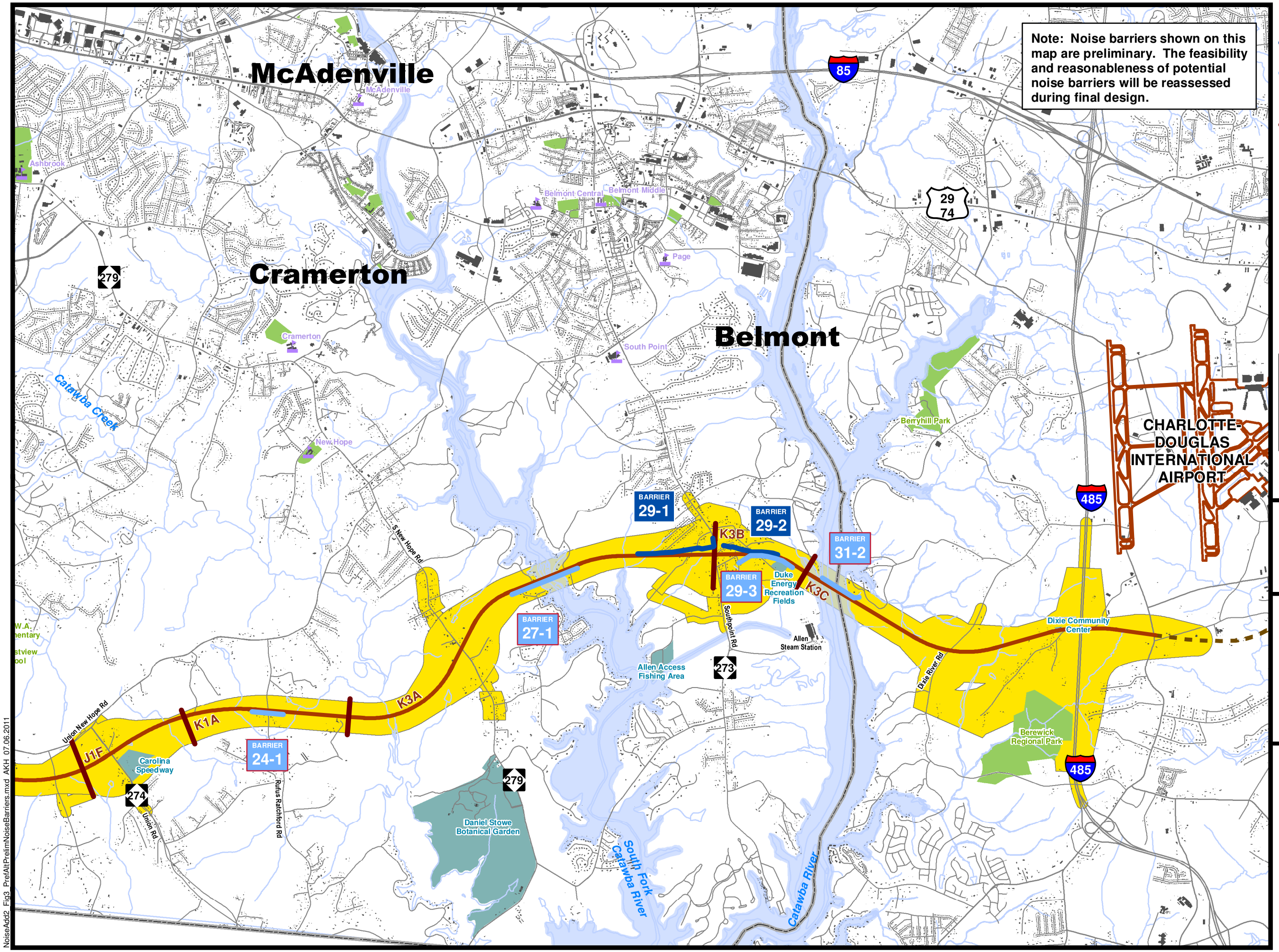
Gaston County and Mecklenburg County

GASTON EAST-WEST CONNECTOR

SELECTED ALTERNATIVE PRELIMINARY NOISE BARRIERS

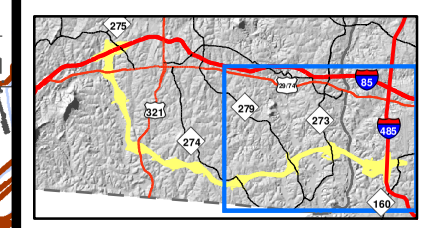
Figure 3a

NoiseAdd2_Fig3_PrefAltPrelimNoiseBarriers.mxd AKH 07.06.2011



Legend

- Preliminary Noise Barriers - Reasonable
- Preliminary Noise Barriers - Not Reasonable
- Preferred Alternative Refined Centerline
- Segment Breaks
- Preferred Alternative Refined DSA Corridor
- West Blvd Realignment (Construction by Others)
- Schools
- County Line
- Buildings
- Streets
- Hydrology
- Parks
- Private Recreation Facilities and Attractions
- K3A Segment Name



Source: Gaston County and Mecklenburg County
Map printed July 2011

N

0 0.375 0.75
Miles

NORTH CAROLINA Turnpike Authority

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Gaston County and Mecklenburg County

GASTON EAST-WEST CONNECTOR

SELECTED ALTERNATIVE PRELIMINARY NOISE BARRIERS

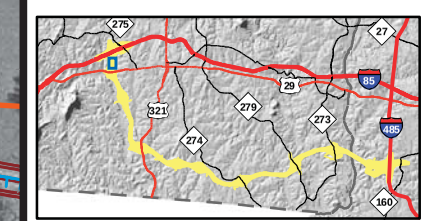
Figure 3b

NoiseAdd2_Fig3_PrefAltPrelimNoiseBarriers.mxd AKH 07.06.2011

Legend

- Benefited Receptor Points
- Receptor Points
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- H2A Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map Printed July 2011.

0 100 200
Feet

NORTH CAROLINA Turnpike Authority

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NO. U-3321

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Mecklenburg County

GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 1-1

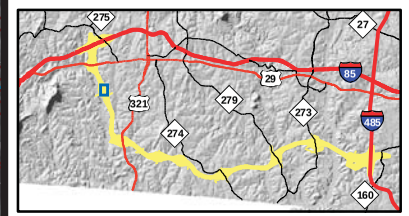
Figure 4

NoiseAdd2_Fig04_Barrier1-1.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.06.2011

Legend

- Benefited Receptor Points
- Receptor Points
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- H3A Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map Printed July 2011.

N
0 100 200
Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and
Mecklenburg County

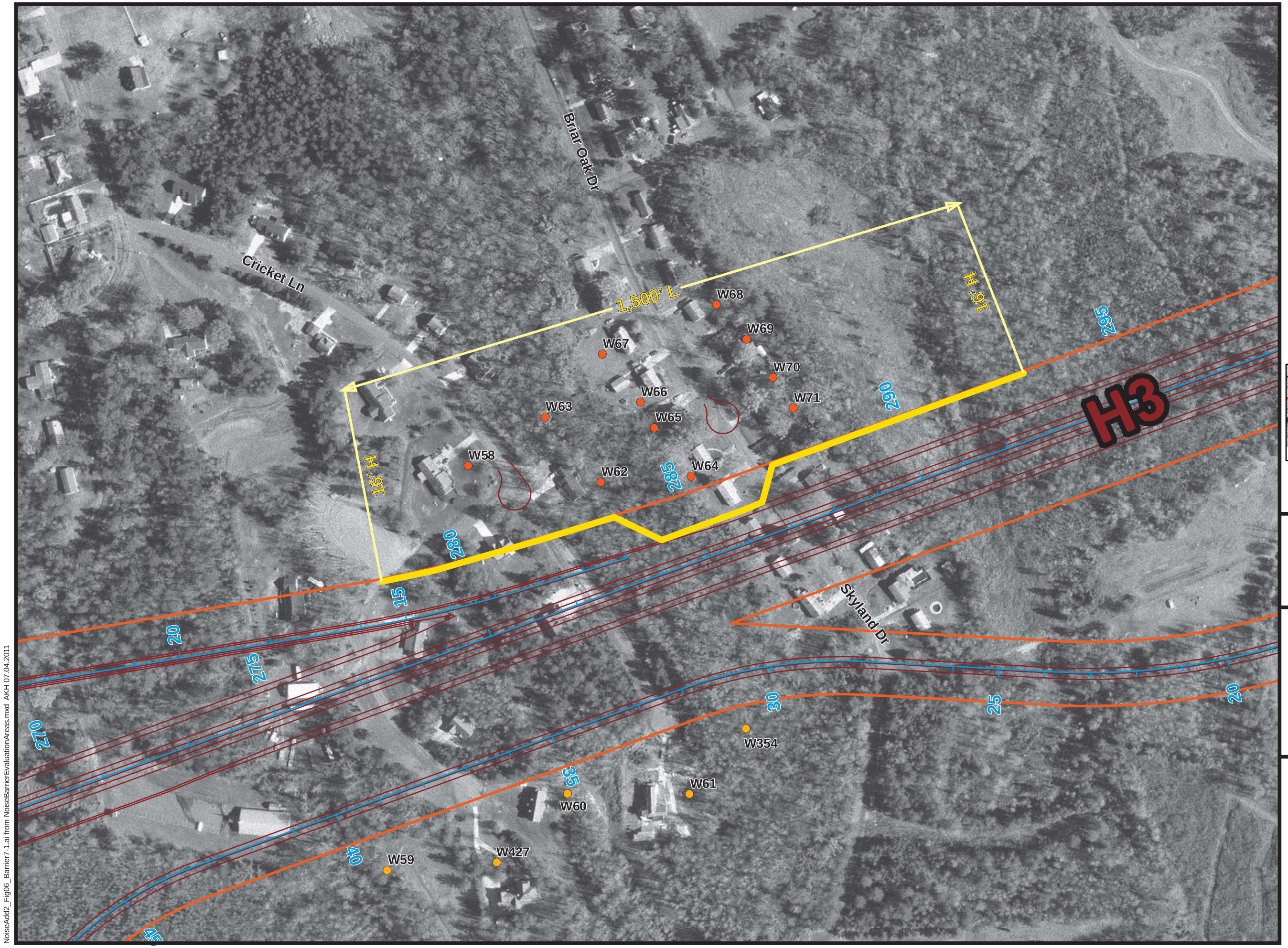
GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 4-1

Figure 5

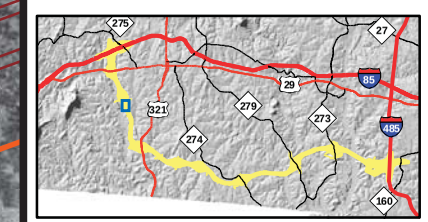
NoiseAdd2_Fig05_Barrier4-1.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.06.2011



Legend

- Benefited Receptor Points
- Receptor Points
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- H3A Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map Printed July 2011.

N 0 100 200 Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and
Mecklenburg County

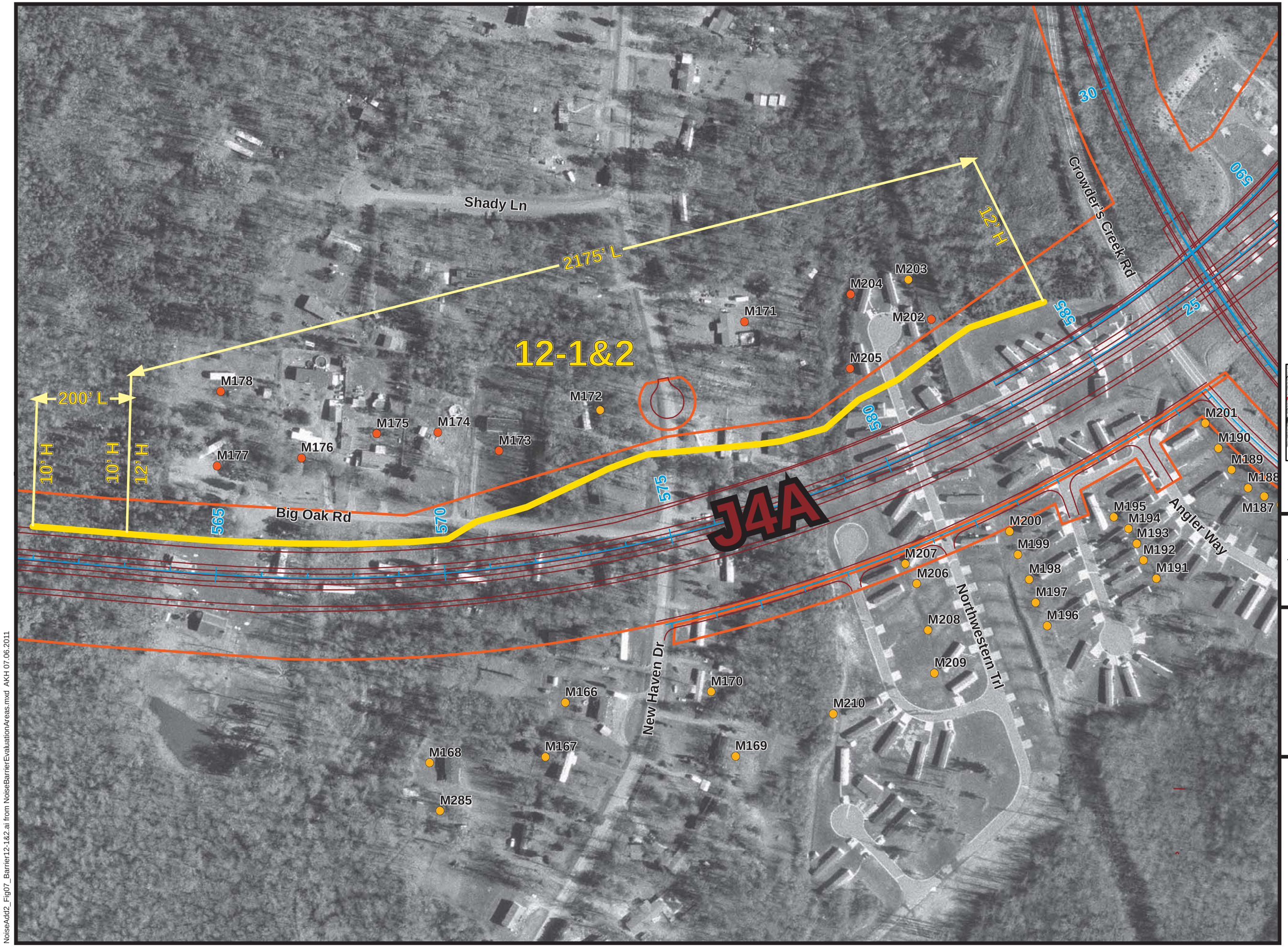
GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 7-1

Figure 6

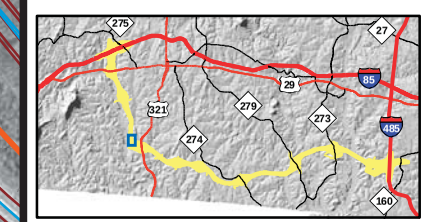
NoiseAdd2_Fig06_Barrier7-1.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.04.2011



Legend

- Benefited Receptor Points
- Receptor Points
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- K&A Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map Printed July 2011.

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NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 12-1&2

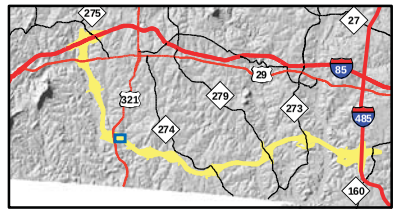
Figure 7

NoiseAdd2_Fig07_Barrier12-1&2.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.06.2011

Legend

- Benefited Receptor Points
- Receptor Points
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- J4A Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map Printed on July 2011.

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NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 17-1

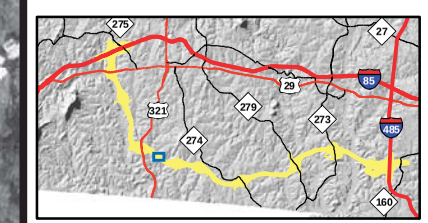
Figure 8

NoiseAdd2_Fig08_Barrier17-1.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.06.2011

Legend

- Benefited Receptor Points
- Receptor Points
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- J2A Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map Printed July 2011.

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NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 17-2

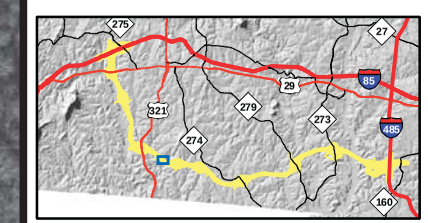
Figure 9

NoiseAdd2_Fig09_Barrier17-2.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.06.2011

Legend

- Benefited Receptor Points
- Receptor Points
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map Printed July 2011.

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NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and
Mecklenburg County

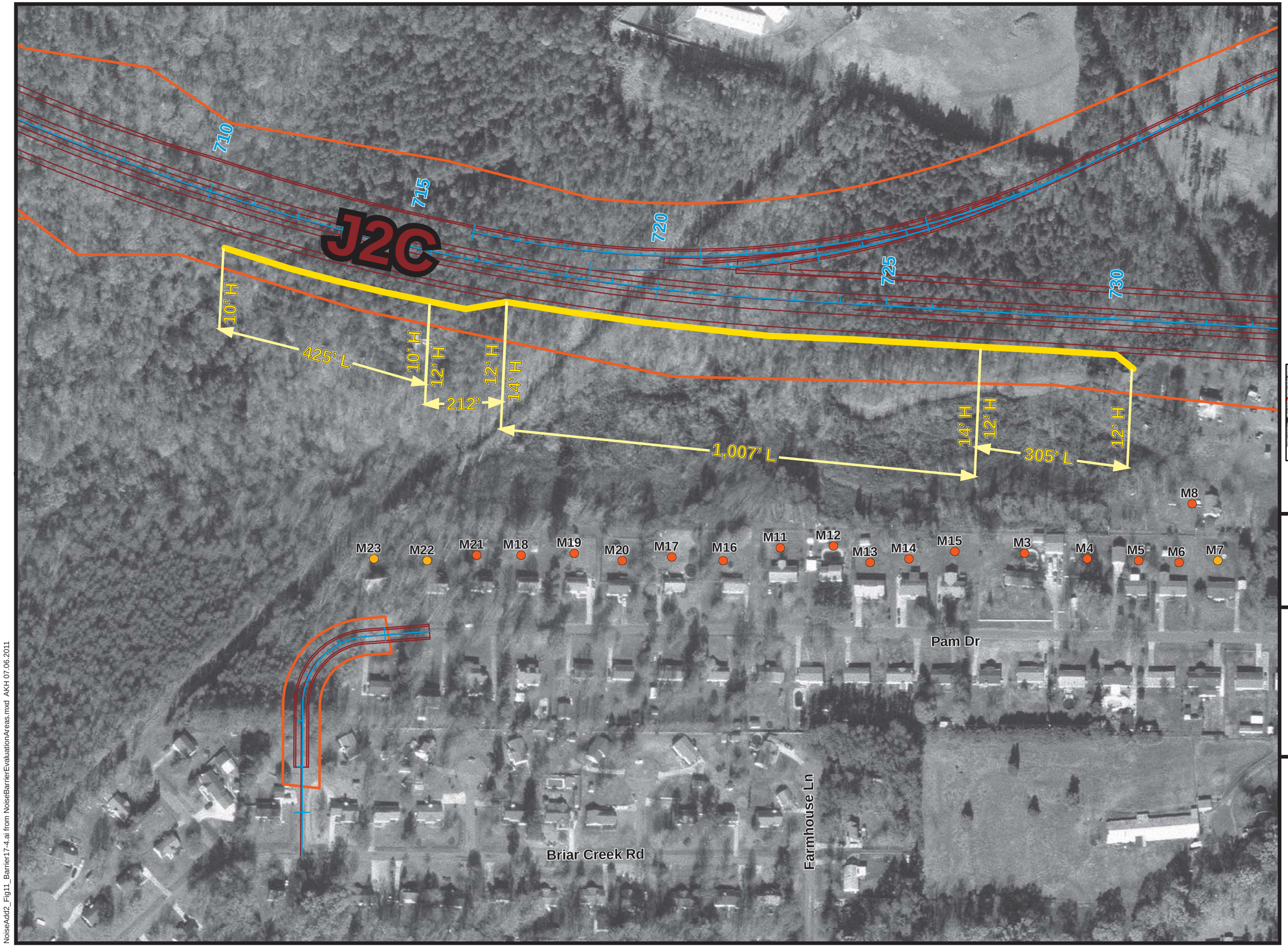
GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 17-3

Figure 10

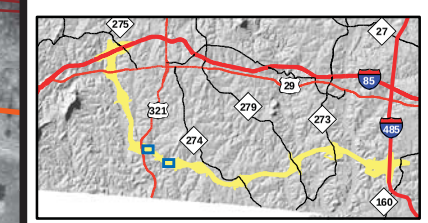
NoiseAdd2_Fig10_Barrier17-3.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.06.2011



Legend

- Benefited Receptor Points
- Receptor Points
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- K3A Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map Printed July 2011.

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NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and
Mecklenburg County

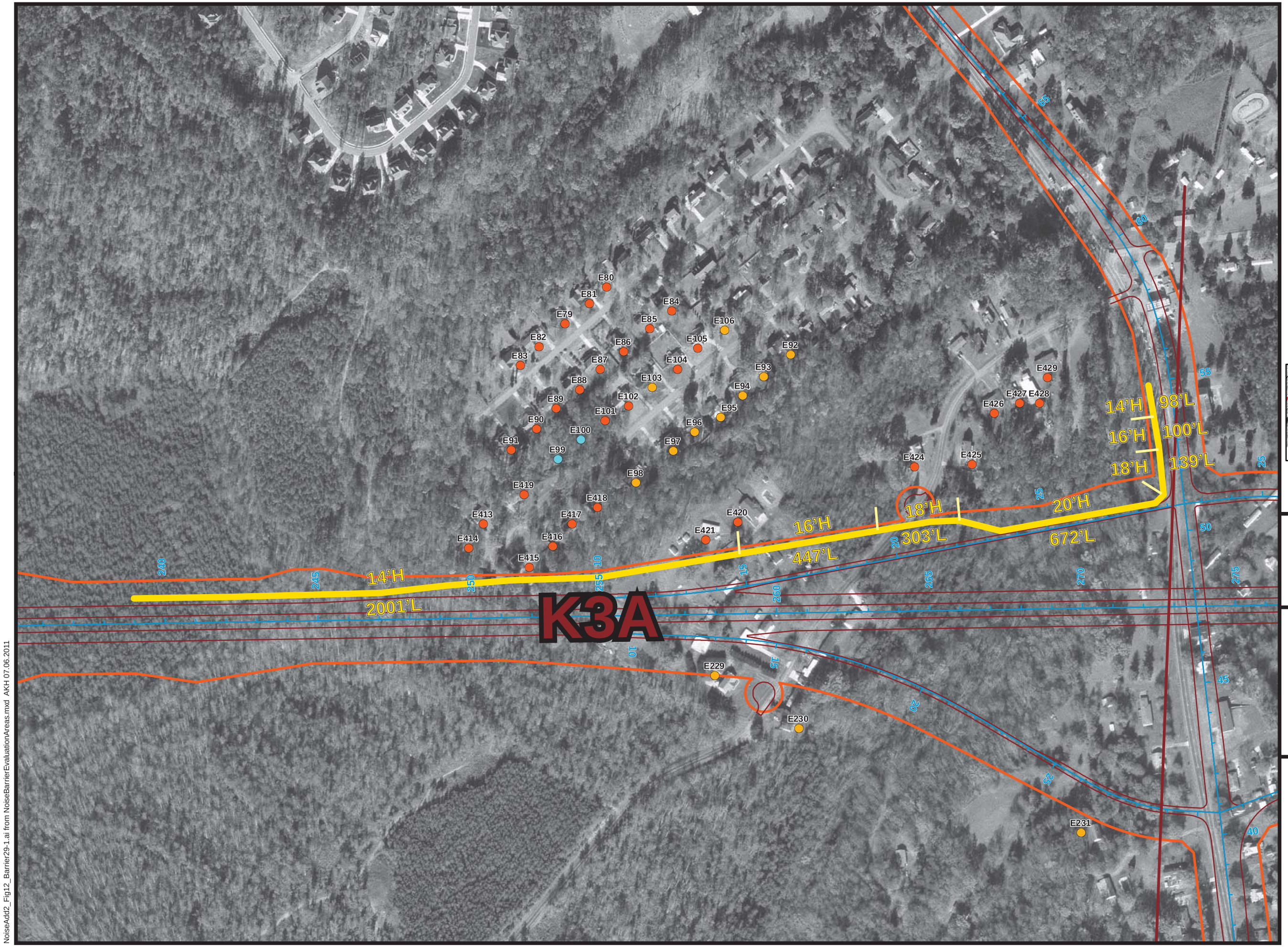
GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 17-4

Figure 11

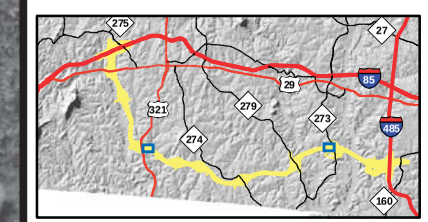
NoiseAdd2_Fig11_Barrier17-4.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.06.2011



Legend

- Benefited Receptor Points
- Receptor Points
- Undeveloped Lots
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- K3A Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map printed July 2011.

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NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 29-1

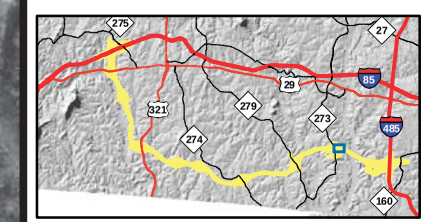
Figure 12

NoiseAdd2_Fig12_Barrier29-1.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.06.2011

Legend

- Benefited Receptor Points
- Receptor Points
- Preferred Alternative Preliminary Noise Barriers
- Preferred Alternative Stationing
- Preferred Alternative Segment Breaks
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- K3A Segment Name

H = Height of barrier segment
L = Length of barrier segment



Source: Gaston County and Mecklenburg County
Map printed July 2011.

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NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

BARRIER EVALUATION AREA

BARRIER 29-2

Figure 13

NoiseAdd2_Fig13_Barrier29-2.ai from NoiseBarrierEvaluationAreas.mxd AKH 07.06.2011

APPENDIX A

2011 NCDOT Traffic Noise Abatement Policy

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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

TRAFFIC NOISE ABATEMENT POLICY

Effective Date: July 13, 2011

Noise Policy Committee:

Jay Bennett, PE.....Roadway Design Unit
Drew Joyner, PE.....Human Environment Unit
Daniel Keel, PE.....NCDOT Operations
Mike Mills, PE.....NCDOT Division 7
Gregory A. Smith, PE.....Human Environment Unit

Technical Resource Team:

Missy Dickens Pair, PE.....Project Development & Environmental Analysis Branch
Ed Lewis.....Human Environment Unit
Joe Rauseo.....Human Environment Unit
Tracy Roberts, AICP.....North Carolina Turnpike Authority
Steve Walker.....Human Environment Unit

Sponsors:

Rob Ayers.....Federal Highway Administration
Felix Davila, PE.....Federal Highway Administration
Mike Fox.....Board of Transportation
Nina Szlosberg-Landis.....Board of Transportation

APPROVED BY:

3/9/2011
Date of Approval

John F. Sullivan, III, PE
Division Administrator
Federal Highway Administration

2/28/2011
Date of Approval

Gene Conti
Secretary of Transportation

2/22/11
Date of Approval

Robert A. Collier, Jr.
Chairman
Board of Transportation

Person Responsible for Policy:

Gregory A. Smith, PE
Traffic Noise & Air Quality Supervisor
Human Environment Unit
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gasmith@ncdot.gov

INTRODUCTION

This document contains the North Carolina Department of Transportation (hereinafter NCDOT) policy on highway traffic noise and construction noise and describes the implementation of the requirements of the Federal Highway Administration (hereinafter FHWA) Noise Standard at 23 Code of Federal Regulations (CFR) Part 772 as they relate to federal and state funded highway construction in North Carolina. This policy was developed by the NCDOT and reviewed and approved by the FHWA.

The North Carolina Department of Transportation Traffic Noise Analysis and Abatement Guidance Manual and 23 CFR 772 are intended to be companion documents to this policy.

PURPOSE

This policy describes the NCDOT process that is used in determining traffic noise impacts and abatement measures and the equitable and cost-effective expenditure of public funds for traffic noise abatement. Where the FHWA has given highway agencies flexibility in implementing the 23 CFR 772 standards, this policy describes the NCDOT approach to implementation.

APPLICABILITY

This policy applies to all "Type I" federal, state or federal-aid highway projects in the State of North Carolina, including federal projects that are administered by local public agencies. NCDOT does not participate in nor fund Type II (retrofit) projects along existing state transportation facilities. Noise analyses are not required for Type III projects. Each of these project types are defined below. This policy shall be applied uniformly and consistently to all Type I federal projects throughout the state.

Type I Project

(a) The construction of a highway on new location; or,

(b) The physical alteration of an existing highway where there is either:
   - (i) Substantial Horizontal Alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition; or,
   - (ii) Substantial Vertical Alteration. A project that removes shielding, therefore exposing the line-of-sight between the receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receptor; or,

(c) The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane; or,

(d) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or,

(e) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,

(f) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,

(g) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.

(h) If a project is determined to be a Type I project under this definition then the entire project area as defined in the environmental document is a Type I project.

Type II Project.

A Federal or Federal-aid highway project for noise abatement on an existing highway. For a Type II project to be eligible for Federal-aid funding, the highway agency must develop and implement a Type II program in accordance with section 772.7(e).

Type III Project

A Federal or Federal-aid highway project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

The highway traffic noise prediction requirements, noise analyses, noise abatement criteria, and requirements for informing local officials in 23 CFR 772 and this policy constitute the noise standards mandated by 23 U.S.C. 109(1). All highway projects which are developed in conformance with this policy shall be deemed to be in accordance with the FHWA noise standards.

Projects let for construction on or after July 13, 2011 shall be reviewed under the criteria of this policy; however, the original date of public knowledge shall remain unchanged.

DATE OF PUBLIC KNOWLEDGE

The Date of Public Knowledge of the location and potential noise impacts of a proposed highway project is the approval date of the final environmental document, e.g., Categorical Exclusion (CE), State or Federal Finding of No Significant Impact (FONSI) or State or Federal Record of Decision (ROD).

After this date, the federal and state governments are no longer responsible for providing noise abatement measures for new development within the noise impact area of the proposed highway project. It is the responsibility of local governments and private landowners to ensure that noise-compatible designs are used for development permitted after the Date of Public Knowledge.

This policy applies only to developed land and to undeveloped land for which development is permitted before the project Date of Public Knowledge. The criteria (trigger date) for determining when undeveloped land is permitted for development is the approval date of a building permit for an individual lot or site.

TRAFFIC NOISE PREDICTION

All traffic noise analyses performed by or for NCDOT must utilize the most current version of the FHWA Traffic Noise Model (TNM®) or any other model determined by the FHWA to be consistent with the methodology of the TNM® model, pursuant to 23 CFR 772.9.

Average pavement type shall be used in the FHWA TNM® for future noise level prediction.

Noise contour lines may be used for project alternative screening or for land use planning, but shall not be used for determining highway traffic noise impacts.

Traffic characteristics that would yield the loudest hourly equivalent traffic noise levels for the design year shall be used in predicting noise levels and assessing noise impacts.

Traffic noise prediction must adhere to all methodologies detailed in the NCDOT Traffic Noise Analysis and Abatement Guidance Manual.

NOISE IMPACT DETERMINATION

Traffic noise abatement for NCDOT highway projects is warranted and must be considered when traffic noise impacts are created by either of the following two conditions:

(a) The predicted traffic noise levels for the Design Year approach (reach one decibel less than) or exceed the Noise Abatement Criteria (NAC) contained in 23 CFR 772 and in Table 1, found on page 4 of this policy, OR

(b) The predicted traffic noise levels for the Design Year substantially exceed existing noise levels as defined in Table 2, found on page 5 of this policy.

A receptor is a discrete or representative location of a noise sensitive area(s) for any of the land uses listed in Table 1. For multifamily dwellings, each residence shall be counted as one receptor when determining impacted and benefited receptors.

Primary consideration shall be given to exterior areas where frequent human use occurs in the determination of traffic noise impacts.

A traffic noise analysis shall be completed for each project alternative under detailed study and for each Activity Category listed in Table 1 that is present in the study area.

Table 1

Noise Abatement Criteria

Hourly Equivalent A-Weighted Sound Level (decibels (dB(A))

Activity Category	Activity Criteria[1] Leq(h)[2]	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B [3]	67	Exterior	Residential
C [3]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section4(f) sites, schools, television studios, trails, and trail crossings
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E [3]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	--	--	Undeveloped lands that are not permitted

1 The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

2 The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq.

3 Includes undeveloped lands permitted for this activity category.

Table 2	
Substantial Noise Level Increase Hourly Equivalent A-Weighted Sound Level (decibels (dB(A))	
Existing Noise Level[1] (Leq(h))	**Predicted Design Year Noise Level Increase[2] (Leq(h))**
50 or less	15 or more
51	14 or more
52	13 or more
53	12 or more
54	11 or more
55 or more	10 or more

1 Loudest hourly equivalent noise level from the combination of natural and mechanical sources and human activity usually present in a particular area.

2 Predicted hourly equivalent Design Year traffic noise level minus existing noise level.

ANALYSIS OF NOISE ABATEMENT MEASURES

When traffic noise impacts are identified and noise abatement is warranted, noise abatement measures shall be considered and evaluated for feasibility and reasonableness. All of the following conditions must be met in order for noise abatement to be justified and incorporated into project design, as applicable. Failure to achieve any single element of feasibility or reasonableness will result in the noise abatement measure being deemed not feasible or not reasonable, whichever applies.

Feasibility

The combination of acoustical and engineering factors considered in the evaluation of a noise abatement measure.

(a) Any receptor that receives a minimum noise level reduction of five dB(A) due to noise abatement measures shall be considered a benefited receptor. Noise reduction of five dB(A) must be achieved for at least one impacted receptor.

(b) Engineering feasibility of the noise abatement measure(s) shall consider adverse impacts created by or upon property access, drainage, topography, utilities, safety, and maintenance requirements.

Reasonableness

The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure.

(a) Viewpoints of the property owners and residents of all benefited receptors shall be solicited. One owner ballot and one resident ballot shall be solicited for each benefited receptor. Points per ballot shall be distributed in the following weighted manner:

- 3 points/ballot for benefited front row property owners
- 1 point/ballot for all other benefited property owners
- 1 point/ballot vote for all residents

Consideration of the noise abatement measure will continue unless a simple majority of all distributed points are returned that indicates the balloted voters do not want the abatement measure.

(b) The maximum allowable base quantity of noise walls and/or earthen berms per benefited receptor shall not exceed 2,500 ft^2 and 7,000 yd^3, respectively. Additionally, an incremental increase of 35 ft^2 for noise walls and 100 yd^3 for earthen berms shall be added to the base quantity per the average increase in dB(A) between existing and predicted exterior noise levels of all impacted receptors within each noise sensitive area, which is defined as a group of receptors that are exposed to similar noise sources. A base dollar value of $37,500 plus an incremental increase of $525 (as defined above) shall be used to determine reasonableness of buffer zones and noise insulation.

(c) A noise reduction design goal of at least 7 dB(A) must be evaluated for all front row receptors. At least one benefited front row receptor must achieve the noise reduction design goal of 7 dB(A) to indicate the noise abatement measure effectively reduces traffic noise.

Other Considerations

Prior to CE approval or issuance of a FONSI or ROD, NCDOT shall identify in environmental documents:

(a) Noise abatement measures that are feasible and reasonable,

(b) Noise impacts for which no abatement appears to be feasible and reasonable;

(c) Locations where noise impacts will occur, where noise abatement is feasible and reasonable, and the locations that have no feasible and reasonable abatement.

(d) Whether it is "likely" or "unlikely" that noise abatement measures will be installed for each noise sensitive area identified. "Likely" does not mean a firm commitment. The final decision on the installation of the abatement measures shall be made upon

completion of the project design, the public involvement process, concurrence with the NCDOT Policy, and FHWA approval.

Acceptable Noise Abatement Measures

The following noise abatement measures may be considered for incorporation into a project to reduce traffic noise impacts.

(a) Construction of noise barriers

(b) Traffic management measures

(c) Alteration of horizontal and vertical alignments

(d) Establishment of buffer zones

(e) Noise insulation of Activity Category D land use facilities listed in Table 1 on Page 4 of this policy.

Third Party Participation

(a) Third party funding of noise abatement measures cannot be used to make up the difference between the reasonable base quantity allowance and the actual quantity of noise abatement. Third party funding is allowed only by public entities, and can only be used to pay for additional features such as landscaping and aesthetic treatments for noise barriers that meet cost-effectiveness criteria.

(b) Traditional highway construction resources pay for required noise abatement measures. Should a local government request that materials be used that are more costly than those proposed by NCDOT, the requesting entity must assume 100% of the actual additional construction cost.

(c) If a local government insists on the provision of a noise abatement measure deemed not reasonable by NCDOT, an abatement measure may be installed provided the local government assumes 100% of the costs and obtains an encroachment permit from NCDOT to perform the work. These costs include, but are not limited to, preliminary engineering, actual construction and maintenance. In addition, local governments must ensure that NCDOT's material, design and construction specifications are met. The local government must also assume 100% of the liability associated with the measure and hold harmless the NCDOT.

(d) For (b) and (c) above, the settlement agreement shall be signed before third party noise abatement design begins and payment shall be made to NCDOT before project construction begins.

Quantity Averaging

NCDOT will utilize abatement measure quantity averaging among all noise sensitive areas within the same Activity Category in Table 1 that are exposed to a common noise environment, i.e., similar noise sources and levels, traffic volumes, traffic mix, speed and topographic features, if:

(a) No single common noise environment exceeds two times the base quantity reasonableness criteria (e.g., two times 2,500 square feet, or two times 7,000 cubic yards); and,

(b) Collectively, all common noise environments being averaged do not exceed the base quantity reasonableness criteria.

PUBLIC INVOLVEMENT

Communication with the community regarding noise impacts and possible noise abatement shall occur at the start of the noise study process and continue throughout the development of the project. NCDOT will communicate with citizens to present information on the nature of highway traffic noise and discuss the effects of noise abatement measures in attenuating traffic noise and the types of noise abatement measures that may be considered. The concerns of the community shall be a major consideration in reaching a decision on the abatement measures to be provided.

COORDINATION WITH LOCAL OFFICIALS

NCDOT will provide all traffic noise analyses to local government officials within whose jurisdiction a highway project is proposed as early in the project planning process as possible to protect future development from becoming incompatible with traffic noise levels. Specifically, environmental documents and design noise reports will contain information identifying areas that may be impacted by traffic noise, predicted noise level contour information, the best estimation of future noise levels for developed and undeveloped lands or properties in the immediate vicinity of the project and other appropriate design information. If requested, NCDOT will assist local officials with coordination and distribution of this information to residents, property owners and developers. NCDOT will provide assistance to local jurisdictions in the development of local noise controls, when requested. NCDOT will advocate the planning, design and construction of noise-compatible development and encourage its practice among planners, building officials, developers and others.

All noise-sensitive areas and any known noise abatement measures will be presented and discussed at the Design Public Hearing and Design Public Meetings.

CONSTRUCTION NOISE

To minimize the impacts of construction noise on the public, NCDOT shall:

(a) Identify land uses or activities that may be affected by noise from construction of the project.

(b) Determine the measures that are needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community. This determination shall consider the benefits achieved and the overall adverse social, economic, and environmental effects and costs of the abatement measures.

(c) Consider construction techniques and scheduling to reduce construction noise impacts to nearby receptors and incorporate the needed abatement measures in the project plans and specifications.

FEDERAL PARTICIPATION

The costs of noise abatement measures may be included in federal-aid participating project costs with the federal share being the same as that for the system on which the project is located when:

(a) Traffic noise impacts have been identified; and

(b) Abatement measures have been determined to be feasible and reasonable pursuant to 23 CFR 772 and this policy.

REVIEW OF POLICY

This policy shall be reviewed by the NCDOT Board of Transportation at least every five years.

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APPENDIX B

2035 TRAFFIC NOISE CONTOURS

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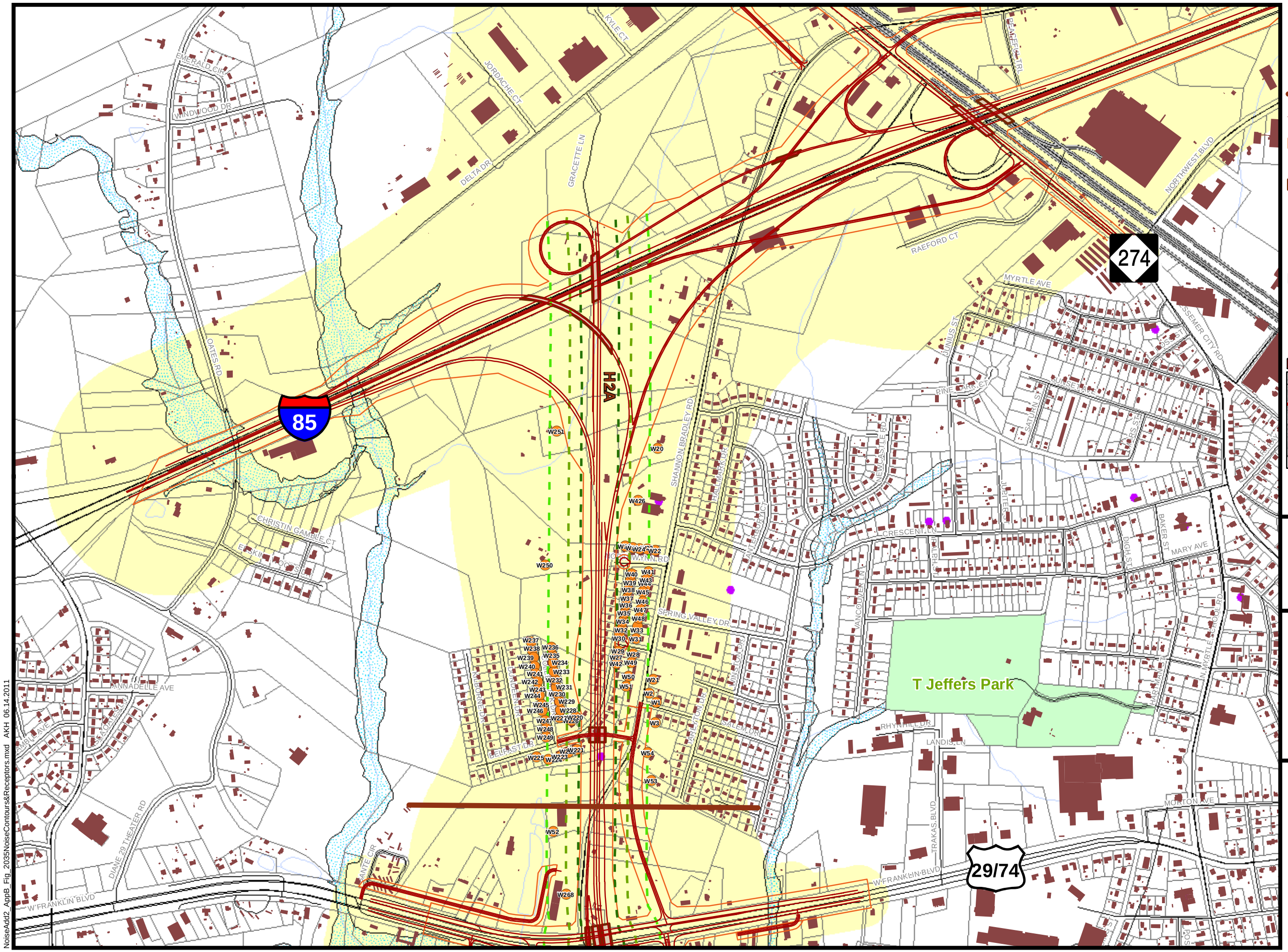

Legend

- New Receptor Points
- Receptor Points Refined
- 71dBA Leq
- 66dBA Leq
- 60dBA Leq
- Segment Break Lines
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- Buildings
- Preferred Alternative Bridges
- Churches
- Cemeteries
- Schools
- Streets
- Railroads
- Parcels
- Parks
- Private Recreation Facilities
- Hydrology
- Preferred Alternative Refined Corridor
- K3A Segment Name

Source: Gaston County and Mecklenburg County
Map Printed June 2011

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NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

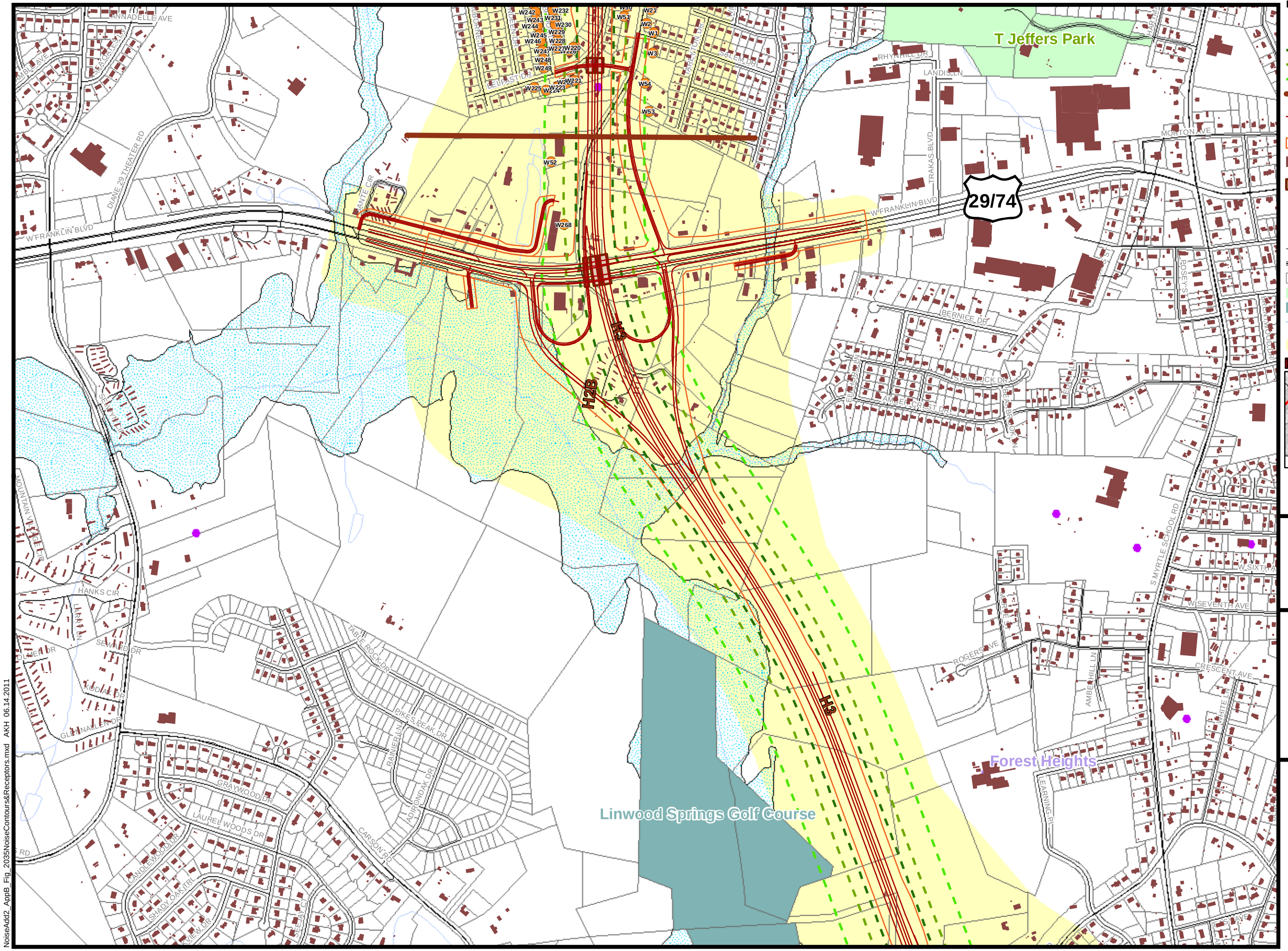
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 1

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
- Receptor Points Refined
- 71dBA Leq
- 66dBA Leq
- 60dBA Leq
- Segment Break Lines
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
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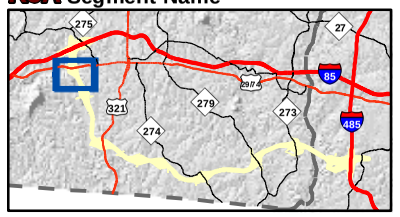
- Streets
- Railroads
- Parcels
- Parks
- Private Recreation Facilities
- Hydrology
- Preferred Alternative Refined Corridor
- K3A Segment Name



Source: Gaston County and Mecklenburg County
Map Printed June 2011

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NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

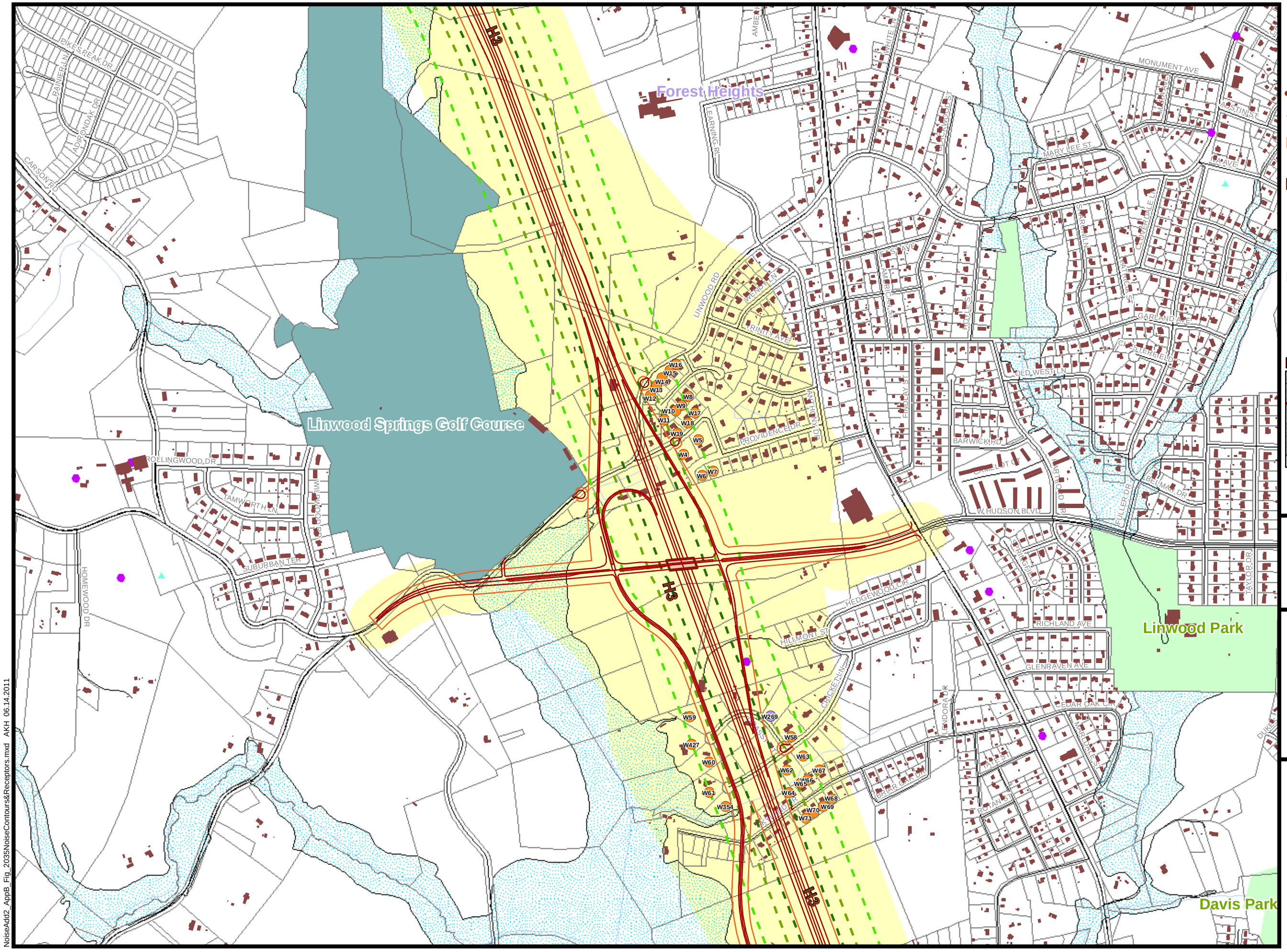
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 2

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
- Receptor Points Refined
- 71dBA Leq
- 66dBA Leq
- 60dBA Leq
- Segment Break Lines
- Preferred Alternative Refined Design
- Preferred Alternative Refined Right of Way
- Buildings
- Preferred Alternative Bridges
- Churches
- Cemeteries
- Schools
- Streets
- Railroads
- Parcels
- Parks
- Private Recreation Facilities
- Hydrology
- Preferred Alternative Refined Corridor
- K3A Segment Name

Source: Gaston County and Mecklenburg County
Map Printed June 2011

N

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

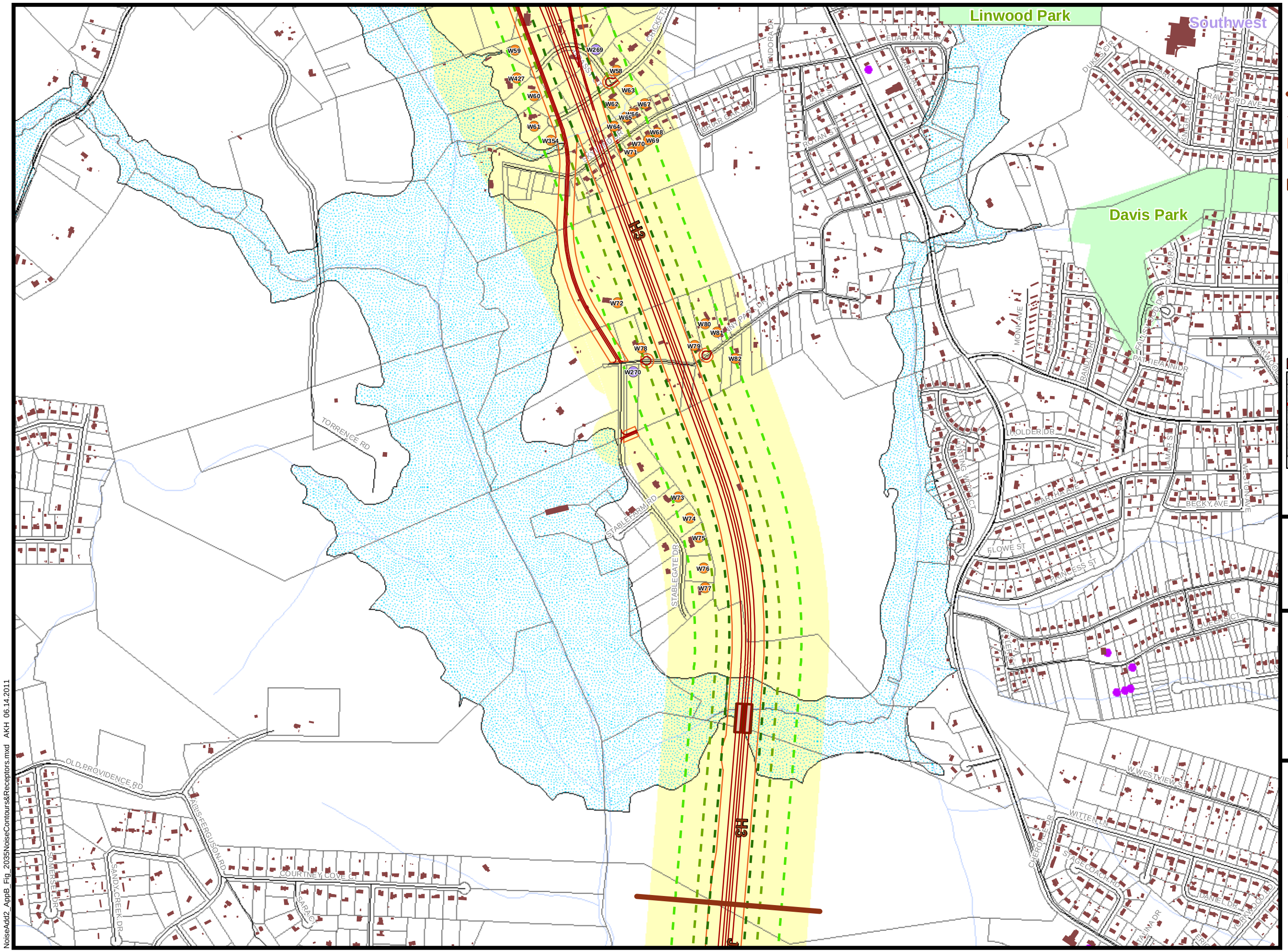
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 3

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
- Receptor Points Refined
- 71dBA Leq
- 66dBA Leq
- 60dBA Leq
- Segment Break Lines
- Preferred Alternative Refined Design
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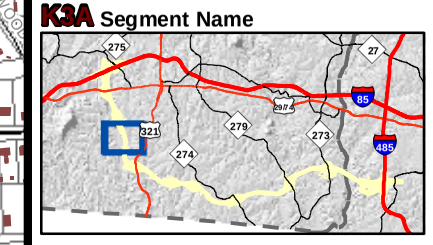

Source: Gaston County and Mecklenburg County
Map Printed June 2011

N

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Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

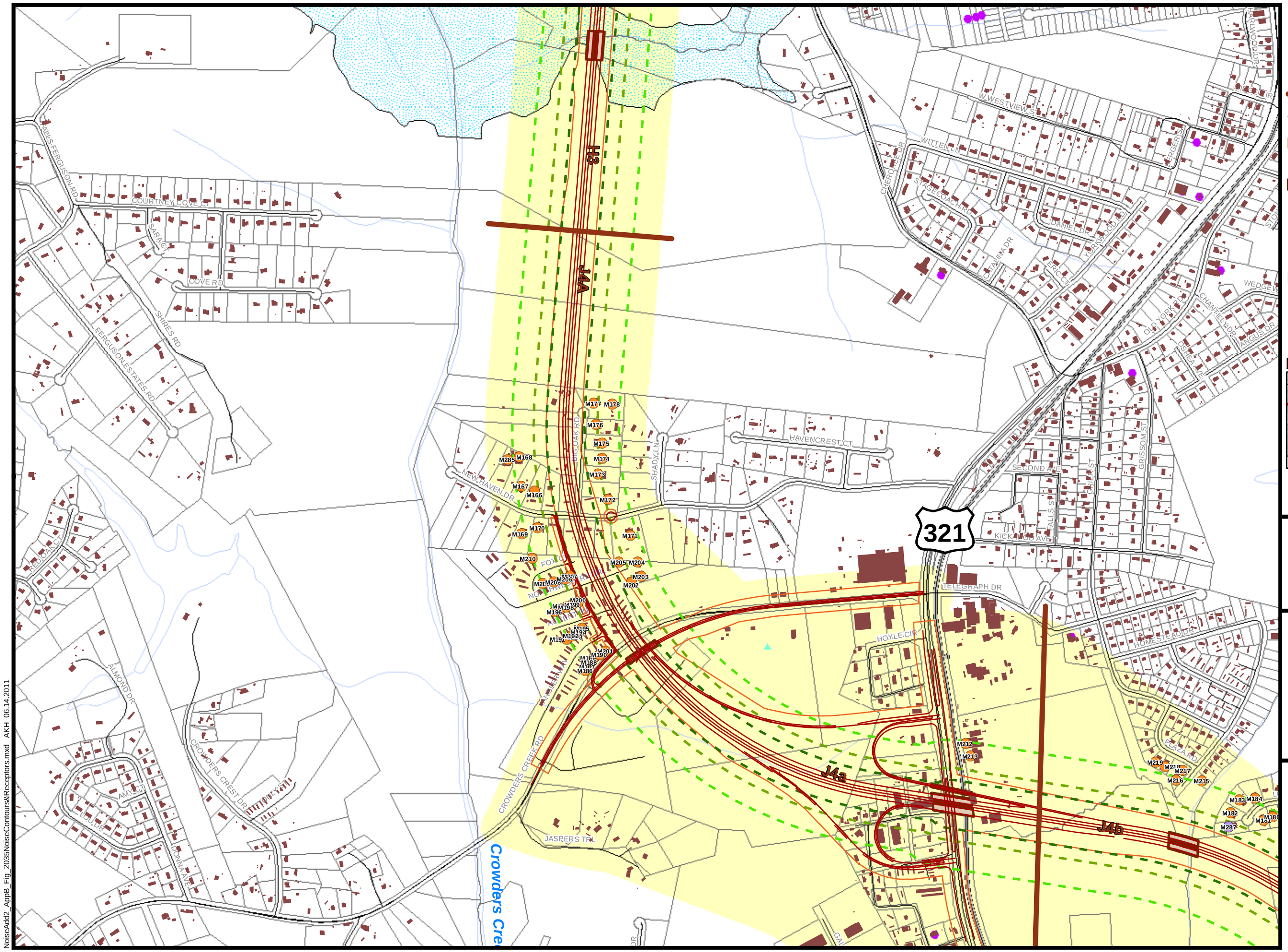
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 4

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
- Receptor Points Refined
- 71dBA Leq
- 66dBA Leq
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Source: Gaston County and Mecklenburg County
Map Printed June 2011

N

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

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NO. U-3321

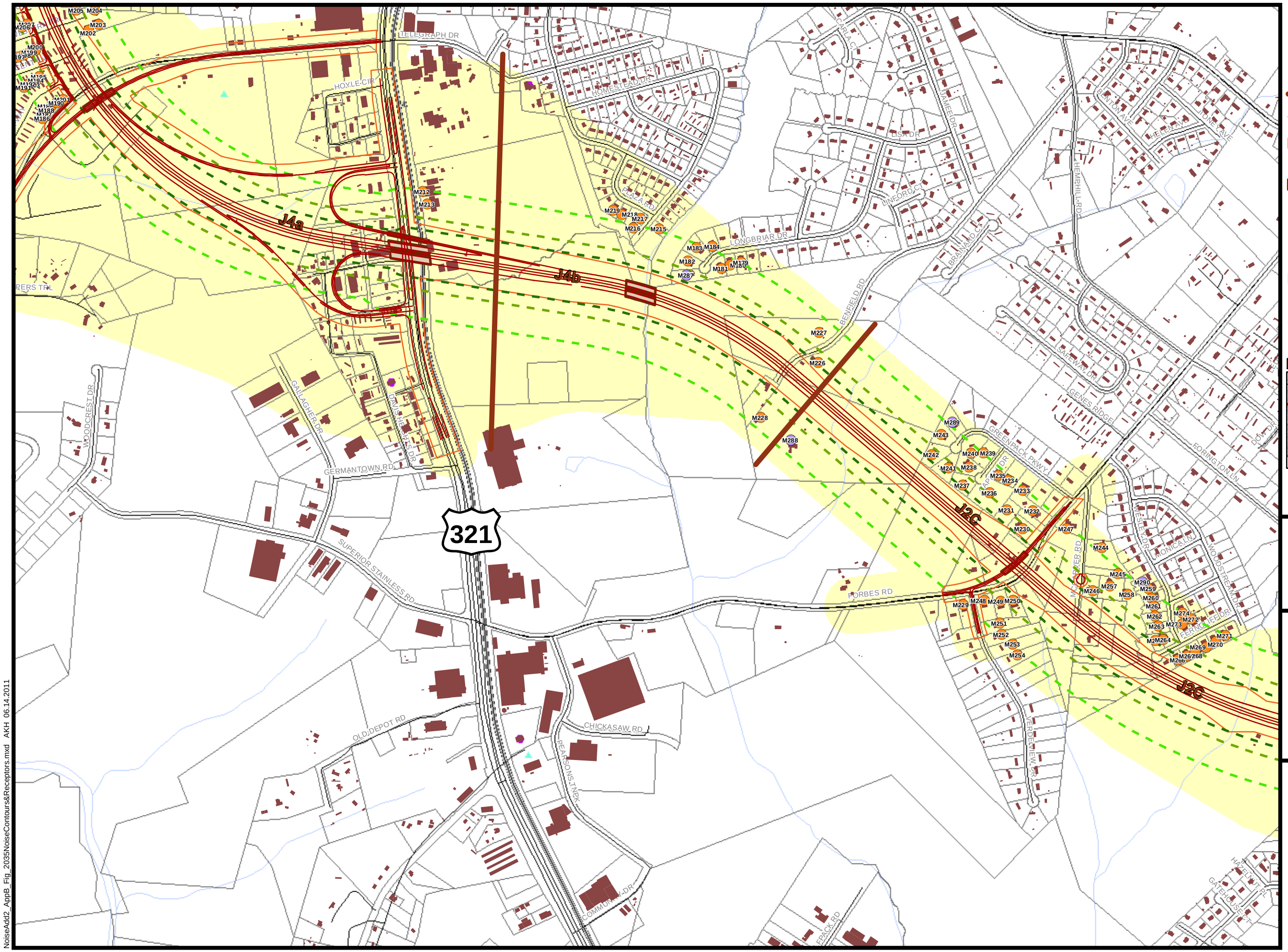
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 5

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
- Receptor Points Refined
- 71dBA Leq
- 66dBA Leq
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- Preferred Alternative Refined Design
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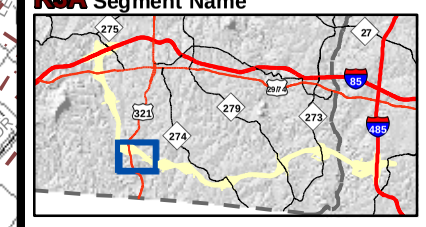


Source: Gaston County and Mecklenburg County
Map Printed June 2011

N

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

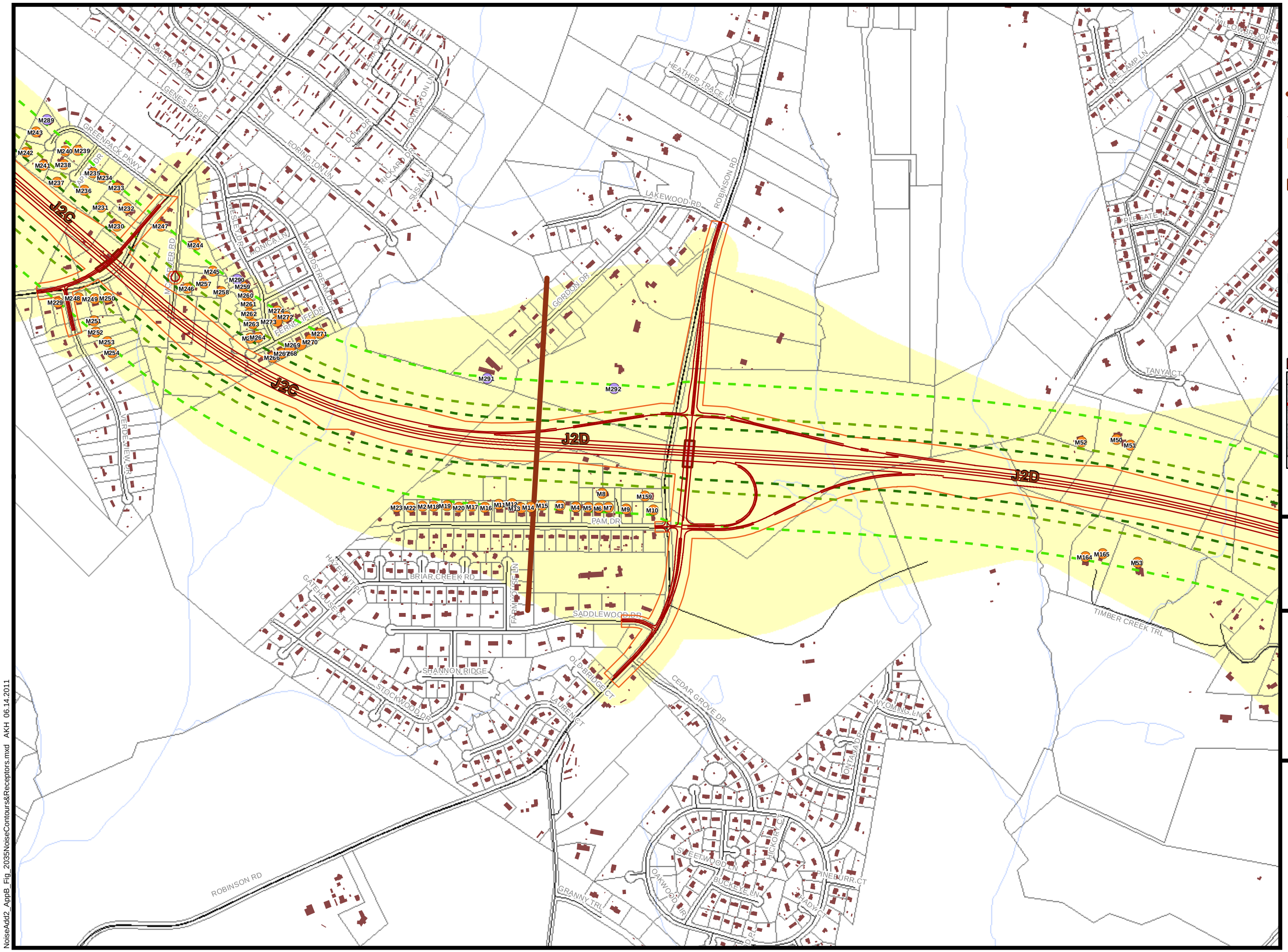
Gaston County and Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 6

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
- Receptor Points Refined
- 71dBA Leq
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Source: Gaston County and Mecklenburg County
Map Printed June 2011

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

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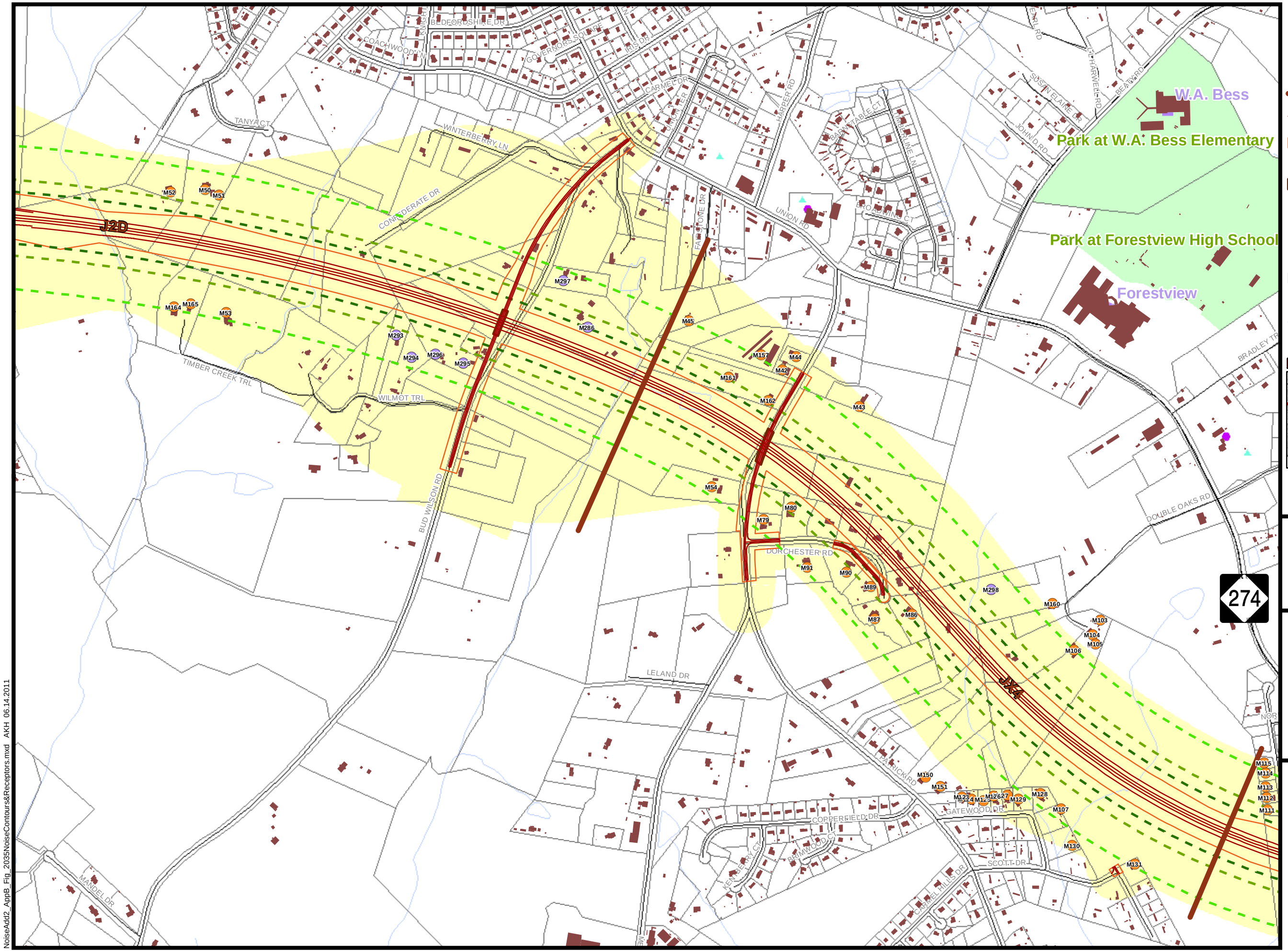
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 7

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
- Receptor Points Refined
- 71dBA Leq
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0 400 800
Feet

NORTH CAROLINA Turnpike Authority

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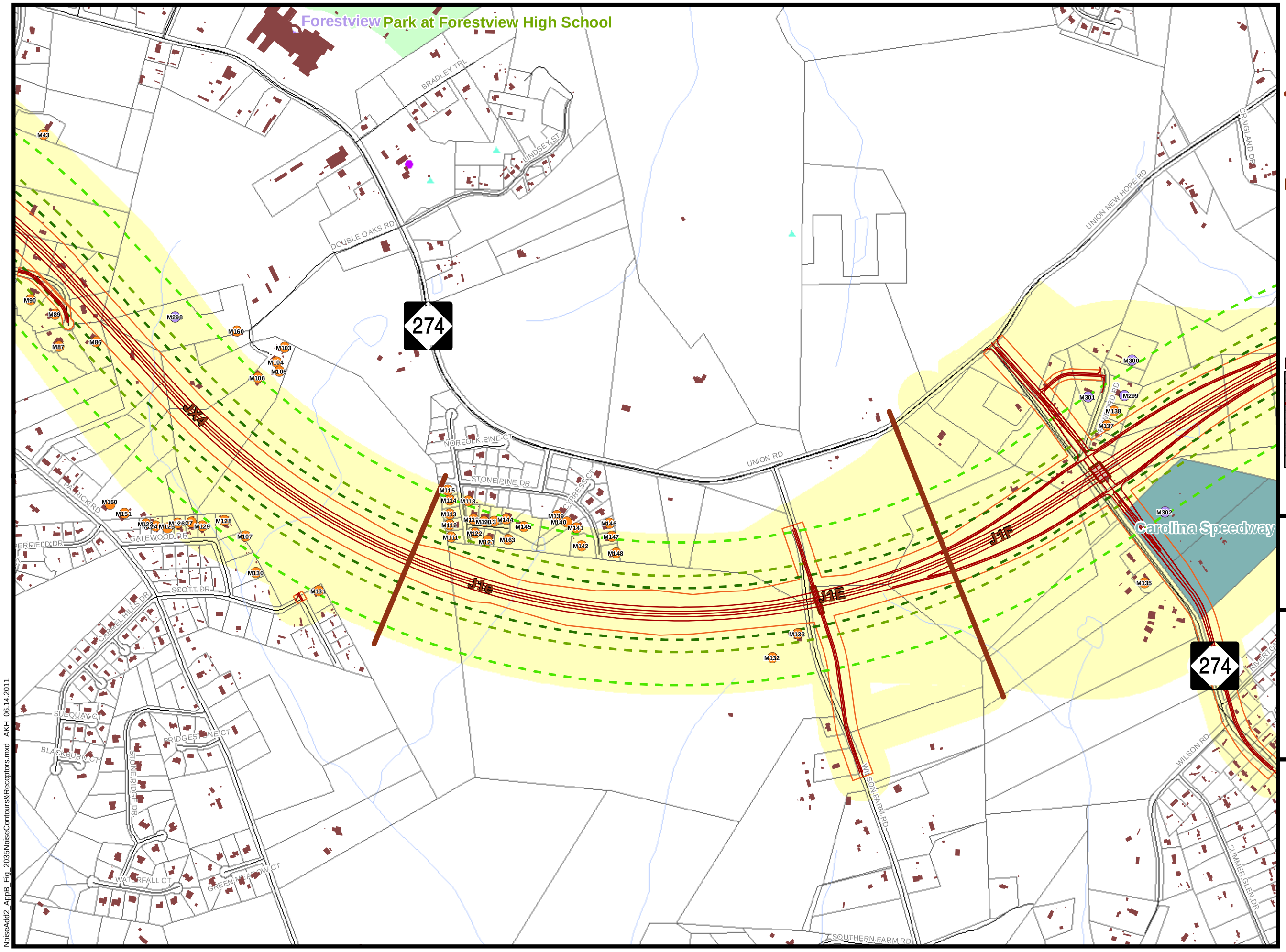
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 8

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
- Receptor Points Refined
- 71dBA Leq
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Source: Gaston County and Mecklenburg County
Map Printed June 2011

N

0 400 800
Feet

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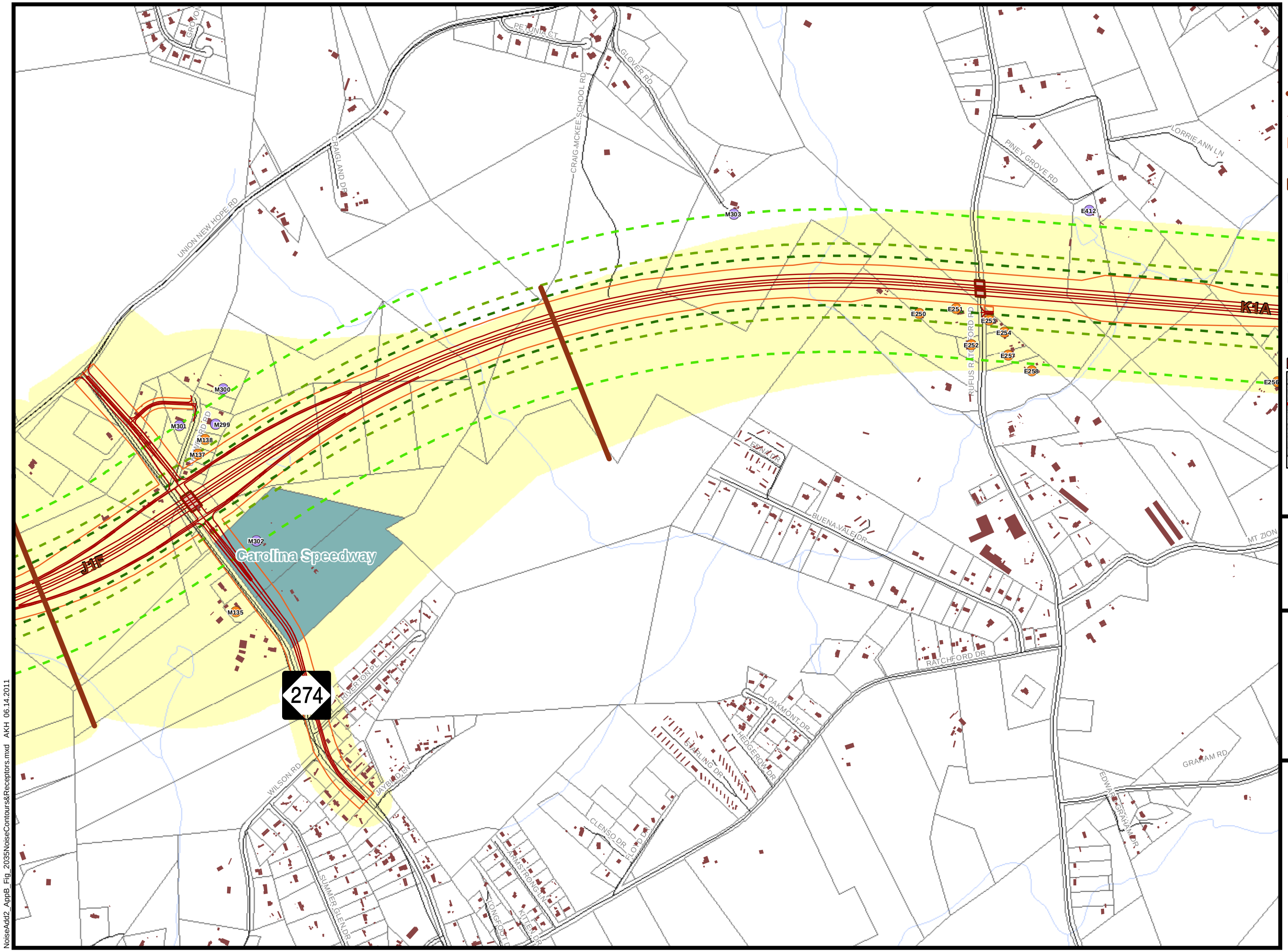
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 9

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

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- 71dBA Leq
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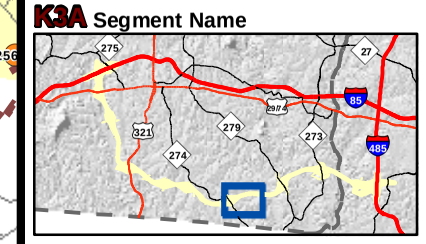


Source: Gaston County and Mecklenburg County
Map Printed June 2011

N

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

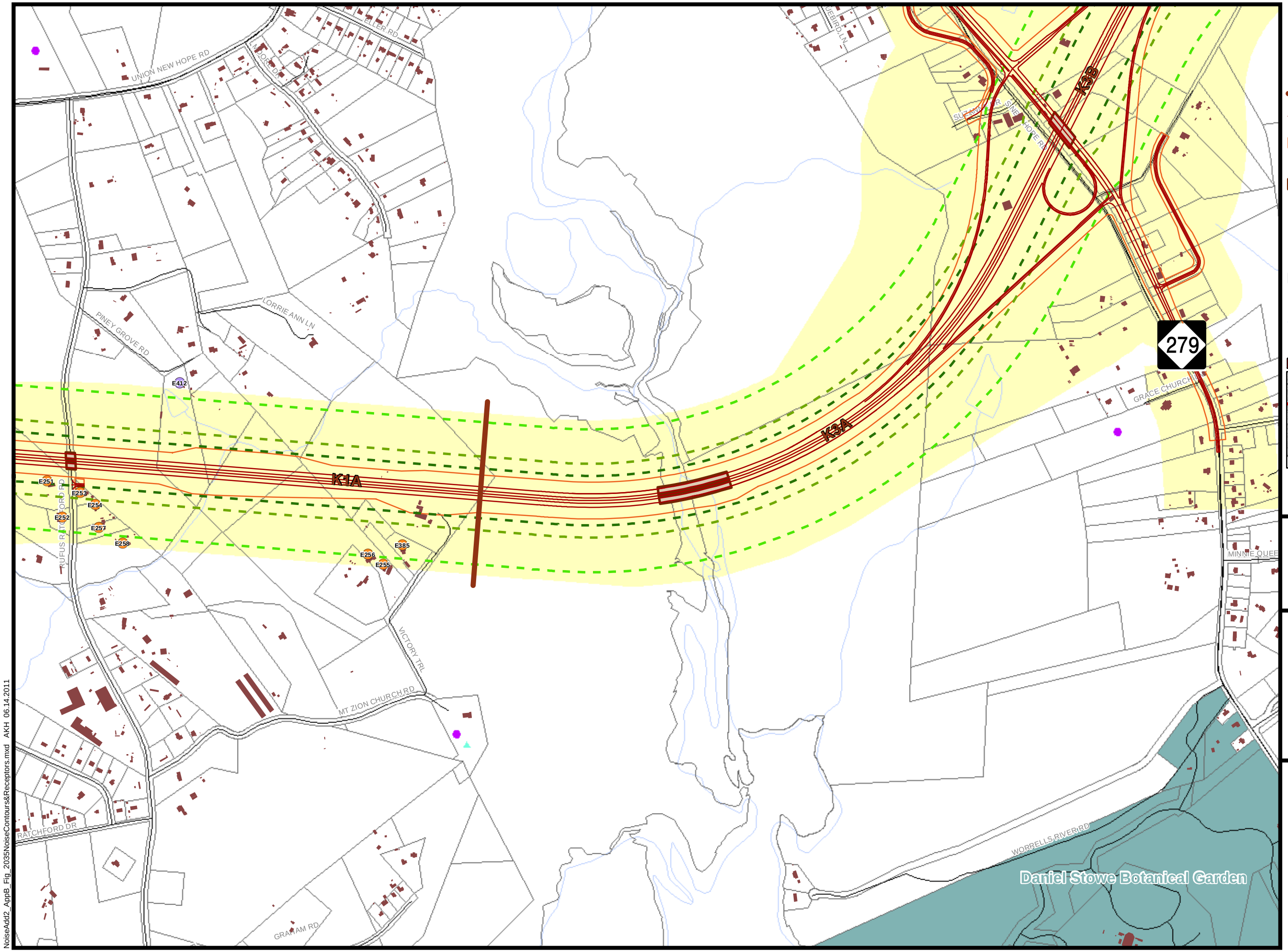
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 10

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

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Source: Gaston County and Mecklenburg County
Map Printed June 2011

N

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

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NO. U-3321

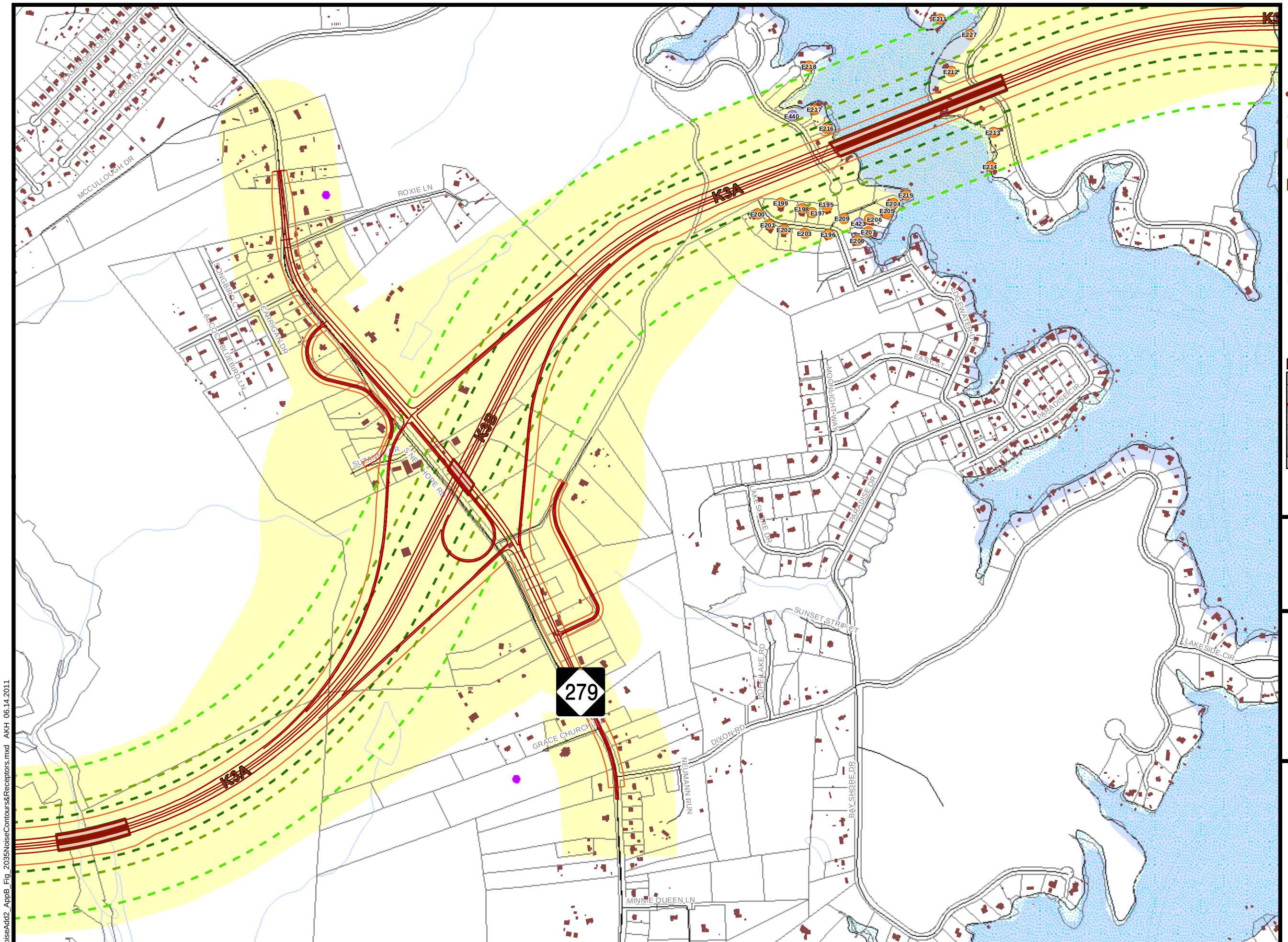
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 11

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

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- 71dBA Leq
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Source: Gaston County and Mecklenburg County
Map Printed June 2011

0 400 800
Feet

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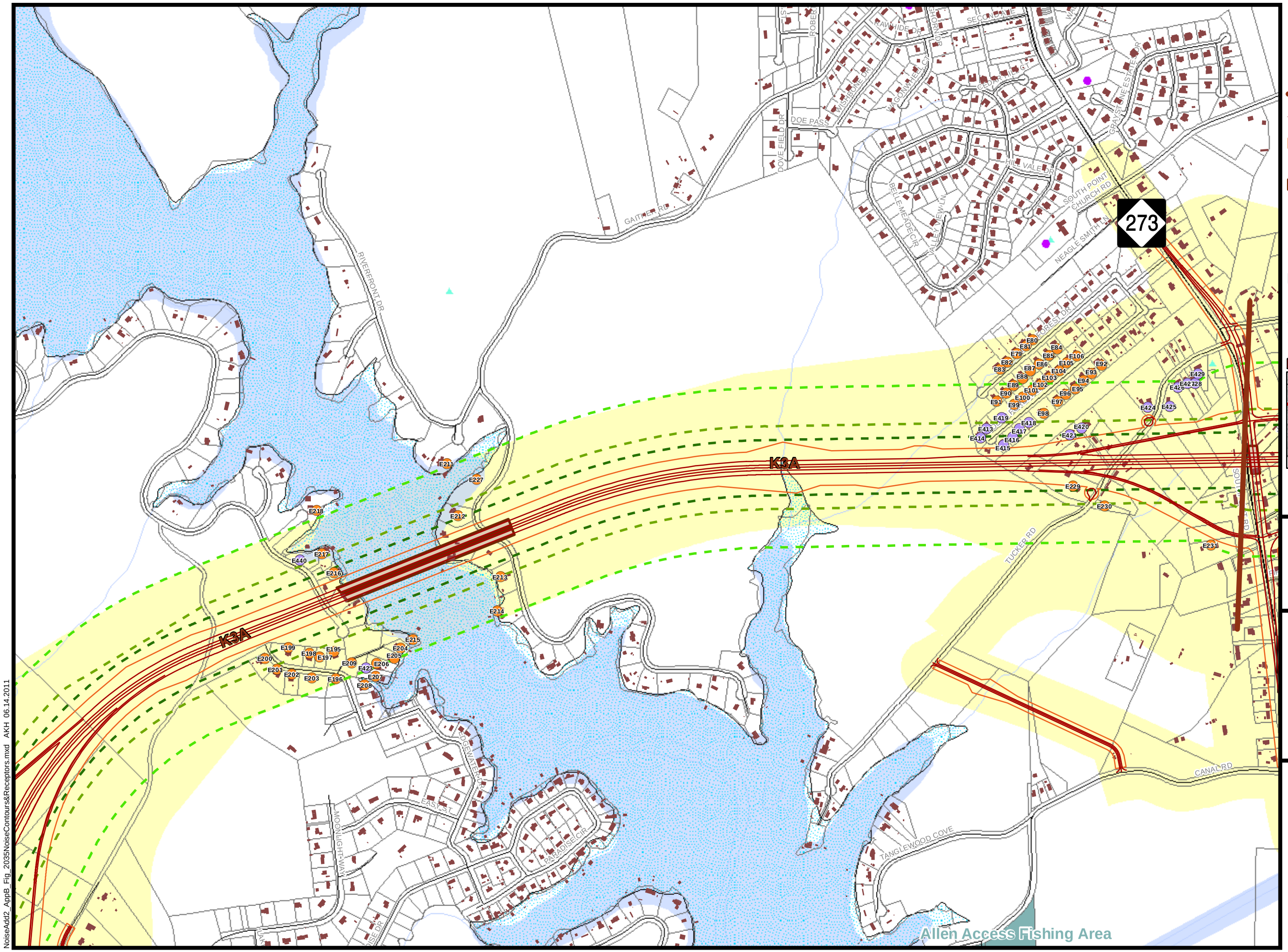
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 12

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
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Source: Gaston County and Mecklenburg County
Map Printed June 2011

N

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

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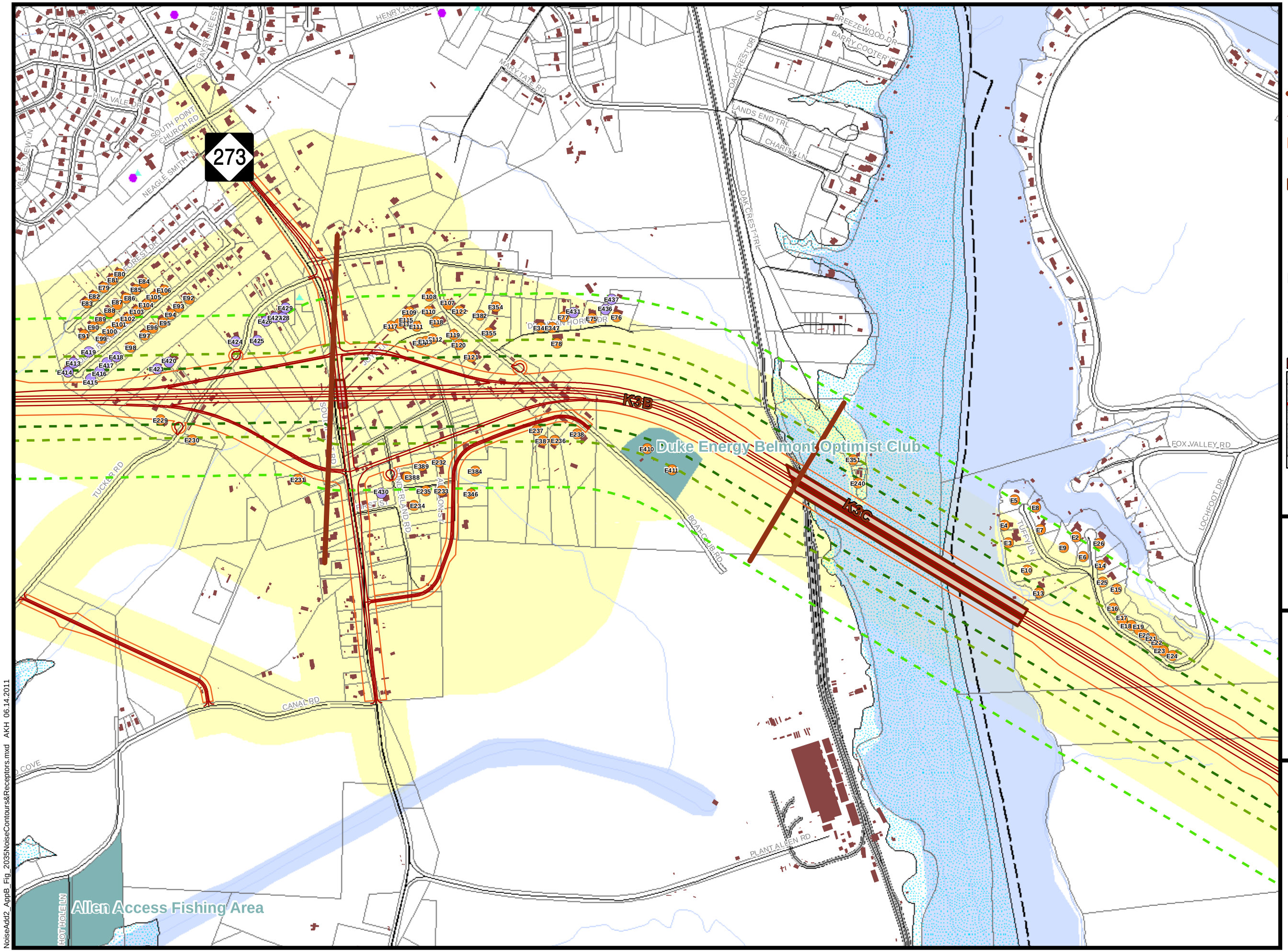
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 13

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
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- 71dBA Leq
- 66dBA Leq
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Source: Gaston County and Mecklenburg County
Map Printed June 2011

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

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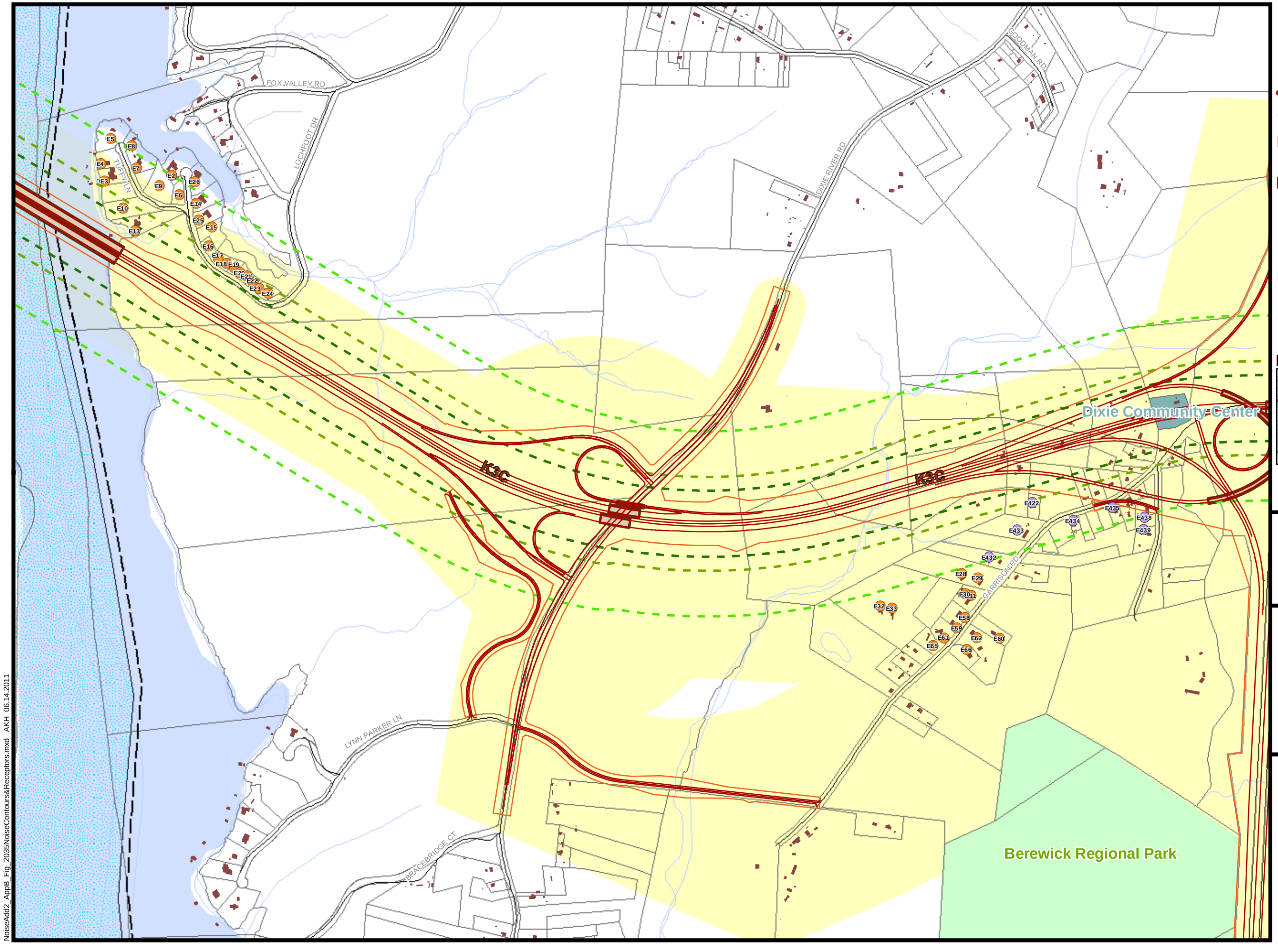
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 14

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
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Source: Gaston County and Mecklenburg County
Map Printed June 2011

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

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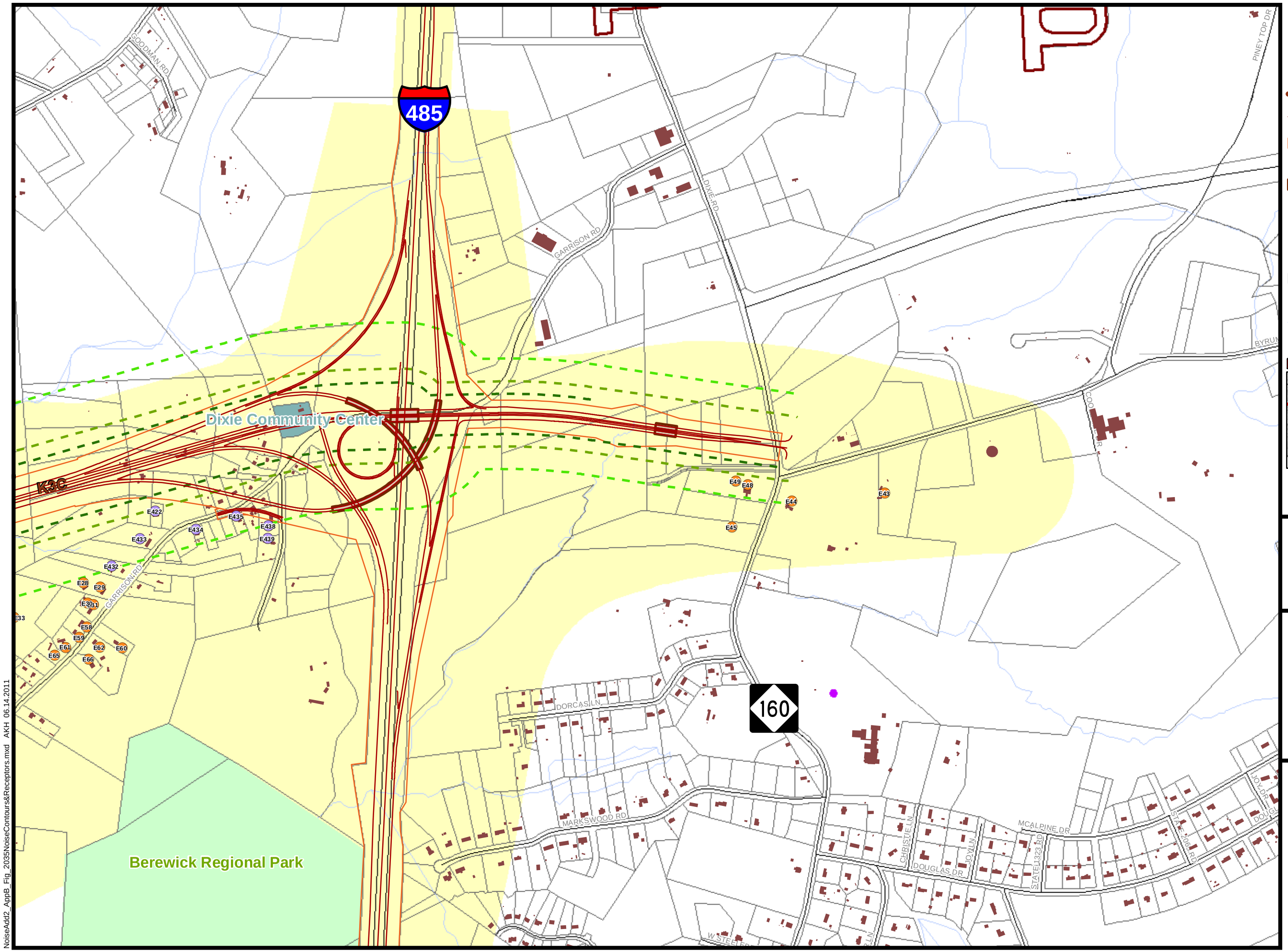
Gaston County and
Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 15

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011



Legend

- New Receptor Points
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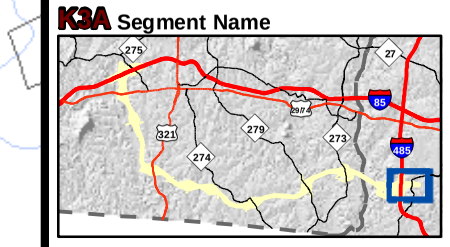

Source: Gaston County and Mecklenburg County
Map Printed June 2011

N

0 400 800
Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. U-3321

Gaston County and Mecklenburg County

GASTON EAST-WEST CONNECTOR

2035 NOISE CONTOURS AND SENSITIVE RECEPTOR LOCATIONS

Figure 16

NoiseAdd2_AppB_Fig_2035NoiseContours&Receptors.mxd AKH 06.14.2011

APPENDIX C

NOISE CONTOUR SUMMARY SPREADSHEETS

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TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt I-85 to US 29/74
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	N/A AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- Alt 4 I-85 to US 29/74	N/A PRD # 2	N/A PRD # 3
72	76.6	0.0	0.0
91	74.6	0.0	0.0
141	71.7	0.0	0.0
241	67.4	0.0	0.0
441	59.9	0.0	0.0
841	54.1	0.0	0.0
1641	45.4	0.0	0.0
R0	37.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	129.9
67	244.5
66	264.5
50	1144.8
DESIRED 55 dBA ^	754.0

Minimum Right-of-way Distance From CL: 140.0

---------- R/W --------

RECEPTOR INFORMATION ID#	LAND USE CAT	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEVE -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
W1	Residence	B	3132 SALEM DR	50	h2a	Project	512.3	-	-	58	8
W2	Residence	B	3138 SALEM DR	51	h2a	"	449.1	-	-	59	8
W3	Residence	B	3125 SALEM DR	50	h2a	"	505.0	-	-	58	8
W20	Residence	B	937 SHANNON BRADLEY RD	48	h2a	"	506.0	-	-	58	10
W21	Residence	B	550 SHANNON BRADLEY RD	51	h2a	"	482.3	-	-	58	7
W22	Residence	B	3200 NORTHWYNN DR	50	h2a	"	492.2	-	-	58	8
W23	Residence	B	3206 NORTHWYNN DR	48	h2a	"	422.0	-	-	60	12
W24	Residence	B	3212 NORTHWYNN DR	48	h2a	"	353.7	-	-	62	14
W25	Residence	B	3218 NORTHWYNN DR	48	h2a	"	294.9	-	-	64	* 16
W26	Residence	B	3224 NORTHWYNN DR	45	h2a	"	228.5	-	-	* 67	* 22
W27	Residence	B	642 BELFAST DR	45	h2a	"	162.3	-	-	* 70	* 25
W28	Residence	B	641 SHANNON BRADLEY RD	48	h2a	"	308.0	-	-	64	* 16
W29	Residence	B	650 BELFAST DR	45	h2a	"	177.0	-	-	* 69	* 24
W30	Residence	B	700 BELFAST DR	45	h2a	"	185.4	-	-	* 69	* 24
W31	Residence	B	701 SHANNON BRADLEY RD	48	h2a	"	329.7	-	-	63	* 15
W32	Residence	B	706 BELFAST DR	48	h2a	"	203.9	-	-	* 68	* 20
W33	Residence	B	639 SHANNON BRADLEY RD	48	h2a	"	342.1	-	-	62	14
W34	Residence	B	714 BELFAST DR	45	h2a	"	216.6	-	-	* 68	* 23
W35	Residence	B	720 BELFAST DR	45	h2a	"	229.3	-	-	* 67	* 22
W36	Residence	B	726 BELFAST DR	45	h2a	"	243.9	-	-	* 67	* 22
W37	Residence	B	732 BELFAST DR	45	h2a	"	251.1	-	-	* 66	* 21
W38	Residence	B	738 BELFAST DR	45	h2a	"	263.7	-	-	* 66	* 21
W39	Residence	B	744 BELFAST DR	45	h2a	"	278.3	-	-	65	* 20
W40	Residence	B	750 BELFAST DR	45	h2a	"	289.2	-	-	64	* 19
W41	Residence	B	749 SHANNON BRADLEY RD	48	h2a	"	435.0	-	-	59	11
W42	Residence	B	634 BELFAST DR	45	h2a	"	160.8	-	-	* 70	* 25
W43	Residence	B	743 SHANNON BRADLEY RD	48	h2a	"	416.6	-	-	60	12
W44	Residence	B	737 SHANNON BRADLEY RD	48	h2a	"	405.7	-	-	60	12
W45	Residence	B	731 SHANNON BRADLEY RD	48	h2a	"	389.0	-	-	61	13
W46	Residence	B	725 SHANNON BRADLEY RD	48	h2a	"	385.9	-	-	61	13
W47	Residence	B	719 SHANNON BRADLEY RD	48	h2a	"	369.4	-	-	61	13
W48	Residence	B	713 SHANNON BRADLEY RD	48	h2a	"	354.8	-	-	62	14
W49	Residence	B	SHANNON BRADLEY RD	48	h2a	"	291.6	-	-	64	* 16
W50	Res-6 apts	B	SHANNON BRADLEY RD	48	h2a	"	269.8	-	-	65	* 17
W51	Res-6 apts	B	SHANNON BRADLEY RD	48	h2a	"	249.6	-	-	* 66	* 18
W52	Bus-Warehouse	F	123 SHANNON BRADLEY RD	53	h3	"	376.5	-	-	61	8
W53	Residence	B	420 SHANNON BRADLEY RD	48	h2a	"	475.3	-	-	59	11
W54	Residence	B	424 SHANNON BRADLEY RD	50	h2a	"	440.5	-	-	59	9
W220	Residence	B	551 BELFAST DR	45	h2a	"	188.2	-	-	* 69	* 24
W221	Residence	B	526 BELFAST DR	45	h2a	"	178.5	-	-	* 69	* 24
W222	Residence	B	518 BELFAST DR	45	h2a	"	250.9	-	-	* 66	* 21

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt I-85 to US 29/74
Addendum #2

RECEPTOR INFORMATION			NEAREST EXISTING	AMBIENT NOISE	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEVE			NOISE LEVEL
ID#	LAND USE CAT	CATEGORY	ROADWAY	LEVEL	SEGMENT	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	INCREASE
W223	Residence	B	510 BELFAST DR	45	h2a	"	320.4	-	-	63	* 18
W224	Residence	B	BELFAST DR	45	h2a	"	421.3	-	-	60	* 15
W225	Residence	B	BELFAST DR	45	h2a	"	526.5	-	-	58	13
W226	Residence	B	543 BELFAST DR	45	h2a	"	225.9	-	-	* 67	* 22
W227	Residence	B	COLEBROOK DR	45	h2a	"	328.6	-	-	63	* 18
W228	Residence	B	612 COLEBROOK DR	45	h2a	"	323.4	-	-	63	* 18
W229	Residence	B	618 COLEBROOK DR	45	h2a	"	329.7	-	-	63	* 18
W230	Residence	B	624 COLEBROOK DR	45	h2a	"	347.3	-	-	62	* 17
W231	Residence	B	630 COLEBROOK DR	45	h2a	"	363.0	-	-	62	* 17
W232	Residence	B	636 COLEBROOK DR	45	h2a	"	371.1	-	-	61	* 16
W233	Residence	B	642 COLEBROOK DR	45	h2a	"	383.1	-	-	61	* 16
W234	Residence	B	648 COLEBROOK DR	45	h2a	"	387.5	-	-	61	* 16
W235	Residence	B	654 COLEBROOK DR	45	h2a	"	397.5	-	-	61	* 16
W236	Residence	B	660 COLEBROOK DR	45	h2a	"	405.6	-	-	60	* 15
W237	Residence	B	673 COLEBROOK DR	45	h2a	"	580.6	-	-	57	12
W238	Residence	B	667 COLEBROOK DR	45	h2a	"	570.5	-	-	57	12
W239	Residence	B	661 COLEBROOK DR	45	h2a	"	558.6	-	-	57	12
W240	Residence	B	655 COLEBROOK DR	45	h2a	"	548.5	-	-	57	12
W241	Residence	B	649 COLEBROOK DR	45	h2a	"	540.4	-	-	57	12
W242	Residence	B	643 COLEBROOK DR	45	h2a	"	524.7	-	-	58	13
W243	Residence	B	637 COLEBROOK DR	45	h2a	"	518.5	-	-	58	13
W244	Residence	B	631 COLEBROOK DR	45	h2a	"	504.7	-	-	58	13
W245	Residence	B	625 COLEBROOK DR	45	h2a	"	485.1	-	-	58	13
W246	Residence	B	619 COLEBROOK DR	45	h2a	"	477.1	-	-	59	14
W247	Residence	B	613 COLEBROOK DR	45	h2a	"	455.5	-	-	59	14
W248	Residence	B	607 COLEBROOK DR	45	h2a	"	447.4	-	-	59	14
W249	Residence	B	601 COLEBROOK DR	45	h2a	"	444.9	-	-	59	14
W250	Residence	B	NORTHWYNN DR	45	h2a	"	464.0	-	-	59	14
W251	Residence	B	SHANNON BRADLEY RD	48	h2a	"	374.7	-	-	61	13
W426	Church	C	909 SHANNON BRADLEY RD	45	h2a	"	336.2	-	-	63	* 18
W268	Bus-Industrial	F	121 SHANNON BRADLEY RD	60	h3	"	266.1	-	-	71	11

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt US29-74 to Linwood Road
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	66.0	0.0	
50	63.0	0.0	45.0
100	60.0	0.0	
200	57.0	0.0	
400	54.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	12.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- Alt. 4 US29-74 to Linwood	N/A PRD # 2	N/A PRD # 3
72	77.8	0.0	0.0
91	75.8	0.0	0.0
141	72.9	0.0	0.0
241	68.7	0.0	0.0
441	61.1	0.0	0.0
841	55.4	0.0	0.0
1641	46.6	0.0	0.0
R0	37.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	153.0
67	270.4
66	292.6
50	1259.3
DESIRED	
55	862.5
dBA ^	

Minimum Right-of-way Distance From CL: 140.0

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
W4	Residence	B	2715 LAKEWOOD DR	45	h3	Project	341.0	-	-	64	* + 19
W5	Residence	B	2705 LAKEWOOD DR	45	h3	"	504.9	-	-	59	+ 14
W6	Residence	B	LAKEWOOD DR	45	h3	"	428.5	-	-	61	* + 16
W7	Residence	B	PROVIDENCE DR	45	h3	"	533.1	-	-	59	+ 14
W8	Residence	B	2639 CASTLE HILL RD	45	h3	"	557.6	-	-	58	+ 13
W9	Residence	B	2647 CASTLE HILL RD	45	h3	"	472.5	-	-	60	* + 15
W10	Residence	B	2655 CASTLE HILL RD	45	h3	"	410.2	-	-	61	* + 16
W11	Residence	B	2663 CASTLE HILL RD	45	h3	"	291.2	-	-	* 66	* + 21
W12	Residence	B	CASTLE HILL RD	45	h3	"	247.2	-	-	* 68	* + 23
W13	Residence	B	2654 CASTLE HILL RD	45	h3	"	330.0	-	-	64	* + 19
W14	Residence	B	2646 CASTLE HILL RD	45	h3	"	397.3	-	-	62	* + 17
W15	Residence	B	2638 CASTLE HILL RD	45	h3	"	485.5	-	-	60	* + 15
W16	Residence	B		45	h3	"	552.3	-	-	59	+ 14
W17	Residence	B	2610 LAKEWOOD DR	45	h3	"	559.7	-	-	58	+ 13
W18	Residence	B	LAKEWOOD DR	45	h3	"	472.6	-	-	60	* + 15
W19	Residence	B	2634 LAKEWOOD DR	45	h3	"	355.0	-	-	63	* + 18

NOTE: Category per updated FHWA NAC categories

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt Linwood Road to US321
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	12.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- Linwood to US321	N/A PRD # 2	N/A PRD # 3
72	77.1	0.0	0.0
91	75.1	0.0	0.0
141	72.2	0.0	0.0
241	68.0	0.0	0.0
441	60.5	0.0	0.0
841	54.7	0.0	0.0
1641	45.9	0.0	0.0
R0	37.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	140.3
67	256.3
66	277.5
50	1194.0
DESIRED 55 dBA ^	807.1

Minimum Right-of-way Distance From CL: 140.0

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE CATEG	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
M166	Residence	B	520 NEW HAVEN DR	45	j4	Project	308.6	-	-	64	* + 19
M167	Residence	B	526 NEW HAVEN DR	45	j4	"	419.9	-	-	60	* + 15
M168	Residence	B	536 NEW HAVEN DR	45	j4	"	408.0	-	-	61	* + 16
M169	Residence	B	519 NEW HAVEN DR	45	j4	"	497.0	-	-	59	+ 14
M170	Residence	B	513 NEW HAVEN DR	45	j4	"	347.4	-	-	63	* + 18
M171	Residence	B	409 NEW HAVEN DR	45	j4	"	406.8	-	-	61	* + 16
M172	Residence	B	4228 BIG OAK RD	45	j4	"	305.5	-	-	64	* + 19
M173	Residence	B	4220 BIG OAK RD	45	j4	"	255.2	-	-	* 67	* + 22
M174	Residence	B	4216 BIG OAK RD	45	j4	"	309.8	-	-	64	* + 19
M175	Residence	B	4212 BIG OAK RD	45	j4	"	315.4	-	-	64	* + 19
M176	Residence	B	4208 BIG OAK RD	45	j4	"	264.1	-	-	* 66	* + 21
M177	Residence	B	4200 BIG OAK RD	45	j4	"	239.2	-	-	* 67	* + 22
M178	Residence	B	4200 BIG OAK RD	45	j4	"	401.6	-	-	61	* + 16
M186	Residence	B	Crowders Ck Rd - Orion Oaks	52	j4	"	485.9	-	-	59	+ 7
M187	Residence	B	Crowders Ck Rd - Orion Oaks	52	j4	"	450.6	-	-	60	+ 8
M188	Residence	B	Crowders Ck Rd - Orion Oaks	52	j4	"	415.3	-	-	61	+ 9
M189	Residence	B	Crowders Ck Rd - Orion Oaks	52	j4	"	362.3	-	-	62	+ 10
M190	Residence	B	Crowders Ck Rd - Orion Oaks	52	j4	"	307.2	-	-	64	+ 12
M191	Residence	B	Crowders Ck Rd - Orion Oaks	47	j4	"	478.2	-	-	59	+ 12
M192	Residence	B	Crowders Ck Rd - Orion Oaks	47	j4	"	429.4	-	-	60	+ 13
M193	Residence	B	Crowders Ck Rd - Orion Oaks	47	j4	"	391.0	-	-	61	+ 14
M194	Residence	B	Crowders Ck Rd - Orion Oaks	47	j4	"	353.9	-	-	63	* + 16
M195	Residence	B	Crowders Ck Rd - Orion Oaks	47	j4	"	315.8	-	-	64	* + 17
M196	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	459.2	-	-	60	* + 15
M197	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	402.8	-	-	61	* + 16
M198	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	351.1	-	-	63	* + 18
M199	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	291.4	-	-	65	* + 20
M200	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	238.2	-	-	* 67	* + 22
M201	Residence	B	Crowders Ck Rd - Orion Oaks	52	j4	"	246.3	-	-	* 67	* + 15
M202	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	252.1	-	-	* 67	* + 22
M203	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	352.1	-	-	63	* + 18
M204	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	377.5	-	-	62	* + 17
M205	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	228.9	-	-	* 68	* + 23
M206	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	260.6	-	-	* 66	* + 21
M207	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	211.1	-	-	* 68	* + 23
M208	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	363.7	-	-	62	* + 17
M209	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	456.1	-	-	60	* + 15
M210	Residence	B	Crowders Ck Rd - Orion Oaks	45	j4	"	466.2	-	-	59	+ 14
M285	Residence	B	544 NEW HAVEN DR	45	j4	"	513.9	-	-	59	+ 14
W58	Residence	B	2334 CRICKET LN	45	h3	"	369.5	-	-	62	* + 17
W59	Residence	B	140 GRASSY CT	45	h3	"	399.0	-	-	61	* + 16
W60	Residence	B	145 GRASSY CT	45	h3	"	376.8	-	-	62	* + 17
W61	Residence	B	2424 CRICKET LN	45	h3	"	468.3	-	-	59	+ 14
W62	Residence	B	2401 CRICKET LN	45	h3	"	237.0	-	-	* 67	* + 22
W63	Residence	B	2349 CRICKET LN	45	h3	"	412.0	-	-	61	* + 16
W64	Residence	B	2714 SKYLAND DR	45	h3	"	181.7	-	-	* 69	* + 24
W65	Residence	B	2710 SKYLAND DR	45	h3	"	308.5	-	-	64	* + 19
W66	Residence	B	2706 SKYLAND DR	45	h3	"	371.1	-	-	62	* + 17
W67	Residence	B	3702 SKYLAND DR	45	h3	"	498.7	-	-	59	+ 14
W68	Residence	B	2701 SKYLAND DR	45	h3	"	514.5	-	-	59	+ 14
W69	Residence	B	2705 SKYLAND DR	45	h3	"	421.5	-	-	60	* + 15
W70	Residence	B	2709 SKYLAND DR	45	h3	"	323.2	-	-	64	* + 19
W71	Residence	B	2713 SKYLAND DR	45	h3	"	245.3	-	-	* 67	* + 22
W72	Residence	B	2501 BRIAR OAK DR	45	h3	"	324.0	-	-	64	* + 19
W73	Residence	B	3020 STABLEGATE DR	45	h3	"	407.6	-	-	61	* + 16

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt Linwood Road to US321
Addendum #2

RECEPTOR INFORMATION			NEAREST EXISTING	AMBIENT NOISE	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEVELS			NOISE LEVEL
ID#	LAND USE CATEG	CATEGORY	ROADWAY	LEVEL	SEGMENT	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	INCREASE
W74	Residence	B	3030 STABLEGATE DR	45	h3	"	368.8	-	-	62	* + 17
W75	Residence	B	3040 STABLEGATE DR	45	h3	"	330.6	-	-	63	* + 18
W76	Residence	B	3050 STABLEGATE DR	45	h3	"	341.0	-	-	63	* + 18
W77	Residence	B	3060 STABLEGATE DR	45	h3	"	348.9	-	-	63	* + 18
W78	Residence	B	2815 PENNY PARK DR	45	h3	"	262.6	-	-	* 66	* + 21
W79	Residence	B	2805 PENNY PARK DR	45	h3	"	177.1	-	-	* 70	* + 25
W80	Residence	B	2765 PENNY PARK DR	45	h3	"	331.3	-	-	63	* + 18
W81	Residence	B	2765 PENNY PARK DR	45	h3	"	404.5	-	-	61	* + 16
W82	Residence	B	2760 PENNY PARK DR	45	h3	"	473.5	-	-	59	+ 14
W354	Residence	B	2433 CRICKET LN	45	h3	"	376.0	-	-	62	* + 17
W427	Residence	B	148 GRASSY CT	45	h3	"	465.2	-	-	59	+ 14
W269	Residence	B	108 GRASSY CT	45	h3	"	262.0	-	-	* 66	* + 21
W270	Residence	B	2818 PENNY PARK DR.	45	h3	"	401.0	-	-	61	* + 16

NOTE: Category per updated FHWA NAC categories

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt US-321 to Robinson Rd
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	12.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- US321 to Robinson	N/A PRD # 2	N/A PRD # 3	NOISE CONTOURS	DISTANCE TO CL
72	78.6	0.0	0.0	72	169.3
91	76.6	0.0	0.0	67	288.8
141	73.7	0.0	0.0	66	313.1
241	69.5	0.0	0.0	50	1345.8
441	62.0	0.0	0.0	DESIRED	
841	56.2	0.0	0.0	55	917.0
1641	47.5	0.0	0.0	dBA ^	
R0	37.0	0.0	0.0		

Minimum Right-of-way Distance From CL: 140.0

---------- R/W ---------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEVE -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
M3	Residence	B	412 PAM DR	45	j2c	Project	520.1	-	-	60	* + 15
M4	Residence	B	416 PAM DR	45	j2c	"	524.2	-	-	60	* + 15
M5	Residence	B	410 PAM DR	45	j2c	"	521.7	-	-	60	* + 15
M6	Residence	B	502 PAM DR	45	j2c	"	520.6	-	-	60	* + 15
M7	Residence	B	506 PAM DR	45	j2c	"	511.7	-	-	60	* + 15
M8	Residence	B	4640 CAMILLE ST	45	j2c	"	390.9	-	-	63	* + 18
M9	Residence	B	512 PAM DR	48	j2c	"	514.9	-	-	60	+ 12
M10	Residence	B	1104 ROBINSON RD	45	j2c	"	509.2	-	-	60	* + 15
M11	Residence	B	308 PAM DR	48	j2c	"	539.2	-	-	60	+ 12
M12	Residence	B	312 PAM DR	51	j2c	"	528.2	-	-	60	+ 9
M13	Residence	B	316 PAM DR	51	j2c	"	559.6	-	-	59	+ 8
M14	Residence	B	320 PAM DR	51	j2c	"	546.7	-	-	59	+ 8
M15	Residence	B	402 PAM DR	51	j2c	"	524.9	-	-	60	+ 9
M16	Residence	B	212 PAM DR	51	j2c	"	575.8	-	-	59	+ 8
M17	Residence	B	206 PAM DR	45	j2c	"	577.5	-	-	59	+ 14
M19	Residence	B	200 PAM DR	47	j2c	"	594.0	-	-	59	+ 12
M20	Residence	B	204 PAM DR	48	j2c	"	596.9	-	-	59	+ 11
M159	Residence	B	1098 ROBINSON RD	45	j2c	"	393.3	-	-	63	* + 18
M229	Residence	B	2642 FORBES RD	45	j2c	"	557.3	-	-	59	+ 14
M230	Residence	B	2703 FORBES RD	45	j2c	"	279.6	-	-	* 67	* + 22
M231	Residence	B	FORBES RD	45	j2c	"	315.3	-	-	65	* + 20
M232	Residence	B	2707 FORBES RD	45	j2c	"	454.9	-	-	61	* + 16
M233	Residence	B	1509 GREENPACK PKY	45	j2c	"	534.3	-	-	60	* + 15
M234	Residence	B	1513 GREENPACK PKWY	45	j2c	"	514.6	-	-	60	* + 15
M235	Residence	B	1603 CAPITAL DR	45	j2c	"	497.2	-	-	60	* + 15
M236	Residence	B	1607 CAPITAL DR	45	j2c	"	332.2	-	-	65	* + 20
M237	Residence	B	1610 CAPITAL DR	45	j2c	"	231.6	-	-	* 69	* + 24
M238	Residence	B	1608 CAPITAL DR	45	j2c	"	387.2	-	-	63	* + 18
M239	Residence	B	1521 GREENPACK PKWY	45	j2c	"	558.6	-	-	59	+ 14
M240	Residence	B	1537 GREENPACK PKWY	45	j2c	"	486.8	-	-	61	* + 16
M241	Residence	B	1543 GREENPACK PKWY	45	j2c	"	265.6	-	-	* 68	* + 23
M242	Residence	B	1544 GREENPACK PKWY	45	j2c	"	256.4	-	-	* 68	* + 23
M243	Residence	B	1540 GREENPACK PKWY	45	j2c	"	443.7	-	-	61	* + 16
M244	Residence	B	123 MCCARVER RD	45	j2c	"	600.6	-	-	59	+ 14
M245	Residence	B	MCCARVER RD	45	j2c	"	517.4	-	-	60	* + 15
M246	Residence	B	135 MCCARVER RD	45	j2c	"	263.6	-	-	* 68	* + 23
M247	Residence	B	2718 FORBES RD	45	j2c	"	528.1	-	-	60	* + 15
M248	Residence	B	2646 FORBES RD	45	j2c	"	410.1	-	-	62	* + 17
M249	Residence	B	2652 FORBES RD	45	j2c	"	324.8	-	-	65	* + 20
M250	Residence	B	2658 FORBES RD	45	j2c	"	247.6	-	-	* 68	* + 23
M251	Residence	B	4811 VERDE VIEW DR	48	j2c	"	474.4	-	-	61	+ 13
M252	Residence	B	4815 VERDE VIEW DR	60	j2c	"	539.8	-	-	60	+ 0
M253	Residence	B	4819 VERDE VIEW DR	58	j2c	"	539.5	-	-	60	+ 2
M254	Residence	B	4823 VERDE VIEW DR	55	j2c	"	584.1	-	-	59	+ 4
M257	Residence	B	131 MCCARVER RD	60	j2c	"	389.2	-	-	63	+ 3
M258	Residence	B	MCARVER RD	62	j2c	"	424.2	-	-	62	+ 0
M259	Residence	B	409 WESLEY DR	55	j2c	"	572.7	-	-	59	+ 4
M260	Residence	B	413 WESLEY DR	60	j2c	"	518.7	-	-	60	+ 0
M261	Residence-Undev	G	WESLEY DR	55	j2c	"	474.3	-	-	61 Undev	+ 6
M262	Residence	B	505 WESLEY DR	55	j2c	"	404.9	-	-	62	+ 7
M263	Residence	B	509 WESLEY DR	55	j2c	"	345.0	-	-	64	+ 9

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt US-321 to Robinson Rd
Addendum #2

RECEPTOR INFORMATION			NEAREST EXISTING	AMBIENT NOISE	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEVE			NOISE LEVEL
ID#	LAND USE	CATEGORY	ROADWAY	LEVEL	SEGMENT	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	INCREASE
M264	Residence	B	513 WESLEY DR	58	j2c	"	267.6	-	-	* 67	+ 9
M265	Residence-Undev	G	FERNCLIFF DR	58	j2c	"	226.1	-	-	69 Undev	+ 11
M266	Residence	B	109 FERNCLIFF DR	55	j2c	"	178.2	-	-	* 71	* + 16
M267	Residence	B	113 FERNCLIFF DR	48	j2c	"	245.6	-	-	* 69	* + 21
M268	Residence	B	201 FERNCLIFF DR	60	j2c	"	307.2	-	-	* 66	+ 6
M269	Residence	B	205 FERNCLIFF DR	51	j2c	"	387.0	-	-	63	+ 12
M270	Residence	B	209 FERNCLIFF DR	51	j2c	"	464.3	-	-	61	+ 10
M271	Residence	B	213 FERNCLIFF DR	51	j2c	"	547.9	-	-	59	+ 8
M272	Residence	B	204 FERNCLIFF DR	52	j2c	"	543.2	-	-	60	+ 8
M273	Residence	B	200 FERNCLIFF DR	45	j2c	"	467.8	-	-	61	* + 16
M274	Residence	B	201 WRENTREE LN	45	j2c	"	550.2	-	-	59	+ 14
M179B	Residence	B	4617 LONGBRIAR DR	45	j4	"	568.4	-	-	59	+ 14
M180B	Residence	B	4621 LONGBRIAR DR	45	j4	"	503.9	-	-	60	* + 15
M181B	Residence	B	4625 LONGBRIAR DR	45	j4	"	443.5	-	-	61	* + 16
M182B	Residence	B	4632 LONGBRIAR DR	45	j4	"	390.6	-	-	63	* + 18
M183B	Residence	B	4628 LONGBRIAR DR	45	j4	"	524.2	-	-	60	* + 15
M184B	Residence	B	4624 LONGBRIAR DR	45	j4	"	586.3	-	-	59	+ 14
M212B	Bus-Bruces Iron-Industrial	F	4539 YORK RD	45	j4	"	540.0	-	-	60	+ 15
M213B	Bus-Bruces Iron-Industrial	F	4539 YORK RD	45	j4	"	438.8	-	-	61	+ 16
M215	Residence	B	4901 APRIL DRIVE	45	j2a	"	576.0	-	-	59	+ 14
M216B	Residence	B	4904 APRIL DR	47	j4	"	525.2	-	-	60	+ 13
M217B	Residence	B	4902 APRIL DR	47	j4	"	620.5	-	-	58	+ 11
M218	Residence	B	4713 PLAZA RD	45	j2a	"	620.7	-	-	58	+ 13
M219B	Residence	B	4711 PLAZA RD	45	j4	"	641.6	-	-	58	+ 13
M226B	Residence-Undev	G	BENFIELD RD.	45	j4	"	226.8	-	-	69 Undev	+ 24
M227B	Residence-Undev	G	BENFIELD RD.	45	j4	"	435.0	-	-	62 Undev	+ 17
M228B	Residence	B	4665 BENFIELD RD	45	j4	"	462.8	-	-	61	* + 16
M18A	Residence	B	132 PAM DR	45	j2c	"	614.8	-	-	58	+ 13
M21A	Residence	B	128 PAM DR	45	j2c	"	630.4	-	-	58	+ 13
M22A	Residence	B	124 PAM DR	45	j2c	"	661.7	-	-	58	+ 13
M23A	Residence	B	120 PAM DR	45	j2c	"	680.9	-	-	58	+ 13
M287	Residence	B	LONGRIAR DR.	45	j3	"	268.0	-	-	* 67	* + 22
M288	Residence	B	4665 BENFIELD RD.	45	j4a	"	440.0	-	-	61	* + 16
M289	Residence	B	1536 GREENPACK PKWY	45	j2c	"	589.0	-	-	59	+ 14
M290	Residence	B	405 WESLEY DR.	45	j2c	"	593.0	-	-	59	+ 14
M291	Bus-Garrison Stables	C	4177 GORDON DR.	45	j2c	"	543.0	-	-	60	* + 15
M292	Residence	B	1030 ROBINSON RD.	45	j2c	"	519.0	-	-	60	* + 15

NOTE: Category per updated FHWA NAC categories
Garrison Stables - categorized as Active Sports Area

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt Robinson Rd to NC274
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	N/A AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- Alt 77 Robinson to NC274	N/A PRD # 2	N/A PRD # 3
72	80.0	0.0	0.0
91	77.8	0.0	0.0
141	74.7	0.0	0.0
241	70.5	0.0	0.0
441	62.4	0.0	0.0
841	57.0	0.0	0.0
1641	48.3	0.0	0.0
R0	37.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	192.9
67	306.6
66	330.6
50	1431.7
DESIRED	
55	974.7
dBA ^	

Minimum Right-of-way Distance From CL: 140.0

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
M42	Residence	B	140 PATRICK RD	52	jx4	Project	640.5	-	-	59	+ 7
M44	Residence	B	136 PATRICK RD	52	jx4	"	800.4	-	-	57	+ 5
M45	Residence	B	5310 UNION RD	45	jx4	"	632.9	-	-	59	+ 14
M50	Residence	B	4640 GREENHAVEN LN	45	j2d	"	460.3	-	-	61	* + 16
M51	Residence	B	4640 GREENHAVEN LN	45	j2d	"	434.8	-	-	62	* + 17
M52	Residence	B	4644 GREENHAVEN LN	45	j2d	"	388.8	-	-	63	* + 18
M53	Residence	B	120 TIMBER CREEK TRCE	45	j2d	"	553.0	-	-	60	* + 15
M54	Residence	B	230 PATRICK RD	45	jx4	"	544.6	-	-	60	* + 15
M79	Residence	B	1257 DORCHESTER RD	51	jx4	"	519.5	-	-	60	+ 9
M80	Residence	B	1259 DORCHESTER RD	48	jx4	"	286.7	-	-	* 67	* + 19
M86	Residence	B	1290 DORCHESTER RD	45	jx4	"	200.1	-	-	* 71	* + 26
M87	Residence	B	1288 DORCHESTER RD	45	jx4	"	467.3	-	-	61	* + 16
M89	Residence	B	1280 DORCHESTER RD	45	jx4	"	302.5	-	-	* 67	* + 22
M90	Residence	B	1272 DORCHESTER RD	45	jx4	"	374.1	-	-	64	* + 19
M91	Residence	B	1260 DORCHESTER RD	48	jx4	"	583.9	-	-	59	+ 11
M107	Res-Undev	G	3432 GATEWOOD DR	45	jx4	"	527.3	-	-	60 Undev	+ 15
M126	Residence	B	3416 GATEWOOD DR	45	jx4	"	800.0	-	-	57	+ 12
M127	Residence	B	3420 GATEWOOD DR	45	jx4	"	700.0	-	-	58	+ 13
M129	Residence	B	3424 GATEWOOD DR	45	jx4	"	700.0	-	-	58	+ 13
M130	Residence	B	3421 GATEWOOD DR	45	jx4	"	700.0	-	-	58	+ 13
M128	Residence	B	3428 GATEWOOD DR	45	jx4	"	526.9	-	-	60	* + 15
M131	Residence	B	3340 SCOTT DR	45	jx4	"	595.6	-	-	59	+ 14
M157	Bus-SelfStorage	F	136 PATRICK RD	47	jx4	"	658.7	-	-	58	+ 11
M161	Residence	B	152 PATRICK RD	46	jx4	"	347.0	-	-	65	* + 19
M162	Residence	B	152 PATRICK RD	52	jx4	"	351.0	-	-	65	* + 13
M164A	Residence	B	130 TIMBER CREEK TRL	45	j2d	"	590.1	-	-	59	+ 14
M165	Residence	B	130 TIMBER CREEK TRL	45	j2d	"	536.2	-	-	60	* + 15
M112A	Residence	B	1842 WHITE CEDAR DR	46	jx4	"	409.2	-	-	63	* + 17
M113A	Residence	B	1840 WHITE CEDAR DR	46	jx4	"	496.5	-	-	61	* + 15
M114A	Residence	B	1836 WHITE CEDAR DR	46	jx4	"	608.5	-	-	59	+ 13
M115A	Residence	B	1832 WHITE CEDAR DR	46	jx4	"	684.2	-	-	58	+ 12
M118A	Residence	B	1602 STONE PINE DR	46	jx4	"	660.3	-	-	58	+ 12
M119A	Residence	B	2001 BUCKTHORNE CT	46	jx4	"	524.9	-	-	60	+ 14
M120A	Residence	B	2005 BUCKTHORNE CT	46	jx4	"	536.7	-	-	60	+ 14
M121A	Residence	B	2006 BUCKTHORNE CT	46	jx4	"	384.5	-	-	64	* + 18
M122A	Residence	B	2002 BUCKTHORNE CT	46	jx4	"	414.4	-	-	63	* + 17
M132A	Residence	B	162 WILSON FARM RD	46	jx4	"	431.1	-	-	62	* + 16
M133A	Residence	B	162 WILSON FARM RD	46	jx4	"	257.2	-	-	* 69	* + 23
M139A	Residence	B	1636 STONE PINE DR	46	jx4	"	748.7	-	-	57	+ 11
M140A	Residence	B	1640 STONE PINE DR	46	jx4	"	712.0	-	-	58	+ 12
M141A	Residence	B	1646 STONE PINE DR	46	jx4	"	676.5	-	-	58	+ 12
M142A	Residence	B	1654 STONE PINE DR	46	jx4	"	528.7	-	-	60	+ 14
M143A	Residence	B	2009 BUCKTHORNE CT	46	jx4	"	562.2	-	-	60	+ 14
M144A	Residence	B	2013 BUCKTHORNE CT	46	jx4	"	610.1	-	-	59	+ 13
M145A	Residence	B	2016 BUCKTHORNE CT	46	jx4	"	591.8	-	-	59	+ 13
M146A	Residence	B	1649 STONE PINE DR	46	jx4	"	757.1	-	-	57	+ 11
M147A	Residence	B	1653 STONE PINE DR	46	jx4	"	643.5	-	-	59	+ 13
M148A	Residence	B	1657 STONE PINE DR	46	jx4	"	505.8	-	-	61	* + 15
M163A	Residence	B	2014 BUCKTHORNE CT	46	jx4	"	446.6	-	-	62	* + 16
M111A	Residence	B	1848 WHITE CEDAR DR	46	jx4	"	314.1	-	-	* 66	* + 20
M106A	Residence	B	182 DOUBLE OAK RD	45	jx4	"	612.3	-	-	59	+ 14
M286	Residence	B	4728 BUD WILSON RD	45	j4a	"	235.0	-	-	* 70	* + 25
M293	Residence	B	530 WILMOT TRL	45	j2d	"	381.0	-	-	64	* + 19
M294	Residence	B	522 WILMOT TRL	45	j2d	"	527.0	-	-	60	* + 15
M295	Residence	B	4919 BUD WILSON RD	45	j2d	"	430.0	-	-	62	* + 17
M296	Residence	B	4919 BUD WILSON RD	45	j2d	"	432.0	-	-	62	* + 17
M297	Residence	B	4628 BUD WILSON RD	45	j2d	"	535.0	-	-	60	* + 15
M298	Residence	B	168 DOUBLE OAKS RD.	45	jx4	"	455.0	-	-	62	* + 17

NOTE: Category per updated FHWA NAC categories

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt NC274 to NC279
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	N/A AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- Alt 77 NC274 to NC279	N/A PRD # 2	N/A PRD # 3
72	79.0	0.0	0.0
91	77.0	0.0	0.0
141	74.1	0.0	0.0
241	69.8	0.0	0.0
441	62.3	0.0	0.0
841	56.6	0.0	0.0
1641	47.8	0.0	0.0
R0	37.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	177.1
67	295.8
66	320.8
50	1380.0
DESIRED	
55	944.1
dBA ^	

Minimum Right-of-way Distance From CL: 140.0

R/W

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
E250	Residence	B	2202 RUFUS RATCHFORD RD	45	k1a	Project	255.9	-	-	* 68	* + 23
E251	Residence	B	2202 RUFUS RATCHFORD RD	48	k1a	"	186.8	-	-	* 71	* + 23
E252	Residence	B	2214 RUFUS RATCHFORD RD	51	k1a	"	490.0	-	-	61	+ 10
E253	Residence	B	2207 RUFUS RATCHFORD RD	51	k1a	"	265.7	-	-	* 68	* + 17
E254	Residence	B	2213 RATCHFORD RD	48	k1a	"	359.0	-	-	64	* + 16
E255	Residence	B	5039 VICTORY TRL	45	k1a	"	678.2	-	-	58	+ 13
E256	Residence	B	5039 VICTORY TRL	45	k1a	"	600.7	-	-	59	+ 14
E257	Residence	B	2223 RUFUS RATCHFORD RD	48	k1a	"	555.0	-	-	60	+ 12
E258	Residence	B	2233 RUFUS RATCHFORD RD	45	k1a	"	675.0	-	-	58	+ 13
E385	Residence	B	5047 VICTORY TR	45	k1a	"	498.5	-	-	61	* + 16
M137	Res-Undev	G	CRAWFORD DR	52	j1ef	"	313.2	-	-	66 Undev	+ 14
M138	Res-Undev	G	CRAWFORD DR	50	j1ef	"	384.3	-	-	63 Undev	+ 13
E412	Residence	B	549 PINEY GROVE RD.	45	k1a	"	751.6	-	-	57	+ 12
M299	Residence	B	210 CRAWFORD DR	45	j1f	"	453.0	-	-	61	* + 16
M300	Residence	B	220 CRAWFORD DR	45	j1f	"	668.0	-	-	58	+ 13
M301	Residence	B	207 CRAWFORD DR	45	j1f	"	606.0	-	-	59	+ 14
M302	Bus-Speedway	F	6355 UNION RD.	45	j1f	"	592.0	-	-	59	+ 14
M303	Residence	B	193 GLOVER RD.	45	j1f	"	617.0	-	-	59	+ 14

NOTE: Category per updated FHWA NAC categories

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4 - TRAFFIC NOISE EXPOSURES
Pref Alt NC279 to NC273
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- C279 to NC2	N/A PRD # 2	N/A PRD # 3
72	80.4	0.0	0.0
91	78.4	0.0	0.0
141	75.5	0.0	0.0
241	71.3	0.0	0.0
441	63.7	0.0	0.0
841	58.0	0.0	0.0
1641	49.1	0.0	0.0
R0	37.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	214.8
67	332.6
66	360.8
50	1525.5
DESIRED	
55	1046.7
dBA ^	

Minimum Right-of-way Distance From CL: 140.0

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
E79	Residence	B	622 BROOK FOREST DR	45	kx1k3b	Project	653.3	-	-	60	* + 15
E80	Residence	B	614 BROOK FOREST DR	45	kx1k3b	"	801.5	-	-	58	+ 13
E81	Residence	B	618 BROOK FOREST DR	45	kx1k3b	"	736.8	-	-	59	+ 14
E82	Residence	B	702 BROOK FOREST DR	45	kx1k3b	"	560.3	-	-	61	* + 16
E83	Residence	B	706 BROOK FOREST DR	45	kx1k3b	"	485.8	-	-	62	* + 17
E84	Residence	B	611 BROOK FOREST DR	45	kx1k3b	"	772.1	-	-	58	+ 13
E85	Residence	B	615 BROOK FOREST DR	45	kx1k3b	"	699.9	-	-	59	+ 14
E86	Residence	B	619 BROOK FOREST DR	45	kx1k3b	"	608.8	-	-	60	* + 15
E87	Residence	B	623 BROOK FOREST DR	45	kx1k3b	"	534.7	-	-	61	* + 16
E88	Residence	B	703 BROOK FOREST DR	45	kx1k3b	"	454.7	-	-	63	* + 18
E89	Residence	B	707 BROOK FOREST DR	45	kx1k3b	"	377.2	-	-	65	* + 20
E90	Residence	B	711 BROOK FOREST DR	45	kx1k3b	"	297.4	-	-	* 68	* + 23
E91	Residence	B	715 BROOK FOREST DR	45	kx1k3b	"	210.1	-	-	* 72	* + 27
E92	Residence	B	521 S FOREST LN	45	kx1k3b	"	701.5	-	-	59	+ 14
E93	Residence	B	601 SOUTH FOREST LN	45	kx1k3b	"	616.1	-	-	60	* + 15
E94	Residence	B	605 SOUTH FOREST LN	45	kx1k3b	"	543.9	-	-	61	* + 16
E95	Residence	B	609 SOUTH FOREST LN	45	kx1k3b	"	460.4	-	-	63	* + 18
E96	Residence	B	613 SOUTH FOREST LN	45	kx1k3b	"	397.5	-	-	64	* + 19
E97	Residence	B	617 SOUTH FOREST LN	45	kx1k3b	"	324.2	-	-	* 67	* + 22
E98	Residence	B	621 SOUTH FOREST LN	45	kx1k3b	"	198.0	-	-	* 72	* + 27
E99	Residence	B	SOUTH FOREST LN	45	kx1k3b	"	217.2	-	-	* 71	* + 26
E100	Residence	B	SOUTH FOREST LN	45	kx1k3b	"	296.4	-	-	* 68	* + 23
E101	Residence	B	SOUTH FOREST LN	45	kx1k3b	"	374.5	-	-	65	* + 20
E102	Residence	B	616 SOUTH FOREST LN	45	kx1k3b	"	438.0	-	-	63	* + 18
E103	Residence	B	612 SOUTH FOREST LN	45	kx1k3b	"	514.0	-	-	62	* + 17
E104	Residence	B	608 SOUTH FOREST LN	45	kx1k3b	"	588.0	-	-	61	* + 16
E105	Residence	B	604 SOUTH FOREST LN	45	kx1k3b	"	668.9	-	-	59	+ 14
E106	Residence	B	600 SOUTH FOREST LN	45	kx1k3b	"	743.0	-	-	59	+ 14
E413	Residence	B	716 FOREST LN.	45	k3ab	"	307.7	-	-	* 67	* + 22
E414	Residence	B	720 FOREST LN.	45	k3ab	"	229.2	-	-	* 71	* + 26
E415	Residence	B	717 FOREST LN.	45	k3ab	"	163.4	-	-	* 74	* + 29
E416	Residence	B	713 FOREST LN.	45	k3ab	"	231.0	-	-	* 71	* + 26
E417	Residence	B	709 FOREST LN.	45	k3ab	"	302.9	-	-	* 68	* + 23
E418	Residence	B	705 FOREST LN.	45	k3ab	"	355.8	-	-	* 66	* + 21
E419	Residence	B	712 FOREST LN.	45	k3ab	"	401.4	-	-	64	* + 19
E420	Residence	B	4076 TUCKER RD.	45	k3ab	"	300.0	-	-	* 68	* + 23
E421	Residence	B	4066 TUCKER RD.	45	k3ab	"	243.6	-	-	* 70	* + 25
E423	Residence	B	838 EDGEWATER DR.	45	k3ab	"	665.0	-	-	59	+ 14
E424	Residence	B	4040 TUCKER RD.	45	k3ab	"	473.0	-	-	62	* + 17
E425	Residence	B	4039 TUCKER RD.	45	k3ab	"	473.0	-	-	62	* + 17
E426	Residence	B	4029 TUCKER RD.	45	k3ab	"	636.0	-	-	60	* + 15
E427	Residence	B	4021 TUCKER RD.	45	k3ab	"	669.0	-	-	59	+ 14
E428	Residence	B	4019 TUCKER RD.	45	k3ab	"	669.0	-	-	59	+ 14
E429	Residence	B	4017 TUCKER RD.	45	k3ab	"	754.0	-	-	58	+ 13
E195	Residence	B	900 EDGEWATER DR	45	k3a	"	433.0	-	-	63	* + 18
E196	Residence	B	825 EDGEWATER DR	45	k3a	"	660.0	-	-	60	* + 15
E197	Residence	B	906 EDGEWATER DR	45	k3a	"	432.0	-	-	63	* + 18
E198	Residence	B	912 EDGEWATER DR	45	k3a	"	370.0	-	-	65	* + 20
E199	Residence	B	924 EDGEWATER DR	45	k3a	"	255.0	-	-	* 70	* + 25
E200	Residence	B	931 EDGEWATER DR	45	k3a	"	269.0	-	-	* 69	* + 24
E201	Residence	B	925 EDGEWATER DR	45	k3a	"	394.0	-	-	64	* + 19
E202	Residence	B	919 EDGEWATER DR	45	k3a	"	482.0	-	-	62	* + 17
E203	Res-Undev	G	907 EDGEWATER DR	45	k3a	"	577.0	-	-	61 Undev	+ 16
E204	Residence	B	856 EDGEWATER DR	45	k3a	"	622.0	-	-	60	* + 15
E205	Residence	B	850 EDGEWATER DR	45	k3a	"	684.0	-	-	59	+ 14

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4 - TRAFFIC NOISE EXPOSURES
Pref Alt NC279 to NC273
Addendum #2

RECEPTOR INFORMATION			NEAREST EXISTING	AMBIENT NOISE	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEVELS			NOISE LEVEL
ID#	LAND USE	CATEGORY	ROADWAY	LEVEL	SEGMENT	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	INCREASE
E206	Residence	B	EDGEWATER DR	45	k3a	"	671.0	-	-	59	+ 14
E207	Residence	B	832 EDGEWATER DR	45	k3a	"	769.0	-	-	58	+ 13
E208	Residence	B	826 EDGEWATER DR	45	k3a	"	802.0	-	-	58	+ 13
E209	Residence	B	844 EDGEWATER DR	45	k3a	"	582.0	-	-	61	* + 16
E215	Residence	B	862 EDGEWATER DR	45	k3a	"	594.0	-	-	60	* + 15
E216	Residence	B	535 LAKE WYLIE RD	45	k3a	"	203.0	-	-	* 72	* + 27
E217	Residence	B	529 LAKE WYLIE RD	45	k3a	"	396.0	-	-	64	* + 19
E218	Residence	B	521 LAKE WYLIE RD	45	k3a	"	764.0	-	-	58	+ 13
E211	Residence	B	201 RIVERFRONT DR	45	k3a	"	720.0	-	-	59	+ 14
E212	Residence	B	1400 GAITHER RD	45	k3a	"	263.0	-	-	* 69	* + 24
E213	Residence	B	1500 GAITHER RD	45	k3a	"	365.0	-	-	65	* + 20
E214	Residence	B	1510 GAITHER RD	45	k3a	"	633.0	-	-	60	* + 15
E227	Res-Undev	G	GAITHER RD	45	k3a	"	499.0	-	-	62 Undev	+ 17
E229	Residence	B	4080 TUCKER RD-in slope stakes	45	kx1k3b	"	374.0	-	-	65 ROW	+ 20
E230	Residence	B	4087 TUCKER RD	45	kx1k3b	"	506.0	-	-	62	* + 17
E231	Residence	B	2024 SOUTH POINT RD	45	kx1k3b	"	754.3	-	-	58	+ 13
E440	Residence	B	527 LAKE WYLIE RD	45	kx1k3b	"	410.0	-	-	64	* + 19

NOTE: Category per updated FHWA NAC categories

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt NC273 to Dixie River Rd.
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2
25	0.0	0.0
50	0.0	0.0
100	0.0	0.0
200	0.0	0.0
400	0.0	0.0
800	0.0	0.0
1600	0.0	0.0
R0	0.0	0.0

BACKGROUND NOISE LEVEL FOR AREA 45.0

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- NC273 to I-485	N/A PRD # 2	N/A PRD # 3
72	81.5	0.0	0.0
91	80.1	0.0	0.0
141	76.8	0.0	0.0
241	73.0	0.0	0.0
441	65.8	0.0	0.0
841	60.0	0.0	0.0
1641	51.2	0.0	0.0
R0	43.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	263.1
67	398.7
66	434.5
50	0.0
DESIRED 55 dBA ^	1227.5

Minimum Right-of-way Distance From CL: 140.0

---------- R/W ---------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEV -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
E2	Residence	B	4627 LOCHFOOT DR	45	k3c	Project	839.9	-	-	60	* + 15
E3	Residence	B	4111 TUFFY LN	45	k3c	"	495.5	-	-	64	* + 19
E4	Res-Undev	G	TUFFY LN	45	k3c	"	608.1	-	-	62 Undev	+ 17
E5	Residence	B	4122 TUFFY LN	48	k3c	"	842.4	-	-	59	+ 11
E6	Res-Undev	G	4002 TUFFY LN	45	k3c	"	727.2	-	-	61 Undev	+ 16
E7	Residence	B	4116 TUFFY LN	45	k3c	"	735.7	-	-	61	* + 16
E8	Residence	B	4116 TUFFY LN	45	k3c	"	883.6	-	-	59	+ 14
E9	Res-Undev	G	4020 TUFFY LN	45	k3c	"	706.1	-	-	61 Undev	+ 16
E10	Res-Undev	G	4017 TUFFY LN	45	k3c	"	374.9	-	-	67 Undev	+ 22
E13	Residence	B	4003 TUFFY LN	45	k3c	"	257.8	-	-	* 72	* + 27
E14	Residence	B	4600 LOCHFOOT DR	45	k3c	"	740.7	-	-	61	* + 16
E15	Res-Undev	G	LOCHFOOT DR	45	k3c	"	634.1	-	-	62 Undev	+ 17
E16	Res-Undev	G	LOCHFOOT DR	45	k3c	"	476.6	-	-	65 Undev	+ 20
E17	Res-Undev	G	LOCHFOOT DR	45	k3c	"	430.7	-	-	66 Undev	+ 21
E18	Res-Undev	G	LOCHFOOT DR	45	k3c	"	428.2	-	-	66 Undev	+ 21
E19	Res-Undev	G	LOCHFOOT DR	45	k3c	"	430.7	-	-	66 Undev	+ 21
E20	Res-Undev	G	LOCHFOOT DR	45	k3c	"	419.5	-	-	66 Undev	+ 21
E21	Res-Undev	G	LOCHFOOT DR	45	k3c	"	424.5	-	-	66 Undev	+ 21
E22	Res-Undev	G	LOCHFOOT DR	45	k3c	"	400.9	-	-	66 Undev	+ 21
E23	Res-Undev	G	LOCHFOOT DR	45	k3c	"	387.2	-	-	67 Undev	+ 22
E24	Res-Undev	G	LOCHFOOT DR	45	k3c	"	390.9	-	-	67 Undev	+ 22
E25	Residence	B	4550 LOCHFOOT DR	45	k3c	"	624.8	-	-	62	* + 17
E26	Residence	B	4616 LOCHFOOT DR	45	k3c	"	897.2	-	-	59	+ 14
E430	Residence	B	1005 FIRST ST.	45	k3ab	"	866.0	-	-	59	+ 14
E431	Residence	B	5037 DRENNAN HORNE RD.	45	k3ab	"	682.0	-	-	61	* + 16
E436	Residence	B	DRENNAN HORNE RD.	45	k3c	"	726.0	-	-	61	* + 16
E437	Residence	B	DRENNAN HORNE RD.	45	k3c	"	820.0	-	-	60	* + 15
E75	Residence	B	5031 DRENNAN HORNE DR	50	k3c	"	637.5	-	-	62	+ 12
E76	Residence	B	5043 DRENNAN HORNE DR	45	k3c	"	674.2	-	-	61	* + 16
E77	Residence	B	5027 DRENNAN HORNE DR	45	k3c	"	640.5	-	-	62	* + 17
E78	Bus-Industrial	F	5028 DRENNAN HORNE DR	45	k3c	"	411.1	-	-	66	+ 21
E107	Residence	B	3423 BOAT CLUB RD	45	k3c	"	761.2	-	-	60	* + 15
E108	Residence	B	3414 BOAT CLUB RD	45	k3c	"	835.7	-	-	60	* + 15
E109	Residence	B	3418 BOAT CLUB RD	45	k3c	"	702.7	-	-	61	* + 16
E110	Residence	B	SOUTH POINT RD/JOYE MHP	45	k3c	"	705.3	-	-	61	* + 16
E111	Residence	B	SOUTH POINT RD/JOYE MHP	45	k3c	"	576.6	-	-	63	* + 18
E112	Residence	B	SOUTH POINT RD/JOYE MHP	45	k3c	"	465.1	-	-	65	* + 20
E113	Residence	B	SOUTH POINT RD/JOYE MHP	45	k3c	"	444.8	-	-	65	* + 20
E114	Residence	B	SOUTH POINT RD/JOYE MHP	45	k3c	"	434.9	-	-	65	* + 20
E115	Residence	B	SOUTH POINT RD/JOYE MHP	45	k3c	"	636.6	-	-	62	* + 17
E116	Residence	B	SOUTH POINT RD/JOYE MHP	45	k3c	"	603.0	-	-	62	* + 17
E117	Residence	B	SOUTH POINT RD/JOYE MHP	45	k3c	"	582.9	-	-	63	* + 18
E118	Residence	B	JOYE LN	45	k3c	"	613.7	-	-	62	* + 17
E119	Residence	B	3432 BOAT CLUB RD	45	k3c	"	499.4	-	-	64	* + 19
E120	Residence	B	3436 BOAT CLUB RD	45	k3c	"	410.7	-	-	* 66	* + 21
E121	Residence	B	3442 BOAT CLUB RD	45	k3c	"	302.4	-	-	* 70	* + 25
E122	Residence	B	3419 BOAT CLUB RD	45	k3c	"	703.6	-	-	61	* + 16

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt NC273 to Dixie River Rd.
Addendum #2

RECEPTOR INFORMATION			NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEV			NOISE LEVEL INCREASE
ID#	LAND USE	CATEGORY			SEGMENT	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	
E232	Residence	B	3112 ALLISON ST	45	k3c	"	606.4	-	-	62	* + 17
E233	Residence	B	3116 ALLISON ST	45	k3c	"	854.5	-	-	59	+ 14
E234	Residence	B	2039 SOUTH POINT RD	45	k3c	"	978.3	-	-	58	+ 13
E235	Residence	B	5011 DOROTHY RUTH LN	45	k3c	"	854.8	-	-	59	+ 14
E236	Residence	B	PLANT ALLEN RD	45	k3c	"	435.9	-	-	65	* + 20
E237	Residence	B	3476 BOAT CLUB RD	45	k3c	"	346.1	-	-	* 68	* + 23
E238	Residence	B	3488 BOAT CLUB RD	45	k3c	"	375.1	-	-	* 67	* + 22
E240	Residence	B	1255 OAK CREST TRL	45	k3c	"	268.0	-	-	* 71	* + 26
E346	Residence	B	3115 ALLISON ST	45	k3c	"	885.3	-	-	59	+ 14
E347	Residence	B	DRENNAN HORNE DR	45	k3c	"	547.1	-	-	63	* + 18
E348	Residence	B	5021 DRENNAN HORNE DR	45	k3c	"	548.1	-	-	63	* + 18
E351	Residence	B	1251 OAK CREST TRL	45	k3c	"	420.1	-	-	* 66	* + 21
E354	Residence	B	DRENNAN HORNE DR	45	k3c	"	735.6	-	-	61	* + 16
E355	Residence	B	3441 BOAT CLUB RD	45	k3c	"	510.2	-	-	64	* + 19
E382	Res-Undev	G	DRENNAN HORNE DR	45	k3c	"	663.4	-	-	62 Undev	+ 17
E384	Residence	B	3111 ALLISON ST	45	k3c	"	688.8	-	-	61	* + 16
E387	Residence	B	3478 BOAT CLUB RD	45	k3c	"	437.5	-	-	65	* + 20
E388	Residence	B	115 SUNDERLAND RD	45	k3c	"	729.6	-	-	61	* + 16
E389	Residence	B	5010 DOROTHY RUTH LN	45	k3c	"	635.9	-	-	62	* + 17
E410	ActiveRec-2 eq recv	C	Private Baseball Field (Duke Power)	45	k3b	"	380.1	-	-	67	* + 22
E411	ActiveRec-2 eq recv	C	Private Rec Field (Duke Power)	45	k3b	"	458.1	-	-	65	* + 20

NOTE: Category per updated FHWA NAC categories

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt Dixie River Rd. to I-485
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	50.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- Dixie Rd to I-485	N/A PRD # 2	N/A PRD # 3	NOISE CONTOURS	DISTANCE TO CL
72	81.2	0.0	0.0	72	256.9
91	79.7	0.0	0.0	67	388.6
141	76.5	0.0	0.0	66	423.4
241	72.7	0.0	0.0	50	0.0
441	65.5	0.0	0.0	DESIRED 55	1200.0
841	59.7	0.0	0.0	dBA ^	
1641	50.9	0.0	0.0		
R0	43.0	0.0	0.0		

Minimum Right-of-way Distance From CL: 140.0

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
E60	Residence	B	10301 GARRISON RD	50	k1d	"	1490.9	-	-	52	+ 2
E61	Residence	B	GARRISON RD	50	k1d	"	1353.1	-	-	53	+ 3
E62	Residence	B	10305 GARRISON RD	50	k1d	"	1431.8	-	-	52	+ 2
E65	Residence	B	10406 GARRISON RD	50	k1d	"	1391.4	-	-	53	+ 3
E66	Residence	B	10315 GARRISON RD	50	k1d	"	1505.4	-	-	52	+ 2
E32	Residence	B	10408 GARRISON RD	50	k1d	"	932.7	-	-	58	+ 8
E33	Residence	B	10408 GARRISON RD	50	k1d	"	979.3	-	-	57	+ 7
E28	Residence	B	10220 GARRISON RD	50	k1d	"	854.0	-	-	59	+ 9
E29	Residence	B	10220 GARRISON RD	50	k1d	"	929.4	-	-	58	+ 8
E30	Residence	B	10300 GARRISON RD	50	k1d	"	1034.9	-	-	56	+ 6
E31	Residence	B	10300 GARRISON RD	50	k1d	"	1060.7	-	-	56	+ 6
E58	Residence	B	10308 GARRISON RD	50	k1d	"	1231.6	-	-	54	+ 4
E59	Residence	B	10308 GARRISON RD	50	k1d	"	1301.5	-	-	53	+ 3
E422	Residence	B	10104 GARRISON RD	50	k3c	"	425.8	-	-	65	* + 15
E432	Residence	B	10216 GARRISON RD	50	k3c	"	785.0	-	-	60	+ 10
E433	Residence	B	10134 GARRISON RD	50	k3c	"	621.0	-	-	62	+ 12
E434	Residence	B	10029 GARRISON RD	50	k3c	"	673.0	-	-	61	+ 11
E435	Residence	B	100001 GARRISON RD	50	k3c	"	657.0	-	-	61	+ 11
E438	Residence	B	9924 HORTON RD.	50	k3c	"	819.0	-	-	59	+ 9
E439	Residence	B	10012 HORTON RD.	50	k3c	"	925.0	-	-	58	+ 8

NOTE: Category per updated FHWA NAC categories

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

TABLE N4
TRAFFIC NOISE EXPOSURES
Pref Alt East of I-485
Addendum #2

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0.0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- East of I-485	N/A PRD # 2	N/A PRD # 3
72	77.5	0.0	0.0
91	75.5	0.0	0.0
141	72.5	0.0	0.0
241	68.3	0.0	0.0
441	60.7	0.0	0.0
841	55.0	0.0	0.0
1641	46.2	0.0	0.0
R0	37.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	145.6
67	262.1
66	283.5
50	1221.5
DESIRED 55 dBA ^	837.0

Minimum Right-of-way Distance From CL: 140.0

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY SEGMENT	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
E43	No longer there	G	BYRUM DR	50	k1d	Project	935.4	-	-	53	+ 3
E44	No longer there	G	6821 STEELE CREEK RD	50	k1d	"	460.1	-	-	60	+ 10
E45	No longer there	G	6829 STEELE CREEK RD	50	k1d	"	746.3	-	-	55	+ 5
E48	No longer there	G	STEELE CREEK RD	50	k1d	"	363.8	-	-	62	+ 12
E49	No longer there	G	STEELE CREEK RD	50	k1d	"	345.9	-	-	63	+ 13

NOTE: Category per updated FHWA NAC categories

Note: A review of the GIS tax parcel data available at www.charmeck.org showed that the properties where these receptors are located are now vacant.

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

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APPENDIX D

BARRIER EVALUATION AREA RESULTS

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Barrier Evaluation Area 1
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted	Noise Level	Barrier Height/ Noise Level	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Level[a]	Name	Distance (ft)	Noise Level	Increase[b]	with Barrier	Loss
										Barrier 1-1	
										10/12 ft Barrier	
W2	Residence	B	H2A	3138 SALEM DR	51	WB Gaston East-West Connector	449	62	11	57	-5
W20	Residence	B	H2A	937 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	506	54	6	48	-6
W426	Church	C	H2A	937 SHANNON BRADLEY RD	45	WB Gaston East-West Connector	336	64	▲ 19	55	-9
W21	Residence	B	H2A	550 SHANNON BRADLEY RD	51	WB Gaston East-West Connector	482	61	10	56	-6
W24	Residence	B	H2A	3212 NORTHWYNN DR	48	WB Gaston East-West Connector	354	58	10	53	-6
W25	Residence	B	H2A	3218 NORTHWYNN DR	48	WB Gaston East-West Connector	295	61	13	55	-6
W26	Residence	B	H2A	3224 NORTHWYNN DR	45	WB Gaston East-West Connector	228	* 67	▲ 22	55	-11
W27	Residence	B	H2A	642 BELFAST DR	45	WB Gaston East-West Connector	162	65	▲ 20	55	-9
W28	Residence	B	H2A	641 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	308	65	▲ 17	55	-10
W29	Residence	B	H2A	650 BELFAST DR	45	WB Gaston East-West Connector	177	* 66	▲ 21	56	-11
W30	Residence	B	H2A	700 BELFAST DR	45	WB Gaston East-West Connector	185	* 66	▲ 21	55	-11
W31	Residence	B	H2A	701 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	330	64	▲ 16	54	-10
W32	Residence	B	H2A	706 BELFAST DR	48	WB Gaston East-West Connector	204	65	▲ 17	55	-10
W33	Residence	B	H2A	639 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	342	64	▲ 16	53	-11
W34	Residence	B	H2A	714 BELFAST DR	45	WB Gaston East-West Connector	217	64	▲ 19	54	-10
W35	Residence	B	H2A	720 BELFAST DR	45	WB Gaston East-West Connector	229	63	▲ 18	54	-9
W36	Residence	B	H2A	726 BELFAST DR	45	WB Gaston East-West Connector	244	63	▲ 18	54	-9
W37	Residence	B	H2A	732 BELFAST DR	45	WB Gaston East-West Connector	251	64	▲ 19	54	-10
W38	Residence	B	H2A	738 BELFAST DR	45	WB Gaston East-West Connector	264	65	▲ 20	54	-11
W39	Residence	B	H2A	744 BELFAST DR	45	WB Gaston East-West Connector	278	65	▲ 20	54	-11
W40	Residence	B	H2A	750 BELFAST DR	45	WB Gaston East-West Connector	289	65	▲ 20	54	-11
W42	Residence	B	H2A	634 BELFAST DR	45	WB Gaston East-West Connector	161	64	▲ 19	55	-8
W47	Residence	B	H2A	719 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	369	63	▲ 15	52	-11
W48	Residence	B	H2A	713 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	355	64	▲ 16	53	-11
W49	3 Unit Apts	B	H2A	SHANNON BRADLEY RD	48	WB Gaston East-West Connector	292	65	▲ 17	57	-8
W50	3 Unit Apts	B	H2A	SHANNON BRADLEY RD	48	WB Gaston East-West Connector	270	* 66	▲ 18	58	-8
W51	6 Unit Apts	B	H2A	SHANNON BRADLEY RD	48	WB Gaston East-West Connector	250	* 66	▲ 18	58	-8
W1	Residence	B	H2A	3132 SALEM DR	50	WB Gaston East-West Connector	512	60	10	56	-5
W3	Residence	B	H2A	3125 SALEM DR	50	WB Gaston East-West Connector	505	60	10	56	-3
W22	Residence	B	H2A	3200 NORTHWYNN DR	50	WB Gaston East-West Connector	492	54	4	53	-1
W23	Residence	B	H2A	3206 NORTHWYNN DR	48	WB Gaston East-West Connector	422	56	8	51	-5
W41	Residence	B	H2A	749 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	435	60	12	52	-8
W43	Residence	B	H2A	743 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	417	60	12	52	-8
W44	Residence	B	H2A	737 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	406	60	12	52	-8
W45	Residence	B	H2A	731 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	389	60	12	52	-9
W46	Residence	B	H2A	725 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	386	61	13	52	-10
W53	Residence	B	H2A	420 SHANNON BRADLEY RD	48	WB Gaston East-West Connector	475	60	12		
W54	Residence	B	H2A	424 SHANNON BRADLEY RD	50	WB Gaston East-West Connector	440	61	11		
W220	Residence	B	H2A	551 BELFAST DR	45	EB Gaston East-West Connector	188	57	12		
W221	Residence	B	H2A	526 BELFAST DR	45	EB Gaston East-West Connector	179	57	12		
W234	Residence	B	H2A	648 COLEBROOK DR	45	EB Gaston East-West Connector	387	59	14		

Barrier Evaluation Area 1
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted	Noise Level	Barrier Height/	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Level[a]	Name	Distance (ft)	Noise Level	Increase[b]	Noise Level with Barrier	Loss
W222	Residence	B	H2A	518 BELFAST DR	45	EB Gaston East-West Connector	251	57	12		
W223	Residence	B	H2A	510 BELFAST DR	45	EB Gaston East-West Connector	320	55	10		
W224	Residence	B	H2A	BELFAST DR	45	EB Gaston East-West Connector	421	53	8		
W225	Residence	B	H2A	BELFAST DR	45	EB Gaston East-West Connector	527	54	9		
W226	Residence	B	H2A	543 BELFAST DR	45	EB Gaston East-West Connector	226	56	11		
W227	Residence	B	H2A	COLEBROOK DR	45	EB Gaston East-West Connector	329	55	10		
W228	Residence	B	H2A	612 COLEBROOK DR	45	EB Gaston East-West Connector	323	55	10		
W229	Residence	B	H2A	618 COLEBROOK DR	45	EB Gaston East-West Connector	330	57	12		
W230	Residence	B	H2A	624 COLEBROOK DR	45	EB Gaston East-West Connector	347	58	13		
W231	Residence	B	H2A	630 COLEBROOK DR	45	EB Gaston East-West Connector	363	58	13		
W232	Residence	B	H2A	636 COLEBROOK DR	45	EB Gaston East-West Connector	371	58	13		
W233	Residence	B	H2A	642 COLEBROOK DR	45	EB Gaston East-West Connector	383	58	13		
W235	Residence	B	H2A	654 COLEBROOK DR	45	EB Gaston East-West Connector	398	59	14		
W236	Residence	B	H2A	660 COLEBROOK DR	45	EB Gaston East-West Connector	406	59	14		
W242	Residence	B	H2A	643 COLEBROOK DR	45	EB Gaston East-West Connector	525	57	12		
W243	Residence	B	H2A	637 COLEBROOK DR	45	EB Gaston East-West Connector	518	57	12		
W244	Residence	B	H2A	631 COLEBROOK DR	45	EB Gaston East-West Connector	505	57	12		
W245	Residence	B	H2A	625 COLEBROOK DR	45	EB Gaston East-West Connector	485	57	12		
W246	Residence	B	H2A	619 COLEBROOK DR	45	EB Gaston East-West Connector	477	57	12		
W247	Residence	B	H2A	613 COLEBROOK DR	45	EB Gaston East-West Connector	456	57	12		
W248	Residence	B	H2A	607 COLEBROOK DR	45	EB Gaston East-West Connector	447	56	11		
W249	UndevResidence	G	H2A	601 COLEBROOK DR	45	EB Gaston East-West Connector	445	56	11		
W250	Residence	B	H2A	NORTHWYNN DR	45	EB Gaston East-West Connector	464	59	14		

UndevResidence - Lot in a subdivision that has not been built upon as of June 2011

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 1 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 1 - Shannon Bradley Rd area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Linear (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 1-1	12	2,640	Exit Ramp 13.1 to 153	31,680	22	12	932	18	630	3,130	Yes

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors.

Barrier Evaluation Area 4
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted	Noise Level	Barrier Height/	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Noise Level[a]	Name	Distance (ft)	Noise Level	Increase	Noise Level with Barrier	Loss
										Barrier 4-1	
										20 ft Barrier	
W4	Residence	B	H3	2715 LAKEWOOD DR	45	WB Gaston East-West Connector	341	59	14	50	-9
W5	Residence	B	H3	2705 LAKEWOOD DR	45	WB Gaston East-West Connector	505	57	12	49	-8
W6	UndevReside	G	H3	LAKEWOOD DR	45	WB Gaston East-West Connector	428	63	18	53	-10
W7	UndevReside	G	H3	PROVIDENCE DR	45	WB Gaston East-West Connector	533	61	16	53	-8
W8	Residence	B	H3	2639 CASTLE HILL RD	45	WB Gaston East-West Connector	558	60	▲ 15	52	-8
W9	Residence	B	H3	2647 CASTLE HILL RD	45	WB Gaston East-West Connector	472	61	▲ 16	52	-9
W10	Residence	B	H3	2655 CASTLE HILL RD	45	WB Gaston East-West Connector	410	63	▲ 18	53	-10
W11	Residence	B	H3	2663 CASTLE HILL RD	45	WB Gaston East-West Connector	291	* 66	▲ 21	53	-14
W12	UndevReside	G	H3	CASTLE HILL RD	45	WB Gaston East-West Connector	247	68	23	53	-15
W13	Residence	B	H3	2654 CASTLE HILL RD	45	WB Gaston East-West Connector	330	* 66	▲ 21	54	-12
W14	Residence	B	H3	2646 CASTLE HILL RD	45	WB Gaston East-West Connector	397	64	▲ 19	54	-10
W15	Residence	B	H3	2638 CASTLE HILL RD	45	WB Gaston East-West Connector	485	61	▲ 16	53	-8
W16	Residence	B	H3	2632 CASTLE HILL RD	45	WB Gaston East-West Connector	552	59	14	53	-7
W17	Residence	B	H3	2610 LAKEWOOD DR	45	WB Gaston East-West Connector	560	58	13	50	-8
W18	Residence	B	H3	LAKEWOOD DR	45	WB Gaston East-West Connector	473	57	12	50	-7
W19	Residence	B	H3	2634 LAKEWOOD DR	45	WB Gaston East-West Connector	355	60	▲ 15	50	-9

UndevResidence - Lot in a subdivision that has not been built upon as of June 2011

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 4 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 4 - Lakewood Forest (Linwood Rd) area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors Benefited	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Length (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 4-1	20	1,605	Exit Ramp 0 to 26	32,100	8	5	2,469	18	630	3,130	Yes

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors.

Barrier Evaluation Area 7
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway					Barrier Height/	
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Noise Level[a]	Name	Distance (ft)	Predicted Noise Level		Noise Level Increase[b]	Noise Level with Barrier	Insertion Loss
											16 ft Barrier	
W59	Residence	B	H3	140 GRASSY CT	45	WB Gaston East-West Connector	678	57		12		
W60	Residence	B	H3	145 GRASSY CT	45	EB Gaston East-West Connector	684	59		14		
W61	Residence	B	H3	2424 CRICKET LN	45	EB Gaston East-West Connector	686	59		14		
W427	Residence	B	H3	148 GRASSY CT	45	EB Gaston East-West Connector	683	57		12		
W58	Residence	B	H3	2334 CRICKET LN	45	EB Gaston East-West Connector	712	62		▲ 17	54	-8
W62	Residence	B	H3	2401 CRICKET LN	45	EB Gaston East-West Connector	695	* 66		▲ 21	54	-12
W63	Residence	B	H3	2349 CRICKET LN	45	EB Gaston East-West Connector	698	57		12	50	-7
W64	Residence	B	H3	2714 SKYLAND DR	45	EB Gaston East-West Connector	696	* 68		▲ 23	56	-12
W65	Residence	B	H3	2710 SKYLAND DR	45	EB Gaston East-West Connector	697	63		▲ 18	53	-10
W66	Residence	B	H3	2706 SKYLAND DR	45	EB Gaston East-West Connector	703	61		▲ 16	53	-9
W67	Residence	B	H3	3702 SKYLAND DR	45	EB Gaston East-West Connector	710	58		13	51	-7
W68	Residence	B	H3	2701 SKYLAND DR	45	EB Gaston East-West Connector	726	59		14	54	-5
W69	Residence	B	H3	2705 SKYLAND DR	45	EB Gaston East-West Connector	722	61		▲ 16	55	-6
W70	Residence	B	H3	2709 SKYLAND DR	45	EB Gaston East-West Connector	718	65		▲ 20	57	-7
W71	Residence	B	H3	2713 SKYLAND DR	45	EB Gaston East-West Connector	713	* 67		▲ 22	58	-8
W72	Residence	B	H3	2501 BRIAR OAK DR	45	WB Gaston East-West Connector	702	60		▲ 15	Isolated	
W73	Residence	B	H3	3020 STABLEGATE DR	45	WB Gaston East-West Connector	697	57		12		
W74	UndevResidence	G	H3	3030 STABLEGATE DR	45	WB Gaston East-West Connector	703	59		14		
W75	Residence	B	H3	3040 STABLEGATE DR	45	WB Gaston East-West Connector	704	57		12		
W76	Residence	B	H3	3050 STABLEGATE DR	45	WB Gaston East-West Connector	700	54		9		
W77	Residence	B	H3	3060 STABLEGATE DR	45	WB Gaston East-West Connector	702	57		12		
W78	Residence	B	H3	2815 PENNY PARK DR	45	WB Gaston East-West Connector	717	58		13		
W79	Residence	B	H3	2805 PENNY PARK DR	45	EB Gaston East-West Connector	732	* 68		▲ 23	Isolated	
W80	Residence	B	H3	2765 PENNY PARK DR	45	EB Gaston East-West Connector	717	59		14		
W81	Residence	B	H3	2765 PENNY PARK DR	45	EB Gaston East-West Connector	723	57		12		
W354	UndevResidence	G	H3	2433 CRICKET LN	45	WB Gaston East-West Connector	677	58		13		

UndevResidence - Lot in a subdivision that has not been built upon as of June 2011

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.
Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 7 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 7 - Cricket Lane area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Length (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 7-1	16	1,500	278 to 293	24,000	8	3	2,182	19	665	3,165	Yes

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors.

Barrier Evaluation Area 12
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/ Noise Level	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]	with Barrier	Loss
										Barrier 12-3 25 ft barrier	
M166	Residence	B	J4	520 NEW HAVEN DR	45	EB Gaston East-West Connector	309	62	▲ 17	56	-6
M167	Residence	B	J4	526 NEW HAVEN DR	45	EB Gaston East-West Connector	420	60	▲ 15	56	-4
M168	Residence	B	J4	536 NEW HAVEN DR	45	EB Gaston East-West Connector	408	57	12	54	-3
M169	Residence	B	J4	519 NEW HAVEN DR	45	EB Gaston East-West Connector	497	55	10	54	-1
M170	Residence	B	J4	513 NEW HAVEN DR	45	EB Gaston East-West Connector	347	59	14	57	-2
M285	Residence	B	J4	544 NEW HAVEN DR	45	EB Gaston East-West Connector	514	54	9	53	-1
										Barrier 12-1&2	
										10-12 ft Barrier	
M172	Residence	B	J4	BIG OAK RD	45	WB Gaston East-West Connector	306	61	▲ 16	57	-4
M173	Residence	B	J4	4220 BIG OAK RD	45	WB Gaston East-West Connector	255	64	▲ 19	58	-6
M174	Residence	B	J4	4216 BIG OAK RD	45	WB Gaston East-West Connector	310	64	▲ 19	57	-7
M175	Residence	B	J4	4212 BIG OAK RD	45	WB Gaston East-West Connector	315	64	▲ 19	55	-9
M176	Residence	B	J4	4208 BIG OAK RD	45	WB Gaston East-West Connector	264	61	▲ 16	53	-9
M177	Residence	B	J4	4200 BIG OAK RD	45	WB Gaston East-West Connector	239	64	▲ 19	55	-9
M178	Residence	B	J4	4200 BIG OAK RD	45	WB Gaston East-West Connector	402	63	▲ 18	56	-7
M171	Residence	B	J4	409 NEW HAVEN DR	45	WB Gaston East-West Connector	407	58	13	52	-6
M204	Residence	B	J4	CROWDERS CREEK RD	45	WB Gaston East-West Connector	377	57	12	51	-6
M205	Residence	B	J4	CROWDERS CREEK RD	45	WB Gaston East-West Connector	229	65	▲ 20	58	-7
M202	Residence	B	J4	CROWDERS CREEK RD	45	WB Gaston East-West Connector	252	64	▲ 19	57	-7
M203	Residence	B	J4	CROWDERS CREEK RD	45	WB Gaston East-West Connector	352	58	13	54	-4
M185	Residence	B	J4	CROWDERS CREEK RD	52	EB Gaston East-West Connector	895	57	5		
M186	Residence	B	J4	CROWDERS CREEK RD	52	EB Gaston East-West Connector	486	55	3		
M187	Residence	B	J4	CROWDERS CREEK RD	52	EB Gaston East-West Connector	451	54	2		
M188	Residence	B	J4	CROWDERS CREEK RD	52	EB Gaston East-West Connector	415	53	1		
M189	Residence	B	J4	CROWDERS CREEK RD	52	EB Gaston East-West Connector	362	52	0		
M190	Residence	B	J4	CROWDERS CREEK RD	52	EB Gaston East-West Connector	307	53	1		
M191	Residence	B	J4	CROWDERS CREEK RD	47	EB Gaston East-West Connector	478	50	3		
M192	Residence	B	J4	CROWDERS CREEK RD	47	EB Gaston East-West Connector	429	51	4		
M193	Residence	B	J4	CROWDERS CREEK RD	47	EB Gaston East-West Connector	391	52	5		
M194	Residence	B	J4	CROWDERS CREEK RD	47	EB Gaston East-West Connector	354	52	5		
M195	Residence	B	J4	CROWDERS CREEK RD	47	EB Gaston East-West Connector	316	53	6		
M196	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	459	50	5		
M197	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	403	52	7		
M198	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	351	53	8		
M199	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	291	55	10		
M200	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	238	58	13		
M201	Residence	B	J4	CROWDERS CREEK RD	52	EB Gaston East-West Connector	246	56	4		
M206	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	261	56	11		
M207	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	211	59	14		
M208	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	364	53	8		
M209	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	456	50	5		
M210	Residence	B	J4	CROWDERS CREEK RD	45	EB Gaston East-West Connector	466	51	6		
M220	Residence	B	J4	544 NEW HAVEN DR	47	EB Gaston East-West Connector	1000	50	3		

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.
Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 12 REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 12 - Fall Estates (New Haven Dr) area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Length (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 12-1&2 combined	10	201	Sta 583 to 585	2,010	8	2	2,810	17	595	3,095	Yes
Continuous barrier	12	2,174	Sta 561 to 583	26,088							
	TOTAL	**2,375**	**TOTAL**	**28,098**							
BEA 12-3	25	570	569 to 575	14,250	1	0	20,200	16	560	3,060	No
	25	238	575 to 577	5,950							
	TOTAL	**808**	**TOTAL**	**20,200**							
BEA 12-1&2 and 12-3			BEA 12-1&2	28,098							No
Considered together			BEA 12-3	20,200	BEA 12-3 exceeds 2x the allowable base quantity of wall (2x 2,500 sq ft), so wall does not						
in common noise env.			**TOTAL**	**48,298**	meet criteria for quantity averaging listed in the 2011 Noise Abatement Policy						

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors.

Barrier Evaluation Area 17
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION ID #	Land Use	Category	Project Segment	Nearest Existing Roadway	Ambient Noise Level[a]	Nearest Proposed Roadway Name	Distance (ft)	Predicted Noise Level	Noise Level Increase[b]	Barrier Height/ Noise Level with Barrier	Insertion Loss
										Barrier 17-4	
										10/12/14/12 ft Barrier	
M03	Residence	B	J2C	412 PAM DR	45	EB Gaston East-West Connector	520	63	▲ 18	54	-8
M04	Residence	B	J2C	416 PAM DR	45	EB Gaston East-West Connector	524	61	▲ 16	54	-7
M05	Residence	B	J2C	410 PAM DR	45	EB Gaston East-West Connector	522	60	▲ 15	54	-6
M06	Residence	B	J2C	502 PAM DR	45	EB Gaston East-West Connector	521	59	14	54	-5
M07	Residence	B	J2C	506 PAM DR	45	EB Gaston East-West Connector	512	59	14	55	-4
M08	Residence	B	J2C	4640 CAMILLE ST	45	EB Gaston East-West Connector	391	61	▲ 16	56	-5
M09	Residence	B	J2C	512 PAM DR	48	EB Gaston East-West Connector	515	59	11	57	-2
M10	Residence	B	J2C	1104 ROBINSON RD	52	EB Gaston East-West Connector	509	62	10	62	0
M11	Residence	B	J2C	308 PAM DR	45	EB Gaston East-West Connector	536	63	▲ 18	56	-7
M12	Residence	B	J2C	312 PAM DR	45	EB Gaston East-West Connector	527	64	▲ 19	56	-8
M13	Residence	B	J2C	316 PAM DR	45	EB Gaston East-West Connector	559	63	▲ 18	56	-7
M14	Residence	B	J2C	320 PAM DR	45	EB Gaston East-West Connector	547	63	▲ 18	55	-8
M15	Residence	B	J2C	402 PAM DR	45	EB Gaston East-West Connector	525	63	▲ 18	55	-8
M16	Residence	B	J2C	212 PAM DR	45	EB Gaston East-West Connector	577	63	▲ 18	56	-7
M17	Residence	B	J2C	206 PAM DR	45	EB Gaston East-West Connector	580	63	▲ 18	56	-7
M18	Residence	B	J2C	132 PAM DR	45	EB Gaston East-West Connector	626	62	▲ 17	56	-6
M19	Residence	B	J2C	200 PAM DR	45	EB Gaston East-West Connector	603	62	▲ 17	56	-6
M20	Residence	B	J2C	204 PAM DR	45	EB Gaston East-West Connector	600	62	▲ 17	55	-7
M21	Residence	B	J2C	128 PAM DR	45	EB Gaston East-West Connector	641	60	▲ 15	56	-5
M22	Residence	B	J2C	124 PAM DR	45	EB Gaston East-West Connector	678	58	13	56	-3
M23	Residence	B	J2C	120 PAM DR	45	EB Gaston East-West Connector	703	58	13	56	-2
M159	Residence	B	J2C	1098 ROBINSON RD	52	EB Gaston East-West Connector	393	61	9	60	-1
										Barrier 17-1	
										12/14 ft Barrier	
M179	Residence	B	J2A	4617 LONGBRIAR DR	45	WB Gaston East-West Connector	513	56	11	51	-5
M180	Residence	B	J2A	4621 LONGBRIAR DR	45	WB Gaston East-West Connector	443	59	14	55	-4
M181	Residence	B	J2A	4625 LONGBRIAR DR	45	WB Gaston East-West Connector	379	61	▲ 16	56	-5
M182	Residence	B	J2A	4632 LONGBRIAR DR	45	WB Gaston East-West Connector	306	64	▲ 19	54	-10
M183	Residence	B	J2A	4628 LONGBRIAR DR	45	WB Gaston East-West Connector	441	61	▲ 16	51	-10
M184	Residence	B	J2A	4624 LONGBRIAR DR	45	WB Gaston East-West Connector	511	59	14	52	-7
M215	Residence	B	J2A	4901 APRIL DR	45	WB Gaston East-West Connector	458	58	13	51	-7
M216	Residence	B	J2A	4904 APRIL DR	45	WB Gaston East-West Connector	404	59	14	54	-5
M217	Residence	B	J2A	4902 APRIL DR	45	WB Gaston East-West Connector	502	58	13	53	-5
M218	Residence	B	J2A	4713 PLAZA RD	45	WB Gaston East-West Connector	484	59	14	55	-4
M219	Residence	B	J2A	4711 PLAZA RD	45	WB Gaston East-West Connector	510	59	14	56	-3
M226	Residence	B	J2A	FORBES RD	45	WB Gaston East-West Connector	227	65	▲ 20	Isolated	
M227	Residence	B	J2A	FORBES RD	45	WB Gaston East-West Connector	434	59	14		
										Barrier 17-2	
										10/12/16/14 ft Barrier	
M230	Residence	B	J2C	2703 FORBES RD	52	WB Gaston East-West Connector	280	59	7	56	-3
M231	UndevResider	G	J2C	FORBES RD	47	WB Gaston East-West Connector	315	60	13	54	-7
M232	Residence	B	J2C	2707 FORBES RD	52	WB Gaston East-West Connector	455	55	3	51	-3
M233	Residence	B	J2C	1509 GREENPACK PKY	47	WB Gaston East-West Connector	534	52	5	48	-5
M234	Residence	B	J2C	1513 GREENPACK PKWY	45	WB Gaston East-West Connector	515	52	7	48	-4
M235	Residence	B	J2C	1603 CAPITAL DR	45	WB Gaston East-West Connector	497	53	8	48	-5
M236	UndevResider	G	J2C	1607 CAPITAL DR	45	WB Gaston East-West Connector	332	56	11	51	-5
M237	Residence	B	J2C	1610 CAPITAL DR	45	WB Gaston East-West Connector	232	* 67	▲ 22	56	-11
M238	Residence	B	J2C	1608 CAPITAL DR	45	WB Gaston East-West Connector	387	59	14	52	-6
M239	Residence	B	J2C	1521 GREENPACK PKWY	45	WB Gaston East-West Connector	559	55	10	49	-5
M240	Residence	B	J2C	1537 GREENPACK PKWY	45	WB Gaston East-West Connector	487	56	11	51	-5
M241	Residence	B	J2C	1543 GREENPACK PKWY	45	WB Gaston East-West Connector	266	* 66	▲ 21	56	-10

Barrier Evaluation Area 17
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient Noise	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/ Noise Level	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Level[a]	Name	Distance (ft)	Level	Increase[b]	with Barrier	Loss
M242	Residence	B	J2C	1544 GREENPACK PKWY	45	WB Gaston East-West Connector	256	* 68	▲ 23	58	-10
M243	Residence	B	J2C	1540 GREENPACK PKWY	45	WB Gaston East-West Connector	444	61	▲ 16	55	-6
										Barrier 17-3	
										12/14/12/10 ft Barrier	
M244	Residence	B	J2C	123 MCCARVER RD	45	WB Gaston East-West Connector	601	54	9	51	-3
M245	Residence	B	J2C	MCCARVER RD	45	WB Gaston East-West Connector	517	56	11	51	-5
M246	Residence	B	J2C	135 MCCARVER RD	45	WB Gaston East-West Connector	264	64	▲ 19	58	-6
M247	Residence	B	J2C	2718 FORBES RD	52	WB Gaston East-West Connector	528	56	4	53	-3
M257	Residence	B	J2C	131 MCCARVER RD	45	WB Gaston East-West Connector	389	58	13	54	-4
M258	Residence	B	J2C	MCARVER RD	45	WB Gaston East-West Connector	424	58	13	52	-7
M259	Residence	B	J2C	409 WESLEY DR	45	WB Gaston East-West Connector	573	56	11	50	-6
M260	Residence	B	J2C	413 WESLEY DR	45	WB Gaston East-West Connector	519	58	13	51	-7
M261	Residence	B	J2C	WESLEY DR	45	WB Gaston East-West Connector	474	60	▲ 15	53	-7
M262	Residence	B	J2C	505 WESLEY DR	45	WB Gaston East-West Connector	405	62	▲ 17	55	-7
M263	Residence	B	J2C	509 WESLEY DR	45	WB Gaston East-West Connector	345	64	▲ 19	57	-8
M264	Residence	B	J2C	513 WESLEY DR	45	WB Gaston East-West Connector	268	* 68	▲ 23	60	-8
M265	UndevResider	G	J2C	FERNCLIFF DR	45	WB Gaston East-West Connector	226	69	24	60	-9
M266	Residence	B	J2C	109 FERNCLIFF DR	45	WB Gaston East-West Connector	178	* 70	▲ 25	60	-10
M267	Residence	B	J2C	113 FERNCLIFF DR	45	WB Gaston East-West Connector	246	* 68	▲ 23	59	-9
M268	Residence	B	J2C	201 FERNCLIFF DR	45	WB Gaston East-West Connector	307	* 66	▲ 21	59	-7
M269	Residence	B	J2C	205 FERNCLIFF DR	45	WB Gaston East-West Connector	387	64	▲ 19	58	-6
M270	Residence	B	J2C	209 FERNCLIFF DR	45	WB Gaston East-West Connector	464	62	▲ 17	57	-5
M271	Residence	B	J2C	213 FERNCLIFF DR	45	WB Gaston East-West Connector	548	61	▲ 16	57	-4
M272	Residence	B	J2C	204 FERNCLIFF DR	45	WB Gaston East-West Connector	543	58	13	54	-4
M273	Residence	B	J2C	200 FERNCLIFF DR	45	WB Gaston East-West Connector	468	60	▲ 15	55	-5
M274	Residence	B	J2C	201 WRENTREE LN	45	WB Gaston East-West Connector	550	58	13	54	-4
M248	Residence	B	J2C	2646 FORBES RD	50	EB Gaston East-West Connector	410	57	7		
M249	Residence	B	J2C	2652 FORBES RD	52	EB Gaston East-West Connector	325	60	8		
M250	Residence	B	J2C	2658 FORBES RD	50	EB Gaston East-West Connector	248	62	12		
M251	Residence	B	J2C	4811 VERDE VIEW DR	46	EB Gaston East-West Connector	474	59	13		
M252	Residence	B	J2C	4815 VERDE VIEW DR	45	EB Gaston East-West Connector	540	54	9		
M253	Residence	B	J2C	4819 VERDE VIEW DR	45	EB Gaston East-West Connector	539	57	12		
M254	Residence	B	J2C	4823 VERDE VIEW DR	45	EB Gaston East-West Connector	584	56	11		

UndevResidence - Lot in a subdivision that has not been built upon as of June 2011

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 17 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 17 - Pam Dr, Wesley Acres, Greenpack Pkwy, Plaza Rd areas

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Length (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 17-4 Pam Drive	10	425	716 to 712	4,250	15	1	1,535	17	595	3,095	Yes
	12	212	718 to 716	2,544							
	14	1,007	728 to 718	14,098							
	12	305	731 to 728	3,660							
	TOTAL	**1,949**	**TOTAL**	**24,552**							
BEA 17-3 Wesley Acres (Wesley Drive)	12	197	710 to 708	2,364	11	4	1,749	19	665	3,165	Yes
	14	296	708 to 705	4,144							
	12	801	705 to 697	9,612							
	10	1,012	697 to 686+75	10,120							
	TOTAL	**2,306**	**TOTAL**	**26,240**							
BEA 17-2 Greenpack Pkwy	10	221	681 to 679	2,210	4	5	2,347	20	700	3,200	Yes
	12	70	679 to 678.5	840							
	16	168	678+50 to 677+50	2,688							
	14	1,099	677+50 to 666	15,386							
	TOTAL	**1,558**	**TOTAL**	**21,124**							
BEA 17-1 Longbriar Dr and Plaza Rd	12	152	651+50 to 649	1,824	3	5	1,873	17	595	3,095	Yes
	14	940	649 to 640	13,160							
	TOTAL	**1,092**	**TOTAL**	**14,984**							

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors.

Although these barriers are in BEA 17, none were considered to be together within a common noise environment.
All barriers were considered excluding undeveloped lots.

Barrier Evaluation Areas 20 and 22
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION ID #	Land Use	Category	Project Segment	Nearest Existing Roadway	Ambient Noise Level[a]	Nearest Proposed Roadway Name	Distance (ft)	Predicted Noise Level	Noise Level Increase[b]	Barrier Height/ Noise Level with Barrier	Insertion Loss
										Barrier 20-2 (Not Reasonable)	
										24 ft Barrier	
M42	Residence	B	JX4	140 PATRICK RD	52	WB Gaston East-West Connector	641	63	11	62	-1
M44	Residence	B	JX4	136 PATRICK RD	52	WB Gaston East-West Connector	795	* 66	▲ 14	65	0
M157	Business	F	JX4	136 PATRICK RD-Self Storage	47	WB Gaston East-West Connector	665	59	12	56	-4
M161	Residence	B	JX4	152 PATRICK RD	46	WB Gaston East-West Connector	347	* 66	▲ 20	56	-10
M162	Residence	B	JX4	152 PATRICK RD	52	WB Gaston East-West Connector	355	65	▲ 13	63	-2
M43	Residence	B	JX4	139 PATRICK RD	45	WB Gaston East-West Connector	765	56	11		
M54	Residence	B	JX4	230 PATRICK RD	50	EB Gaston East-West Connector	545	61	11		
										Barrier 20-1 (Not Reasonable)	
										10/12/14/16 ft Barrier	
M79	Residence	B	JX4	1257 DORCHESTER RD	51	EB Gaston East-West Connector	520	65	▲ 14	64	-1
M80	Residence	B	JX4	1259 DORCHESTER RD	48	EB Gaston East-West Connector	287	* 67	▲ 19	59	-8
M91	Residence	B	JX4	1260 DORCHESTER RD	48	EB Gaston East-West Connector	584	57	9	54	-3
M90	Residence	B	JX4	1272 DORCHESTER RD	45	EB Gaston East-West Connector	374	60	▲ 15	55	-5
M89	Residence	B	JX4	1280 DORCHESTER RD	45	EB Gaston East-West Connector	303	62	▲ 17	56	-6
M87	Residence	B	JX4	1288 DORCHESTER RD	45	EB Gaston East-West Connector	467	57	12	53	-4
M86	Residence	B	JX4	1290 DORCHESTER RD	45	EB Gaston East-West Connector	200	64	▲ 19	56	-8
M103	Residence	B	J5A	182 DOUBLE OAK RD	45	WB Gaston East-West Connector	960	54	9	not in barrier area	
M104	Residence	B	J5A	182 DOUBLE OAK RD	45	WB Gaston East-West Connector	825	56	11	not in barrier area	
M105	Residence	B	J5A	182 DOUBLE OAK RD	45	WB Gaston East-West Connector	780	57	12	not in barrier area	
M106	Residence	B	J5A	182 DOUBLE OAK RD	45	WB Gaston East-West Connector	615	59	14	not in barrier area	
M160	Residence	B	J5A	168 DOUBLE OAKS RD	45	WB Gaston East-West Connector	294	59	14	not in barrier area	
										BEA 22	
M107	Residence	B	JX4/J1D	3432 GATEWOOD DR	45	EB Gaston East-West Connector	527	55	10	No impacts	
M126	Residence	B	JX4/J1D	3416 GATEWOOD DR	45	EB Gaston East-West Connector	800	59	14		
M127	Residence	B	JX4/J1D	3420 GATEWOOD DR	45	EB Gaston East-West Connector	700	57	12		
M128	Residence	B	JX4/J1D	3428 GATEWOOD DR	45	EB Gaston East-West Connector	530	55	10		
M129	Residence	B	JX4/J1D	3424 GATEWOOD DR	45	EB Gaston East-West Connector	700	55	10		
M130	Residence	B	JX4/J1D	3421 GATEWOOD DR	45	EB Gaston East-West Connector	653	54	9		

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 20 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 20 - Dorchester Rd area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Length (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 20-2	24	1,637	811 to 828	39,288	1	0	39,288	16	560	3,060	No
BEA 20-1	10	155	829 to 831	1,550	4	0	7,304	17	595	3,095	No
	12	1,032	831 to 841	12,384							
	16	780	841 to 849	12,480							
	14	200	849 to 851	2,800							
	TOTAL	**2,167**	**TOTAL**	**29,214**							

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors.

All calculations exclude undeveloped lots

Barrier Evaluation Area 22A
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]
M111	Residence	B	J1BD	1848 WHITE CEDAR DR	46	EB Gaston East-West Connector	314	62	▲ 16
M112	Residence	B	J1BD	1842 WHITE CEDAR DR	46	EB Gaston East-West Connector	409	60	14
M113	Residence	B	J1BD	1840 WHITE CEDAR DR	46	EB Gaston East-West Connector	496	59	13
M119	Residence	B	J1BD	2001 BUCKTHORNE CT	46	EB Gaston East-West Connector	525	58	12
M120	Residence	B	J1BD	2005 BUCKTHORNE CT	46	EB Gaston East-West Connector	537	56	10
M121	Residence	B	J1BD	2006 BUCKTHORNE CT	46	EB Gaston East-West Connector	385	60	14
M122	UndevResidence	G	J1BD	2002 BUCKTHORNE CT	46	EB Gaston East-West Connector	415	59	13
M143	Residence	B	J1BD	2009 BUCKTHORNE CT	46	EB Gaston East-West Connector	562	57	11
M144	Residence	B	J1BD	2013 BUCKTHORNE CT	46	EB Gaston East-West Connector	610	57	11
M145	Residence	B	J1BD	2016 BUCKTHORNE CT	46	EB Gaston East-West Connector	592	57	11
M163	UndevResidence	G	J1BD	2014 BUCKTHORNE CT	46	EB Gaston East-West Connector	447	60	14
M142	UndevResidence	G	J1BD	1654 STONE PINE DR	46	EB Gaston East-West Connector	529	58	12
M147	Residence	B	J1BD	1653 STONE PINE DR	46	EB Gaston East-West Connector	644	54	8
M148	Residence	B	J1BD	1657 STONE PINE DR	46	EB Gaston East-West Connector	506	55	9

UndevResidence - Lot in a subdivision that has not been built upon as of June 2011

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 22A - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 22A - Stone Pine Dr area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Linear (feet)	Approximate Stations	Area of Barrier Square Feet							
No Barrier modeled for BEA22A since only 1 receptor was impacted.											

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors

Barrier Evaluation Area 24
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]	Noise Level with Barrier	Loss
										Barrier 24-1 (Not Reasonable)	
										18 ft Barrier	
E250	Residence	B	K1A	2202 RUFUS RATCHFORD RD	45	EB Gaston East-West Connector	195	64	▲ 19	56	-8
E251	Residence	B	K1A	2202 RUFUS RATCHFORD RD	48	EB Gaston East-West Connector	159	* 66	▲ 18	59	-7
E252	Residence	B	K1A	2214 RUFUS RATCHFORD RD	51	EB Gaston East-West Connector	474	62	11	60	-2
E253	Residence	B	K1A	2207 RUFUS RATCHFORD RD	51	EB Gaston East-West Connector	257	64	13	63	-1
E254	Residence	B	K1A	2213 RUFUS RATCHFORD RD	48	EB Gaston East-West Connector	356	63	▲ 15	60	-3
E257	Residence	B	K1A	2223 RUFUS RATCHFORD RD	48	EB Gaston East-West Connector	553	60	12	58	-2
E258	Residence	B	K1A	2233 RUFUS RATCHFORD RD	45	EB Gaston East-West Connector	675	58	13	57	-1

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 24 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 24 - Rufus Ratchford Rd area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Length (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 24-1	18	1,400	Sta 38 to 52	25,200	2	0	12,600	18	630	3,130	No

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors

Barrier Evaluation 27
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient Noise	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/ Noise Level	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Level[a]	Name	Distance (ft)	Level	Increase[b]	with Barrier	Loss
										BEA27-1	
										18/16/10 ft Barrier (Not Reasonable)	
E195	Residence	B	K3AB	900 EDGEWATER DR	45	EB Gaston East-West Connector	433	61	▲ 16	54	-7
E196	Residence	B	K3AB	825 EDGEWATER DR	45	EB Gaston East-West Connector	659	58	13	51	-6
E197	UndevResid	G	K3AB	906 EDGEWATER DR	45	EB Gaston East-West Connector	432	60	15	54	-6
E198	Residence	B	K3AB	912 EDGEWATER DR	45	EB Gaston East-West Connector	369	62	▲ 17	55	-7
E199	Residence	B	K3AB	924 EDGEWATER DR	45	EB Gaston East-West Connector	255	64	▲ 19	57	-7
E200	Residence	B	K3AB	931 EDGEWATER DR	45	EB Gaston East-West Connector	269	61	▲ 16	57	-4
E201	Residence	B	K3AB	925 EDGEWATER DR	45	EB Gaston East-West Connector	394	58	13	55	-3
E202	Residence	B	K3AB	919 EDGEWATER DR	45	EB Gaston East-West Connector	481	58	13	53	-4
E203	UndevResid	G	K3AB	907 EDGEWATER DR	45	EB Gaston East-West Connector	576	57	12	52	-5
E204	Residence	B	K3AB	856 EDGEWATER DR	45	EB Gaston East-West Connector	621	58	13	53	-5
E205	Residence	B	K3AB	EDGEWATER DR	45	EB Gaston East-West Connector	683	59	14	52	-7
E206	Residence	B	K3AB	844 EDGEWATER DR	45	EB Gaston East-West Connector	671	59	14	52	-7
E207	Residence	B	K3AB	832 EDGEWATER DR	45	EB Gaston East-West Connector	769	58	13	51	-7
E208	Residence	B	K3AB	826 EDGEWATER DR	45	EB Gaston East-West Connector	802	57	12	51	-6
E209	Residence	B	K3AB	EDGEWATER DR	45	EB Gaston East-West Connector	583	60	▲ 15	52	-7
E215	Residence	B	K3AB	862 EDGEWATER DR	45	EB Gaston East-West Connector	592	58	13	53	-5
E213	Residence	B	K3AB	1500 GAITHER RD	45	EB Gaston East-West Connector	365	59	14	57	-2
E214	Residence	B	K3AB	1510 GAITHER RD	45	EB Gaston East-West Connector	632	57	12	55	-2
										BEA27-2	
										16 ft Barrier (Not Reasonable # receptrs)	
E216	Residence	B	K3AB	535 LAKE WYLIE RD	45	WB Gaston East-West Connector	203	61	▲ 16	55	-6
E217	Residence	B	K3AB	529 LAKE WYLIE RD	45	WB Gaston East-West Connector	395	61	▲ 16	55	-6
E212	Residence	B	K3AB	1400 GAITHER RD	45	WB Gaston East-West Connector	264	61	▲ 16	Isolated	
E227	UndevResid	G	K3AB	GAITHER RD	45	WB Gaston East-West Connector	499	58	13		

UndevResidence - Lot in a subdivision that has not been built upon as of June 2011

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.
Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 27 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 27 - South Fork Catawba River crossing area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Length (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 27-1	18	1,455	178 to 192.8	26,190	4	7	4,227	17	595	3,095	No
south side of mainline	16	810	192.8 to 202	12,960							
	10	735	202 to 208.3	7,350							
	TOTAL	**3,000**	**TOTAL**	**46,500**							

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors

All calculations exclude undeveloped lots

Barrier Evaluation Area 29
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/ Noise Level	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]	with Barrier	Loss
										BEA 29-1	
										14-20 ft Barrier	
E79	Residence	B	KX1K3B	622 BROOK FOREST DR	45	WB Gaston East-West Connector	958	58	13	52	-6
E80	Residence	B	KX1K3B	614 BROOK FOREST DR	45	WB Gaston East-West Connector	1076	57	12	51	-6
E81	Residence	B	KX1K3B	618 BROOK FOREST DR	45	WB Gaston East-West Connector	1023	56	11	51	-5
E84	Residence	B	KX1K3B	611 BROOK FOREST DR	45	WB Gaston East-West Connector	995	56	11	51	-5
E85	Residence	B	KX1K3B	615 BROOK FOREST DR	45	WB Gaston East-West Connector	938	57	12	52	-5
E86	Residence	B	KX1K3B	619 BROOK FOREST DR	45	WB Gaston East-West Connector	865	58	13	52	-6
E87	Residence	B	KX1K3B	623 BROOK FOREST DR	45	WB Gaston East-West Connector	807	58	13	52	-6
E88	Residence	B	KX1K3B	703 BROOK FOREST DR	45	WB Gaston East-West Connector	742	59	14	53	-6
E89	Residence	B	KX1K3B	707 BROOK FOREST DR	45	WB Gaston East-West Connector	682	60	▲ 15	53	-7
E90	Residence	B	KX1K3B	711 BROOK FOREST DR	45	WB Gaston East-West Connector	616	59	14	54	-5
E91	Residence	B	KX1K3B	715 BROOK FOREST DR	45	WB Gaston East-West Connector	548	58	13	53	-5
E82	Residence	B	KX1K3B	702 BROOK FOREST DR	45	WB Gaston East-West Connector	885	58	13	51	-7
E83	Residence	B	KX1K3B	706 BROOK FOREST DR	45	WB Gaston East-West Connector	825	58	13	51	-7
E415	Residence	B	K3AB	FOREST LN.	45	EB Gaston East-West Connector	163	* 74	▲ 29	60	-14
E414	Residence	B	K3AB	FOREST LN.	45	EB Gaston East-West Connector	229	* 69	▲ 24	59	-10
E416	Residence	B	K3AB	FOREST LN.	45	EB Gaston East-West Connector	231	65	▲ 20	58	-7
E413	Residence	B	K3AB	FOREST LN.	45	EB Gaston East-West Connector	308	* 66	▲ 21	58	-8
E417	Residence	B	K3AB	FOREST LN.	45	EB Gaston East-West Connector	303	63	▲ 18	57	-6
E418	Residence	B	K3AB	FOREST LN.	45	EB Gaston East-West Connector	356	60	▲ 15	55	-5
E419	Residence	B	K3AB	FOREST LN.	45	EB Gaston East-West Connector	401	62	▲ 17	56	-6
E420	Residence	B	K3AB	TUCKER RD.	45	EB Gaston East-West Connector	300	62	▲ 17	56	-6
E421	Residence	B	K3AB	TUCKER RD.	45	EB Gaston East-West Connector	244	* 66	▲ 21	58	-8
E100	UndevResidence	G	KX1K3B	SOUTH FOREST LN	45	WB Gaston East-West Connector	578	57	12	52	-5
E99	UndevResidence	G	KX1K3B	SOUTH FOREST LN	45	WB Gaston East-West Connector	516	55	10	53	-2
E101	Residence	B	KX1K3B	SOUTH FOREST LN	45	WB Gaston East-West Connector	639	59	14	53	-6
E102	Residence	B	KX1K3B	616 SOUTH FOREST LN	45	WB Gaston East-West Connector	686	58	13	53	-5
E98	Residence	B	KX1K3B	621 SOUTH FOREST LN	45	WB Gaston East-West Connector	435	56	11	53	-3
E97	Residence	B	KX1K3B	617 SOUTH FOREST LN	45	WB Gaston East-West Connector	537	55	10	52	-3
E96	Residence	B	KX1K3B	613 SOUTH FOREST LN	45	WB Gaston East-West Connector	597	54	9	51	-3
E104	Residence	B	KX1K3B	608 SOUTH FOREST LN	45	WB Gaston East-West Connector	663	57	12	52	-5
E103	Residence	B	KX1K3B	612 SOUTH FOREST LN	45	WB Gaston East-West Connector	746	57	12	53	-4
E106	Residence	B	KX1K3B	600 SOUTH FOREST LN	45	WB Gaston East-West Connector	928	55	10	51	-4
E105	Residence	B	KX1K3B	604 SOUTH FOREST LN	45	WB Gaston East-West Connector	871	56	11	51	-5
E92	Residence	B	KX1K3B	521 S FOREST LN	45	WB Gaston East-West Connector	845	54	9	51	-3
E93	Residence	B	KX1K3B	601 SOUTH FOREST LN	45	WB Gaston East-West Connector	774	54	9	52	-2
E94	Residence	B	KX1K3B	605 SOUTH FOREST LN	45	WB Gaston East-West Connector	714	55	10	52	-3
E95	Residence	B	KX1K3B	609 SOUTH FOREST LN	45	WB Gaston East-West Connector	644	54	9	51	-3
E424	Residence	B	K3AB	TUCKER RD.	45	EB Gaston East-West Connector	473	63	▲ 18	57	-6
E425	Residence	B	K3AB	TUCKER RD.	45	EB Gaston East-West Connector	473	62	▲ 17	56	-6
E426	Residence	B	K3AB	TUCKER RD.	45	EB Gaston East-West Connector	636	61	▲ 16	56	-5
E427	Residence	B	K3AB	TUCKER RD.	45	EB Gaston East-West Connector	669	62	▲ 17	57	-5
E428	Residence	B	K3AB	TUCKER RD.	45	EB Gaston East-West Connector	669	63	▲ 18	58	-5
E429	Residence	B	K3AB	TUCKER RD.	45	EB Gaston East-West Connector	754	64	▲ 19	60	-4
										BEA29-2	
										20/18 ft Barrier	

Barrier Evaluation Area 29
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/ Noise Level	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]	with Barrier	Loss
E117	Residence	B	K3C	SOUTH POINT RD	45	WB Gaston East-West Connector	583	64	▲ 19	58	-6
E114	Residence	B	K3C	SOUTH POINT RD	45	WB Gaston East-West Connector	435	* 66	▲ 21	56	-10
E116	Residence	B	K3C	SOUTH POINT RD	45	WB Gaston East-West Connector	603	65	▲ 20	59	-6
E113	Residence	B	K3C	SOUTH POINT RD	45	WB Gaston East-West Connector	445	* 66	▲ 21	57	-9
E112	Residence	B	K3C	SOUTH POINT RD	45	WB Gaston East-West Connector	465	* 66	▲ 21	57	-9
E111	Residence	B	K3C	SOUTH POINT RD	45	WB Gaston East-West Connector	577	65	▲ 20	58	-7
E115	Residence	B	K3C	SOUTH POINT RD	45	WB Gaston East-West Connector	637	64	▲ 19	59	-5
E109	Residence	B	K3C	3418 BOAT CLUB RD	45	WB Gaston East-West Connector	703	63	▲ 18	59	-4
E108	Residence	B	K3C	BOAT CLUB RD	45	WB Gaston East-West Connector	836	61	▲ 16	57	-4
E110	Residence	B	K3C	SOUTH POINT RD	45	WB Gaston East-West Connector	703	63	▲ 18	58	-5
E118	Residence	B	K3C	JOYE LN	45	WB Gaston East-West Connector	614	64	▲ 19	58	-6
E107	Residence	B	K3C	3423 BOAT CLUB RD	45	WB Gaston East-West Connector	761	61	▲ 16	56	-5
E122	Residence	B	K3C	3419 BOAT CLUB RD	45	WB Gaston East-West Connector	704	62	▲ 17	57	-5
E119	Residence	B	K3C	BOAT CLUB RD	45	WB Gaston East-West Connector	499	* 67	▲ 22	59	-8
E120	Residence	B	K3C	3436 BOAT CLUB RD	45	WB Gaston East-West Connector	410	* 68	▲ 23	59	-9
E121	Residence	B	K3C	3442 BOAT CLUB RD	45	WB Gaston East-West Connector	302	* 71	▲ 26	60	-11
E382	UndevResidence	G	K3C	DRENNAN HORNE DR	45	WB Gaston East-West Connector	663	62	17	55	-7
E354	Residence	B	K3C	DRENNAN HORNE DR	45	WB Gaston East-West Connector	736	59	14	53	-6
E355	Residence	B	K3C	3441 BOAT CLUB RD	45	WB Gaston East-West Connector	510	65	▲ 20	57	-8
E348	Residence	B	K3C	DRENNAN HORNE DR	45	WB Gaston East-West Connector	548	63	▲ 18	54	-9
E347	Residence	B	K3C	DRENNAN HORNE DR	45	WB Gaston East-West Connector	547	63	▲ 18	55	-8
E77	Residence	B	K3C	5027 DRENNAN HORNE DR	45	WB Gaston East-West Connector	641	61	▲ 16	54	-7
E78	Business-Industrial	F	K3C	5028 DRENNAN HORNE DR	45	WB Gaston East-West Connector	411	67	22	56	-11
E75	Residence	B	K3C	5031 DRENNAN HORNE DR	50	WB Gaston East-West Connector	638	61	11	55	-6
E76	Residence	B	K3C	5043 DRENNAN HORNE DR	45	WB Gaston East-West Connector	674	62	▲ 17	58	-4
E436	Residence	B	K3C	DRENNAN HORNE RD.	45	EB Gaston East-West Connector	726	61	▲ 16	57	-4
E437	Residence	B	K3C	DRENNAN HORNE RD.	45	EB Gaston East-West Connector	820	60	▲ 15	56	-4
										Barrier 29-3 (Not Reasonable)	
										14/12/14 ft Barrier	
E236	Residence	B	K3C	PLANT ALLEN RD	45	EB Gaston East-West Connector	436	61	▲ 16	56	-5
E237	Residence	B	K3C	3476 BOAT CLUB RD	45	EB Gaston East-West Connector	346	63	▲ 18	57	-6
E238	Residence	B	K3C	3488 BOAT CLUB RD	45	EB Gaston East-West Connector	376	65	▲ 20	59	-6
E387	Residence	B	K3C	3478 BOAT CLUB RD	45	EB Gaston East-West Connector	437	61	▲ 16	56	-5
E410	Recreation - baseball fld - see Note c (Assumed to equal 2 resid)	B	K3C	BOAT CLUB RD	45	EB Gaston East-West Connector	380	* 69	▲ 24	60	-9
E411	Recreation - general rec field - see Note c (Assumed to equal 2 resid)	B	K3C	BOAT CLUB RD	45	EB Gaston East-West Connector	458	65	▲ 20	60	-5
E430	Residence	B	K3C	FIRST ST.	45	EB Gaston East-West Connector	866	62	▲ 17		
E389	Residence	B	K3C	5010 DOROTHY RUTH LN	45	WB Gaston East-West Connector	636	55	10		
E232	Residence	B	K3C	3112 ALLISON ST	45	EB Gaston East-West Connector	606	53	8		
E233	Residence	B	K3C	3116 ALLISON ST	45	EB Gaston East-West Connector	855	56	11		
E234	Residence	B	K3C	2039 SOUTH POINT RD	45	EB Gaston East-West Connector	978	59	14		

Barrier Evaluation Area 29
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/ Noise Level	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]	with Barrier	Loss
E235	Residence	B	K3C	5011 DOROTHY RUTH LN	45	EB Gaston East-West Connector	855	58	13		
E346	Residence	B	K3C	3115 ALLISON ST	45	EB Gaston East-West Connector	885	54	9		
E384	Residence	B	K3C	3115 ALLISON ST	45	EB Gaston East-West Connector	689	54	9		
E388	Residence	B	K3C	115 SUNDERLAND RD	45	EB Gaston East-West Connector	730	58	13		
E431	Residence	B	K3AB	DRENNAN HORNE RD.	45	EB Gaston East-West Connector	682	59	14		

UndevResidence - Lot in a subdivision that has not been built upon as of June 2011

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Special use area - Duke Energy Recreational Fields. Equivalent # of residences calculated as follows:

Equivalent # Residences = # Occupants/(# people / residence) * usage

Using the equations: Eq. # Resid = (50/3) * (2/24) = 1.4 (so assume 2 eq resid per field)

Occupants - Assumed 50 people at each field for a game

people/residence = 3

Usage = # of hours used per day/ 24 hours per day Assumed 2 hrs per 24 hrs (this probably overstates the use, as the fields likely are not used every day)

[d] Distances to the nearest proposed roadway are measured from the alignment's center line.

[e] Business is an industrial use with no apparent frequent outdoor use area.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 29 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 29 - Southpoint Rd interchange area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Length (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 29-1	14	2,001	WB Entrance Ramp Sta 19 to Bypass WB Sta 242	28,014	15	16	1,920	19	665	3,165	Yes
Brook Forest	16	447	NC273 SB Sta 56 to WB Entrance Ramp Sta 19	7,152							
NW quadrant of	18	303	Sta 19 to Sta 22	5,454							
interchange	20	672	Sta 22 to Sta 29	13,440							
	18	139	52.5	2,502							
	16	100	Sta 52.5 to 54	1,600							
	14	98	Sta 54 to Sta 55	1,372							
	TOTAL	**3,760**	**TOTAL**	**59,534**							
BEA 29-2	20	306	WB Exit Ramp Sta 24 to Sta 21	6,120	18	2	2,245	19	665	3,165	Yes
Boat Club Rd	18	2,154	WB Exit Ramp Sta 21 to Bypass WB Sta301	38,772							
NE quadrant of	**TOTAL**	**2,460**	**TOTAL**	**44,892**							
interchange											
BEA 29-3	14	995	EB Entrance Ramp Sta 26 to Sta 16	13,930	8	0	3,968	19	665	3,165	No
Allison St/ Optimist Club	12	1,138	EB Entrance Ramp Sta 16 to Bypass EB Sta 306	13,656							
SE quadrant of	14	297	Bypass EB Sta 306 to Sta 308	4,158							
interchange	**TOTAL**	**2,430**	**TOTAL**	**31,744**							
BEA 29-2, 29-3			BEA 29-2	44,892	26	2	2,737	19	not applicable		No
Common Noise			BEA 29-3	31,744							
Environment	**Avg ht = 16 ft**		**TOTAL**	**76,636**							

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors

All barriers were considered excluding undeveloped lots.

Barrier Evaluation Area 31
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project		Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/	Insertion
ID #	Land Use	Category	Segment	Nearest Existing Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]	Noise Level with Barrier	Loss
										Barrier 31-1	
										14 ft Barrier	
										Not Reasonable	
E240	Residence	B	K3C	OAK CREST TRL	45	WB Gaston East-West Connector	268	63	▲ 18	56	-7
E351	Residence	B	K3C	1251 OAK CREST TRL	45	WB Gaston East-West Connector	420	62	▲ 17	57	-5
										Barrier 31-2	
										14 ft Barrier	
										Not Reasonable	
E2	Residence	B	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	840	47	2	56	
E3	Residence	B	K3C	TUFFY LN	45	WB Gaston East-West Connector	496	62	▲ 17	56	-6
E4	Residence	B	K3C	TUFFY LN	45	WB Gaston East-West Connector	608	61	▲ 16	56	-5
E10	UndevResidence	G	K3C	TUFFY LN	45	WB Gaston East-West Connector	375	65	20	57	-8
E13	Residence	B	K3C	TUFFY LN	45	WB Gaston East-West Connector	258	64	▲ 19	56	-8
E5	Residence	B	K3C	TUFFY LN	48	WB Gaston East-West Connector	842	61	13		
E6	UndevResidence	G	K3C	TUFFY LN	45	WB Gaston East-West Connector	727	54	9		
E7	Residence	B	K3C	TUFFY LN	45	WB Gaston East-West Connector	736	59	14		
E8	Residence	B	K3C	TUFFY LN	45	WB Gaston East-West Connector	884	57	12		
E9	UndevResidence	G	K3C	TUFFY LN	45	WB Gaston East-West Connector	706	51	6		
E14	Residence	B	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	741	59	14		
E15	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	634	47	2		
E16	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	477	51	6		
E17	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	431	47	2		
E18	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	428	53	8		
E19	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	431	59	14		
E20	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	419	59	14		
E21	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	424	57	12		
E22	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	401	57	12		
E23	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	387	55	10		
E24	UndevResidence	G	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	391	56	11		
E25	Residence	B	K3C	LOCHFOOT DR	45	WB Gaston East-West Connector	625	53	8		

UndevResidence - Lot in a subdivision that has not been built upon as of June 2011

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 31 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Preferred Alternative (DSA 9)
BEA 31 - Catawba River crossing area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft	Reasonable? Yes/No
	Height (feet)	Length (feet)	Approximate Stations	Area of Barrier Square Feet							
BEA 31-1	14	1,900	314 to 333	26,600	2	0	13,300	18	630	3,130	No
north side, west bank											
BEA 31-2	14	1,755	323 to 340.3	24,570	3	0	8,190	18	630	3,130	No
north side, east bank											

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Criteria based on the 2011 NCDOT Noise Abatement Policy:
2,500 = allowable base quantity of wall (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors

All calculations exclude undeveloped lots

Barrier Evaluation Area 33
(Preferred Alternative)
Addendum #2

RECEPTOR INFORMATION			Project	Nearest Existing	Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/	Insertion
ID #	Land Use	Category	Segment	Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]	Noise Level with Barrier	Loss
										No Barrier	
										Needed	
E28	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	854	62	12		
E29	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	919	61	11		
E30	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	1035	60	10		
E31	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	1061	60	10		
E32	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	933	60	10		
E33	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	979	59	9		
E58	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	1232	58	8		
E59	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	1302	57	7		
E60	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	1491	55	5		
E61	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	1353	56	6		
E62	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	1432	55	5		
E65	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	1391	55	5		
E66	Residence	B	k1d	GARRISON RD	50	EB Gaston East-West Connector	1505	54	4		
E422	Residence	B	k3c	GARRISON RD	50	EB Gaston East-West Connector	426	* 68	▲ 18		
E432	Residence	B	k3c	GARRISON RD	50	EB Gaston East-West Connector	785	61	11		
E433	Residence	B	k3c	GARRISON RD	50	EB Gaston East-West Connector	621	62	12		
E434	Residence	B	k3c	GARRISON RD	50	EB Gaston East-West Connector	673	61	11		
E435	Residence	B	k3c	GARRISON RD	50	EB Gaston East-West Connector	657	63	13		
E438	Residence	B	k3c	HORTON RD	50	EB Gaston East-West Connector	819	62	12		
E439	Residence	B	k3c	HORTON RD	50	EB Gaston East-West Connector	925	61	11		

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase (defined as follows) as defined in NCDOT's 2011 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
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52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

BEA 33 - REASONABLENESS EVALUATION
2011 NCDOT Noise Abatement Policy

Selected Alternative (DSA 9)
BEA 33 - Garrison area

Barrier ID	Proposed Barrier Dimensions				Number of Impacted Receptors Benefited	[1] Other Benefited Receptors	Square Footage per Benefited Receptor	Average dB Increase for Impacted Receptors Benefited	Allowable Barrier Sq Ft Adjustment for Avg dB Increase	Adjusted Allowable Barrier Sq Ft for Impacted Receptors	Reasonable? Yes/No
	Height (feet)	Linear (feet)	Approximate Stations	Area of Barrier Square Feet							
No Barrier modeled for BEA 33 since only 1 receptor was impacted.											

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier

Notes: Assumptions based on the 2011 NCDOT Noise Abatement Policy:
2,500 = base quantity of wall threshold (square feet/benefited receptor)
35 = Sq ft adjustment per average decibel increase for impacted receptors that are benefited.

APPENDIX E

TNM INPUT AND OUTPUT FILES

(on CD only)