

D. Infrastructure

Transportation

Roads

As part of county-wide transportation planning, roads in the planning area have been classified using a road classification system refined from the NC Department of Transportation's classification system. Classification categories and general descriptions are as follows:

Category	General Description
Interstate	Major traffic-carrying facilities that are part of the Federal Interstate Highway system; trip length characteristics are predominantly long-distance intra- and inter-state. Right-of-way width is a minimum of 230-feet and can increase to over 300-feet, depending on the number of lanes.
Arterial	The primary traffic-carrying facilities in the county; trip length and travel density characteristics of substantial inter-county travel or of serving urban-type development; typically would include rural freeways. Right-of-way width is typically 70- to 110-feet, depending on the number of lanes and whether bicycle lanes are provided.
Collector	Facilities that generally service intra-county travel. Provides the network connection between local roads and the arterial system. Shorter lengths, lower volumes, and more land access than the arterial system. Right-of-way width is typically 60- to 100-feet, depending on the number of lanes and whether bicycle lanes are provided.
Local	Primarily serves as access to adjacent land use. Any traffic is local in nature, therefore volumes and length are relatively low. Local roads comprise all remaining public roads not classified as a higher function. Right-of-way width is typically 60- to 80-feet.

Map 9 depicts the road classifications in the planning area.

Efland Small Area Plan - Road Classifications



Legend

- Small Area Plan Boundary
- Intentional
- Arterial
- Collector
- Local
- Fire Station
- Efland Chokeo Park and Community Center
- Gravelly Hill Middle School
- Lake Michael Park

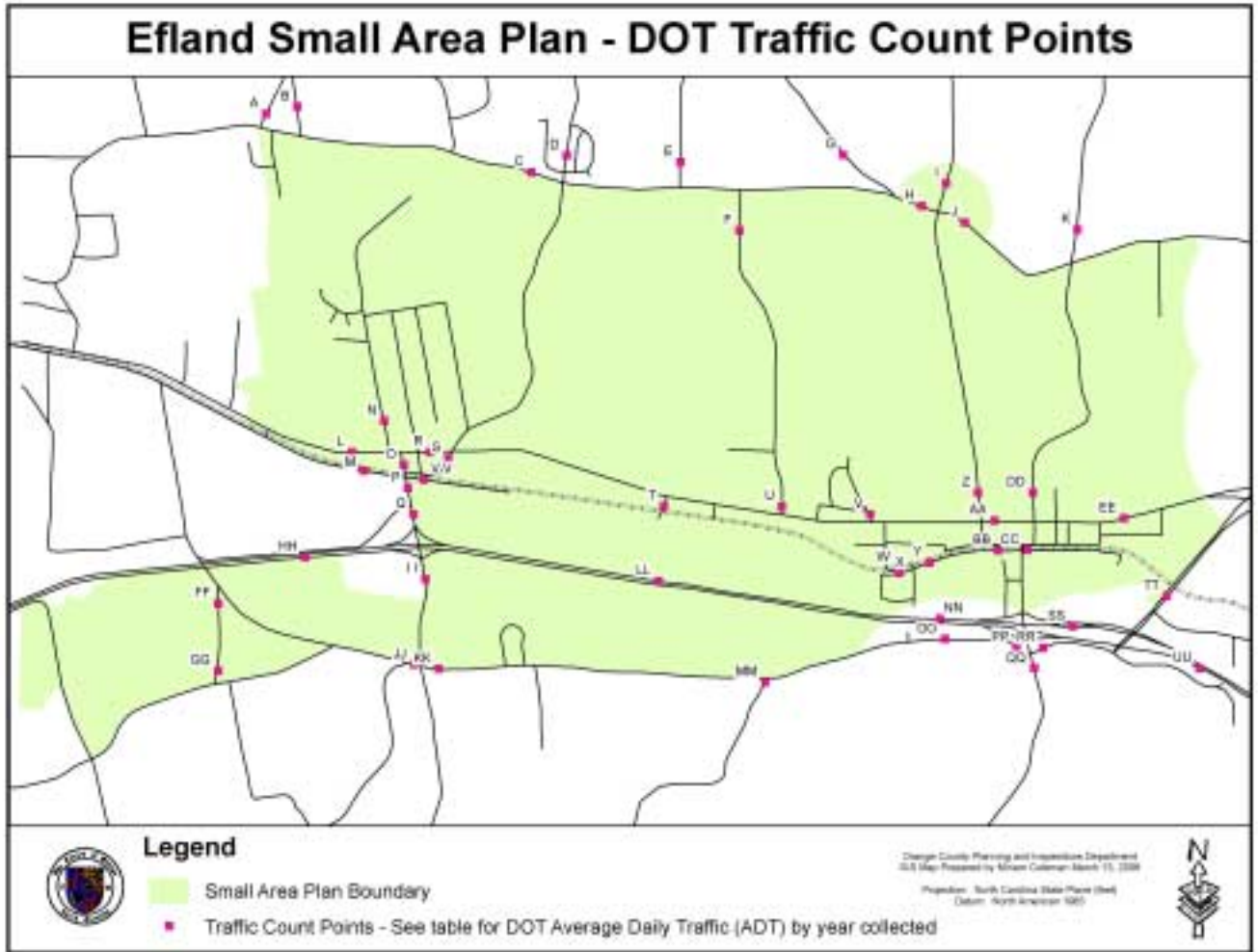


Orange County Planning and Inspections Department
058 Map Prepared by Milans Coover on March 10, 2008
Projection: North Carolina State Plane (NAD83)
Datum: North American 1983

Source of Data: Orange County Planning Department

Map 10 depicts the points at which the North Carolina Department of Transportation (DOT) collects traffic count data. The Table that begins on page 26 shows the Average Daily Traffic counts collected by the (DOT) from 1999 to 2003. DOT does not collect traffic count data at every collection site every year. Years for which no data was collected at a specific point do not have a value in the chart showing the count.

Map 10



Source of Data: North Carolina Department of Transportation

Average Daily Traffic relates directly to a concept called “Level of Service” (LOS). LOS calculations attempt to describe the traffic conditions of a given roadway as it relates to the carrying capacity of the road. The following are descriptions of LOS:

Level of Service	Description of Operating Condition
A	Free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and maneuver within the traffic stream is extremely high.
B	Stable flow but the presence of other users in the traffic stream begins to be noticed. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream.
C	Stable flow but marks the beginning of the range in flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. Selection of speed affected and maneuvering within the traffic stream requires substantial vigilance on the part of the user.
D	High-density but stable flow. Speed and freedom to maneuver are severely restricted. Small increases in traffic flow will generally cause operational problems at this level.
E	Operating conditions at or near the capacity level. Speeds are reduced to a low, but relatively uniform level. Freedom to maneuver within the traffic stream is extremely difficult.
F	Forced or breakdown flow. In the extreme, speed can be reduced to zero.

Source: Highway Capacity Manual, Transportation Research Board, 1985.

For reference, many local governments adopt policies requiring that new development not decrease LOS below level C or D. Whether Level C or D is chosen depends upon the individual policy decision of the local government and/or the jurisdiction having maintenance control.

Determining the LOS for a given roadway involves complex calculations taking into account factors such as roadway grades and lane width. However, generalized tables have been developed to serve as a guide in determining LOS using Average Daily Traffic (ADT) counts. The following table depicts the information relevant to the planning area:

Average Daily Traffic and Generalized Level of Service					
Total Number of Lanes	A	B	C	D	E
Freeways in Urbanizing Areas					
4	23,500	38,700	52,500	62,200	69,100
6	36,400	59,800	81,100	96,000	106,700
8	49,100	80,900	109,600	129,800	144,400
State Two-Way Arterials (Less than 2 signalized intersections per mile)					
2, Undivided	*	4,000	13,100	15,500	16,300
State Two-Way Arterials (2 to 4.5 signalized intersections per mile)					
2, Undivided	*	*	10,500	14,500	15,300
Major County Roadways					
2, Undivided	*	*	7,000	13,600	14,600
Signalized Intersections on Major County Roadways					
2, Undivided	*	*	4,400	9,400	12,000

* - Not Determined

Source: Florida Department of Transportation, Systems Planning Office

The Orange County/North Carolina DOT road classifications that correspond to the categories shown above are as follows:

Interstate: Freeways in Urbanizing Areas
 Arterial: State Two-Way Arterials
 Collector: Major County Roadways
 Local: (not addressed)

**Average Daily Traffic Counts, by Year
1999 – 2004**

(See Map 10 for ID Locations)

ID	Location	1999	2000	2001	2002	2003	2004
A	Mill Creek Rd., just north of Lebanon Rd.*	2,100		1,700	1,800		1,600
B	Doe Run Rd., just north of Lebanon Rd.*		150				
C	Lebanon Rd., just west of Frazier Rd.	1,900		1,800			
D	Frazier Rd., just north of Fieldview Rd.*		200				
E	Ira Rd., just north of Lebanon Rd.*		400				
F	Richmond Rd., south of Lebanon Rd.		220				
G	High Rock Rd., north of Lebanon Rd.*		900				
H	Lebanon Rd., between High Rock Rd. & Efland-Cedar Grove Rd.	2,000		2,300			2,800
I	Efland-Cedar Grove Rd., north of Lebanon Rd.	2,900		3,100			
J	Lebanon Rd., just east of Efland-Cedar Grove Rd.		160				
K	Brookhollow Rd., north of Lebanon Rd.*		340				
L	Hwy 70, west of Mace Rd.			6,300			
M	Washington St., west of Buckhorn Rd.*	5,200		1,400			
N	Mace Rd., north of Hwy 70	990	970	990	950		870
O	Buckhorn Rd., between Hwy 70 & Railroad tracks			5,600			
P	Buckhorn Rd., just south of Railroad tracks	5,000				6,800	
Q	Buckhorn Rd., between Industrial Dr. & Interstate 85/40			6,300	6,500		6,700
R	Hwy 70, between Shambley Rd. & Frazier Rd.	6,000	5,800	5,500	5,200	5,600	5,100
S	Frazier Rd., just south of Hwy 70					760	
T	Redman Crossing Rd., just south of Hwy 70	50		210			320
U	Richmond Rd., just north of Hwy 70		660			940	
V	Tinnen Rd., between Hwy 70 & Fuller Rd.		400				
W	Gaines Chapel Rd., north of Railroad			340		290	
X	Southern Dr., west of Gaines Chapel Rd.		140				
Y	Southern Dr., east of Gaines Chapel Rd.	330					
Z	Efland-Cedar Grove Rd., north of Hwy 70	4,200		4,800	4,800		5,400
AA	Hwy 70, between Efland-Cedar Grove Rd. & Brookhollow	4,600	4,400	4,100	4,200	4,500	4,500
BB	Southern Dr., west of Mt. Willing Rd.	450		440			450
CC	Mt. Willing Rd., between Railroad tracks & Forrest Ave.	5,300		6,300		6,500	
DD	Brookhollow Rd., north of Hwy 70	1,000		1,100	1,200		1,200
EE	Hwy 70, between Forrest Ave. & Gym Rd.	4,200	4,100	3,700	3,700	4,100	4,100
FF	Rock Quarry Rd., just south of West Ten Rd.		380				
GG	Rock Quarry Rd., just north of Bowman Rd.		390				
HH	Interstate 85/40 between Buckhorn Rd. interchange & Mattress Factory Rd. overpass	83,000	81,000	81,000	83,000	77,000	
II	Buckhorn Rd., south of Interstate 85/40	2,300		2,400		2,500	
JJ	West Ten Rd., just west of Buckhorn Rd.			1,200			

ID	Location	1999	2000	2001	2002	2003	2004
KK	West Ten Rd., just east of Buckhorn Rd.	860		860	790		880
LL	Interstate 85/40 between Buckhorn Rd. & Efland interchanges		82,000		84,000	77,000	83,000
MM	Bushy Cook Rd., just south of West Ten Rd.*		310		240		230
NN	Interstate 85/40, west of Mt. Willing Rd.	85,000		81,000			
OO	West Ten Rd., west of Mt. Willing Rd.*			810		830	
PP	West Ten Rd., west of Mt. Willing Rd.*	820					
QQ	Mt. Willing Rd., south of West Ten Rd.*	1,500		1,600	1,800		1,800
RR	West Ten Rd., west of Mt. Willing Rd.*		200				
SS	Interstate 85/40, between Mt. Willing Rd. & 85/70 Connector	88,000	84,000	86,000	88,000	82,000	84,000
TT	85/70 Connector between Ben Johnston Rd. & Railroad overpass			3,200	3,300	3,600	3,400
UU	Interstate 85/40 east of 85/70 Connector*	88,000				79,000	82,000
VV	Frazier Rd., south of Hwy 70		230				

* - Not within Planning Area but within very close proximity to Planning Area.

Note: Cells with no data indicates that counts were not performed at the given location in the given year.

Source of Data: North Carolina Department of Transportation

Comparison of Average Daily Traffic (ADT) Counts and Generalized Level of Service shows that all roadways within the planning area are operating at Level of Service C or better. However, ADT has been increasing at most count points over the period analyzed (1999 through 2004). Additionally, Peak Hour counts are not available but planning area residents have reported that “rush hour” traffic volumes are particularly heavy in the stretch of Mt. Willing Road/Forrest Avenue/Efland-Cedar Grove Road north of Interstate 85/40.

Rail

Efland was “born and grew up” around the railroad and was an important stop for tobacco and other agricultural products from the late 1800’s to the mid 1900’s. Although rail traffic has decreased considerably in North Carolina, the Southern Railway right-of-way traverses the south-central portion of the planning area and is still used for general rail transport and intrastate commuter service provided by Amtrak.

The Triangle Transit Authority (TTA) has completed final plans for Phase I of its regional commuter rail service in the Triangle. TTA is presently attempting to procure Federal funding to implement Phase I service that will link Raleigh, Cary and Durham. Phase I service, originally planned to start by the end of 2007, has been set back because of changes in federal cost-effectiveness guidelines. TTA has been given a September 30, 2006, deadline to meet current cost-effectiveness guidelines, or be dropped from further consideration for funding by the Federal Transit Administration. Future plans to link Durham and Chapel Hill in Phase II of the Regional Transit Plan are currently unfunded.

TTA’s “Recommendations for a Regional Transit Plan” long-term recommendations include extension of the regional rail service to smaller municipalities and outlying neighborhoods, including Hillsborough and the Efland area.

Pedestrian/Bicycle Facilities

The planning area lacks pedestrian facilities. Sidewalks are not provided adjacent to any of the major thoroughfares nor are they located in any subdivisions.

The NCDOT recently widened US 70 to include 2-foot paved shoulders on both sides of the highway. The extra width, while not providing a full bicycle lane, provides extra road width and enhances safety for bicycling. Many other thoroughfares require additional right-of-way in order to be widened to include bicycle lanes.

Bus, Car/Van Pool, and Park ‘n Ride Lots

General bus services do not serve the Efland area at this time. However, Orange Public Transit (OPT) provides transit service for area senior citizens to the Efland-Cheeks Community Center for the Monday through Friday senior lunch program. In addition, seniors and low income residents can arrange for transportation to and from medical appointments through OPT. Orange and Alamance Counties are currently discussing the possibility of partnering to add east-west OPT service into Alamance County. If implemented, this new service would be available to the general public.

Triangle Transit Authority (TTA) operates a ridesharing matching service for commuters who are interested in carpooling. In addition, TTA operates vanpools that are made up of at

least seven commuters who live and work near each other and who share approximately the same work hours. One leg of the vanpool's trip must begin or end in Wake, Durham, or Orange County. TTA provides the van, pays for gas and insurance; and arranges, oversees, and pays for all maintenance. Riders pay a monthly fare based on the average daily round-trip mileage. At this time, no vanpools begin or end in Efland although two different vanpools pass by Efland from Greensboro to Raleigh and RTP. One of the vanpools picks riders up at the Petro Station on Buckhorn Road and one picks up riders at the B.P. Station across from the Petro Station. Commuters who are interested in joining a vanpool may contact TTA to inquire about joining an existing vanpool or starting a new vanpool.

At the present time, there are no official park 'n ride lots located in the Efland area.

Utilities

Communications

Telephone

Land-line telephone service in the planning area is provided by either Mebtel or Sprint. Mebtel serves the western portion of the planning area and Sprint serves the eastern portion. The "boundary line" between the two service providers is generally in the vicinity of Richmond Road (the line tends to "zig-zag").

Cellular phone service in Orange County is provided by nine (9) providers. Service providers with antennas in and in close proximity to the planning area include: Nextel, Alltel, Sprint, Cingular, Verizon, and BellSouth. Verizon, Nextel, and Alltel operate at 800 Mhz; the other service providers operate at 1.8 Ghz. The 800 Mhz providers are able to provide more extensive coverage in rural areas because the lower wavelength frequency translates into fewer towers needed for coverage.

The planning area has fairly good wireless phone coverage. Outlying areas still have a number of zones where reception can be weak. At least one additional tower/antenna facility would be needed to provide coverage in the "dead zones."

Internet Service

Mebtel recently installed new optical cable along U.S. 70 from Mebane to slightly west of Ashwick subdivision. Mebtel is in the process of ensuring DSL service is available in addition to dial-up service throughout their service area in the planning area.

Sprint provides dial-up service in its service area. At this time, Sprint has no plans to provide DSL service in the portion of the planning area it serves.

Time Warner Cable (TWC) provides Road Runner broadband service along the Highway 70 corridor but services do not extend past McGowan Creek. TWC and Orange County are currently working on an agreement for service extensions to areas that contain at least 18 houses per street mile. Some portions of the planning area are expected to meet the 18 houses per street mile minimum threshold and would receive access to the TWC cable network.

Verizon Wireless is in the process of offering wireless broadband service on the tower located on Southern Drive. Coverage will extend throughout the southeast portion of the planning area once the service comes on-line.

Natural Gas and Electric Power

Natural gas service lines run along U.S. 70. Generally, the service lines extend approximately ½ mile north of U.S. 70 and approximately 1 mile south of U.S. 70. Areas that are not served by natural gas rely on individual propane tanks for any natural gas needs.

Electric service in the planning area is provided either by Duke Power or Piedmont Electrical Membership Cooperative. Neither electrical provider has a map that shows their exact service areas. Generally speaking, Duke Power serves the more developed areas and Piedmont Electrical Membership Cooperative serves the predominantly rural areas. There is service overlap in transitional areas.

Water Service

Water service in the planning area is provided by the Orange-Alamance Water System (OAWS), a non-profit membership corporation organized in 1965. OAWS lines extend through much of the planning area and those areas not serviced rely on individual wells for water. (See Map 11 for the location of existing water lines). In some parts of its service area, OAWS water pressure is not sufficient for fire suppression needs due to small diameter pipe sizes. In partnership with Orange County, OAWS may eventually plan to conduct an engineering study of the water system. Funding for the study may be discussed in future Orange County and OAWS budgets.






Within Orange County, OAWS' raw water comes from Corporation Lake, an impoundment on the Eno River just north of U.S. 70. Water withdrawals on the Eno River are subject to the Eno River Capacity Use Agreement which regulates how much water the Town of Hillsborough, Orange-Alamance Water System, and Piedmont Minerals can withdraw from the Eno River at various storage capacities (i.e., during times of drought and diminishing water storage, less water may be withdrawn by each of the parties). Corporation Lake's safe yield was 0.8 MGD. Major sedimentation in the lake has limited capacity and yield. Water treatment is provided by a 1.0 MGD water filtration facility at Corporation Lake. In addition, within neighboring Alamance County OAWS has a pumping station in Haw River and a water purchase agreement with the City of Burlington. OAWS also has agreements with the Town of Hillsborough and the City of Mebane to provide back-up water supplies if necessary. Large capacity wells are available as well.

In the summer of 2004, Orange County entered into a Utility Service Agreement with the City of Mebane to provide water and sanitary sewer service to much of the Economic Development District located between West Ten Road and Interstate 40/85. The City of Mebane will serve the areas designated as 1a, 1b, 2a, and 3 on Map 12. Service lines to provide service to the new Orange County Middle School that is under construction on West Ten Road have been engineered and the project is currently in permit review. Construction is expected to start in early 2006 and be complete in the summer of 2006.

Efland Area Water Lines



Legend

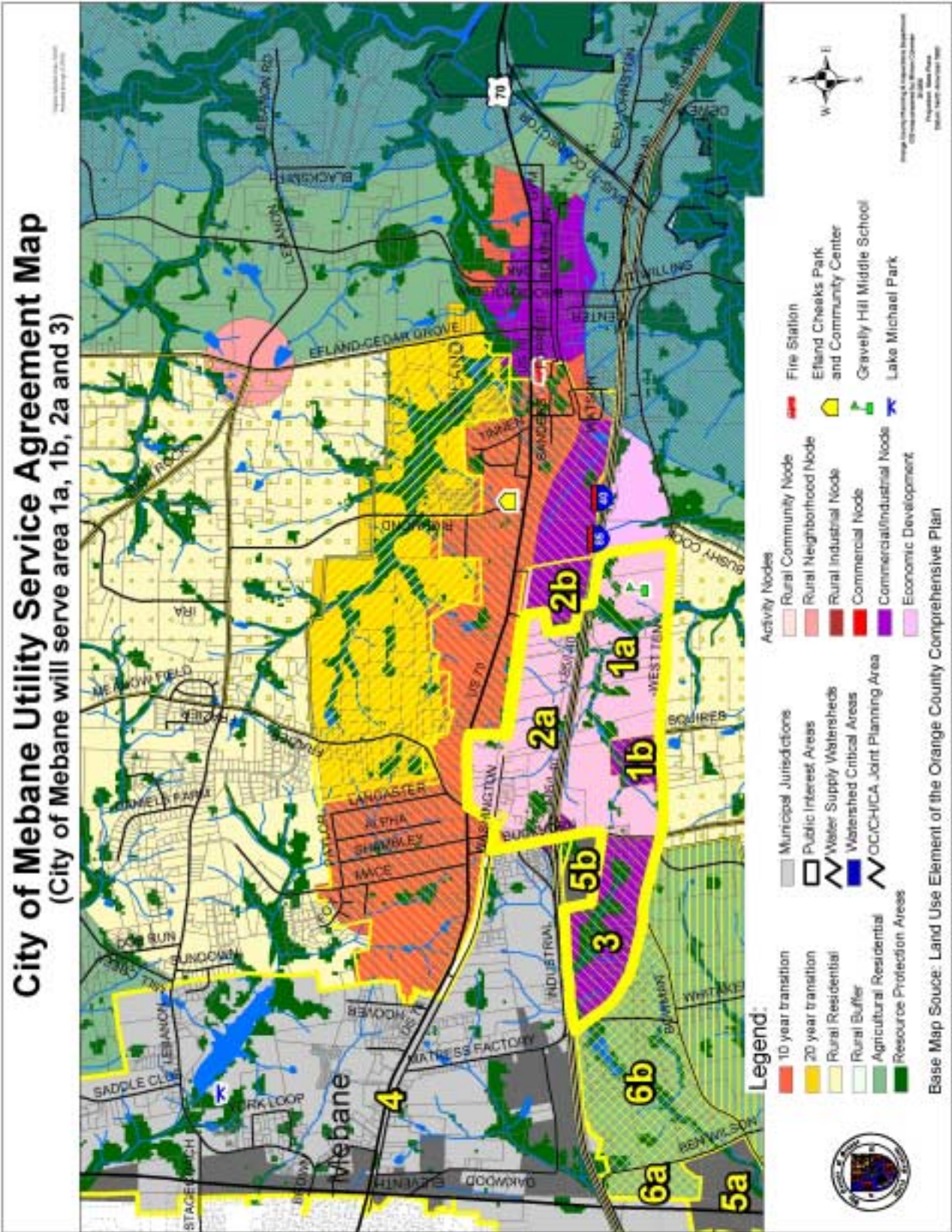
-  Fire Station
-  Efland Cheeks Park and Community Center
-  Gravelly Hill Middle School
-  Lake Michael Park
-  Pipe Size
 - 12 inch
 - 8 inch
 - 6 inch
 - 4 inch
 - 3 inch
 - 2.5 inch



Orange County Planning and Inspection Department
 GIS/Map Preparation by Brian Coleman, March 13, 2008
 Population: North Carolina State Water Facts
 (Date: 10/1/2007) (02)

Source of Data: Orange-Alamance Water System

City of Mebane Utility Service Agreement Map (City of Mebane will serve area 1a, 1b, 2a and 3)



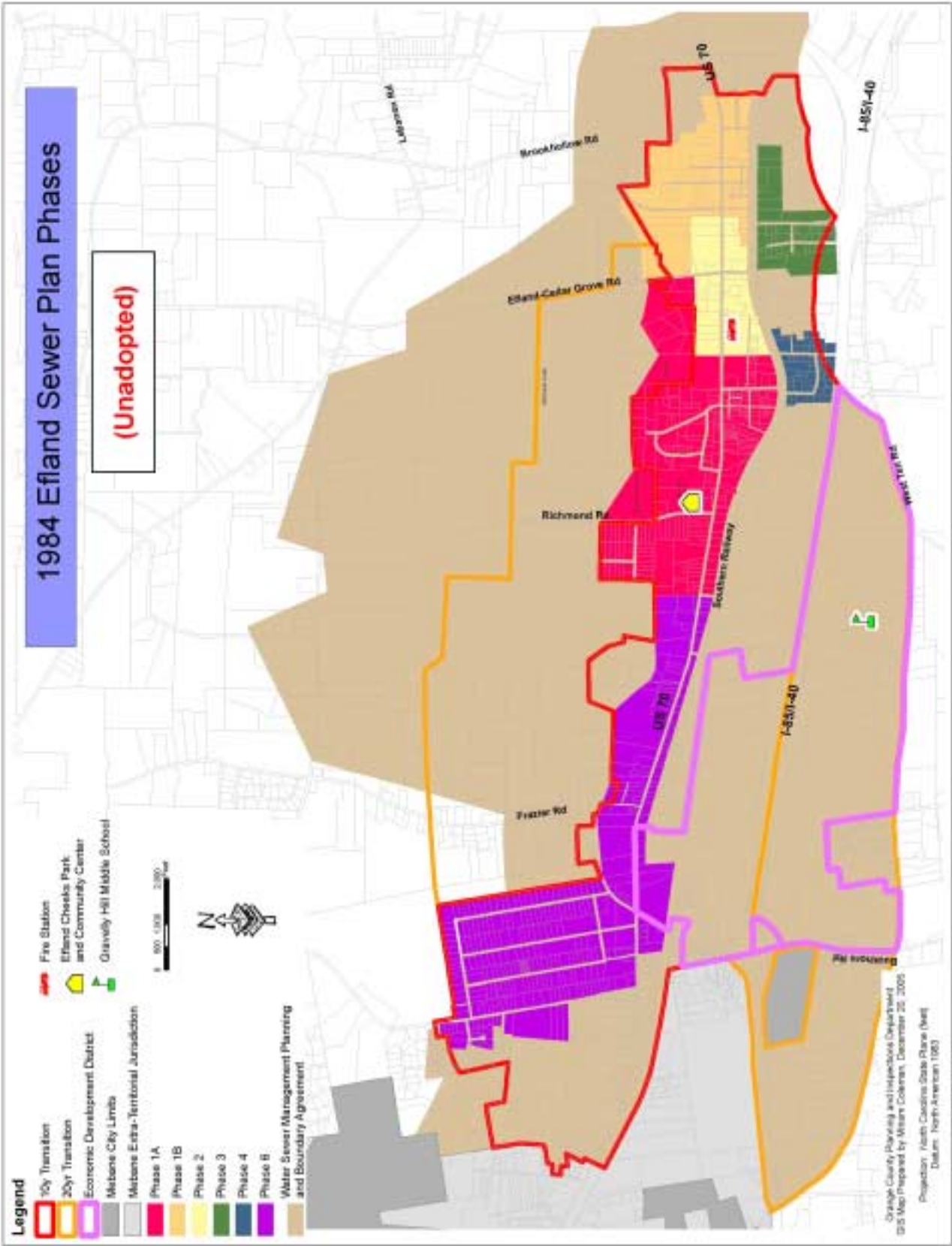
Sanitary Sewer Service

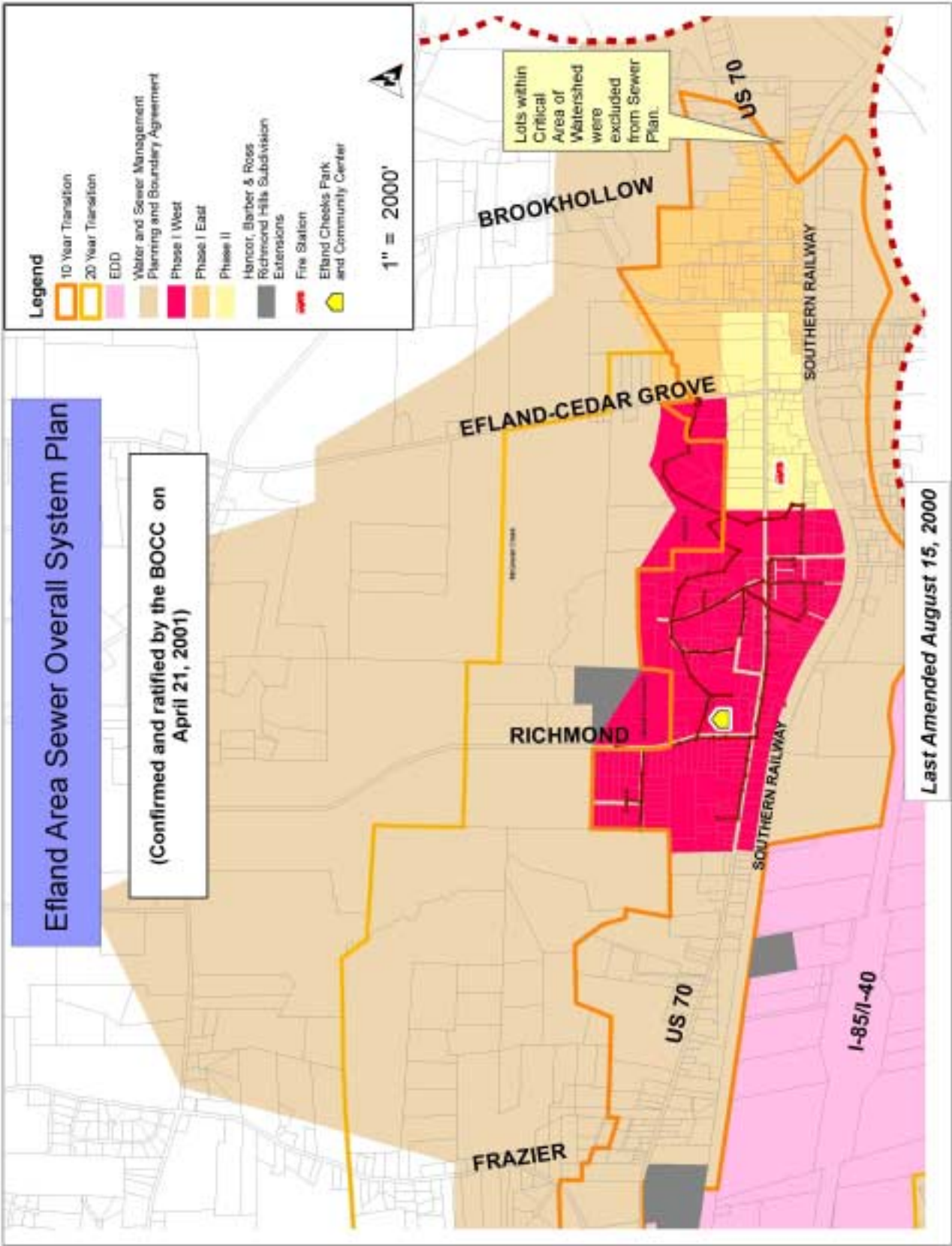
Sanitary sewer service is available in a small portion of the planning area. In 1984, the John R. McAdams Company completed a “Cheeks Township Water and Sewer Extension Feasibility Report” which identified possible water and sewer service areas (see Map 13). However, the feasibility report was not adopted by the Orange County Board of Commissioners. Instead, the decision was made to provide sewer service to only a portion of the area identified in the Feasibility Report. The first phase of the Efland Sewer Project was completed in 1988 and provided sewer service to the area identified as “Phase I West” on Map 14.

In 1997, a \$1.2 million bond was passed to extend sewer service in Phase I and Phase II areas of the Efland sewer system. Several details needed to be resolved prior to moving forward on the expansion and the expansion project is currently in the final design engineering stages. Sewer service is expected to be provided in “Phase I East” and “Phase II.” The extent of service may be contingent upon construction cost estimates which could mean that the entire area of Phase I East and Phase II may not be served at this time. Construction of the project is expected to begin in late Spring, 2006.

The sewer infrastructure is owned by Orange County and the county has an agreement with the Town of Hillsborough to accept up to 360,000 gallons per day (gpd) of effluent for treatment by the Town’s treatment facility. The existing capacity of the sewer system is limited predominantly by the characteristics of the existing pumps. The maximum capacity of the pumps is approximately 750,000 gpd. However, when taking into consideration a peaking factor and a general desire to have the pumps working approximately 8 hours per day, the functional capacity is approximately 100,000 gpd. Currently, the sewer system handles roughly 35,000 gpd of effluent, resulting in 65,000 gpd of unused capacity. The Phase I East and Phase II expansion, anticipated to be accomplished in the near future, is expected to use 35,000 gpd of the existing unused capacity, leaving 30,000 gpd of unused capacity. Increasing capacity could be accomplished by a change in the pump capacity.

In the summer of 2004, Orange County entered into a Utility Service Agreement with the City of Mebane to provide water and sanitary sewer service to much of the Buckhorn Economic Development District located between West Ten Road and Interstate 40/85. The City of Mebane will serve the areas designated as 1a, 1b, 2a, and 3 on Map 12. Service lines to provide service to the new Orange County Middle School that is under construction on West Ten Road have been engineered and the project is currently in permit review. Construction is expected to start in early 2006 and be complete in the summer of 2006.





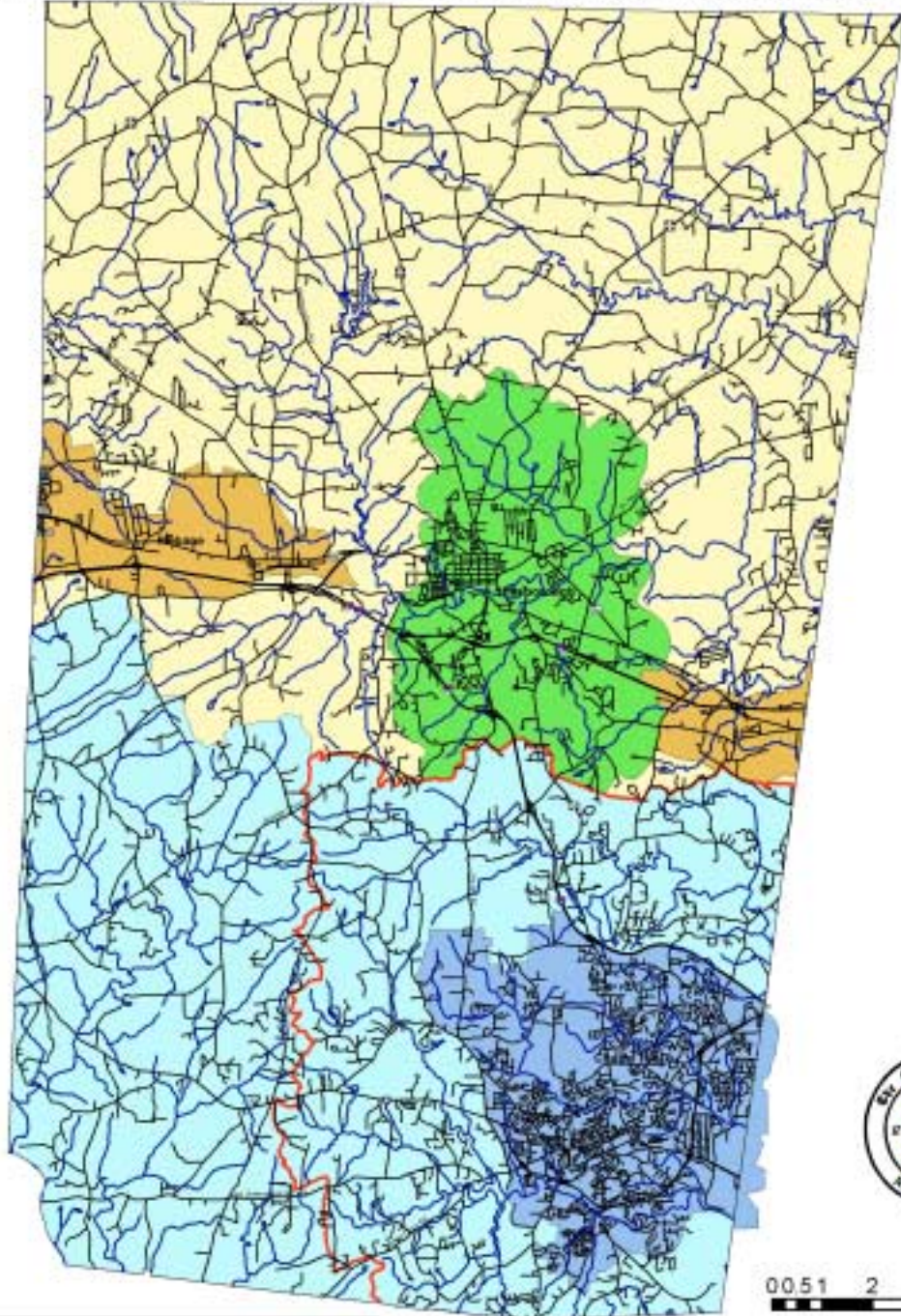
Water and Sewer Management Planning and Boundary Agreement

As a result of many years of discussion among the local governments located in Orange County and the Orange Water and Sewer Authority (OWASA), in 2001 Orange County, OWASA, and the Towns of Chapel Hill, Carrboro, and Hillsborough entered into a Water and Sewer Management Planning and Boundary Agreement (WSMPBA). The agreement provided a comprehensive county-wide system of utility service areas upon which the signatory entities could rely when making decisions related to issues such as planning, land use, annexation, zoning, and growth management.

The agreement is in effect for 10 years and will renew automatically unless a signatory party provides a notice of intent to withdraw by following the process outlined in the agreement. All parties to the agreement must approve any changes to the service boundaries shown on the WSMPBA map.

Map 15 is the WSMPBA map approved by the signatory parties. Primary Service Areas shown on the map are those areas where water and/or sewer service is now provided, or might reasonably be provided in the future. Long-Term Interest Areas are those areas within which public water and/or sewer service is not anticipated to be provided but if such services were to be provided for “emergency” purposes due to private system failures, the designated party would be the service provider.

Appendix A Water and Sewer Management Planning and Boundary Agreement



Legend

Water and Sewer Boundaries

	Hillsborough Primary Service Area		Rural Buffer Boundary
	OWRSA Long Term Interest Area		
	Orange County Primary Service Area		
	OWRSA Primary Service Area		
	Orange County Long Term Interest Area		



0 0.5 1 2 3 4 5 Miles

Orange County Planning and Inspection Department
Updated Street, Myrtle Coliseum, 2002
Revised Map to show proposed Chapel Hill Urban Service Boundary
Prepared by Carole R. Skidell
7/1/01
Original Map Prepared by Bob McFarland
8/17/97