



Zebulon Multimodal Transportation Plan

2035 Update

March 2014



**CDM
Smith**

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Section 1

Introduction

The Town of Zebulon has undertaken an effort to update the town's existing transportation plan. This update takes into account recent developments in local and regional patterns of socioeconomic growth. Growth projected through 2035 in the Triangle region will continue to strain the existing transportation systems. Additional investment in the town's transportation system will be needed to accommodate future economic growth.

The study area is the Zebulon Planning Jurisdiction, which extends beyond the Zebulon town limits. Encompassing approximately 13.4 square miles, the study area extends generally to the Johnston County line on the southeast, the Wendell Urban Service Area on the southwest, the Little River on the west and southwest, north of Pippin Road on the north, and the Franklin and Nash County lines on the east sides. Significant transportation facilities in the study area include U.S. 64, U.S. 264, and N.C. 96 (Arendell Avenue). The junction of U.S. 64 and U.S. 264 is located within the study area.

Study Purpose: Updating the Existing Plan

The purpose of this report is to recommend changes to the *Zebulon Multimodal Transportation Plan*. The previous transportation plan was developed by the town in 2001. It included sections on a Thoroughfare Plan, Pedestrian and Bicycle Plan, Transit Plan, and an Implementation Plan. Relevant supporting information was included to qualify results and assumptions made during the planning process. This addendum is the result of analyses of existing conditions, future travel demand projections, and overall transportation system conditions. It also takes into account the Capital Area Metropolitan Planning Organization's (CAMPO) recent Northeast Area Study effort which includes Zebulon and the surrounding communities. This report is meant to be an addendum to the older 2001 transportation plan and makes recommendations on what changes should be made to that plan. This plan combines the Thoroughfare Plan elements and portions of the Pedestrian and Bicycle Plan elements of the 2001 *Zebulon Multimodal Transportation Plan* into a new single Thoroughfare Plan. This new thoroughfare plan not only addresses changes to the roadway system throughout the study area, it also incorporates within those changes sidewalks and bicycle lanes when appropriate. This multi-modal approach seeks to provide an integrated solution to the town's transportation needs. The new thoroughfare plan also includes a couple of greenway projects. This study did not address the transit element of the 2001 plan.

Future projections of travel demand are based on the Triangle Regional Model. The Triangle Regional Model Service Bureau, supported by local planning agencies and the North Carolina Department of Transportation (NCDOT), provided the future year traffic volumes to CDM Smith for this study.

Study Participants

The study was conducted and guided by a study working group. Individuals participating in the working group included members of the town's Board of Commissioners and technical staff employed by the town. CDM Smith, an international engineering and planning firm, assisted in developing the study on behalf of the town. The members of the working group are identified below:

- Robert Matheny-Mayor

- Don Bumgarner – Town Commissioner
- Curtis Strickland – Town Commissioner
- Rick Hardin – Town Manager
- Chris Ray – Director of Public Works
- Mark Hetrick – Planning Director
- Julie Spriggs – Senior Planner

Process

Five working group meetings were held in a conference room in Town Hall. Presentations were made to the working group by the town's staff and the town's consultant. These presentations were followed by discussions and working sessions that involved all of the members of the working group. CDM Smith staff used their technical knowledge of transportation planning to present transportation needs and alternatives to the steering committee members who were then able to deliberate and provide the appropriate local context for the plan's project priorities. CDM Smith staff worked with the group to develop roadway cross sections that are in line with the Town's current desires, while continuing to provide sufficient capacity for future traffic and appropriate access management considering the various types of developments that may occur within the Town.

As of this writing, this addendum has yet to go before the full Board of Commissioners or the general public.

Section 2

Needs Assessment

CDM Smith staff conducted an analysis of future forecast traffic for the study area. This analysis takes into account the latest assumptions concerning growth both in Zebulon and in the larger Research Triangle Region. Based on the findings of this analysis, CDM Smith made recommendations to the working group. This section discusses the analysis that was conducted.

Existing Document and Plan Review

CDM Smith gathered and reviewed existing documents and plans for the study area including:

- NCDOT traffic volume maps;
- Zebulon Town Codes;
- 2001 *Zebulon Multimodal Transportation Plan*;
- NC 96 Corridor Study;
- CAMPO Long Range Transportation Plan; and,
- CAMPO Northeast Area Study (preliminary documents).

These documents were used to understand the greater context of transportation plan in the region as it might concern the Town of Zebulon. The information gleaned from these documents directly informed this addendum.

Travel Demand Modeling

CDM Smith modeling staff developed future traffic volume maps for the study area based on the current version of the Triangle Regional Model (TRM) available from Triangle Regional Model Service Bureau (maintained by the Institute of Transportation Research and Education at NC State University). No modifications were made to the roadway network or socioeconomic data within the TRM. For the purpose of this study, data from the TRM was used as provided by the Triangle Regional Model Service Bureau. The TRM is the travel demand model used by CAMPO for long range transportation planning and travel demand forecasting.

The travel demand model indicated that in 2035 the vast majority of roads within the planning jurisdiction of the town will function acceptably as two-lane facilities. The lone exception is Arendell Avenue (NC 96) north of US 64, which will need to be a four-lane facility. **Figure 2-1** shows the congestion in Zebulon from the 2035 model in terms of daily volume over capacity. The segment of Arendell Avenue north of US 64 shown in purple indicates a volume over capacity ratio of greater than 1.0.

The picture looks a bit different when we concentrate on what is occurring during the evening peak period. **Figure 2-2** is a map showing congestion in Zebulon in terms of 2035 PM peak volume over capacity. The PM peak hour forecast shows that additional congestion occurs during the peak period. While the segment of Arendell Avenue north of US 64 continues to be the only over capacity segment in Zebulon, it becomes apparent that Pearces Road, Shepard School Road, and Gannon Avenue approach capacity and could benefit from additional investment to improve access management and multi-modal opportunities.

Figure 2-1: Daily Volume over Capacity

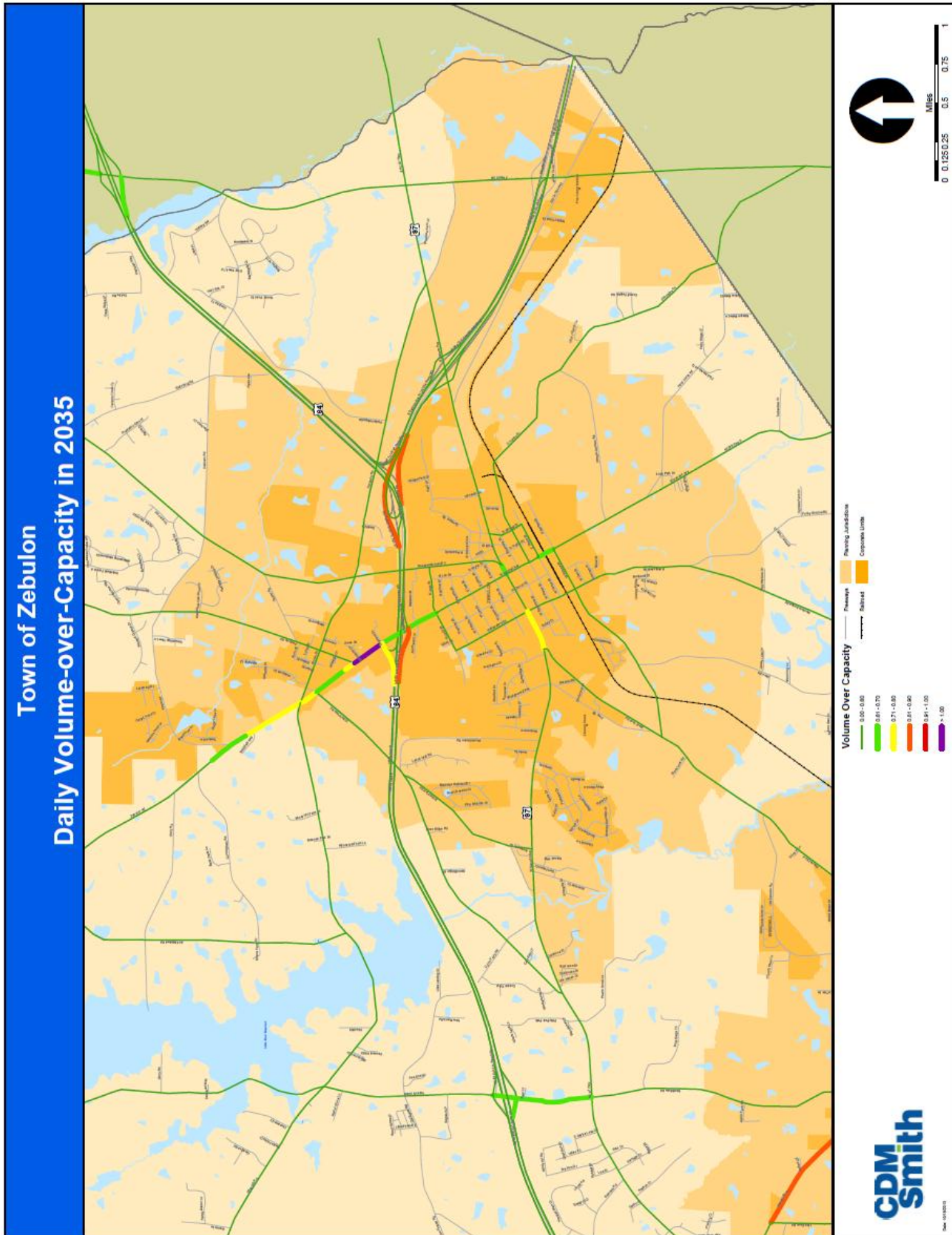
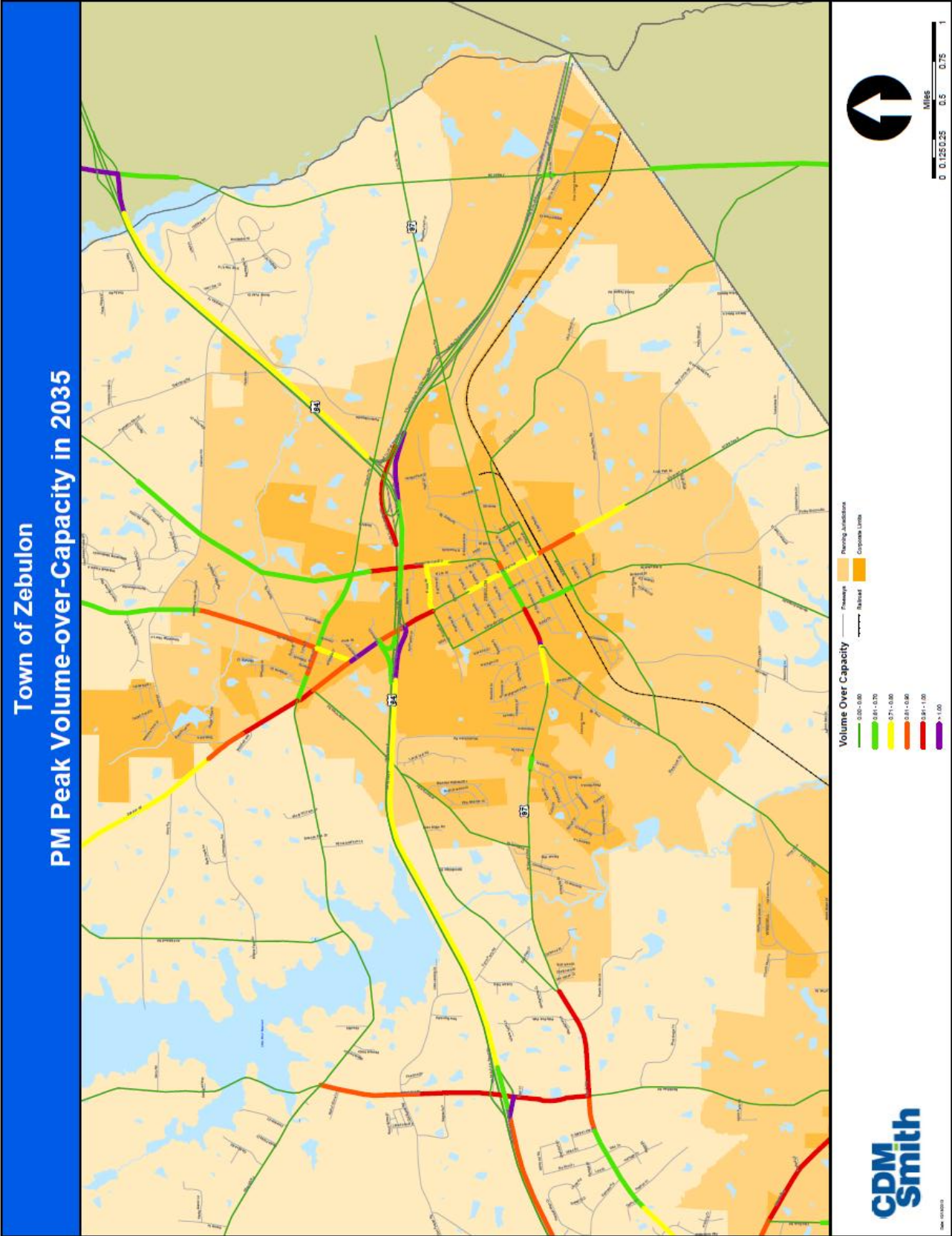


Figure 2-2: PM Peak Period Volume over Capacity



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Section 3

Project Recommendations

The current *Zebulon Multimodal Transportation Plan* was developed in 2001. Since then significant growth has occurred throughout the Research Triangle region of North Carolina. Furthermore, the planning horizon of the Triangle Regional Model available in 2001 was 2025. The current Triangle Regional Model planning horizon is 2035. These changes affect how traffic is expected to flow through the study area in the future.

As a result, certain projects that were included in the original plan may no longer be needed. Other projects that did not appear to be a concern then should now be added to the plan. This section will identify those projects from the 2001 plan that should be removed. This section will also discuss what the new project list looks like and which projects are to be included in this addendum. These recommendations are being made on the basis of the needs assessment conducted by CDM Smith as well as on the basis of thorough discussion with the study's working group. Toward the end of the section is a recommended project list and map for the Town of Zebulon. This final project list and map should be considered the Town of Zebulon's new Thoroughfare Plan and should replace the thoroughfare plan element, the pedestrian plan element, and the bicycle plan element from the 2001 *Zebulon Multimodal Transportation Plan*.

Projects Removed from the 2001 Plan

The following list in **Table 3-1** identifies the projects that originally appeared in the 2001 *Zebulon Multimodal Transportation Plan* that should be removed from the transportation plan. These projects are no longer needed to advance the transportation goals of the town.

Table 3-1: Projects to be Removed from the 2001 Plan Project List

Project	From	To	2001 Plan Reference
Arendell Ave.	Vance St.	Sycamore St.	Page A8
Barbee St.	Mack Todd Rd.	Wakefield St.	Page A13
Barbee St.	Wakefield St.	Chamblee Rd.	Page A14
Chamblee Rd. Ext.	Bunn Rd.	Horton St.	Page A15
Chamblee Rd.	NS RR Tracks	NC 39	Page A16
Gannon Ave.	Little River Bridge	Pineview Dr.	Page A17
Gannon Ave.	Rotary Dr.	Shepard School Rd.	Page A19
Green Pace Rd.	Arendell Ave.	Proctor St.	Page A22
Hospital Rd.	Mack Todd Rd.	Pony Rd.	Page A27
Judd St.	Wakefield St.	Arendell Ave.	Page A28
NC 39	Johnston Co. Line	US 264	Page A33
NC 39	US 264	Franklin Co. Line	Page A32
Pippin / Debnam Rd.	Gannon Ave.	NC 39	Page A37
Temple -Johnson Rd.	Gannon Ave.	US 264	Page A44
US 264	US 64	NC 39	Page A45

Table 3-1: Projects to be Removed from the 2001 Plan Project List

Project	From	To	2001 Plan Reference
US 64	Little River Bridge	NC 39	Page A46
Wakefield St.	Gannon Ave.	Judd St.	Page A47
Water Plant Rd.	Gannon Ave.	Western Parkway	Page A51
Western Parkway	Arendell Ave., South	Arendell Ave., North	Page A52
Whitley St.	Vance St.	Gannon Ave.	Page A53
Worth Hinton Rd.	Gannon Ave.	Green Pace Rd.	Page A54

Recommended Project List for 2013 Addendum

The existing Zebulon Transportation Plan included plans separated by use. These were the thoroughfare plan, the pedestrian plan, the bicycle plan, and the transit plan. The CDM Smith team focused on combining the thoroughfare plan, pedestrian plan, and bicycle plan into one cohesive map. This identifies proposed changes in the roadway cross section and considers the needs of all users. This method will better assist the town, public, and developers in understanding how the road will actually appear and will better define the dimensions of the roadway, which can then be incorporated into future development plans. Though not included as a project in this addendum, the Town of Zebulon is aware that a north-south NC 96 Bypass along an as of yet undetermined alignment may be needed at some point in the future.

Table 3-2 contains the recommended project list that will make up the updated *Zebulon Multi-modal Transportation Plan*. This project list contains both projects which have been retained from the 2001 plan as well as new projects needed to address the town's transportation goals. The Map Number column in **Table 3-2** corresponds to the project numbers that appear on the project map. The project map appears in **Appendix A**. Descriptions of individual cross sections are in **Appendix B**. The project configurations for NC 96 are shown in **Appendix C**.

Table 3-2: New Zebulon Multi-modal Transportation Plan Project List

Main Rd	From	To	Project Description	Map Number
Arendell Ave., North	Pippin Rd.	Proctor St.	2-lane with wide paved shoulders and sidewalk on one side of the roadway	17
Arendell Ave., North	Proctor St.	US 64	Consistent with the town's NC 96 Engineering Report (3/27/2012).	1
Arendell Ave., North	At Judd St.		Intersection improvement	4
Arendell Ave., North	Gannon Ave.	Lee St.	3-lane curb and gutter with wide outside lanes, narrow center turn lane, and sidewalks on both sides of the road	28
Arendell Ave., North	Lee St.	US 64	3-lane curb and gutter with wide lanes and sidewalks on both sides of the roadway	15

Table 3-2: New Zebulon Multi-modal Transportation Plan Project List

Main Rd	From	To	Project Description	Map Number
Arendell Ave., South	Planning Jurisdiction	Town Limits	2-lane with wide paved shoulders	10
Arendell Ave., South	Town Limits	Vance St.	2-lane with sharrows, on street parking, and sidewalks on one side of the roadway	3
Barbee St.	Town Limits	Five County Stadium	Greenway / multi-use path	9
Gannon Ave., West	Pineview Dr.	Rotary St.	3-lane with wide paved shoulders and sidewalks on both sides of the roadway	2
Gannon Ave., East	Arendell Ave.	0.20 miles east of Industrial Dr.	2-lane median divided with wide lanes and sidewalks on both sides of the roadway	22
Gannon Ave., East	0.20 miles east of Industrial Dr.	0.16 miles west of Old US 264	2-lane median divided with narrow concrete median, wide lanes, and sidewalks on both sides of the roadway	23
Gannon Ave., East	0.16 miles west of Old US 264	US 264	2-lane median divided with wide lanes and sidewalks on both sides of the roadway	24
Gannon Ave., East	US 264	0.11 miles west of Old Bunn Rd.	2-lane with wide paved shoulders	25
Ginger Lake Ct.			Greenway / multi-use path	12
Green Pace Rd.	East of River Ridge Rd.	Arendell Ave.	2-lane with wide paved shoulders	5
Horton St.	Arendell Ave.	Whitley St.	2-lane curb and gutter with wide lanes and sidewalks on both sides of the roadway	20
Horton St.	Whitley St.	Planning Jurisdiction	2-lane with wide paved shoulders	21
Judd St., East	Arendell Ave.	Shepard School Rd.	2-lane curb and gutter with wide lanes and sidewalks on both sides of the roadway	32

Table 3-2: New Zebulon Multi-modal Transportation Plan Project List

Main Rd	From	To	Project Description	Map Number
Mack Todd Rd.	North of Barbee St.	Gannon Ave.	2-lane with wide paved shoulders and sidewalk on one side of the roadway	6
Old Bunn Rd.	Shepard School Rd.	Karial Ct.	2-lane curb and gutter with wide lanes and sidewalks on both sides of the roadway	16
Old Bunn Rd.	Karial Ct.	Planning Jurisdiction	2-lane with wide paved shoulders	14
Old US 264	Gannon Ave.	0.25 miles south of Gannon Ave.	2-lane with wide paved shoulders and sidewalk on one side of the roadway	30
Pearces Rd.	Arendell Ave.	Proctor St.	2-lane curb and gutter with wide lanes and sidewalks on both sides of the roadway	26
Pearces Rd.	Proctor St.	Beaver Dam Creek	2-lane with wide paved shoulders	27
Pony Rd.	South of Shannon Dr.	Gannon Ave.	2-lane with wide paved shoulds and sidewalk on one side of the roadway	11
Proctor.	Arendell Ave.	Shepard School Rd.	2-lane curb and gutter with wide lanes and sidewalks on both sides of the roadway	7
Riley Hill Rd.	Planning Jurisdiction	Arendell Ave.	2-lane rural roadway with wide paved shoulders	31
Shepard School Rd.	Gannon Ave.	Old Bunn Rd.	2-lane curb and gutter with wide lanes and sidewalks on both sides of the roadway	13
Shepard School Rd.	Old Bunn Rd.	Tippett Rd.	2-lane with wide paved shoulders	18
Wakefield St.	Sir David Dr.	Town Limits	2-lane with wide paved shoulders and sidewalk on one side of the roadway	29
Wakefield St.	Town Limits	Gannon Ave.	2-lane with wide paved shoulders and sidewalk on one side of the roadway	8

Section 4

Plan Implementation

A review of the Town of Zebulon ordinances indicates that there are very few ordinances pertaining to the requirement for transportation facilities as part of new developments, rezoning, or the upgrade of existing buildings to a higher use. The lone exception is section 152.194 which requires the completion of a traffic impact analysis (TIA) for any new development that is anticipated to generate at least 100 trips in the AM or PM peak hour or redevelopment projects that are anticipated to generate at least 250 trips in the AM or PM peak hour. The recommendations included in the TIA are then considered by the Technical Review Committee for incorporation in the site plan. The current ordinances also allows for the waiver of the preparation of a TIA or certain elements of the TIA to be decided by the Board of Commissioners.

Additionally the town has special legislation from the 1989 General Assembly (Ch. 606 HB 802) which allows the collection of a transportation fee. These transportation fees are subject to the following limitations:

- Used to fund transportation projects;
- No more than 50% of the capital costs of a given project can be paid for by these fees;
- The town must estimate the capital costs of each project included in the plan;
- The fee must be based on reasonable and uniform considerations of capital cost;
- The fee must be based on reasonable classifications and rates; and,
- That the money collect as fees must be spent within:
 - Six years for projects that the town provides on its own; or,
 - Ten years for projects provided in conjunction with other government agencies, such as the North Carolina Department of Transportation.

Strategies for Implementation

The town has several options to implement the recommendations included in this plan. They include:

- 1 **Require the dedication of right-of-way** – This would only be applicable for situations for where the proposed cross section on the roadway exceeds the available right-of-way. However, during the completion of this plan, special care was given to fit the proposed improvements within the right of way, so that additional right-of-way needs would be minimal.
- 2 **Require the construction of half of the roadway cross section within the road frontage limits of the proposed development** – This would accelerate the construction of the roadway facilities, but would result in a piecemeal approach to construction that would create inconsistencies in the roadway network.
- 3 **Require the construction of pedestrian facilities for the road frontage limits of the proposed development** – This method would also create inconsistencies in the pedestrian

network, but this would not be as obtrusive as the requirement for construction of half of the roadway cross section. This strategy could be combined with a requirement for right-of-way dedication.

- 4 **Require only the improvements identified as part of a TIA** – This could be considered the “do nothing” approach as it would be consistent with the Town’s current ordinances, would fix any site specific issues, but would not advance the construction of the roadway network consistent with the updated Transportation Plan. However, improvements required as part of this approach could be required to be constructed in a manner consistent with the updated Transportation Plan.
- 5 **Fee in Lieu** – The town could assess a cash value to any of the previous three options and request that the developer provide a cash payment to the town in lieu of the developer constructing the required improvements. The town would then use the cash collected toward the construction of the improvements. This would ensure an orderly and rational construction of the transportation improvements as opposed to the piecemeal improvements that developers would make on their own. However, the legislative authority to accept fee in lieu payments is uncertain at this time and would require extra research to determine whether or not such a strategy would be legal.
- 6 **Implement a transportation fee** – This would take advantage of the special legislation and would allow for faster and seamless construction of prioritized facilities within the town. However, this would also require that the town estimate capital costs for all roadway recommendations and develop a formula for applying the fee to specific developments.

Applicability

As currently written a TIA is required for any new developments that are expected to generate more than 100 trips in a peak hour or any re-development expected to generate more than 250 trips in the peak hour. This is a reasonable standard and is consistent with other municipalities in the area. This standard may be too high for strategies that require the dedication of right-of-way. If right-of-way dedication is used by the town, CDM Smith recommends that for any situation in which the town requires the review of a site plan a right-of-way dedication be identified as an option. Again, it is important to remember that opportunities for right-of-way dedication will be limited. The development thresholds for a TIA are also reasonable for the other implementation strategies listed above; however, if the construction of pedestrian facilities will be required, the town may wish to tie the construction of those facilities with certain land uses that may not generate much vehicular traffic but could generate significant amounts of pedestrian traffic.

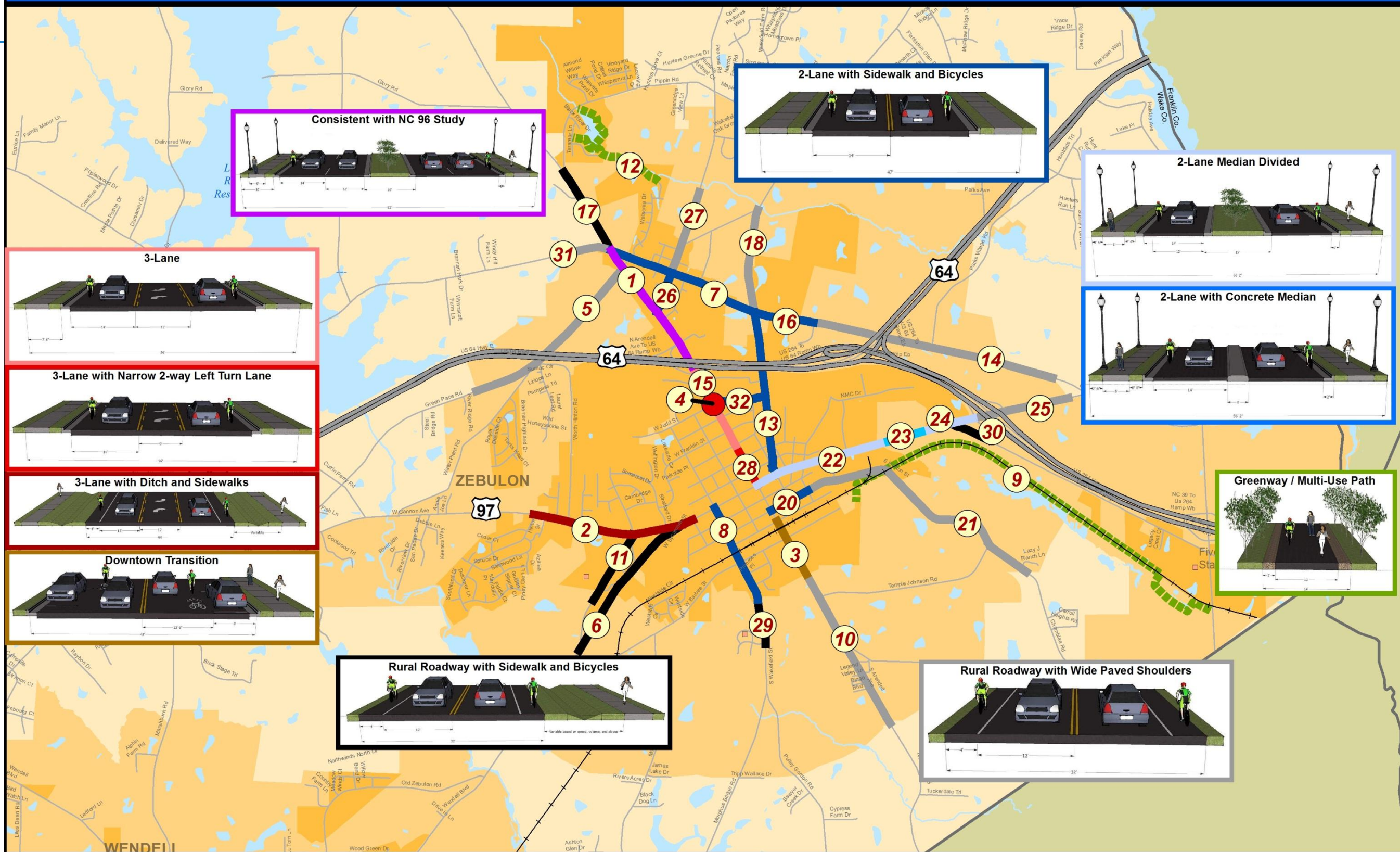
The transportation fee identified above as option 6 provides the most flexible and comprehensive approach to implementing a transportation plan of this scope. The legislation which enables the transportation fee is quite clear in the applications and limitations of the uses of such a fee. As such, the town would need to conduct a thorough review of the techniques employed by comparable municipalities around the region for transportation fee calculation before implementing such a strategy. A robust and defensible methodology will be based on forecast peak traffic, future development trip generation, and transportation project capital costs. The town should be sure to consult with its attorney prior to implementing any transportation plan to ensure compliance with state legislation.

Appendix A

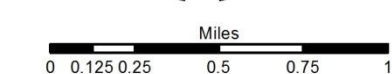
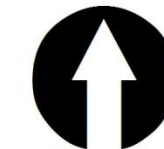
Project Map

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Town of Zebulon Thoroughfare Plan



- | | | | | |
|--------------------------|-----------------------------------|---|--|------------------------|
| 1 Project Number | Freeways | 3-Lane | Rural Roadway with Wide Paved Shoulders | Planning Jurisdictions |
| Intersection Improvement | Railroad | 3-Lane with Narrow 2-way Left Turn Lane | Rural Roadway with Sidewalk and Bicycles | Corporate Limits |
| | 2-Lane Median Divided | 3-Lane with Ditch and Sidewalk | Greenway | |
| | 2-Lane with Concrete Median | NC 96 Study | | |
| | 2-Lane with Sidewalk and Bicycles | Downtown Transition | | |

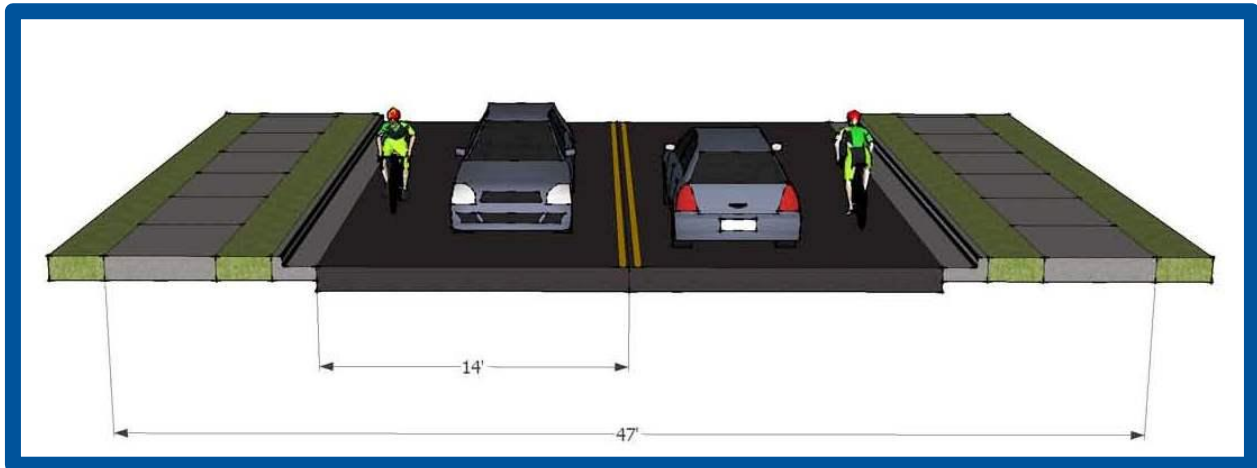


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Appendix B

Project Cross Sections

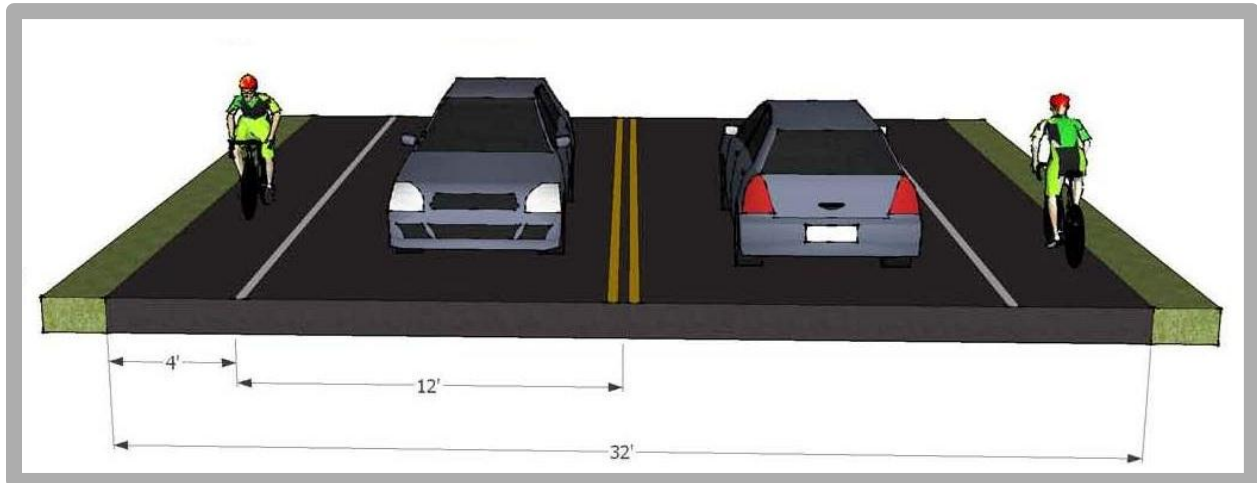
2-Lane with Sidewalk and Bicycles



This cross section configuration includes two, 14 foot lanes with curb and gutter and sidewalks on both sides of the roadway. The wide lane width could be used to accommodate bicycles. The total width from side walk to sidewalk is 47 feet.

Main Rd	From	To	Map Number
Proctor St.	Arendell Ave.	Shepard School Rd	7
Wakefield St.	Town Limits	Gannon Ave.	8
Shepard School Rd	Gannon Ave.	Old Bunn Rd.	13
Old Bunn Rd.	Karial Ct.	Planning Jurisdiction	16
Horton St.	Arendell Ave.	Whitley St.	20
Pearces Rd.	Arendell Ave.	Proctor St.	26
Judd St., East	Arendell Ave.	Shepard School Rd.	32

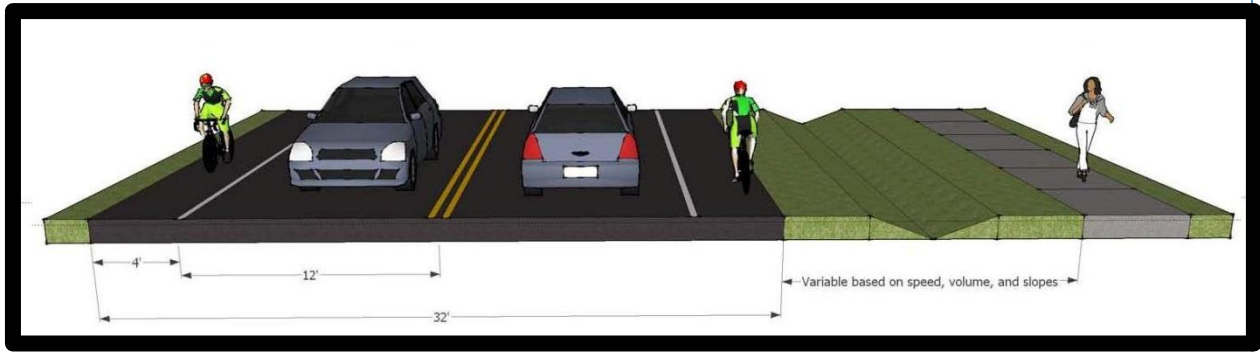
Rural Roadway with Wide Paved Shoulders



This cross section consists of two, 12 foot lanes with 4 foot paved shoulders that could accommodate bike lanes on both sides of the roadway. The total width of the pavement is 32 feet.

Main Rd	From	To	Map Number
Green Pace Rd.	East of River Ridge Rd.	Arendell Ave.	5
Arendell Ave., South	Planning Jurisdiction	Town Limits	10
Old Bunn Rd.	Shepard School Rd.	Karial Ct.	14
Shepard School Rd.	Old Bunn Rd.	Tippett Rd.	18
Horton St.	Whitley St.	Planning Jurisdiction	21
Gannon Ave., East	0.16 miles west of Old US 264	US 264	25
Pearces Rd.	Proctor St.	Beaver Dam Creek	27
Riley Hill Rd.	Planning Jurisdiction	Arendell Ave.	31

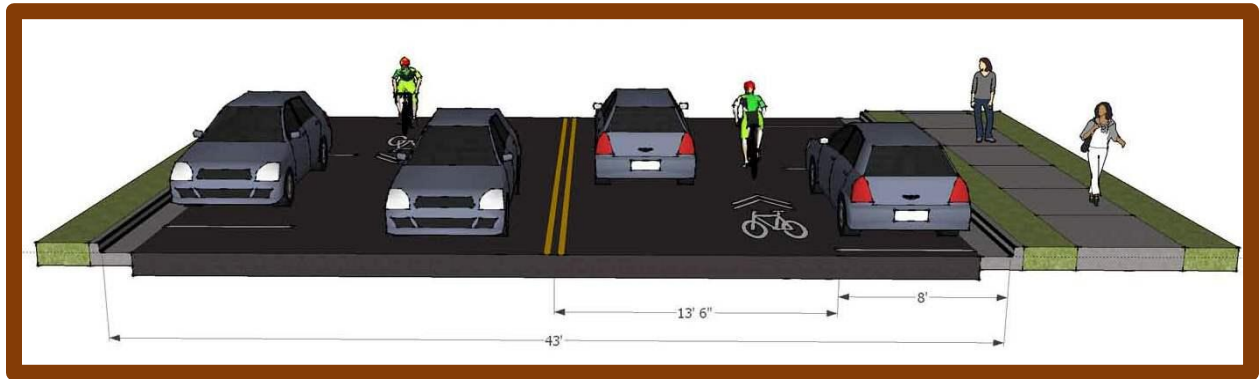
Rural Roadway with Sidewalk and Bicycles



This cross section consists of two, 12 foot lanes with 4 foot paved shoulders that could accommodate bicycle lanes. The cross section also features a side walk on one side that is separated from the road by a ditch. The distance of separation of the side walk is variable based on speed, volume, and the slope of the ditch. The total width of the pavement is 32 feet.

Main Rd	From	To	Map Number
Mack Todd Rd.	North of Barbee St.	Gannon Ave.	6
Pony Rd.	South of Shannon Dr.	Gannon Ave.	11
Arendell Ave.,	Pippin Rd.	Proctor St.	17
Wakefield St.	Sir David Dr.	Town Limits	29
Old US 264	Gannon Ave.	0.25 Miles south of Gannon Ave.	30

Downtown Transition



This cross section consists of two, 13 foot, 6 inch lanes with shared lane markings for bicycles, 8 foot on street parking lanes, and curb and gutters on both sides of the roadway. The cross section also has sidewalks on one side of the roadway. The total width from curb to curb is 43 feet.

Main Rd	From	To	Map Number
Arendell Ave., South	Planning Jurisdiction	Town Limits	3

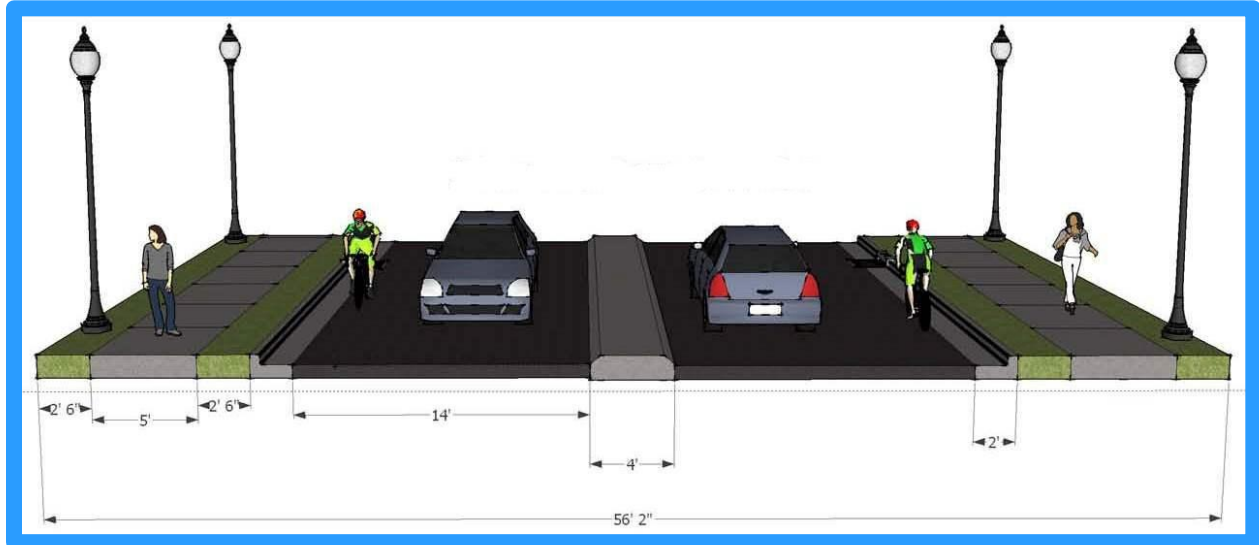
Greenway / Multi-Use Path



This cross section includes a 10 foot paved multi-use path that can accommodate pedestrian and bicycle traffic and 2 foot soft shoulders.

Main Rd	From	To	Map Number
Barbee St.	Town Limits	Five County Stadium	9
Ginger Lake Ct.			12

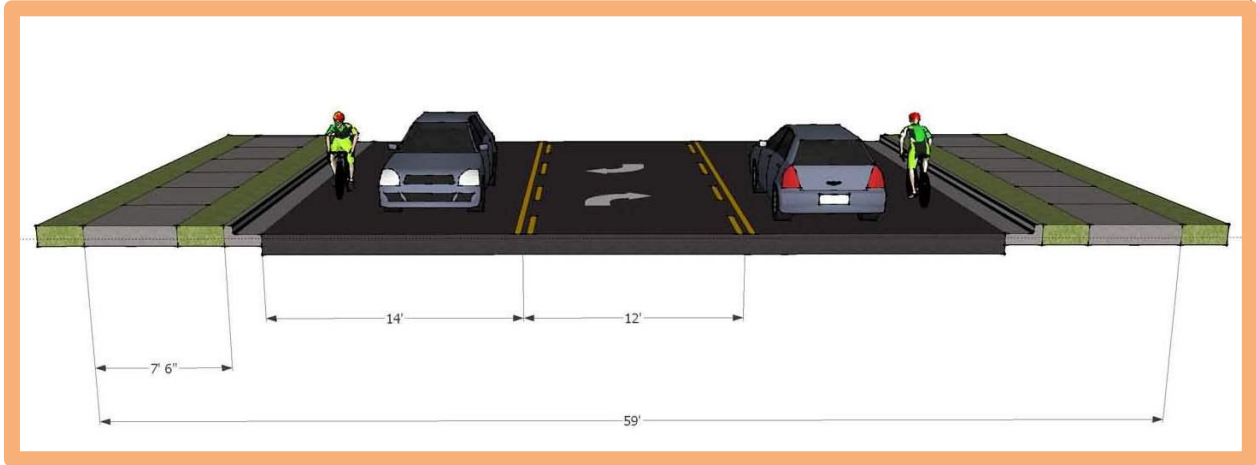
2-Lane with Concrete Median



This cross section includes two, 14 foot lanes with curb and gutter separated by a 4 foot concrete median. The wide lane width could be used to accommodate bicycles. The cross section also includes 5 foot sidewalks with 2 foot 6 inches of terrain on both sides. There are lamp posts posted along the sidewalks located within the far side terrain area. The total width of the cross section is 56 feet 2 inches.

Main Rd	From	To	Map Number
Gannon Ave., East	0.20 miles east of Industrial Dr.	0.16 miles west of Old US 264	23

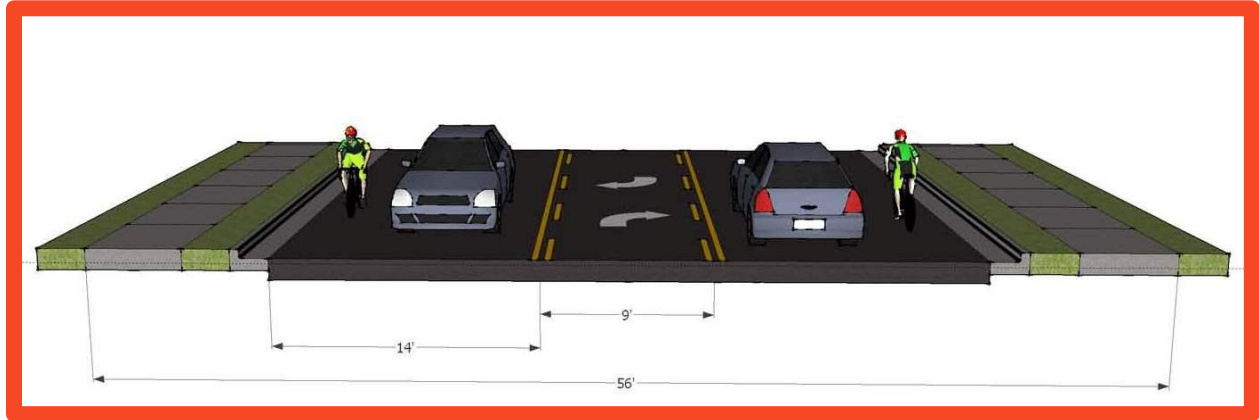
3-Lane



This cross section includes two 14 foot lanes and a 12 foot two-way center turn lane with curb and gutters. The wide lane width could be used to accommodate bicycles. The cross section also includes sidewalks on both sides of the roadway. The length from the edge of the sidewalk to the curb and gutter is 7 foot 6 inches. The total width from sidewalk to sidewalk is 59 feet.

Main Rd	From	To	Map Number
Arendell Ave., North	Lee St.	US 64	15

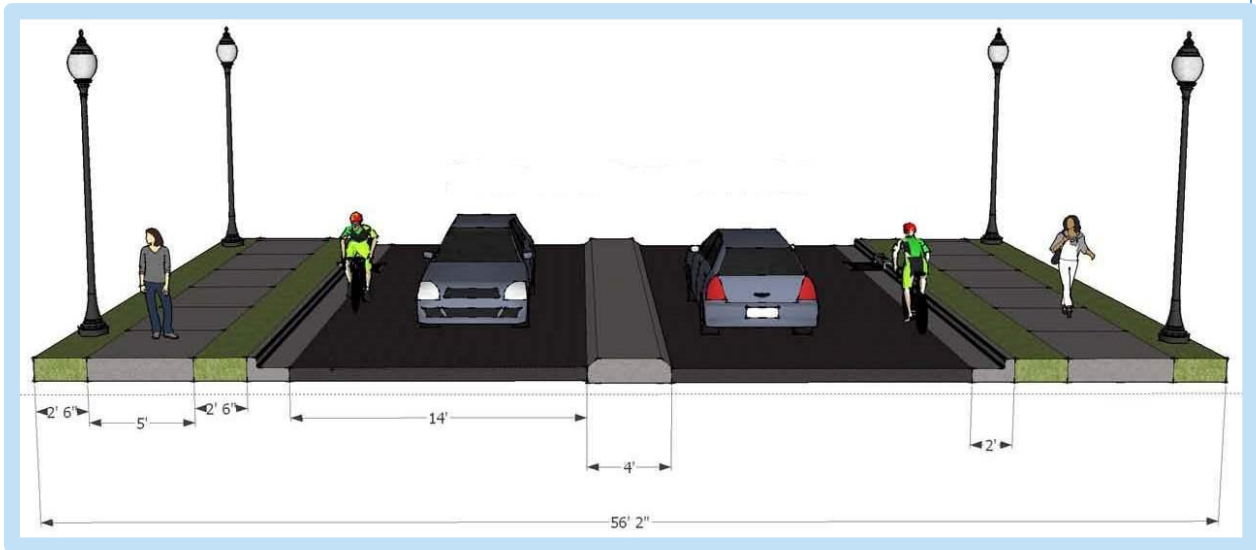
3-Lane with Narrow 2-way Left Turn Lane



This cross section includes two 14 foot lanes and a narrow 9 foot two-way center turn lane. The wide lane width could be used to accommodate bicycles. The cross section also includes sidewalks on both sides of the roadway. The total width of the cross section from sidewalk to sidewalk is 56 feet.

Main Rd	From	To	Map Number
Arendell Ave., North	Gannon Ave.	Lee St.	28

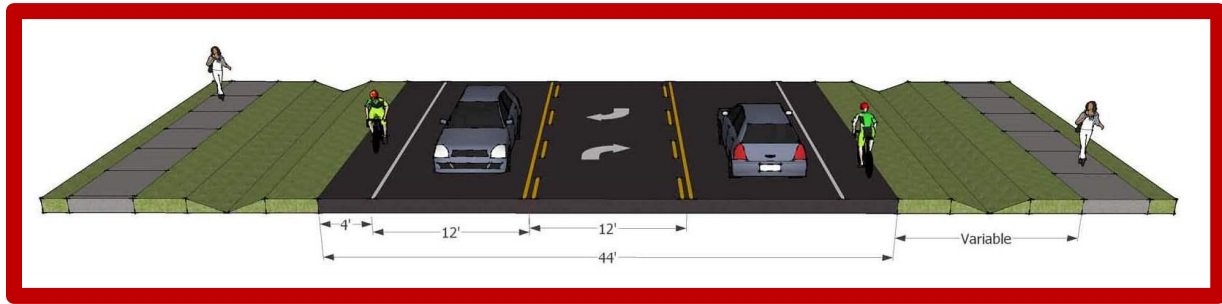
2-Lane Median Divided



This cross section includes two 14 foot lanes with curb and gutter, divided by a 4 foot concrete median. The wide lane width could be used to accommodate bicycles. The cross section also includes 5 foot sidewalks with 2 foot 6 inches of terrain on both sides. There are lamp posts posted along the sidewalks located within the far side terrain area. The total width of the cross section is 56 feet 2 inches.

Main Rd	From	To	Map Number
Gannon Ave., East	Arendell Ave.	0.20 miles east of Industrial Dr.	22
Gannon Ave., East	0.16 miles west of Old US 264	US 264	24

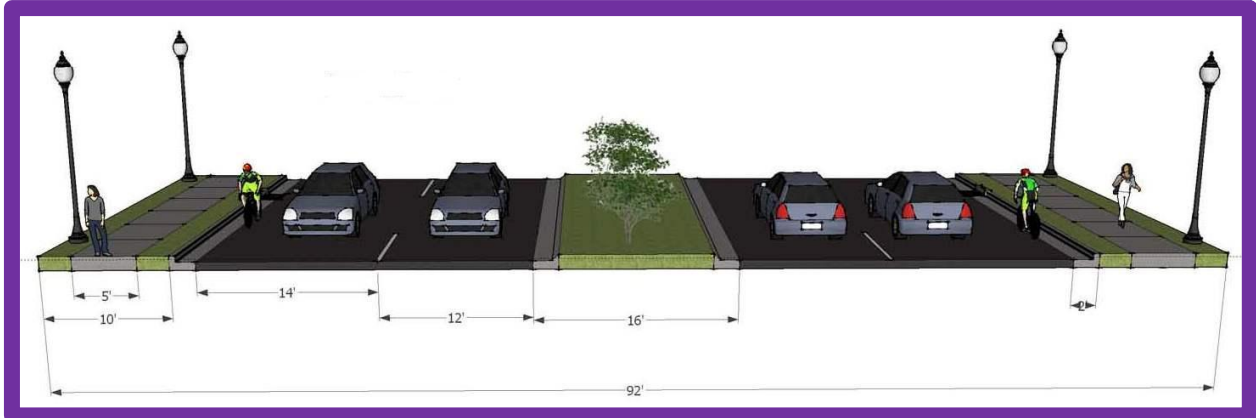
3-Lane with Ditch and Sidewalks



This cross section includes two 12 foot lanes, a 12 foot two-way center turn lane, and 4 foot paved shoulders on both sides of the roadway that could accommodate bicycle traffic. The cross section also features sidewalks on both sides that are separated by a ditch. The distance of separation of the side walk is variable based on speed, volume, and the slope of the ditch. The total width of the paved section is 44 feet.

Main Rd	From	To	Map Number
Gannon Ave., West	Pineview Dr.	Rotary St.	2

Consistent with NC 96 Study



The Town of Zebulon has recently conducted a corridor study of NC 96 / North Arendell Avenue. The preferred configuration developed as part of that study is attached to this plan. Please refer to Appendix C for the preferred configuration for this project.

Main Rd	From	To	Map Number
Arendell Ave., North	Pippin Rd.	Proctor St.	1

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Appendix C

NC 96 Corridor Study

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PROJECT REFERENCE NO.	SHEET NO.
NC 96	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS	
DO NOT USE FOR A/W ACQUISITION	
CDM Smith 421 Spruill Blvd. Raleigh, N.C. 27601 P.O. BOX 1001	CDM Smith 421 Spruill Blvd. Raleigh, N.C. 27601 P.O. BOX 1001



MATCH TO SHEET 3 -- L -- POT 16 + 50.00

5/14/09

*****SYTIME*****

PROJECT REFERENCE NO.	SHEET NO.
NC 96	5
RAW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/FV ADJUSTMENTS	
CDM Smith <small>(21) Reynolds Blvd. Suite 100 AMSTERDAM, N.C. 27803 P. 828.452.1000</small>	CDM Smith <small>(21) Reynolds Blvd. Suite 100 AMSTERDAM, N.C. 27803 P. 828.452.1000</small>

MATCH TO SHEET 4 - I - POT 16+50.00

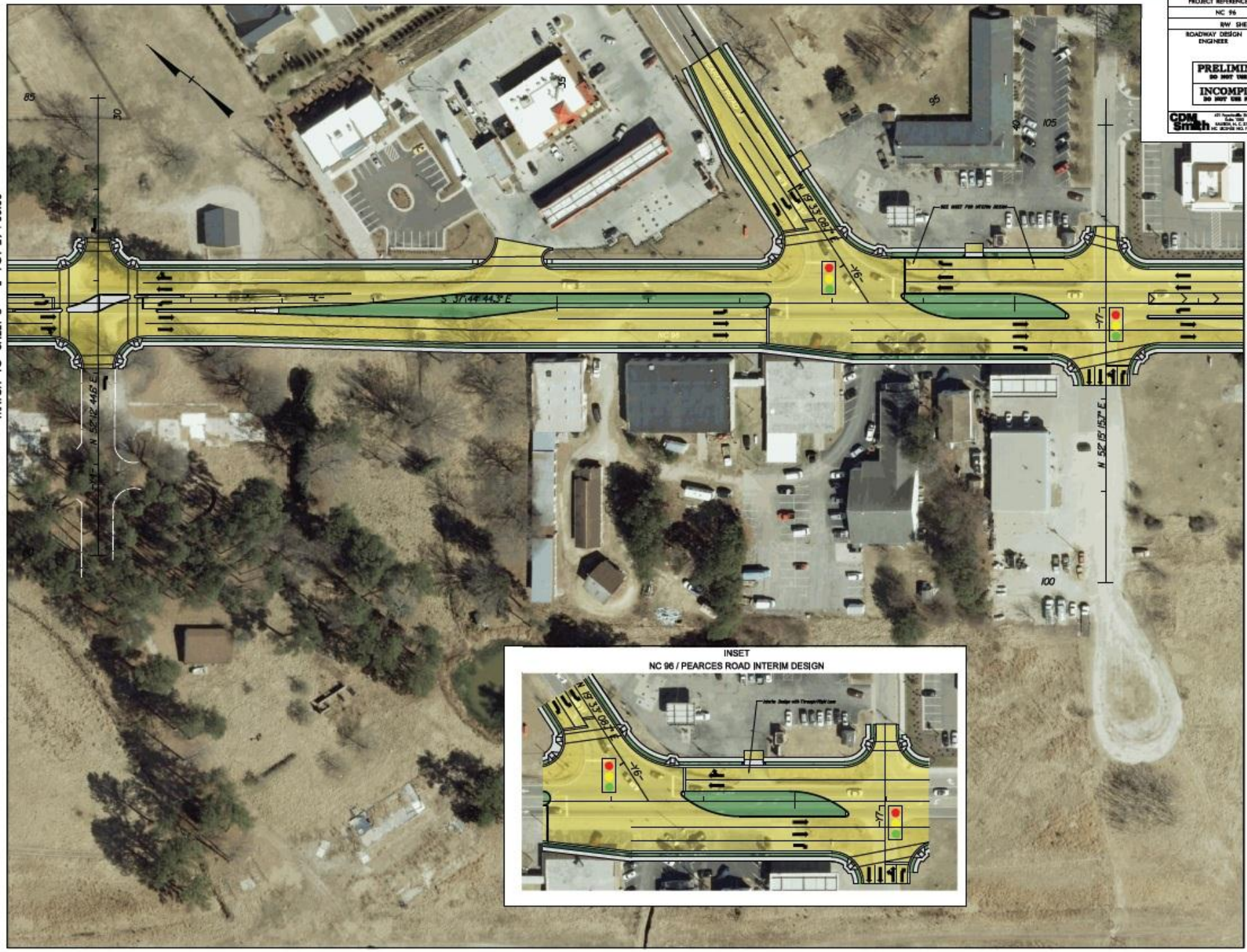
MATCH TO SHEET 6 - I - POT 29+00.00



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

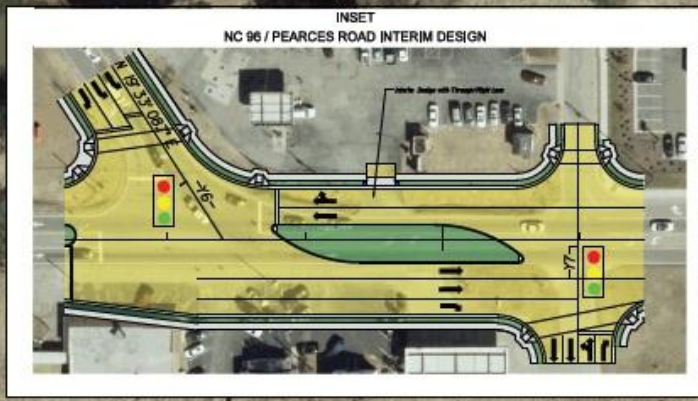
8141725

MATCH TO SHEET 5 - L - POT 29 + 00.00

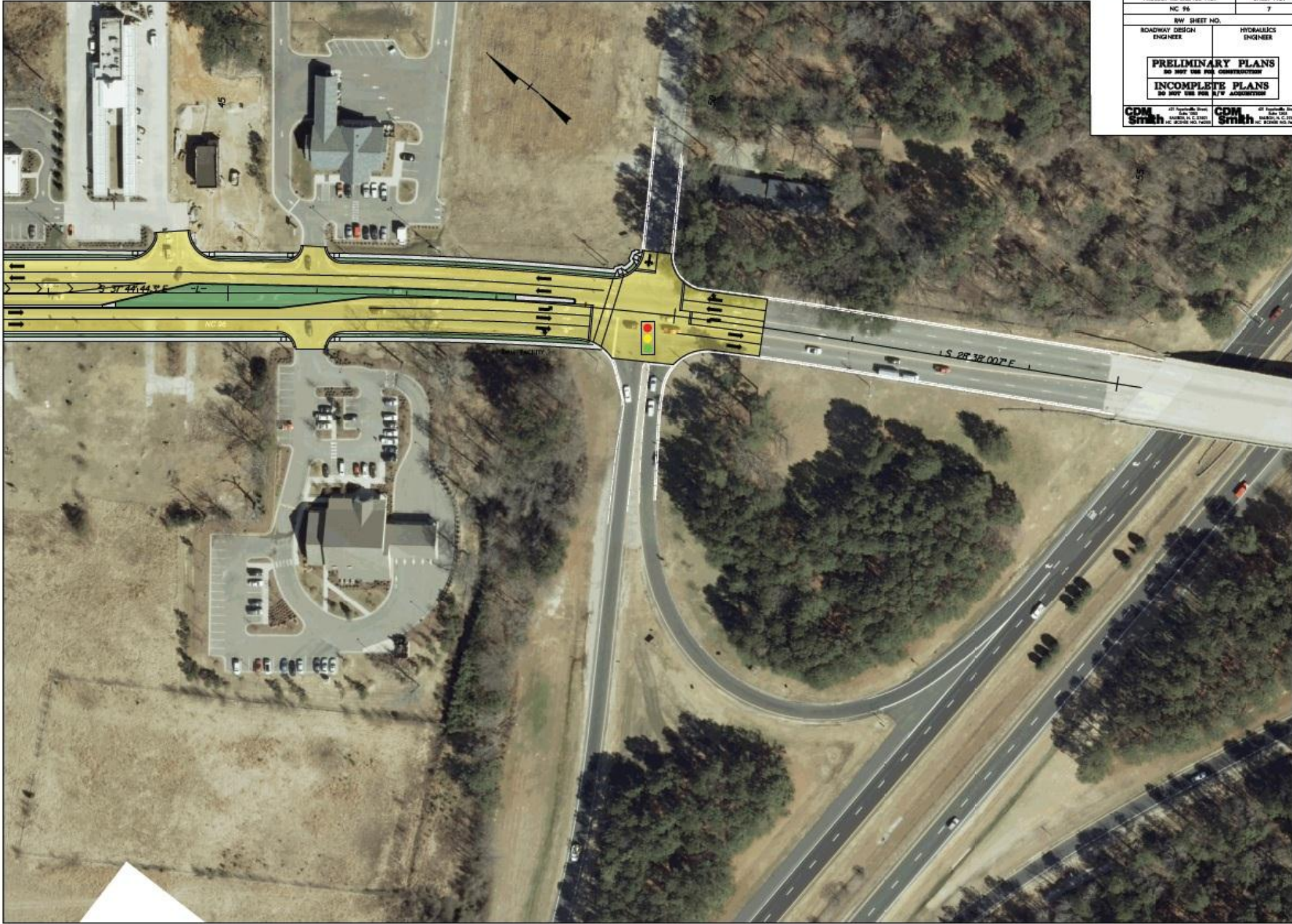


PROJECT REFERENCE NO.	SHEET NO.
NC 96	4
SW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS	
DO NOT USE FOR R/W ACQUISITION	
CDM Smith 471 Fayetteville Street Rm. 1700 Atlanta, GA 30308 Tel. 404.525.8600	CDM Smith 471 Fayetteville Street Rm. 1700 Atlanta, GA 30308 Tel. 404.525.8600

MATCH TO SHEET 7 - L - POT 42 + 50.00



MATCH TO SHEET 6 --L-- POT 42+50.00



PROJECT REFERENCE NO. NC 96	SHEET NO. 7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
CDM Smith <small>221 Fayetteville Street Suite 1000 Charlotte, N.C. 28201 N.C. LICENSE NO. 74261</small>	CDM Smith <small>221 Fayetteville Street Suite 1000 Charlotte, N.C. 28201 N.C. LICENSE NO. 74261</small>

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**CDM
Smith**