NORTH CAROLINA
Turnpike Authority

Maintenance Rating Program

Triangle Expressway

August 2023

2023 Second Quarter Report

CONSULTANT CERTIFICATION OF COMPLETION

July 31, 2023

Alan Shapiro, PE
Director of Highway Operations, NCTA
1 South Wilmington Street
Raleigh, NC 27601

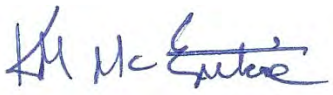
NCTA Triangle Expressway Roadway Maintenance Performance Rating Program; Q2, FY 2023 Rating

This is to certify that I, Ken M. McEntire, PE am an authorized official representative of the company Mott MacDonald I&E, LLC, a subconsultant to HNTB North Carolina, P.C. Collaboratively; we are working as the Triangle Expressway Roadway and Facility Maintenance Performance Rating Program Consultants.

I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been independently performed in accordance with, and in conformity to, the *NCTA Roadway and Facility Maintenance Performance Standards*.

Sincerely,

Mott MacDonald I&E, LLC



Ken M. McEntire, PE
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1.0 Executive Summary

The North Carolina Turnpike Authority (NCTA) Maintenance Rating Program (MRP) is a maintenance evaluation program for roadway features and toll facilities on the NCTA system. This report presents results from the 2023 Second Quarter Assessment of the Triangle Expressway.

The overall 2023 second quarter maintenance rating of the Triangle Expressway was **96.4,** above the NCTA target rating of 90. As shown in ***Table 1,*** all five elements assessed achieved a rating greater than the target rating of 85.

Table 1: MRP Element Results for the 2023 Second Quarter Assessment

Element	MRP Rating	Target Rating
Road Surface	98.0	85.0
Unpaved Shoulders and Ditches	97.4	85.0
Drainage	95.7	85.0
Roadside	95.9	85.0
Traffic Control Devices	95.3	85.0
Overall MRP Performance Rating	**96.4**	**90.0**

This report also provides a rolling rating of the latest four quarterly inspections of the Triangle Expressway. As presented in ***Table 2,*** the rolling maintenance rating of the Triangle Expressway was **95.2**.

Table 2: MRP Rolling Element Results

Element	Q3 2022 Rating	Q4 2022 Rating	Q1 2023 Rating	Q2 2023 Rating	Rolling Rating
Road Surface	100.0	96.0	96.9	98.0	97.7
Unpaved Shoulders and Ditches	94.7	98.7	99.1	97.4	97.5
Drainage	92.1	94.8	93.3	95.7	94.0
Roadside	93.3	93.8	94.2	95.9	94.3
Traffic Control Devices	92.5[1]	90.9[1]	94.2[1]	95.3[1]	93.1[2]
Overall MRP Performance Rating	**94.7[1]**	**94.3[1]**	**95.3[1]**	**96.4[1]**	**95.2[2]**

[1]Excludes concrete surface pavement markers, striping, and symbols on mainline NC-540 and asphalt surface markers on mainline NC-885.
[2]Excludes quarter ratings for elements listed above.

In addition, the report provides findings of the Green Level Historic District signs inspection. This quarter, two signs were inspected. Both signs were found to be in good physical condition. The landscaped area around the two signs was maintained in accordance with NCTA MRP standards.

2.0 Introduction

The NCTA MRP is a comprehensive planning, measuring, and managing process that provides a means for communicating to managers, stakeholders, and customers the impacts of policy and budget decisions on program service delivery.

Using outcome-based performance measures and the service level scale (0 through 100), the inspection results are rated against established threshold criteria. The program analysis is accomplished using sampling procedures that capture the level of service being provided for individual assets. The evaluation procedure is based on the establishment of threshold conditions that quantify the maximum defect allowed on assets. Over time, the results can be charted to identify work needs and subsequent necessary actions.

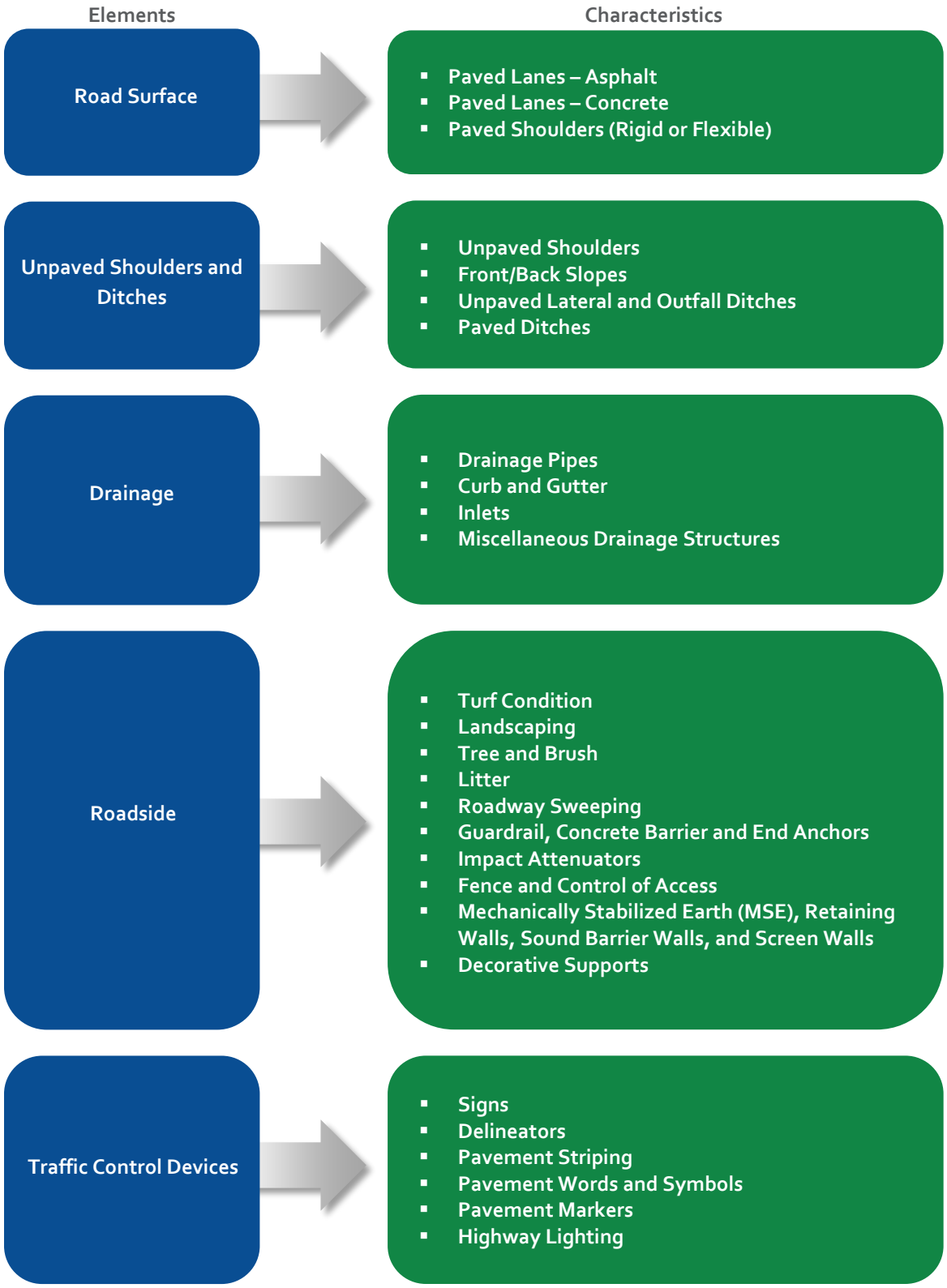
The NCTA performance standards, threshold criteria, and maintenance rating program were developed through a collaborative effort by NCTA managers, NCDOT maintenance staff, and consultants.

Using field survey information, a maintenance matrix can be developed to show the ties between maintenance activities and the characteristics of various roadway features. The purpose of this evaluation is to provide information that can be used to schedule and prioritize routine maintenance activities and provide uniform maintenance conditions that meet established objectives.

3.0 MRP Procedure

Per the *NCTA Roadway and Facility Maintenance Performance Standards V7*, roadway assets or characteristics on NCTA facilities have been grouped into elements. These elements and corresponding characteristics are shown in ***Figure 1:***

Figure 1: Maintenance Elements and Characteristics



A weighting system has been established to identify the importance of each element and characteristic. This system consists of two weighting factors: one that accounts for the importance of individual characteristics within a given maintenance element (1-9), and one that accounts for the importance of the maintenance elements to the total rating (by % of score). This two-factor system reveals deficiencies among characteristics and elements.

The program analysis is accomplished using statistically valid, random sampling procedures that capture the level of service for individual characteristics, with a 95% confidence level in sampling. The sample characteristics selected are evaluated during quarterly inspections, which are performed during the months of February, May, August, and November to account for dynamic changes in assets during the various seasons. The evaluation process is completed using electronic data collection tablets and is based on established threshold conditions described in the NCTA Roadway and Facility Maintenance Standards V6. Those characteristics that meet or exceed the threshold are coded as PASSING; those that do not meet the threshold are coded as NOT PASSING.

When the evaluation process is completed, the number of PASSING samples and total sample are multiplied by the weighted values (1-9) to determine the actual and possible rating points for characteristics and elements. MRP ratings for elements and characteristics are then calculated as the ratio of the actual rating points to possible rating points. The MRP ratings represent the maintenance level of service currently being provided, as they define the percent of characteristics and elements that meet the maintenance condition standard. For instance, an MRP rating of 83 signifies that 83 percent of the inspected elements/characteristics met the standard.

The overall MRP rating is determined by calculating the sum of the elements' ratings multiplied by the following weighted factors:

Road Surface =	**25%**
Unpaved Shoulders =	**13%**
Drainage =	**15%**
Roadside =	**17%**
Traffic Control Devices =	**30%**
Total	**100%**

The NCTA's overall target rating is 90, with elements scoring 85 or higher, and characteristics 80 or higher. In addition to quarterly ratings, the cumulative rolling annual rating is calculated each quarter. This rating is obtained by adding the ratings of the latest four quarterly inspections to compensate for the likelihood of uneven sample sizes.

4.0 Triangle Expressway Description

The Triangle Expressway extends for approximately 18.8 miles from the interchange of I-40 and Toll NC-885 in Durham to the NC-55 Bypass near Holly Springs (***Figure 2***). It includes a one-mile segment on Toll NC-540 extending north from the Toll NC-540 / Toll NC-885 interchange to the NC-54 interchange. The Triangle Expressway consists of twelve interchanges and twenty-two all-electronic toll collection zones.

Figure 2: Triangle Expressway Map

5.0 Triangle Expressway Asset Inventory Update

Through normal day-to-day maintenance activities and the construction of special projects, roadside assets are continuously being added or modified on the roadway. NCTA coordinates closely with NCDOT Division 5 Maintenance and conducts routine field visits to maintain an accurate asset inventory and ensure the validity of the MRP survey.

During this quarter assets on Toll NC 540 exit ramps to and from NC-55 Bypass were removed from the inventory due to the Complete 540 construction project. ***Table 3*** presents the updated number of assets that are currently available for inspections.

Table 3: Asset Inventory

Assets	Total Inventory	2023 Eligible Inventory
Barriers	801	616
Curb and Gutter	428	391
Decorative Supports	305	298
Drainage	1179	1127
Misc. Drainage	218	202
Fences	508	483
Highway Lighting	435	430
Impact Attenuators	48	46
Inlets	1129	1075
Linear Segments	795	755
Plant Beds	266	257
Paved Ditches	2	2
Pavement Symbols	652	591
Signs	1224	1168
Tree and Brush	603	567
Turf	1074	1011
Walls	88	84

6.0 MRP Second Quarter Assessment

6.1 Quarterly Results

The overall 2023 second quarter maintenance rating of the Triangle Expressway was 96.4, above NCTA's target overall rating of 90. All elements assessed achieved quarter ratings above the target rating of 85 established for element groups.

It is important to note that these results are only representative of the second quarter sample, one of the four surveys to provide an intermediate snapshot of seasonal conditions. Therefore, they are not a statistically valid representation of the assets; only the total of all four quarterly inspections, reported as the rolling rating, provide a 95% confidence level in statistical sampling. The second quarter MRP performance ratings for elements and characteristics are presented in ***Table 4*** and ***Table 5***, respectively.

Table 4: MRP Element Results for Q2 2023

Element	MRP Rating
Road Surface	98.0
Unpaved Shoulders and Ditches	97.4
Drainage	95.7
Roadside	95.9
Traffic Control Devices	95.3
Overall MRP Performance Rating	**96.4**

Table 5: MRP Characteristics Results for Q2 2023

Road Surface	Sample Passed	Sample Total	Weighted Values	Actual Pts	Available Pts	Q2 Rating
Paved Lanes Asphalt	15	15	9	135	135	100
Paved Lanes Concrete	16	17	9	144	153	94
Paved Shoulder	32	32	5	160	160	100
Element Total				**439**	**448**	**98.0**
Unpaved Shoulders and Ditches	**Sample Passed**	**Sample Total**	**Weighted Values**	**Actual Pts**	**Available Pts**	**Q2 Rating**
Unpaved Shoulder	30	32	9	270	288	94
Front/Back Slopes	32	32	6	192	192	100
Lateral and Outfall Ditches, Unpaved	32	32	6	192	192	100
Ditches, Paved	2	2	5	10	10	100
Element Total				**664**	**682**	**97.4**
Drainage	**Sample Passed**	**Sample Total**	**Weighted Values**	**Actual Pts**	**Available Pts**	**Q2 Rating**
Drainage Pipes	33	34	7	231	238	97
Curb and Gutter	27	28	6	162	168	96
Inlets	33	34	7	231	238	97
Misc. Drainage Structure	22	25	4	88	100	88
Element Total				**712**	**744**	**95.7**
Roadside	**Sample Passed**	**Sample Total**	**Weighted Values**	**Actual Pts**	**Available Pts**	**Q2 Rating**
Turf Condition	35	38	7	245	266	92
Landscaping	23	25	4	92	100	92
Trees and Brush	31	31	4	124	124	100
Litter	28	32	4	112	128	88
Roadway Sweeping	32	32	5	160	160	100
Guardrail, Concrete Barrier, and End Anchors	31	31	9	279	279	100
Impact Attenuators	9	9	9	81	81	100
Fence, Control Access	28	29	7	196	203	97
Retaining Walls and Sound Barrier Walls	14	18	5	70	90	78
Decorative Supports	26	26	5	130	130	100
Graffiti and Stain Removal	44	44	4	176	176	100
Element Total				**1665**	**1737**	**95.9**
Traffic Control Devices	**Sample Passed**	**Sample Total**	**Weighted Values**	**Actual Pts**	**Available Pts**	**Q2 Rating**
Signs	32	33	7	224	231	97
Delineators	28	32	3	84	96	88
Pavement Striping/Marking	17	17	8	136	136	100
Words and Symbols	23	24	7	161	168	96
Pavement Markers	14	14	9	126	126	100
Highway Lighting	26	29	6	156	174	90
Element Total				**887**	**931**	**95.3**

Additionally, ***Appendix A*** includes maps that present the location of all assets assessed during the second quarter. ***Appendix B*** includes a list of the individual assets that did not achieve their target ratings.

6.2 Quarterly Analysis and Recommendations

Elements

During the second quarter, all elements exceeded NCTA's quarter score threshold criteria of 85. All elements received a quarter score above 90.

Road Surface (98.0) experienced a 0.2 point decrease from the previous quarter's rolling rating. Paved Lanes Concrete (94) rolling rating decreased by 1.3 points. All characteristics within this element continued scoring above 90.

Unpaved Shoulders and Ditches (97.4) experienced an increase in rolling rating. The rating for this element was 0.4 points higher than the previous quarter rolling rating. All characteristics within this element continued scoring above 90.

Drainage (95.7) rolling rating also increased by 0.4 points from the previous quarter rolling rating. Curb and Gutter (96) and Inlets (97) rolling rating increased from last quarter by 0.9 and 0.8 points respectively.

Roadside (95.9) rolling rating increased by 0.9 points from the previous quarter rolling rating. Turf Condition (92) scored above 90 for the second consecutive quarter, increasing by 2.2 points from the previous quarter's rolling rating. Litter (88) experienced a decrease in rating of 3.1 points from the previous quarter rolling rating.

Traffic Control Devices (95.3) experienced an increase in rolling rating of 0.4 points from the previous quarter. Pavement Markers (100) and Words and Symbols (88) experienced an increase in rolling rating of 4.7 and 1.7 points respectively. Replacement of striping and markers for the remaining concrete sections was ongoing at the time of inspection in May.

Recommendations to improve specific critical characteristic ratings are provided in the following sections.

Characteristics

This quarter, all but one characteristic, Retaining Walls and Sound Barrier Walls (78), met the NCTA target threshold criteria of 80. A description of the characteristic's conditions and future work planning recommendations are provided below. Pictures of all characteristic failures are included in ***Appendix B***.

Retaining Walls and Sound Barrier Walls (78 rating –14 of the 18 assets passed): The four wall sections that did not pass inspection had unsealed cracks/joints. Two of the sections that did not pass inspection are presented in ***Figure 3***.

Figure 3: Retaining Walls and Sound Barrier Walls Inspection Results Sample

Maintenance Program:

1) Walls shall be inspected during daily patrols.

2) Unwanted vegetation and graffiti (see graffiti standard) shall be scheduled for removal.

3) Minor wall or column damage shall be scheduled for repair within the annual work program.

4) Staining damage shall be scheduled for repair within the annual work program.

5) Any structural damage that poses a safety risk shall be scheduled immediately upon observation. Mitigate any safety hazard upon observation.

Maintenance and Evaluation Standards: MSE/retaining walls, sound barrier walls, and screen walls do not meet the maintenance standards when any of the following criteria is observed:

1) More than 10% of exposed surface is covered with unwanted vegetation.

2) Any single spall 1 inch deep or greater or cumulative spalls covering an area over 5 SF on any single facing.

3) More than 25% of weep holes within the sample section are not functioning properly.

4) Unsealed cracks or joints greater than 0.25 inches in width.

5) Stained areas exhibit cumulative scaling in excess of 1 SF.

7.0 Current Rolling MRP Rating

The rolling maintenance rating of the Triangle Expressway was **95.2**, exceeding NCTA's target overall rating of 90. All elements exceeded NCTA's rolling rating threshold criteria of 85. Twenty-seven of the twenty-eight characteristic ratings met or exceeded the target rating of 80.

The 2022/2023 results are presented in ***Exhibit 1*** and ***Table 6***. These results are a collection of the four quarterly inspections conducted in the last year.

Exhibit 1: MRP Element Results for 2022/2023

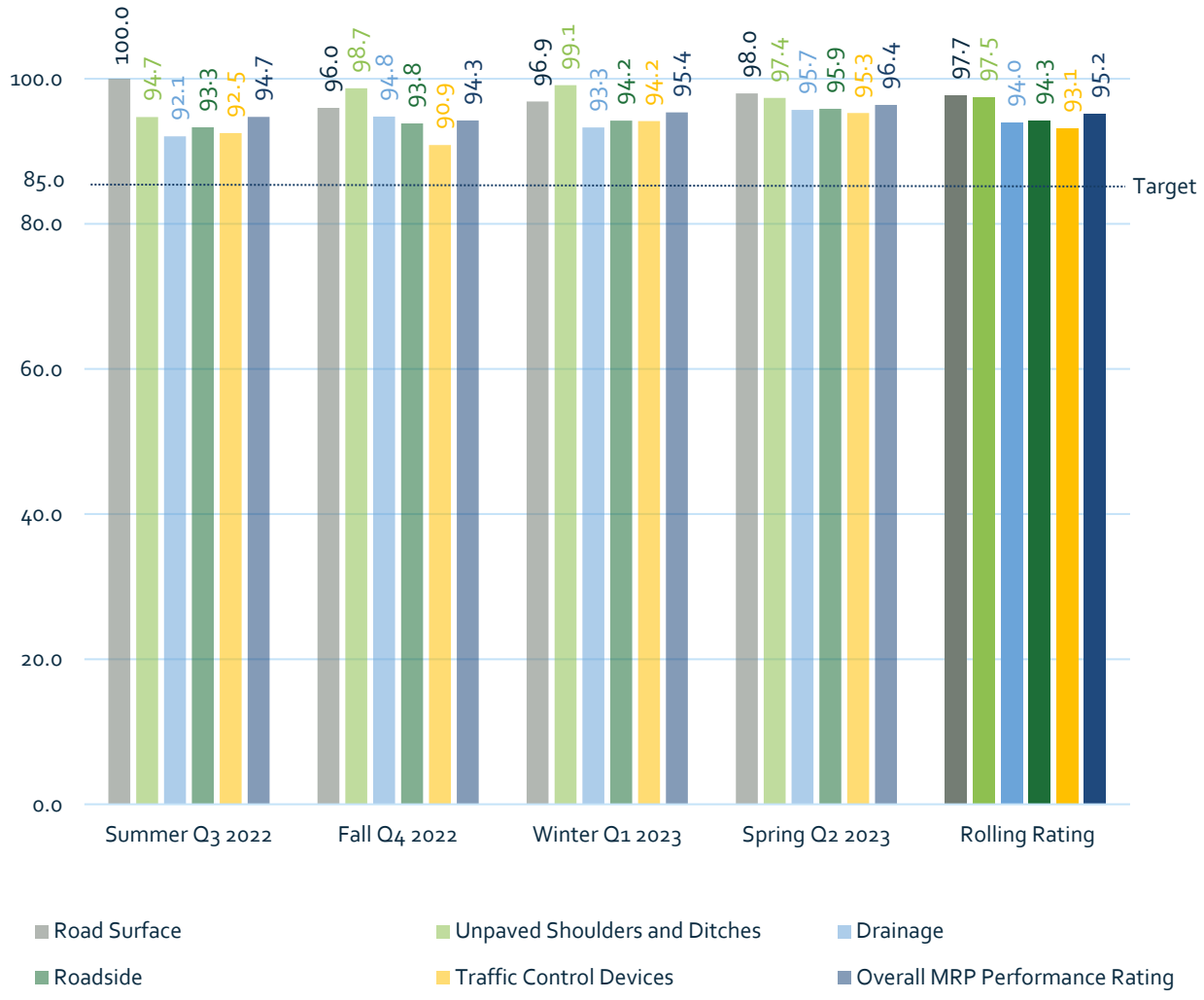


Table 6: MRP Rolling Element Results

Road Surface	Q3 2022 Rating	Q4 2022 Rating	Q1 2023 Rating	Q2 2023 Rating	Rolling Rating
Paved Lanes Asphalt	100	100	100	100	100
Paved Lanes Concrete	100	88	94	94	95
Paved Shoulder	100	100	97	100	99
Element Total	**100.0**	**96.0**	**96.9**	**98.0**	**97.7**
Unpaved Shoulders and Ditches	**Q3 2022 Rating**	**Q4 2022 Rating**	**Q1 2023 Rating**	**Q2 2023 Rating**	**Rolling Rating**
Unpaved Shoulder	88	97	100	94	95
Front/Back Slopes	100	100	100	100	100
Lateral and Outfall Ditches, Unpaved	100	100	97	100	99
Ditches, Paved	100	100	100	100	100
Element Total	**94.7**	**98.7**	**99.1**	**97.4**	**97.5**
Drainage	**Q3 2022 Rating**	**Q4 2022 Rating**	**Q1 2023 Rating**	**Q2 2023 Rating**	**Rolling Rating**
Drainage Pipes	100	94	88	97	95
Curb and Gutter	93	96	96	96	96
Inlets	88	97	100	97	96
Misc. Drainage Structure	82	89	84	88	86
Element Total	**92.1**	**94.8**	**93.3**	**95.7**	**94.0**
Roadside	**Q3 2022 Rating**	**Q4 2022 Rating**	**Q1 2023 Rating**	**Q2 2023 Rating**	**Rolling Rating**
Turf Condition	88	88	97	92	91
Landscaping	92	100	96	92	95
Trees and Brush	94	100	100	100	98
Litter	97	88	100	88	93
Roadway Sweeping	100	100	100	100	100
Guardrail, Concrete Barrier, and End Anchors	93	100	94	100	97
Impact Attenuators	89	100	100	100	97
Fence, Control Access	94	80	71	97	89
Retaining Walls and Sound Barrier Walls	75	75	83	78	78
Decorative Supports	100	92	100	100	98
Graffiti and Stain Removal	100	98	100	100	99
Element Total	**93.3**	**92.3**	**94.2**	**95.9**	**94.3**
Traffic Control Devices	**Q3 2022 Rating**	**Q4 2022 Rating**	**Q1 2023 Rating**	**Q2 2023 Rating**	**Rolling Rating**
Signs	91	91	91	97	93
Delineators	100	91	94	88	93
Pavement Striping/Marking	91[1]	100[1]	100[1]	100[1]	98[2]
Words and Symbols	83[1]	82[1]	92[1]	96[1]	87[2]
Pavement Markers	100[1]	100[1]	100[1]	100[1]	100[2]
Highway Lighting	97	94	97	90	94
Element Total	**92.5[1]**	**90.9[1]**	**94.2[1]**	**95.3[1]**	**93.1[2]**

[1] Excludes concrete surface pavement markers, striping, and symbols on mainline NC-540 and asphalt surface markers on mainline NC-885.

[2] Excludes the indicated quarter ratings for characteristics listed above.

8.0 Green Level Historic District Signs

Green Level Historic District signs and surrounding landscaped areas were installed as part of the Triangle Expressway construction project. Currently, NCDOT is maintaining the Green Level Historic District Signs and the Town of Cary is providing maintenance to the landscaped areas surrounding these signs.

8.1 Analysis and Recommendations

As part of each quarterly inspection, an assessment team visits the two remaining Green Level Historic District signs to conduct a visual inspection of each sign and ensure they are in good standing. The two signs included in the inspection inventory were found to be in good condition. ***Figure 4*** shows the two signs assessed.

Figure 4: Green Level West Historic District Signs, Landscape Areas

9.0 Conclusion

This report presents the 2023 second quarter assessment of the Triangle Expressway. The NCTA's target ratings are 90 for the rolling rating, 90 for the overall quarter rating, 85 for elements, and 80 for characteristics. The second quarter 2023 overall rating was **96.4** and the rolling rating was **95.2** , both ratings met the target rating of 90.

All element ratings were above the target ratings for the quarter and rolling assessment. During the second quarter assessment, all but one characteristic met or exceeded the target rating of 80. The characteristic that received a quarter score less than 80 was Retaining Walls and Sound Barriers (78).

To maintain/improve the condition ratings, it is recommended that the pavement striping/marking replacement cycles are completed as planned in the capital budget. Replacement of pavement striping, and marking was ongoing during this quarter's inspection.

This quarter, the two Green Level Historic District signs inspected were found to be in good condition. Additionally, the landscaped areas surrounding the signs were found to be well maintained.

Appendix A

Triangle Expressway 2032 Second Quarter Asset Assessment Locations

Appendix A: Triangle Expressway 2023 Second Quarter Asset Assessment Locations

Provided below are a series of maps outlining the assets that were a part of this quarter's sample and their corresponding result. Assets are defined by an Inventory ID, which is a unique identifier given to each individual asset. The components that make up the Inventory ID are an asset specific prefix along with a number, such as LS_1. All assets and their respective prefixes are listed below:

- Guardrail, Concrete Barrier and End Anchors – BR
- Curb and Gutter – CG
- Decorative Supports – DS
- Drainage Pipes – DP
- Misc. Drainage Structures – MDP
- Fence and Control of Access – FN
- Graffiti – GR
- Highway Lighting – HL
- Impact Attenutators – IA
- Inlets – IN
- Landscaping – PB
- Linear Samples – LS
    - Paved Lanes – Asphalt
    - Paved Lanes – Concrete
    - Paved Shoulders
    - Unpaved Shoulders
    - Front/Back Slopes
    - Unpaved Lateral and Outfall Ditches
    - Litter
    - Roadway Sweeping
    - Pavement Striping/Markings
    - Pavement Markers
    - Delineators
- Paved Ditches – PD
- Pavement Words and Symbols – PS
- Signs – SN
- Tree and Brush – TB
- Turf Condition – TF
- MSE/Retaining Walls, Sound Barrier Walls, and Screen Walls – WL

Appendix A: Triangle Expressway 2023 Second Quarter Asset Assessment Locations

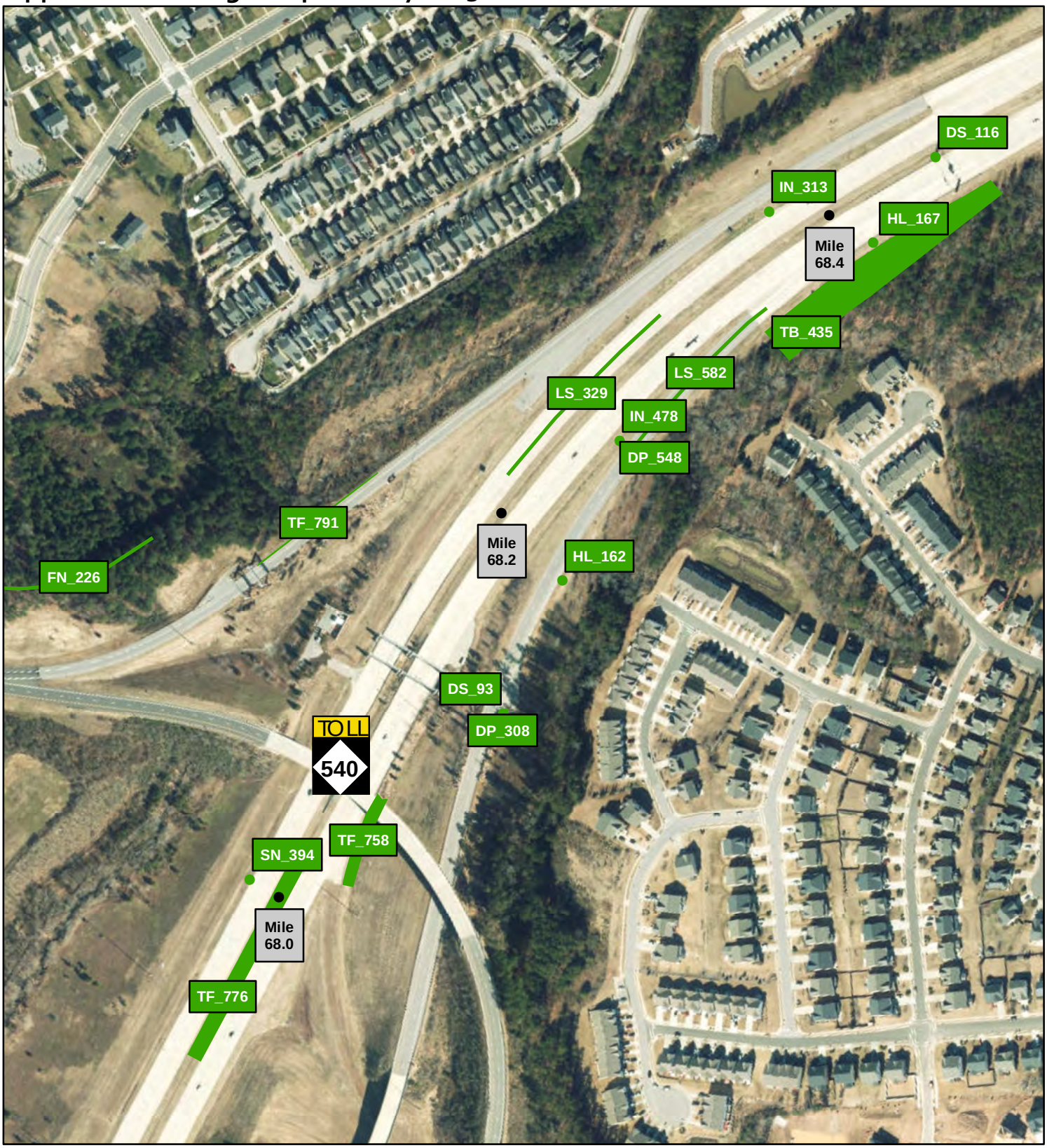
Legend

Failing Asset

Passing Asset

NORTH CAROLINA Turnpike Authority

Appendix A: Triangle Expressway 2023 Second Quarter Asset Assessment Locations



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Failing Asset

Passing Asset

NORTH CAROLINA Turnpike Authority

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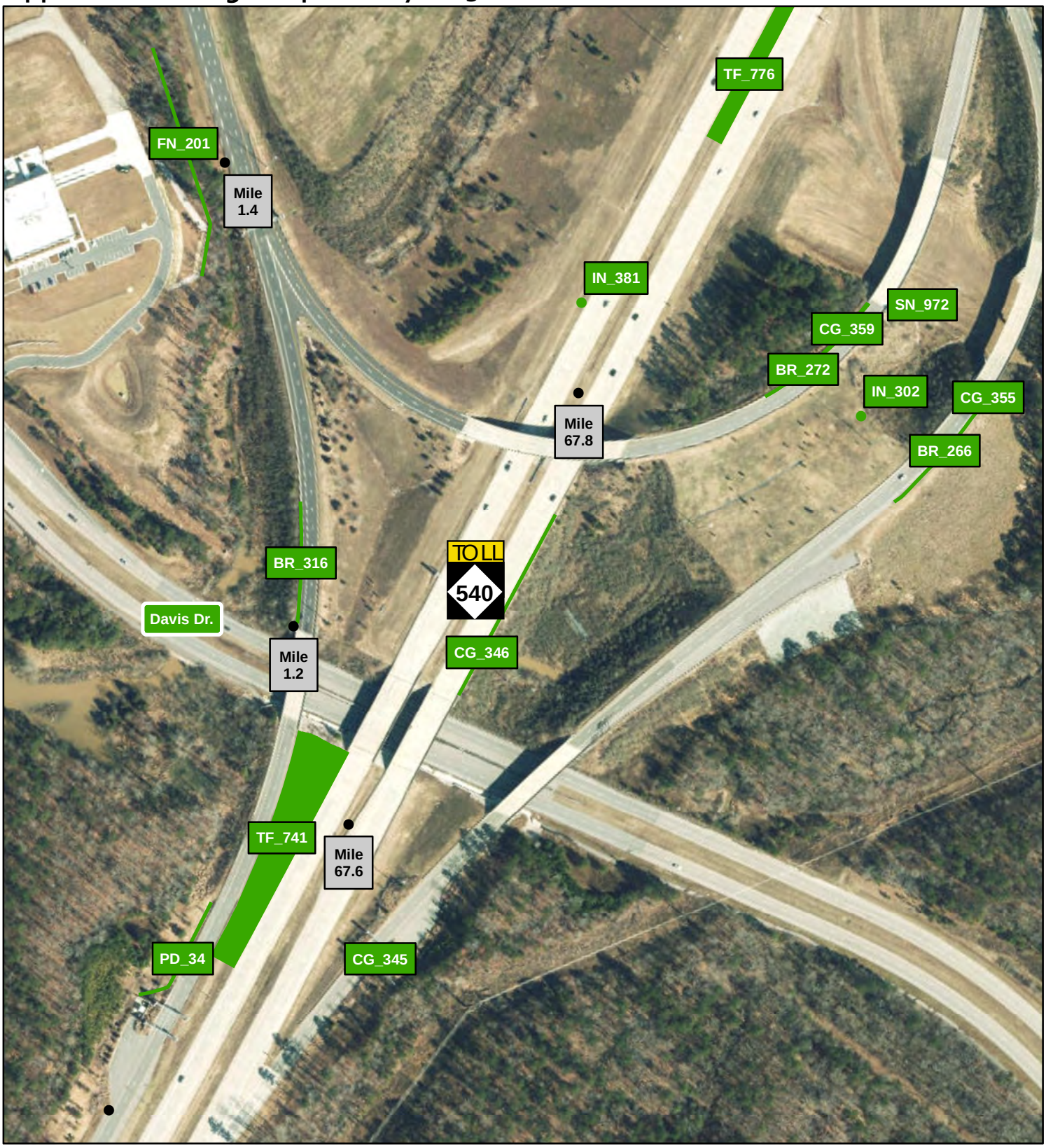

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Failing Asset

Passing Asset

NORTH CAROLINA Turnpike Authority

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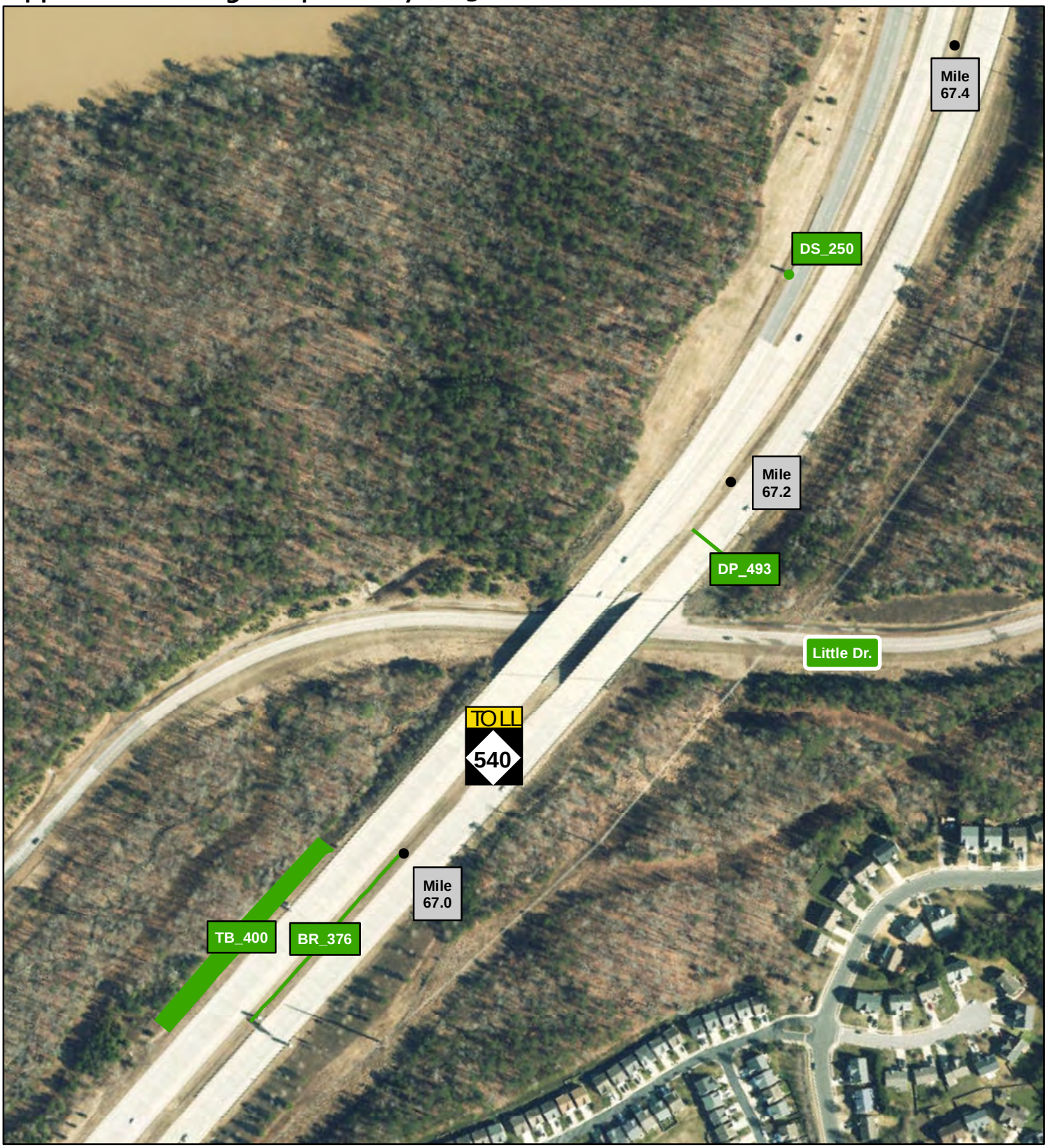

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Failing Asset

Passing Asset

NORTH CAROLINA Turnpike Authority

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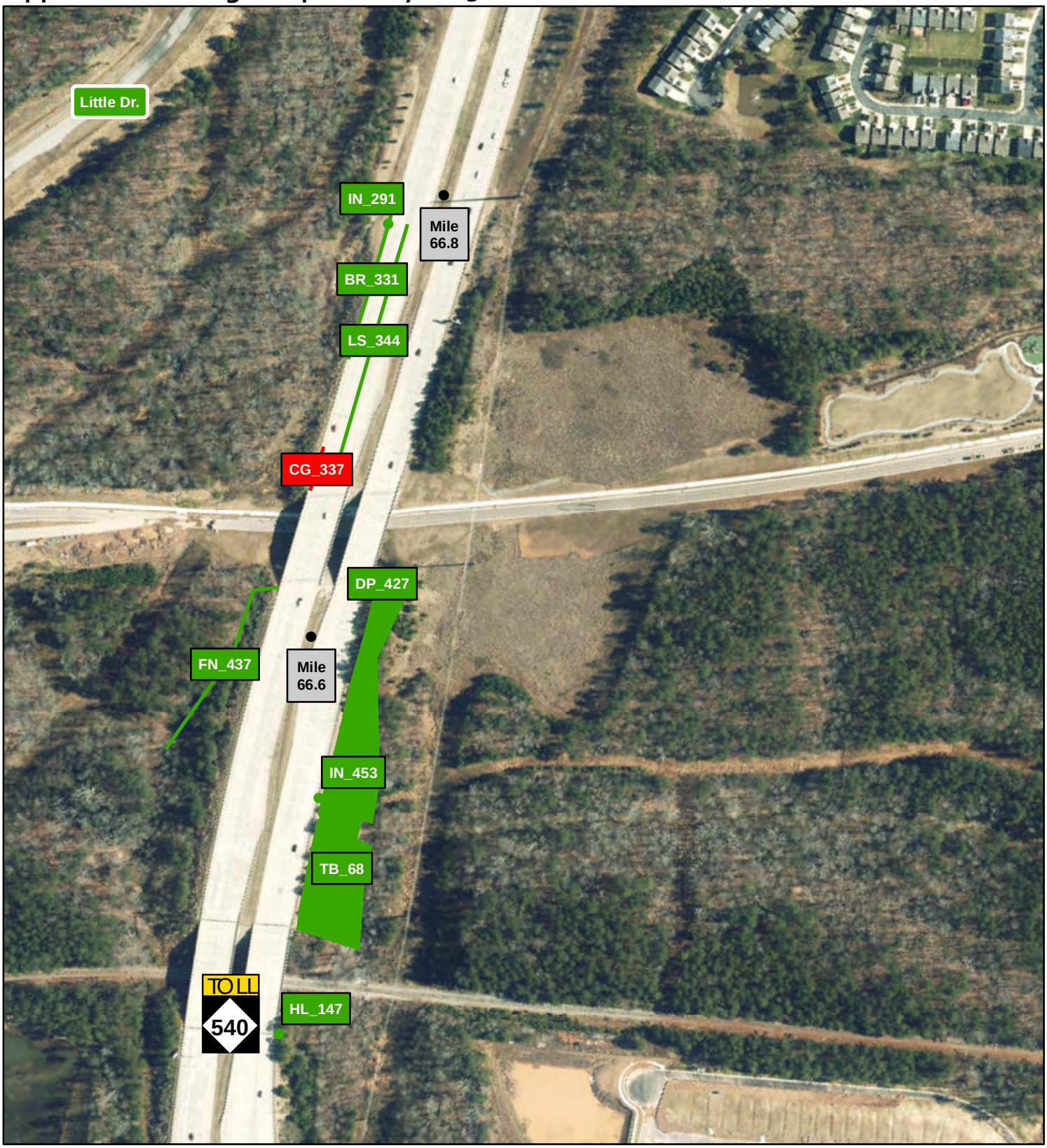

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Failing Asset

Passing Asset

NORTH CAROLINA Turnpike Authority

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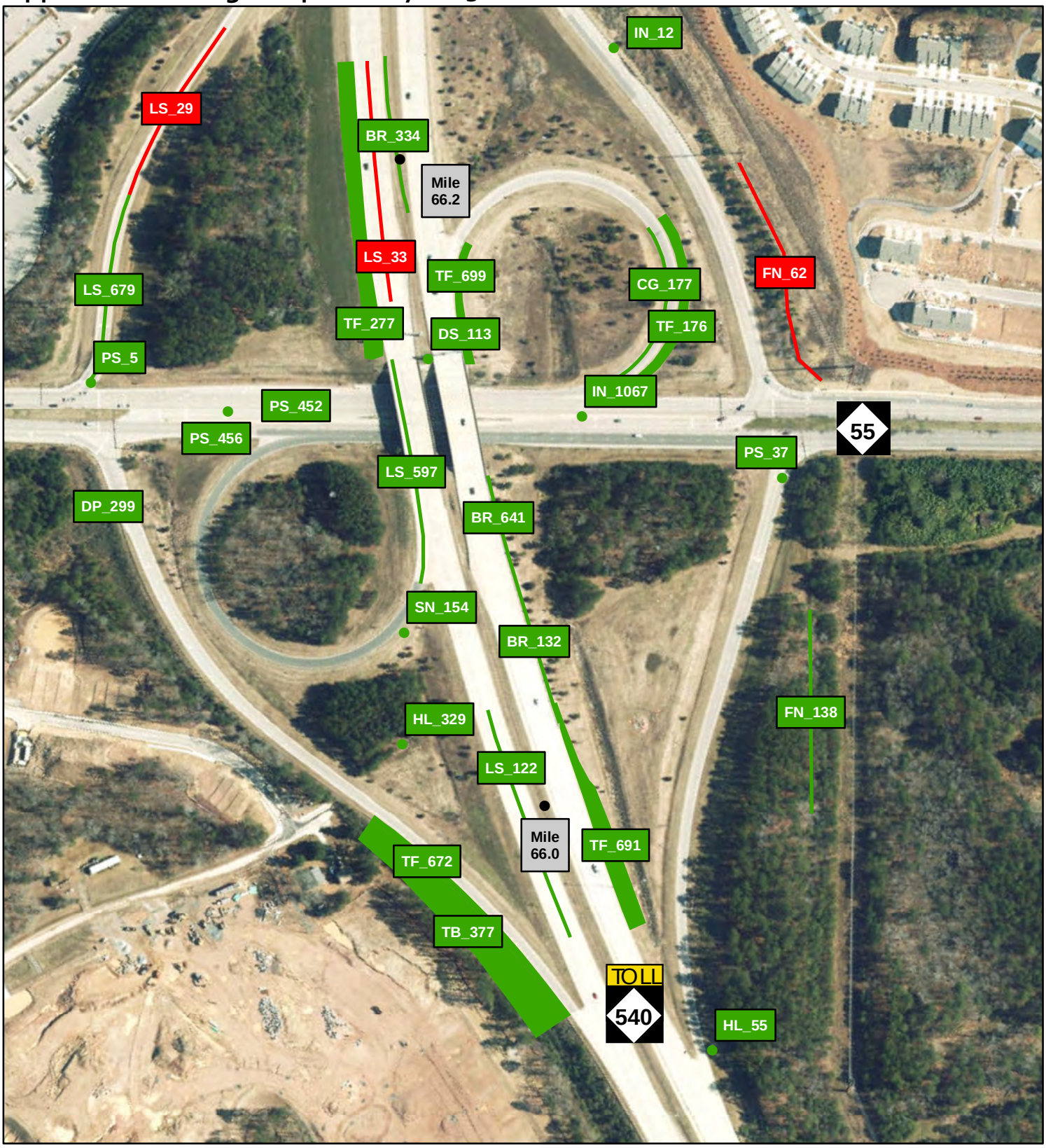

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Failing Asset

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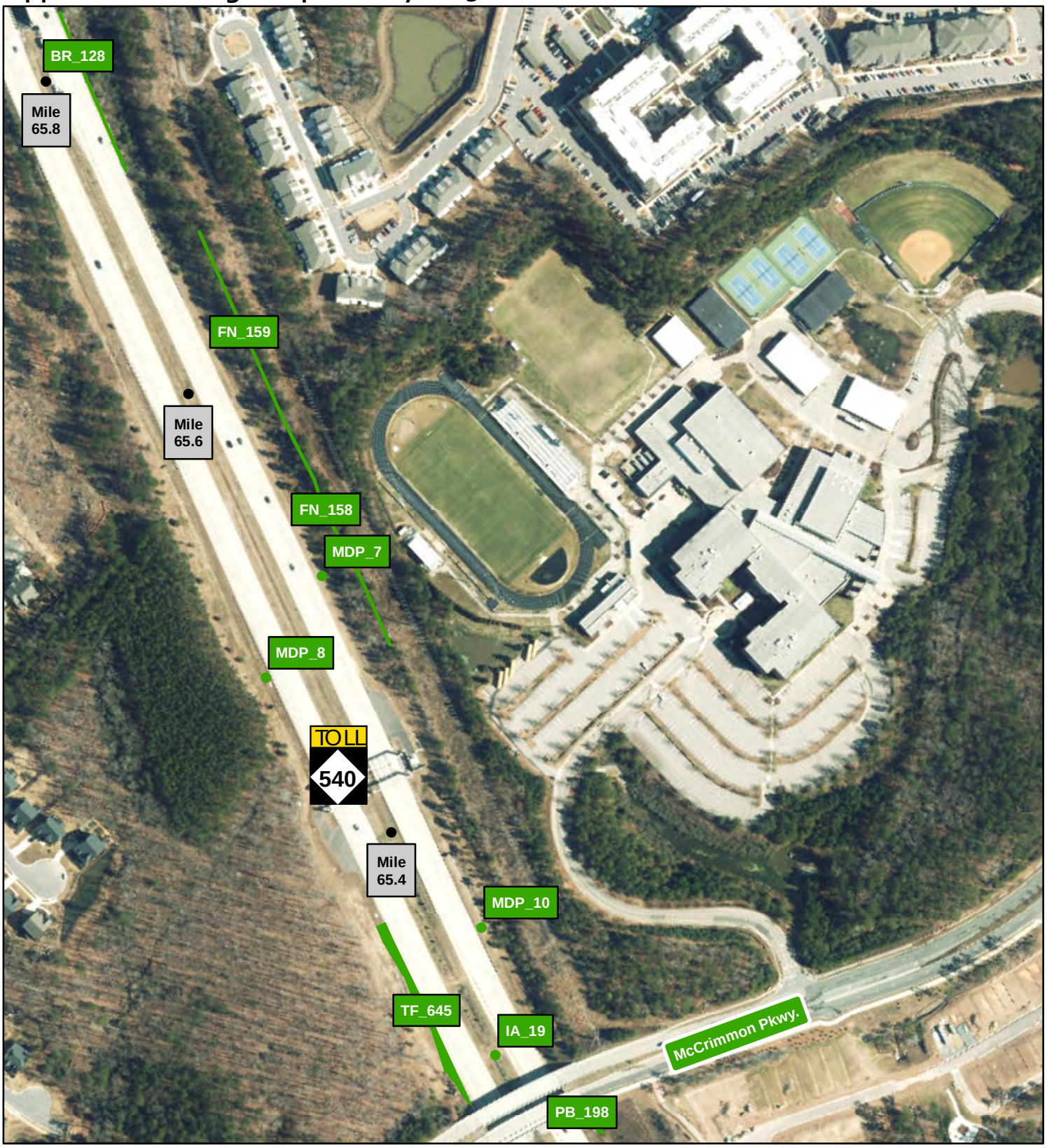

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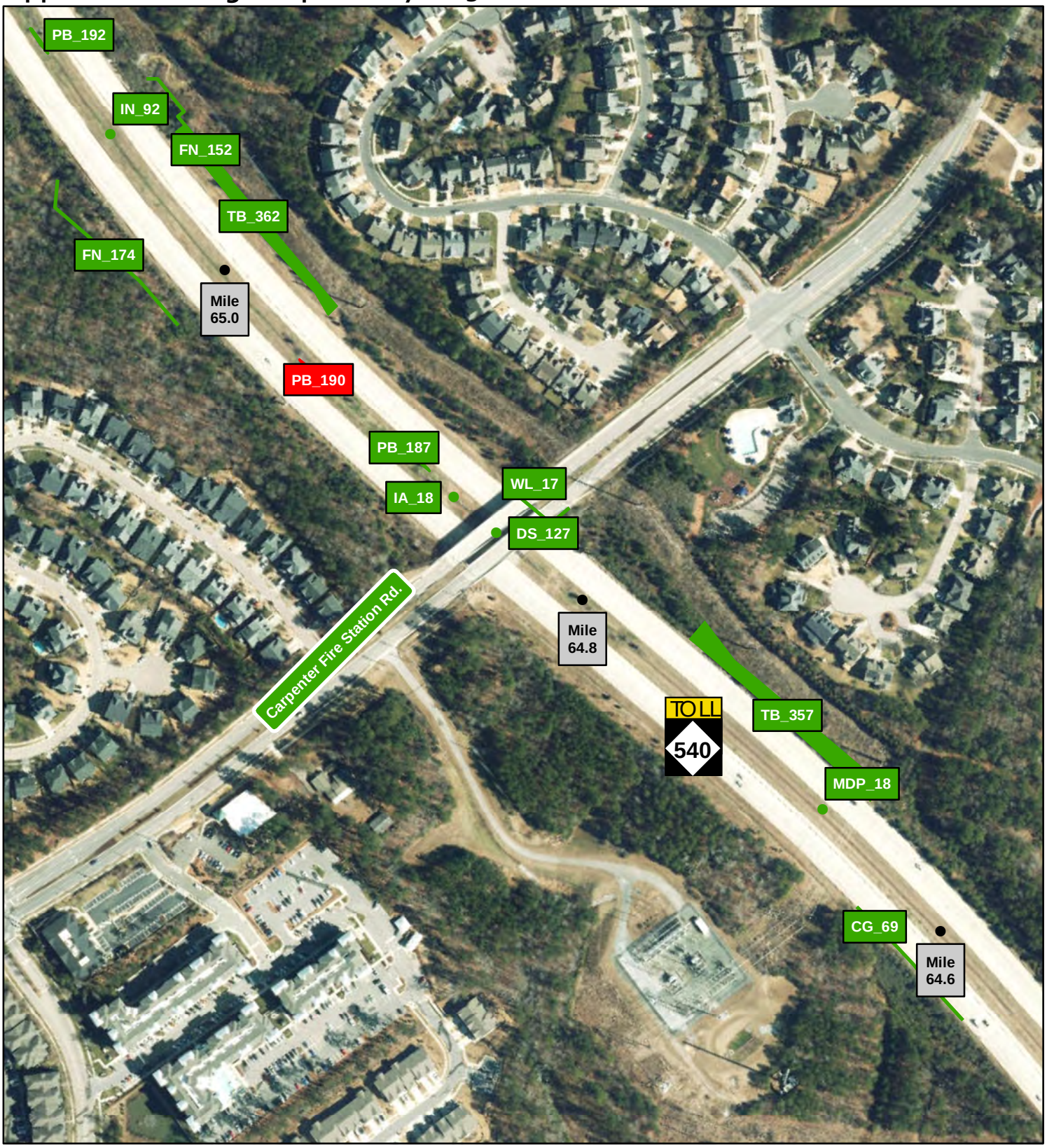

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Failing Asset

Passing Asset

NORTH CAROLINA Turnpike Authority

Appendix A: Triangle Expressway 2023 Second Quarter Asset Assessment Locations

Legend

- Failing Asset
- Passing Asset

NORTH CAROLINA Turnpike Authority

Appendix A: Triangle Expressway 2023 Second Quarter Asset Assessment Locations

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Failing Asset

Passing Asset

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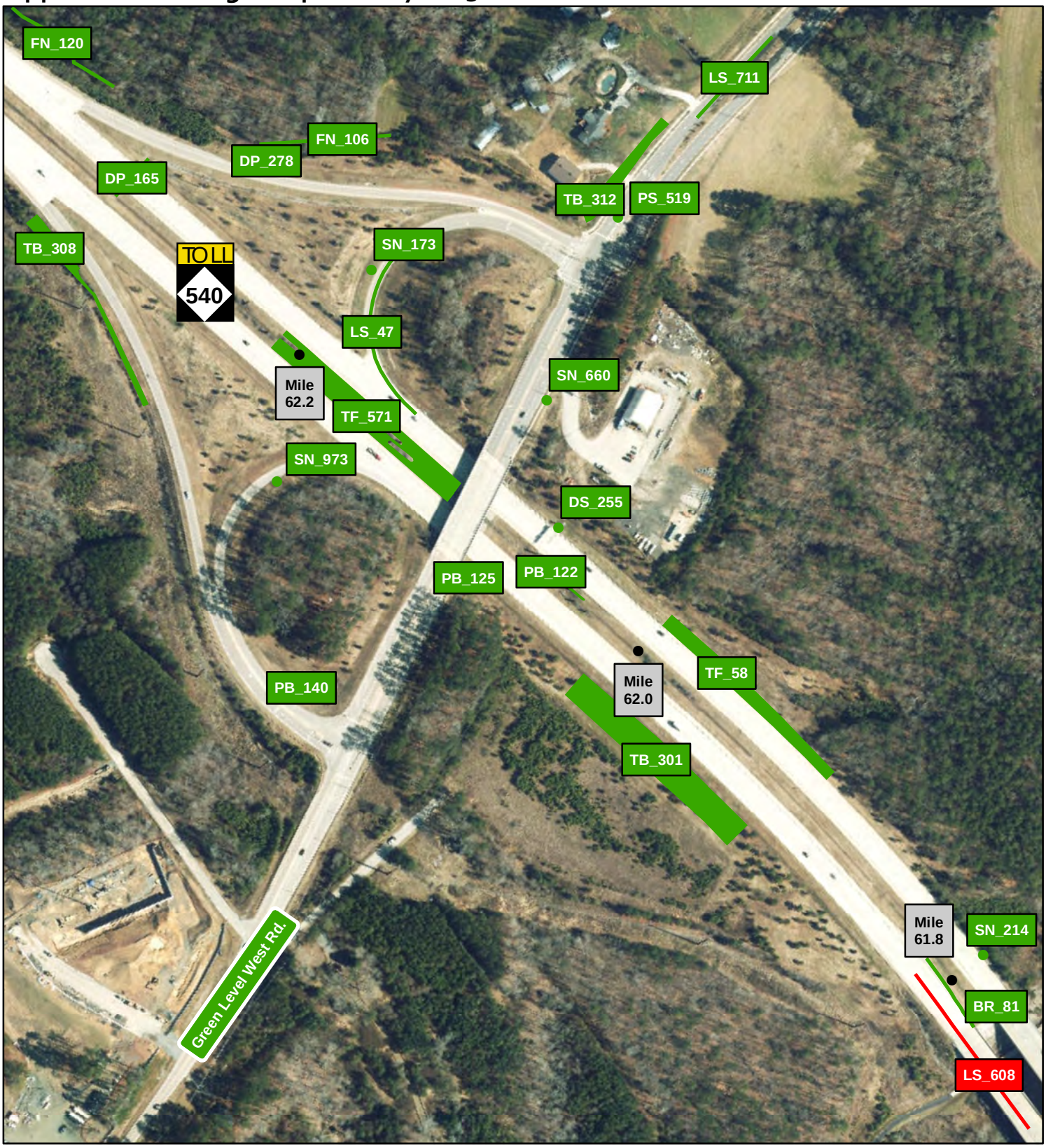
Appendix A: Triangle Expressway 2023 Second Quarter Asset Assessment Locations



Legend

Failing Asset

Passing Asset

NORTH CAROLINA Turnpike Authority

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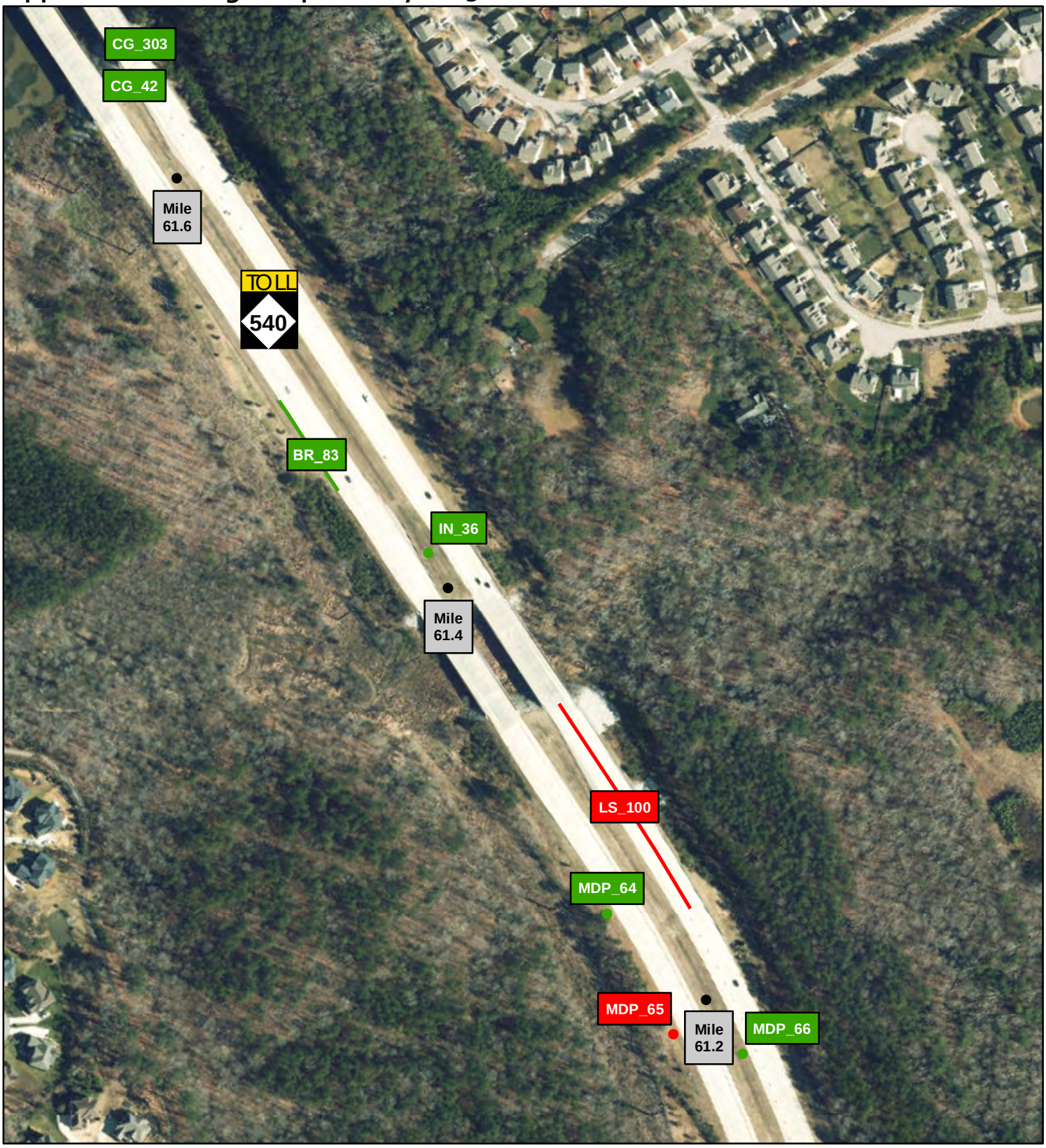

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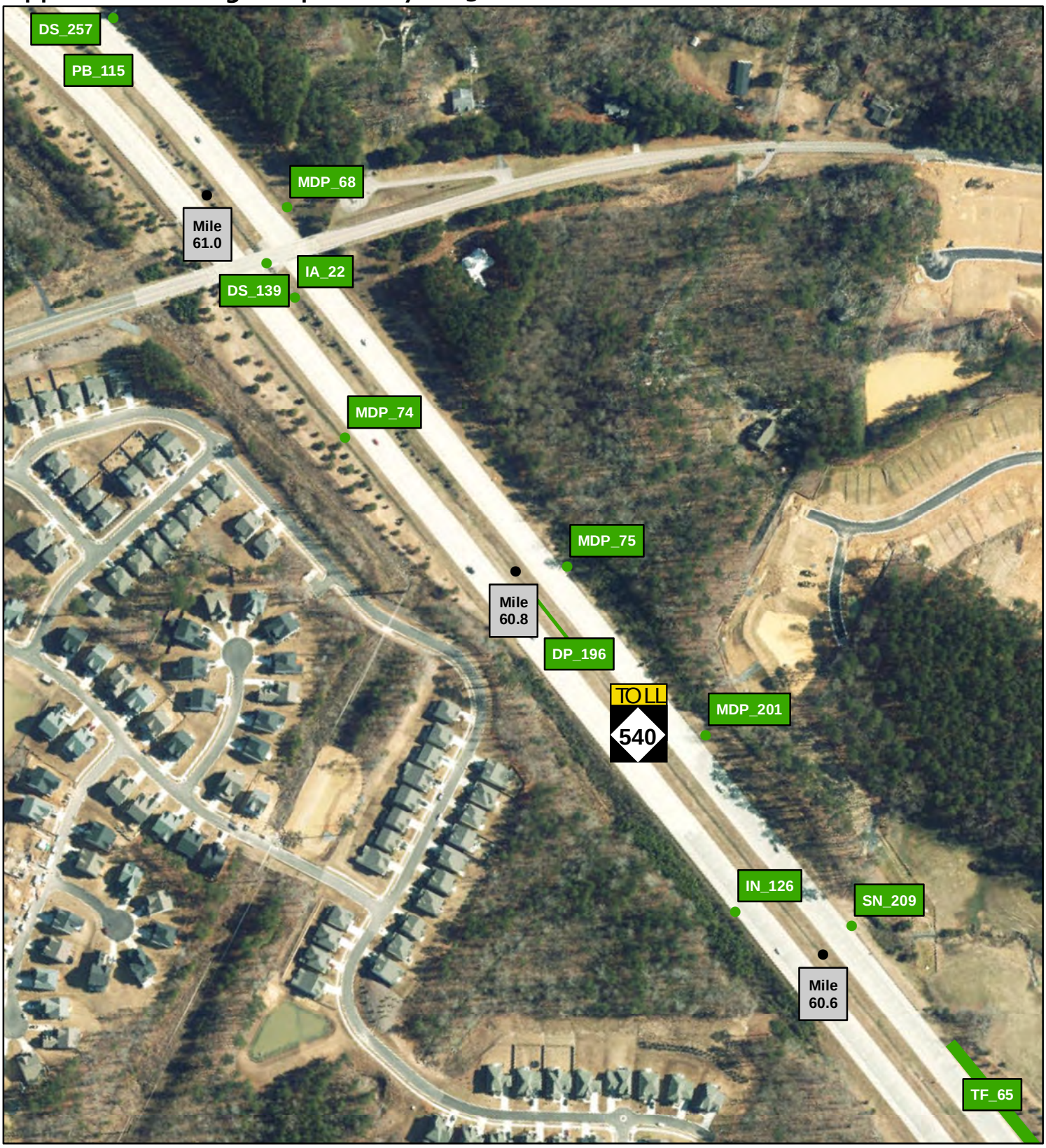

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Failing Asset

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NORTH CAROLINA Turnpike Authority

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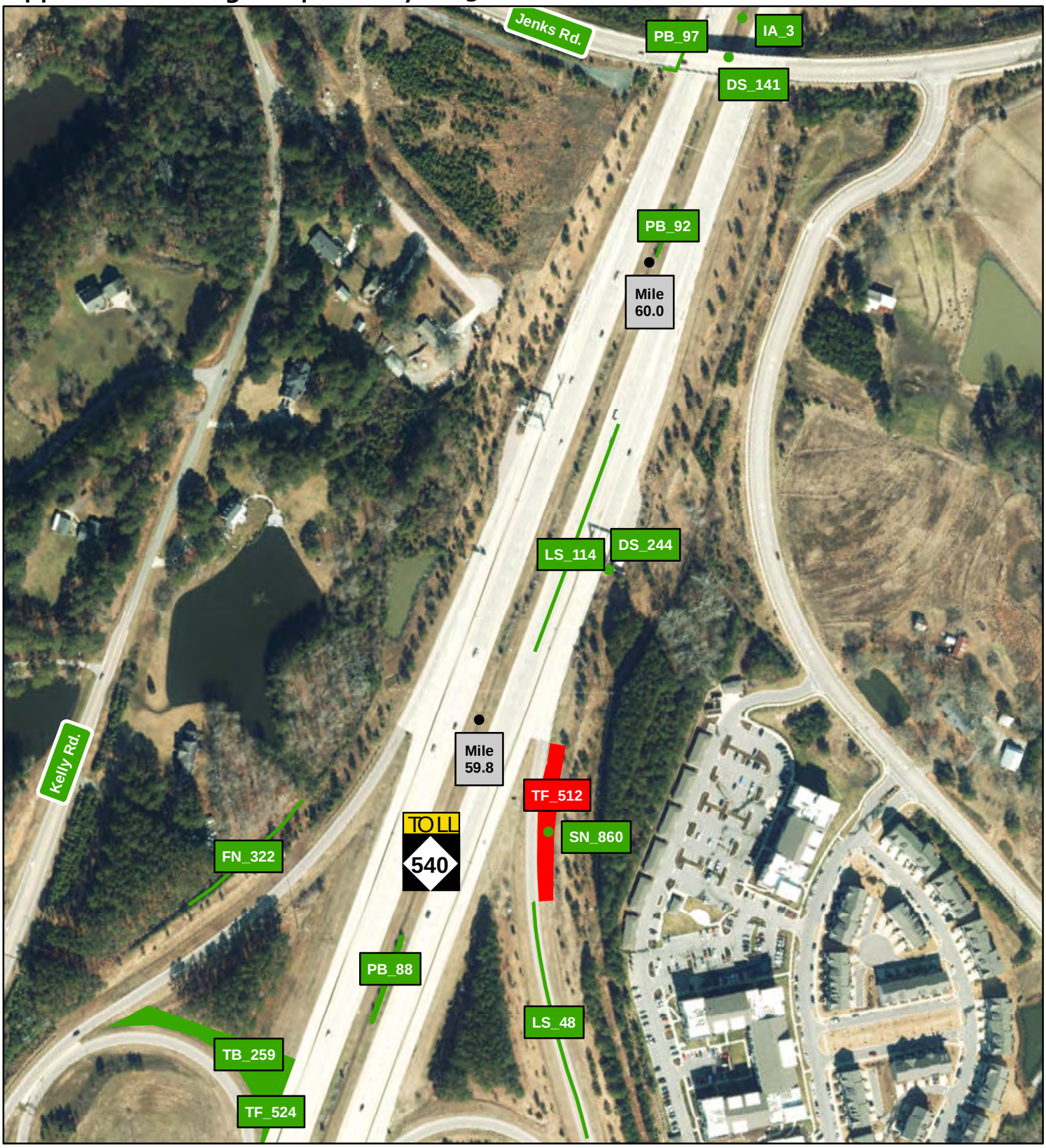

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- Failing Asset
- Passing Asset

NORTH CAROLINA Turnpike Authority

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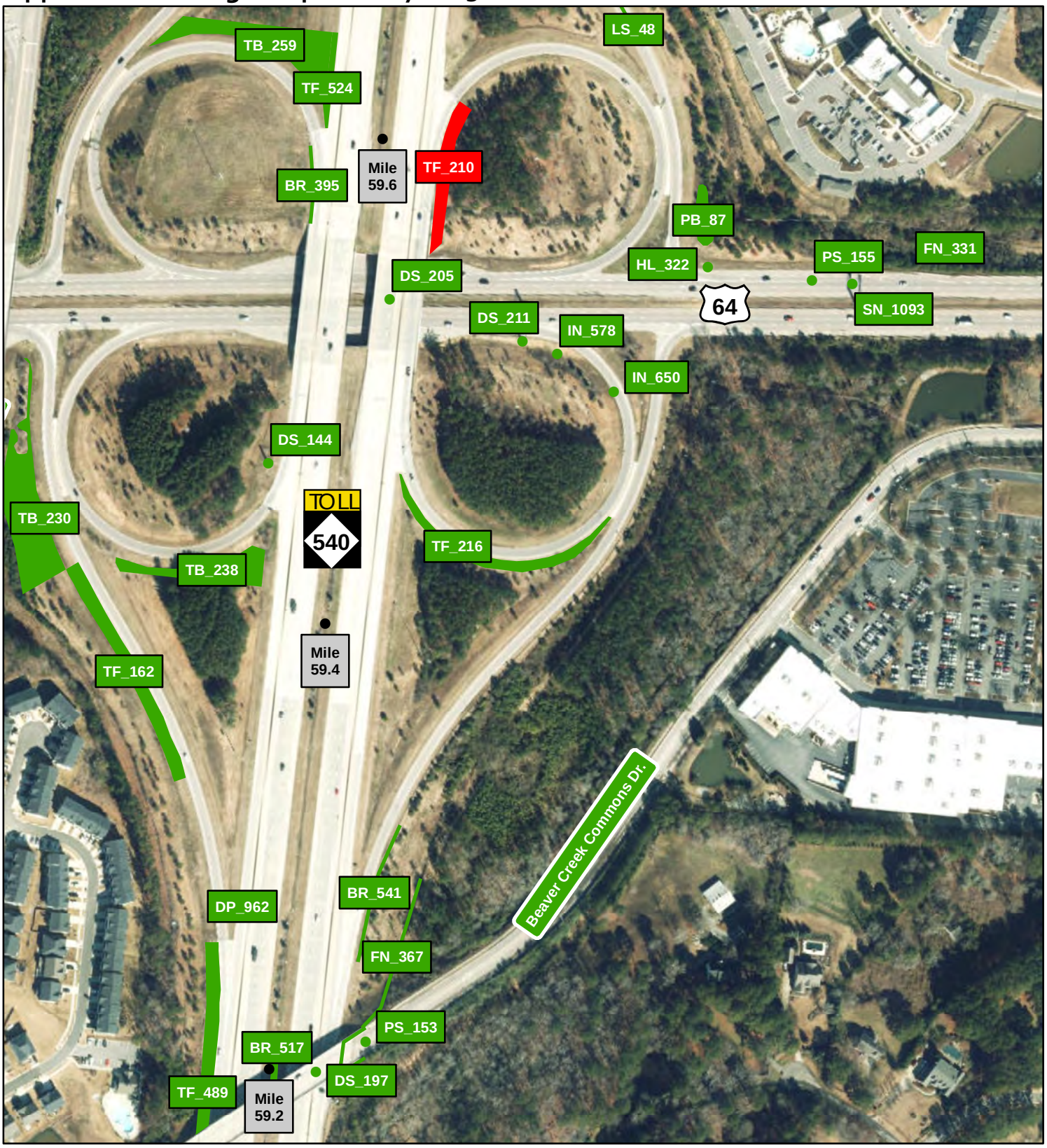

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Failing Asset

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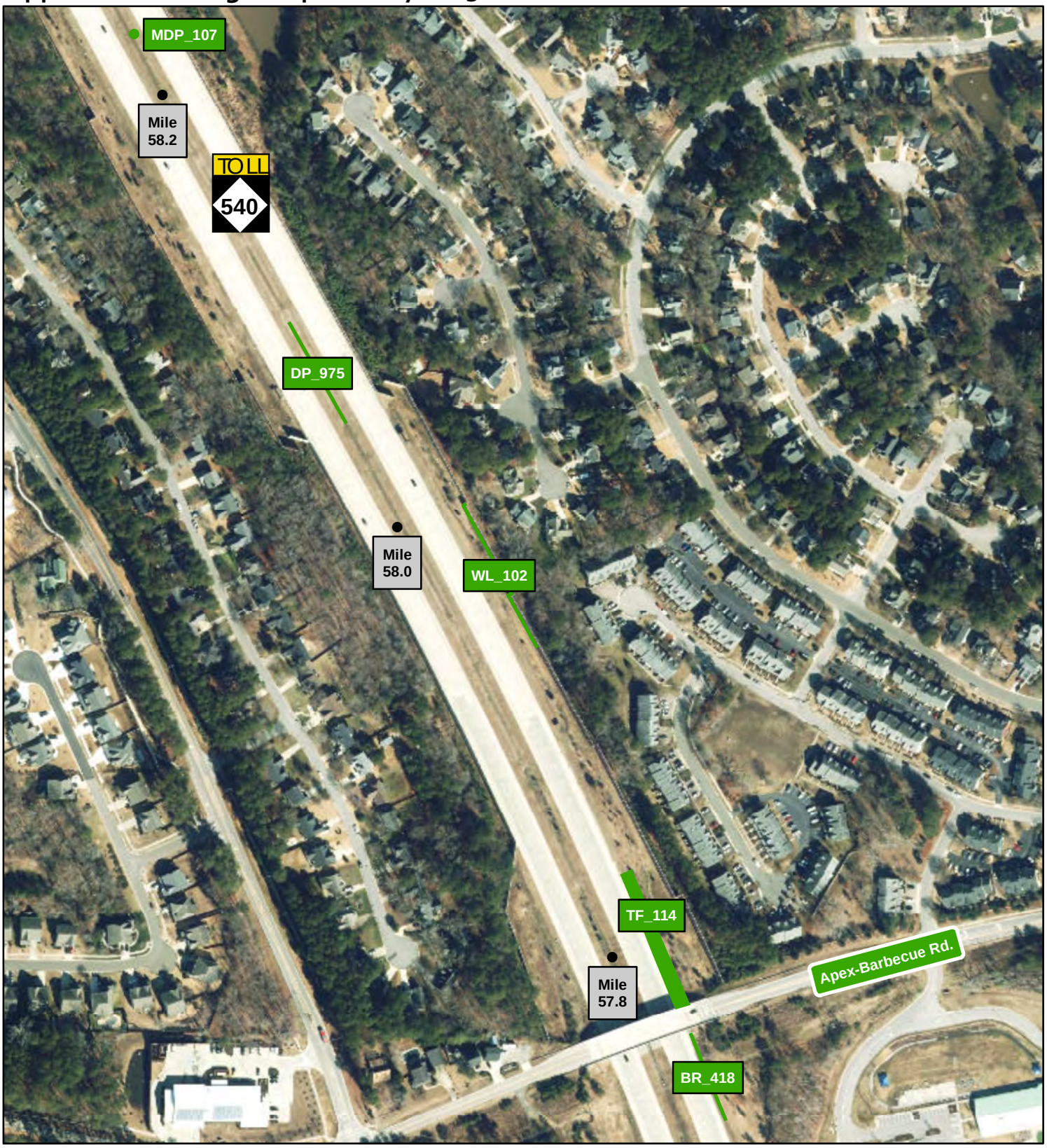

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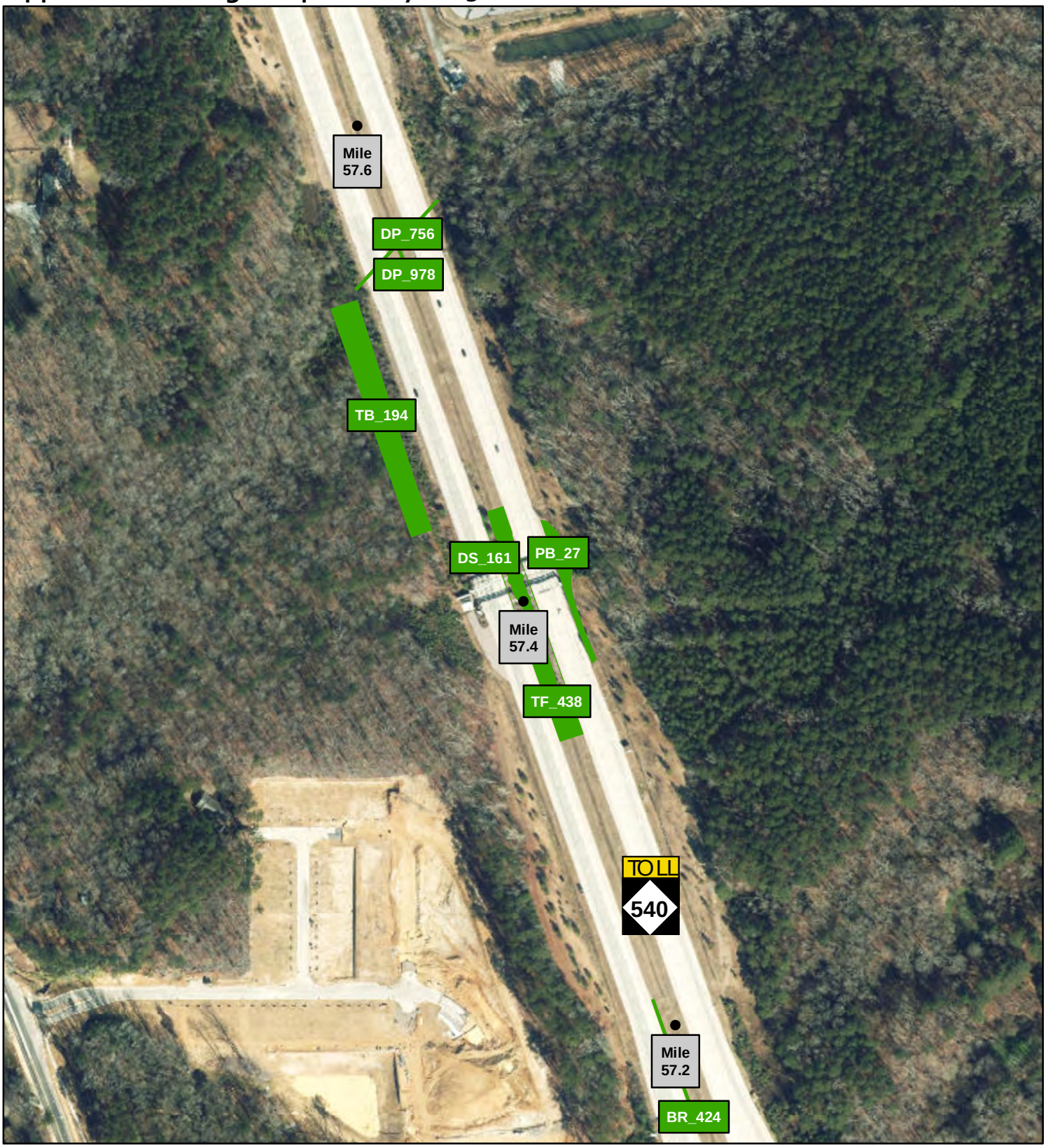

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NORTH CAROLINA Turnpike Authority

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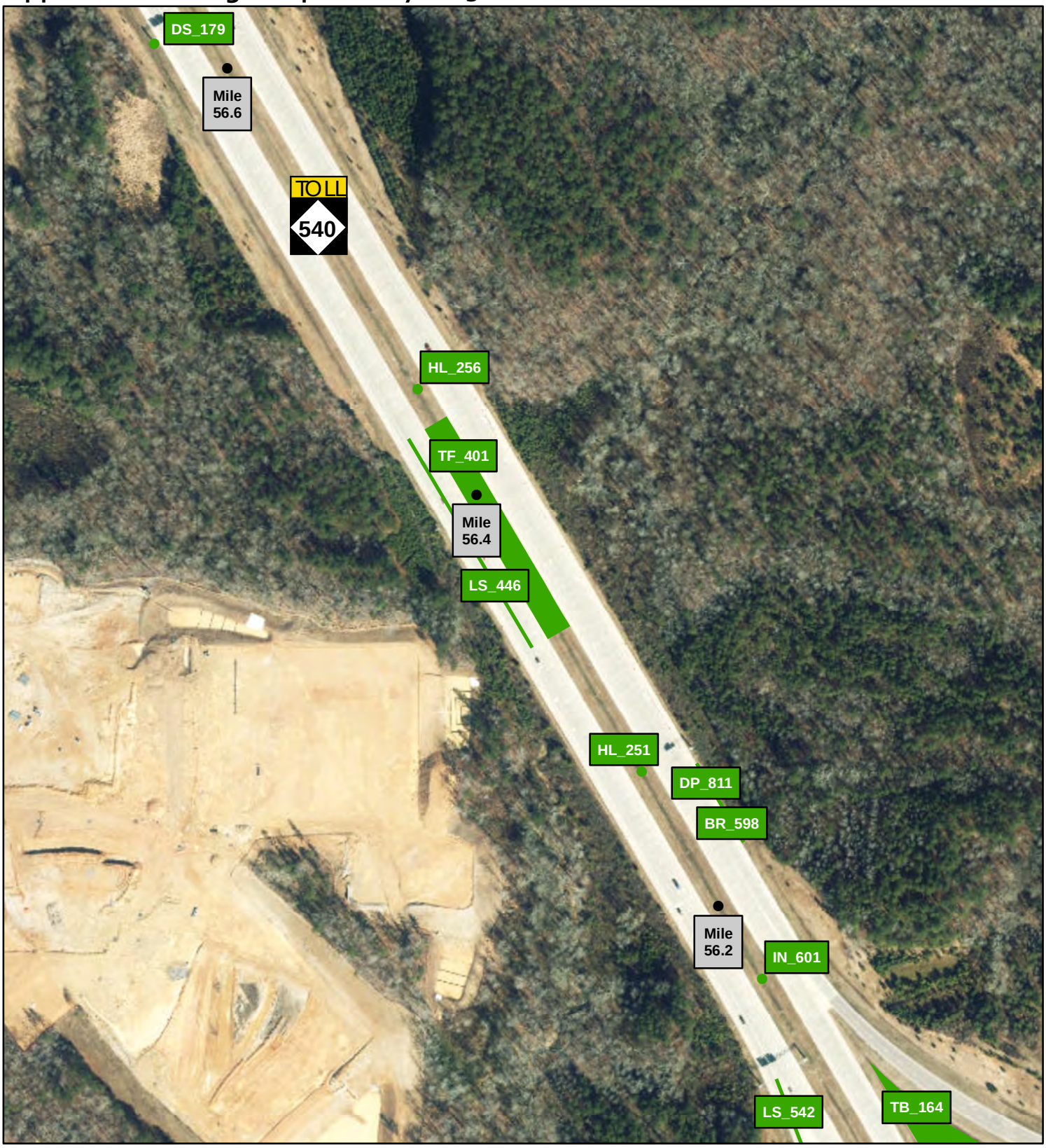

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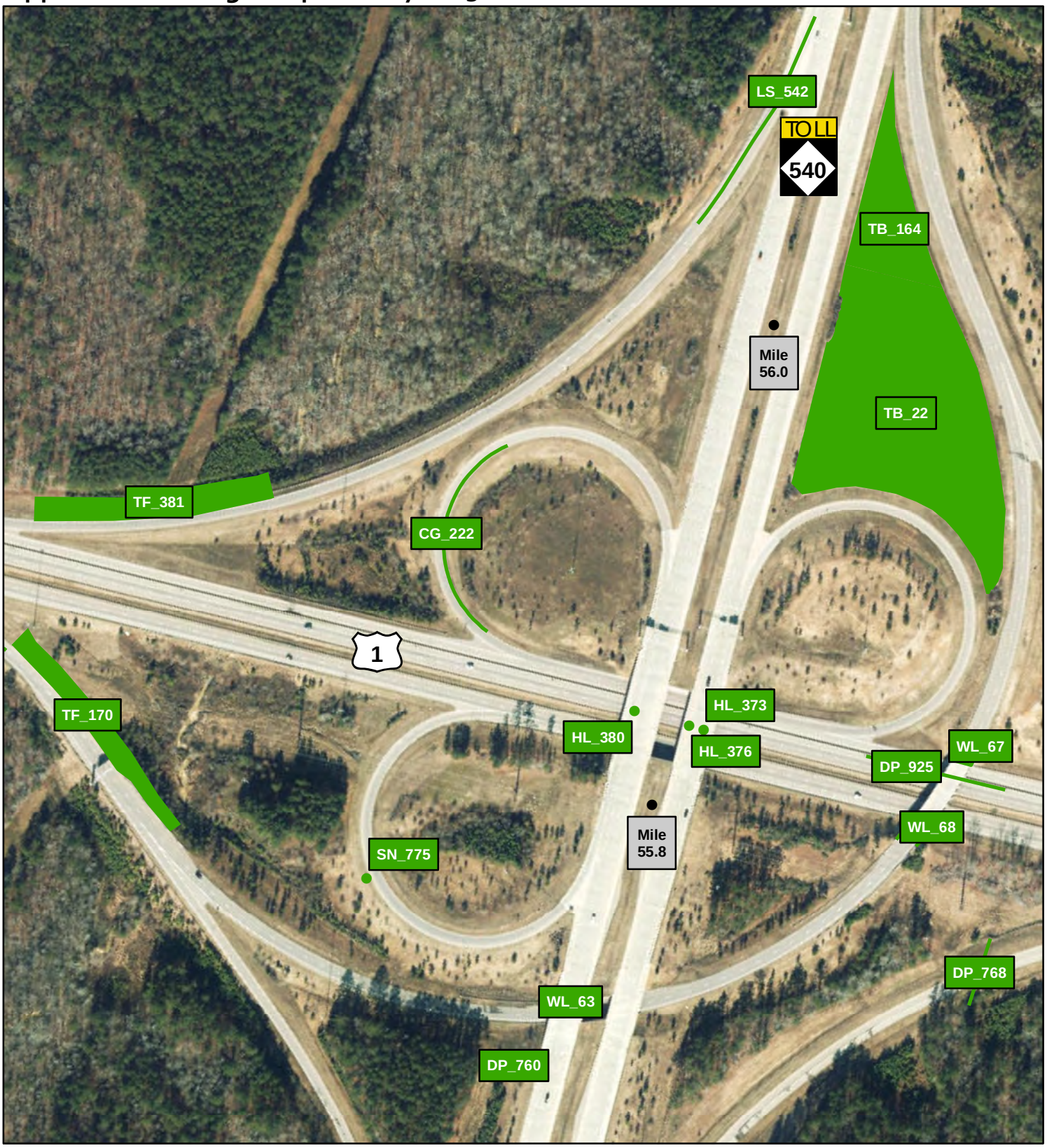

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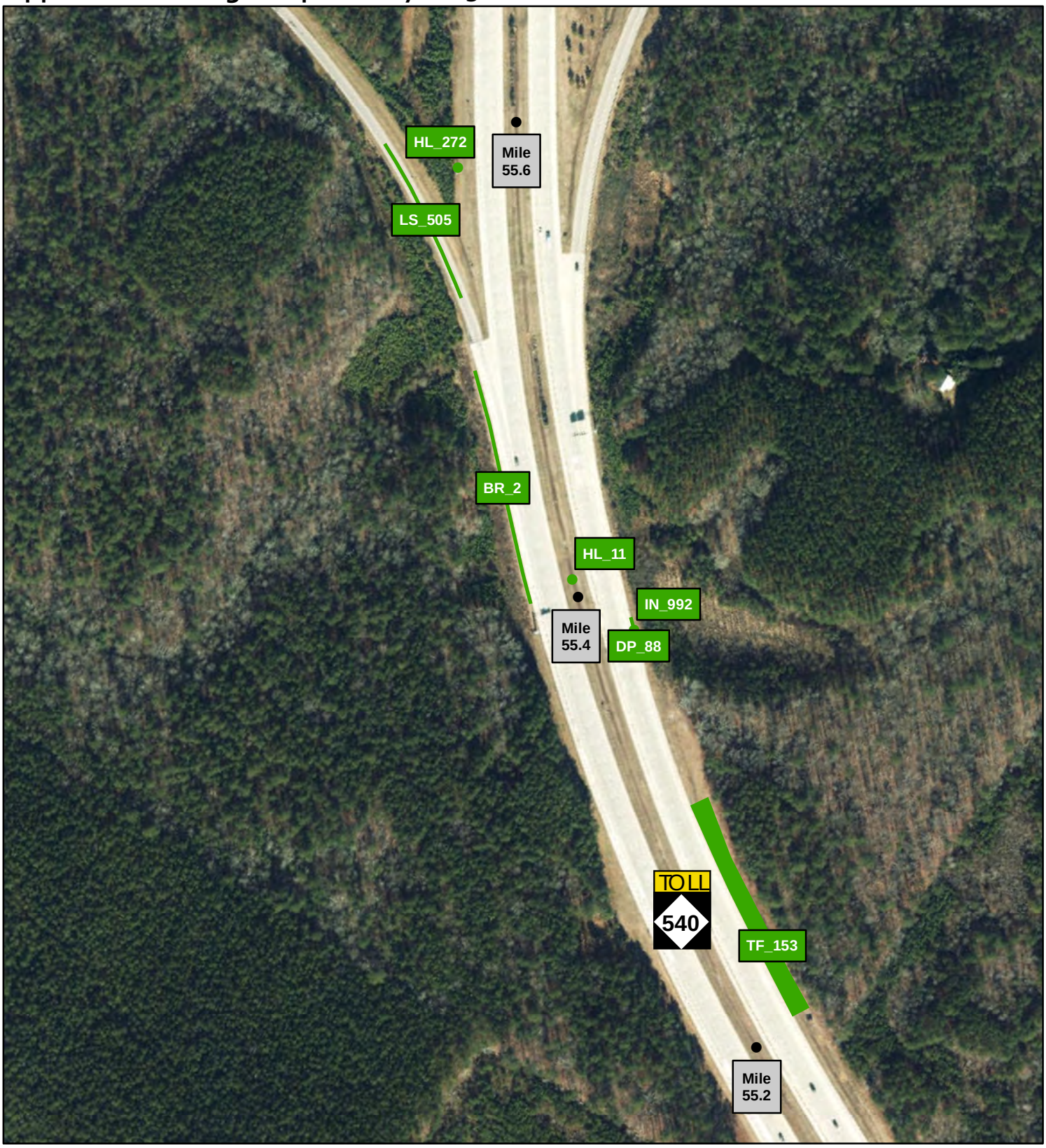

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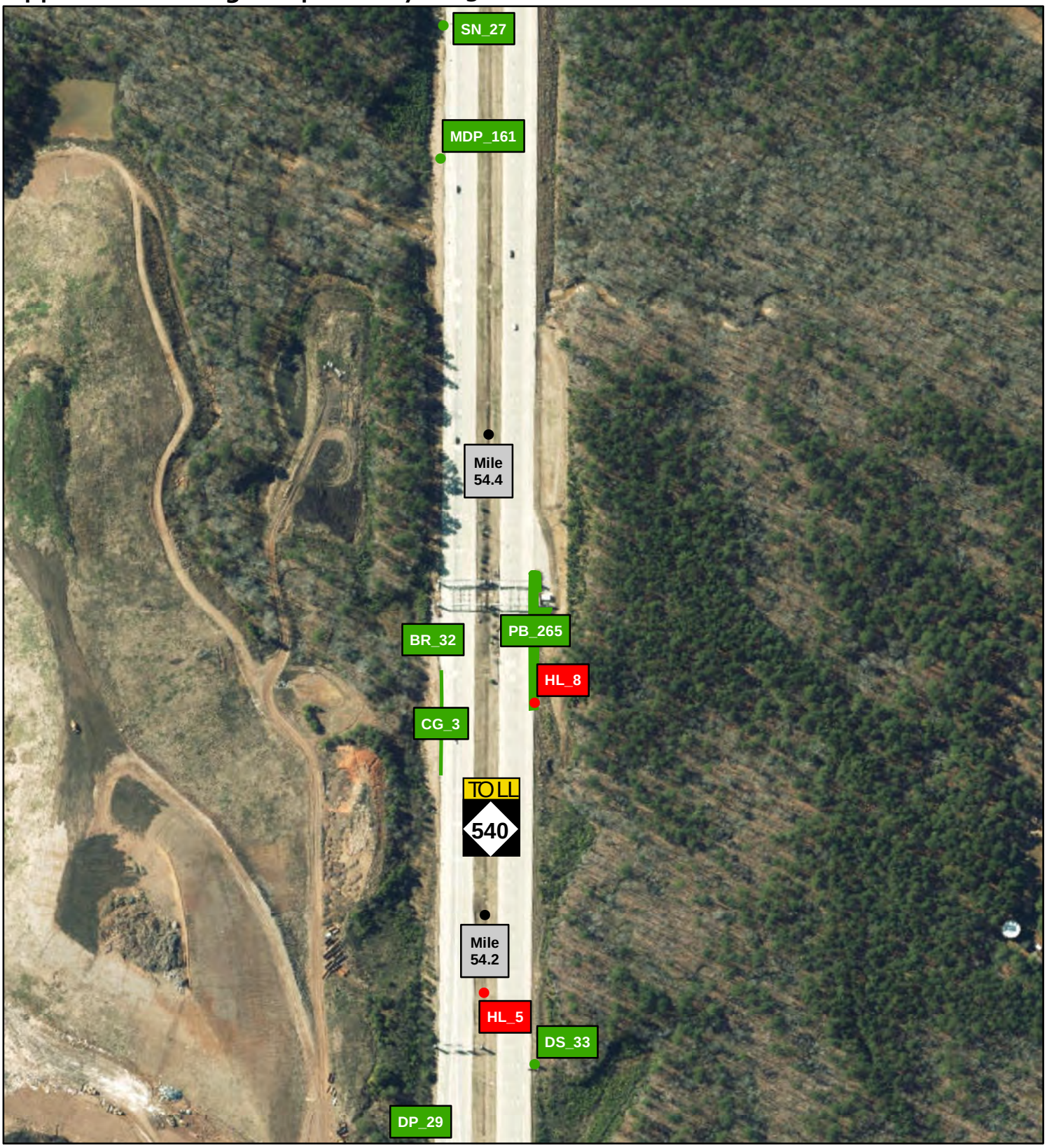

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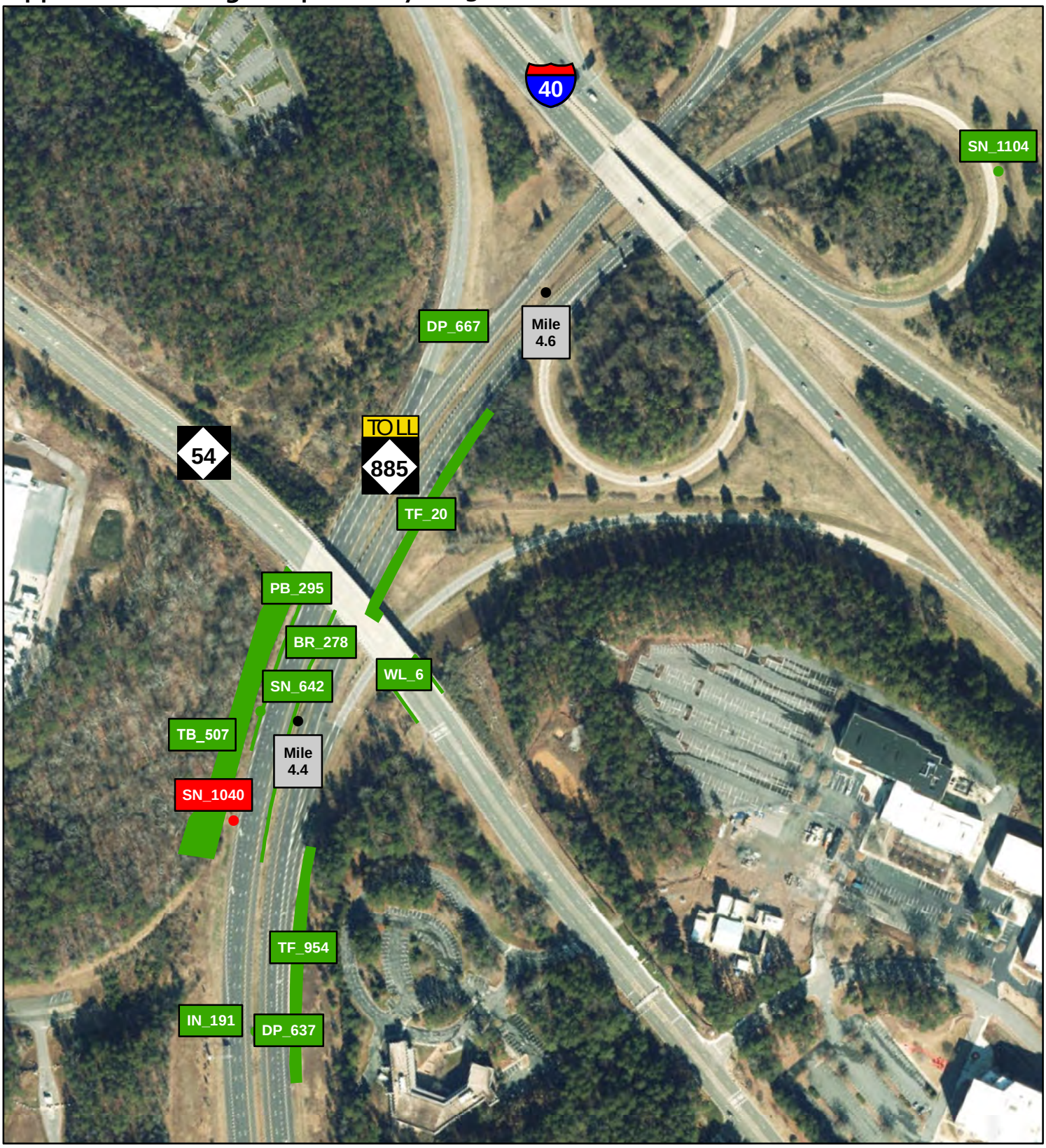

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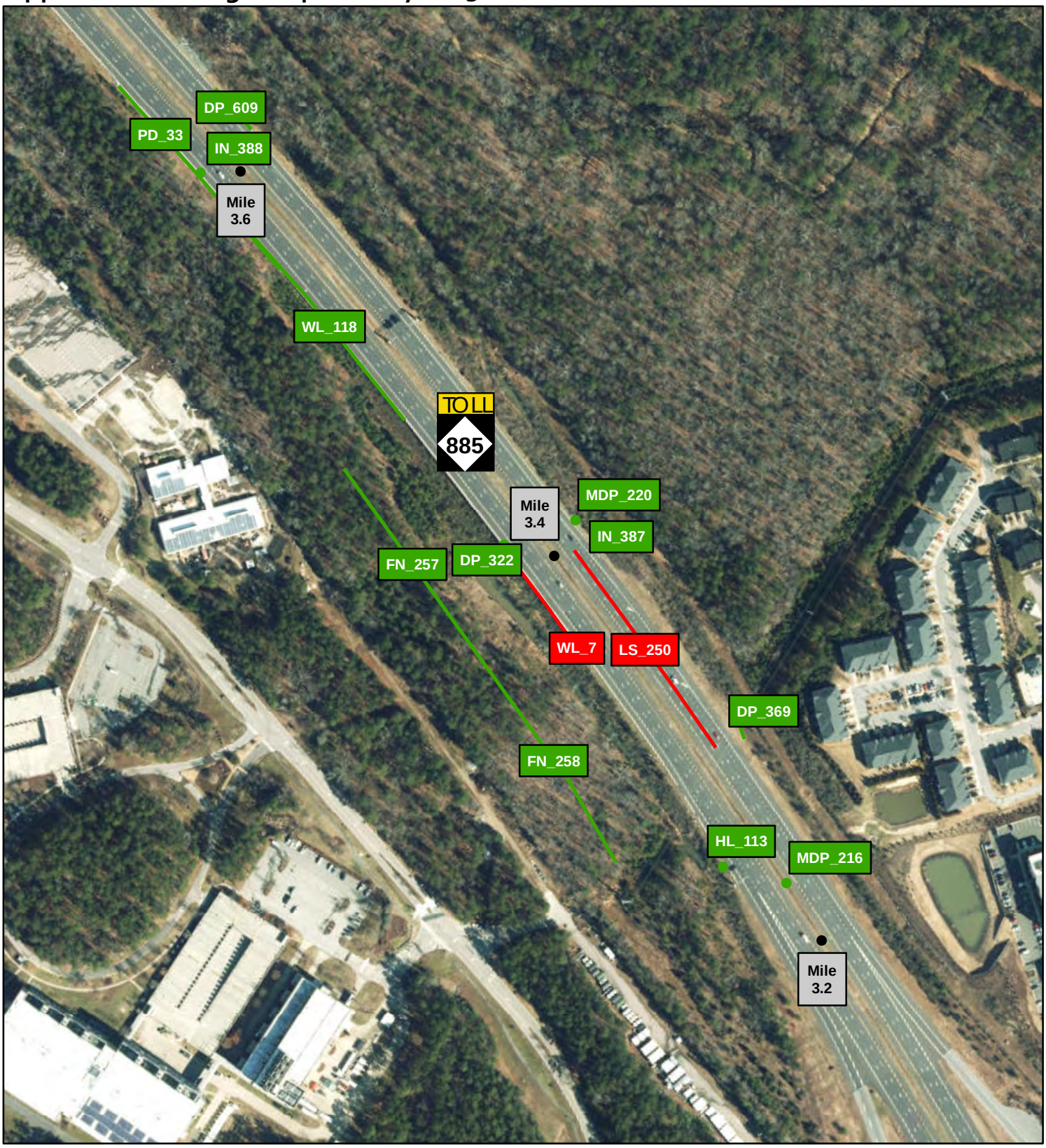

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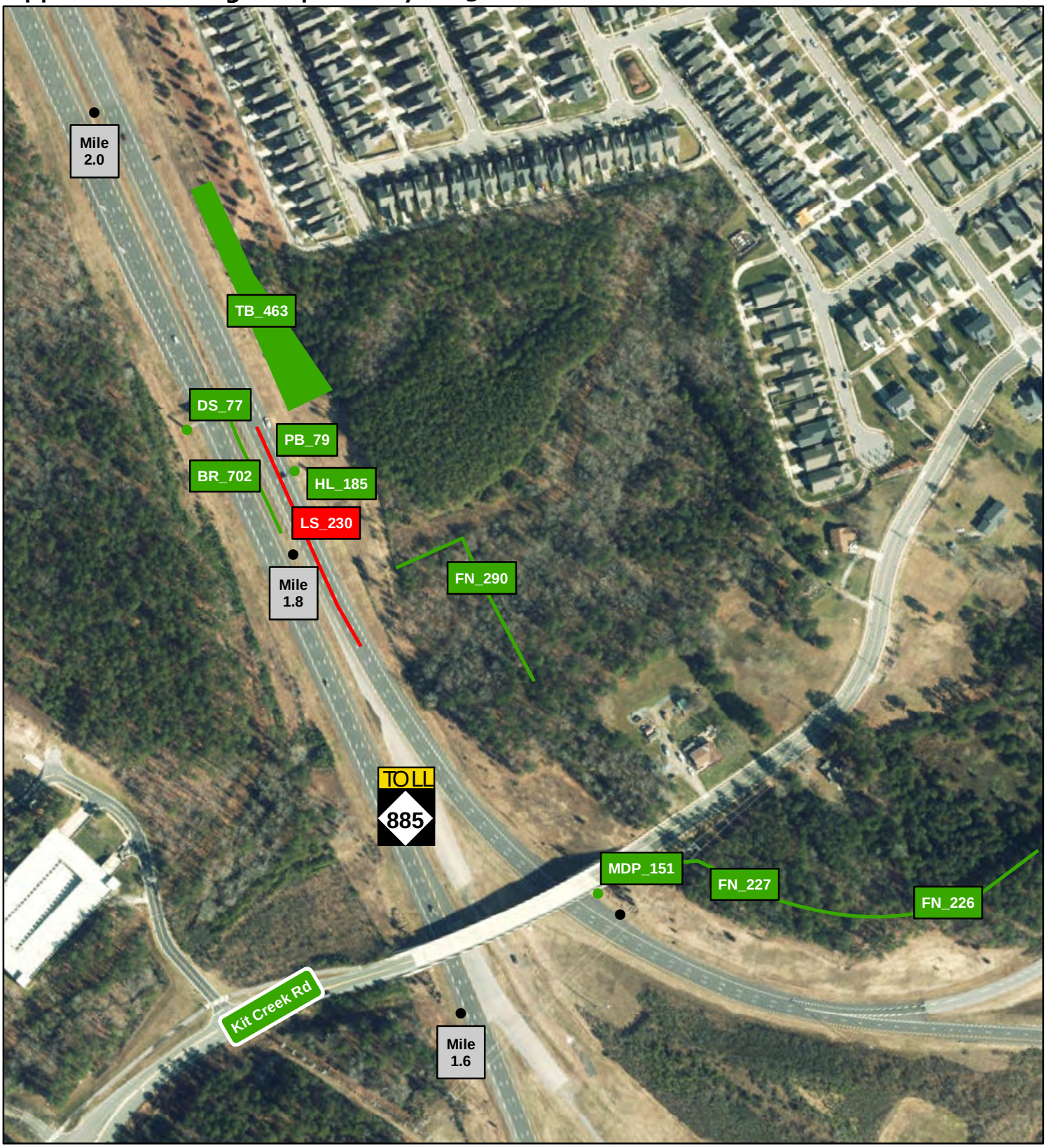

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Appendix B

Triangle Expressway 2023 Second Quarter Table Results of Assets Failing MRP

Appendix B: Triangle Expressway 2023 Second Quarter Table Results of Assets Failing MRP

Provided below are a series of tables outlining the existing failures that occurred throughout the facility. Assets are defined by an Inventory ID, which is a unique identifier given to each individual asset. The components that make up the Inventory ID are an asset specific prefix along with a number, such as LS_1. The Inventory ID and GIS Reference Page number correspond to the provided map packets and allow for quick location of particular asset failures. Photos of failures were provided when applicable.

All assets and their respective prefixes are listed below:

Guardrail, Concrete Barrier and End Anchors (BR) B1
Curb and Gutter (CG) B2
Decorative Supports (DS) B3
Drainage Pipes (DP) B4
Misc. Drainage Structure (MDP) B5
Fence and Control of Access (FN) B6
Graffiti (GR) B7
Highway Lighting (HL) B8
Impact Attenuators (IA) B9
Inlets (IN) B10
Landscaping (PB) B11
Paved Lanes – Asphalt (LS) B12
Paved Lanes – Concrete (LS) B12
Paved Shoulders (LS) B13
Unpaved Shoulders (LS) B13
Front/Back Slopes (LS) B14
Unpaved Lateral and Outfall Ditches (LS) B14
Litter (LS) B15
Roadway Sweeping (LS) B16
Pavement Striping (LS) B17
Pavement Markers (LS) B17
Delineators (LS) B18
Paved Ditches (PD) B19
Pavement Words and Symbols (PS) B20
Signs (SN) B21
Tree and Brush (TB) B22
Turf Condition (TF) B23
MSE/Retaining Walls, Sound Barrier Walls, and Screen Walls (WL) B24

Guardrail, Concrete Barrier, and End Anchors (BR)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Curb and Gutter (CG)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Express-way Gutter	CG_337	Misalignment		A5

Decorative Supports (DS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Drainage Pipes (DP)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Drain	DP_781	Obstruction		A24

Misc. Drainage Structure (MDP)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Shoulder Drain	MDP_65	Rodent Screen		A13
2	Shoulder Drain	MDP_93	Obstruction		A17
3	Shoulder Drain	MDP_98	Obstruction/ Rodent Screen		A17

Fence and Control of Access (FN)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Woven	FN_62	Hole Height		A6

Graffiti (GR)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Highway Lighting (HL)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Double Roadway	HL_5	Part Damage		A26
1	Single Roadway	HL_8	Part Damage		A26
1	High Mast	HL_203	Rodent Screen		A30

Impact Attenuators (IA)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Inlets (IN)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Drop Inlet	IN_787	Eroded Area		A24

Landscaping (PB)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Plant Bed	PB_75	Overgrown		A31
2	Plant Bed	PB_190	Health		A8

Paved Lanes – Asphalt (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Paved Lanes – Concrete (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Concrete	LS_608	Joint Malfunction		A12

Paved Shoulders (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Unpaved Shoulders (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Asphalt	LS_29	Drop off		A6
2	Asphalt	LS_784	Elevation Deviation		A9

Front/Back Slopes (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Unpaved Lateral and Outfall Ditches (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Litter (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Concrete	LS_33	Hazardous		A6
2	Asphalt	LS_230	Hazardous		A32
3	Concrete	LS_441	Hazardous		A20
4	Concrete	LS_588	Hazardous		A1

Roadway Sweeping (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Pavement Striping (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Pavement Markers (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Delineators (LS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Concrete	LS_100	Nighttime Reflectivity	Not available for nighttime failure	A13
2	Asphalt	LS_250	Missing, Nighttime Reflectivity		A29
3	Concrete	LS_588	Nighttime Reflectivity	Not available for nighttime failure	A1
4	Concrete	LS_608	Missing, Nighttime Reflectivity		A12

Paved Ditches (PD)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Pavement Words and Symbols (PS)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Left Turn	PS_409	Nighttime Reflectivity		A1

Signs (SN)

#	Sign Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Speed Limit Interstate	SN_1040	Missing		A27

Tree and Brush (TB)

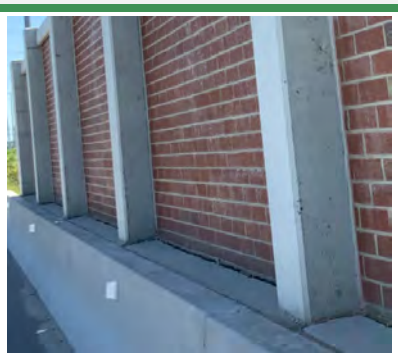
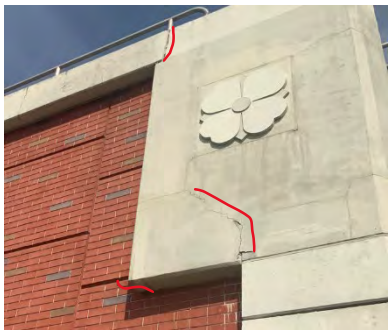
#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page

This asset did not produce any failures.

Turf Condition (TF)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Turf	TF_210	Bare Ground		A16
2	Turf	TF_512	Bare Ground		A15
3	Turf	TF_1054	Bare Ground		A9

MSE/Retaining Walls, Sound Barrier Walls, and Screen Walls (WL)

#	Material Type	Object ID	Failure Type	Photo	GIS Reference Page
1	Sound Wall	WL_7	Unsealed Cracks/Joints		A29
2	Bridge Wall	WL_9	Unsealed Cracks/Joints		A30
3	Bridge Wall	WL_11	Unsealed Cracks/Joints		A31
4	Bridge Wall	WL_58	Unsealed Cracks/Joints		A20