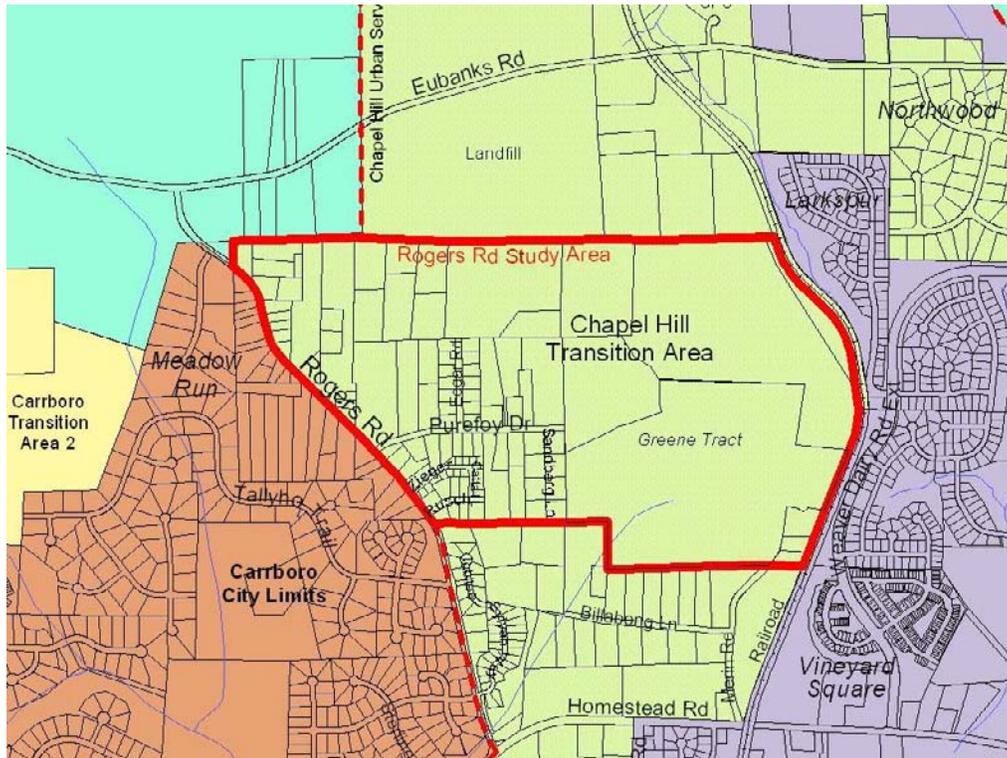


# Rogers Road Small Area Plan Task Force

## Interim Report

June 21, 2007



Rogers Road Small Area Plan Task Force:

Mayor Pro Tem Bill Strom

Council Member Mark Kleinschmidt

Bonnie Norwood

Robert Dowling

Susan Levy

James Stroud

Tom Tucker

Ruby Sinreich

Laura Wenzel

Delores Bailey

Neloa Barbee Jones

Barbara Hopkins

Robert Campbell

Timothy Peppers

## **Background**

The Rogers Road study area is located in Orange County to the north west of the existing town limits of the Town of Chapel Hill; it also adjoins the Town limits of Carrboro to the west. The study area is located in the Chapel Hill Transition Area, an area which is planned to become part of the Town of Chapel Hill. The future growth of the Town of Chapel Hill and the Town of Carrboro was established with Orange County, through a Joint Planning Agreement in 1987.

The Town of Chapel Hill Comprehensive Plan, a long range plan for future development of the Town, reflects the Joint Planning Agreement and identifies an Urban Services Boundary which defines the future town limits in which it is intended that the Town will grow and provide typical urban services. The Rogers Road study area is located within the Urban Services Boundary.

The study area is approximately 330 acres. It is bounded by the Norfolk and Southern Railroad to the east, the existing residential neighborhood of Billabong Road and Homestead Place to the south, Rogers Road to the west and the Orange County Land fill to the north.

Draw an imaginary vertical line through the middle of the study area. East of the line almost half of the study area (164 acres) consists of the Greene Tract. Approximately 60 acres of the Greene Tract is owned by Orange County and 104 acres is jointly owned by Orange County, the Town of Chapel Hill and the Town of Carrboro. The Greene Tract was originally purchased in 1984 as a potential future landfill. It is located south east of the existing Orange County landfill. A concept plan prepared by a Greene Tract Workgroup was approved by the joint owners in late 2002. The concept plan identifies that 18.1 acres of the jointly owned portion will be developed for housing and the remaining acres of the jointly owned portion will be preserved and managed as open space.

West of the imaginary line the study area consists of approximately 80 lots and tracts of the Rogers Road Neighborhood. The properties are mostly accessed via Purefoy Drive off Rogers Road.

### **Rogers Road Small Area Plan Task Force**

Following a community open house in December 2006, the Rogers Road Small Area Plan Task Force was formed and began meeting in February 2007. The Task Force has met six times holding a meeting on the second Thursday in the month.

The charge of the Task Force is to take a more detailed look at the impacts of providing public services in the study area, especially the extension of sanitary sewer, and the impacts of developing an affordable housing site on the Greene Tract.

The Task Force has been reviewing background information about existing conditions and infrastructure of the study area in order to establish a vision for the future. To date the Task Force has focused on how to improve facilities for existing residents in association with planning for future development of the study area.

## Interim Findings

This interim report includes a potential sanitary sewer plan to serve existing property in the study area. The plan was developed with the assistance of OWASA staff. The report also includes potential options for a road network to open up and connect the neighborhood.

Keeping the neighborhood affordable is the key issue from the work so far. How to get sanitary sewer and additional road access to the neighborhood without causing financial hardship to existing residents? Who should pay for these facilities and how should they be paid for?

The Task Force believes that the development of housing on the Greene Tract ought not proceed without providing current residents of the neighborhood the opportunity to be served by sanitary sewer.

The Task Force recommends:

- The development of an action plan to address sanitary sewer provision.
- The development of an action plan to address additional road access to the neighborhood.
- That the Town Council of the Town of Chapel Hill receive and refer this interim report to the Board of County Commissioners, the Carrboro Board of Aldermen and the OWASA Board of Directors concerning the provision of sanitary sewer and that the Council refer the report to the Board of County Commissioners concerning additional road access.
- That the Chapel Hill Town Manager be authorized to work with the staff of Orange County, the Town of Carrboro and OWASA to draw up action plans and proposals for the provision of these facilities.

## Guiding Principles

The Task Force has developed the following principles to guide the development of the small area plan:

- Provide alternative road access into and out of the neighborhood
- Improve transportation access through all modes (vehicles, bicycle and pedestrian, transit)
- Manage existing and through traffic
- Maintain affordable living to current residents
- Preserve the environment and cultural heritage of the study area
- Foster a sense of community amongst the residents
- Encourage rehabilitation of declining residential properties
- Encourage a full range of services for existing and future residents
- Don't leave the existing residents behind
- Provide utilities to meet community needs
- Encourage well built, affordable, smaller homes
- Improve the standard of facilities for the community

## Sanitary Sewer Plan

Most of the Rogers Road study area is served with water from OWASA. Water lines extend eastward from Rogers Road. OWASA sanitary sewer has been extended into the southwestern part of the study area. OWASA policy is that to work best sewers need to run downhill so that wastewater will flow using gravity rather than being pumped mechanically. Pumps are not desirable because they may fail during storms and they involve operating costs for electricity and maintenance.

In March OWASA staff presented a conceptual layout of a sanitary sewer network that could provide service to existing lots within the Rogers Road study area. The conceptual layout identifies new lines that would need to be constructed and an existing line extended to provide a gravity sanitary sewer service to existing lots. Topography in the study area indicates that portions of the study area would best be served with gravity sewer falling in different directions from the study area. This includes extending the existing line from the south west, a new line to Eubanks Road in the north east and a new line to the west which could be provided in cooperation with the Town of Carrboro.

Appendix 1 is maps showing a conceptual sewer network plan to serve most of the existing lots in the study area. There is one concept for the study area with two versions; Concept A serves the Neville Tract and the adjoining 24 acre Harris property via a new line to the north. Concept A has greater potential to facilitate subdivision of the Harris property. Construction is estimated to cost \$ 2.9 million. Concept B serves the same properties via a new line to the west. Construction is estimated to cost \$ 2.5 million. Neither Concept A or B serve properties off Sandberg Lane or 3 lots off Merin Road. Concept C shows how gravity sewer could be provided to those lots not served by A or B via a new line along Billabong Lane. Billabong Lane is beyond the study area. Construction of the lines in Concept C would add \$1.3 million to the construction cost of Concepts A or B.

Appendix 2 provides more detail from the OWASA on the conceptual sewer network plan and a breakdown of the cost to construct the lines. It also sets out indicative non-construction costs to hook up existing homes to the lines.

The Task Force reviewed the OWASA water and sewer extension policies. In accordance with the OWASA policies, benefiting properties would bear the cost of extending water and sewer lines. The Task Force also reviewed the assessment process for neighborhoods pursuing water and sewer service.

Members expressed great concern over the ability of existing homeowners to bear the cost of installing main lines, hooking up to services and paying utility bills, thereby decreasing the affordability of low-cost housing that currently exists in the study area.

The Task Force believes that the development of housing on the Greene Tract ought not proceed without providing current residents of the neighborhood the opportunity to be served by sanitary sewer.

Appendix 3 outlines the cost per lot to provide sewer with an assessment project. It also shows how that cost could be reduced by additional development in the neighborhood, increasing the number of lots. In other words how the assessment cost could be reduced by splitting it between 200 lots as opposed to 100 lots.

The Task Force recommends that an action plan is made to address sanitary sewer provision. The Task Force requests that the Town Council of the Town of Chapel Hill, the Board of County Commissioners and the Carrboro Board of Aldermen work with OWASA to develop an action plan for the provision of sanitary sewer.

### **Additional Road Access**

Properties in the study area are mostly accessed via Purefoy Drive off Rogers Road. Rogers Road is currently classified as a collector street by the North Carolina Department of Transportation (NCDOT). Rogers Road carries approximately 5,000 vehicles per day, a rise from 3,000 vehicles per day in 1990. In general traffic on Rogers Road increases by 4 to 6 percent per year. We would anticipate continued growth in vehicle traffic along Rogers Road linked to continued development along both Homestead Road and Eubanks Road in Chapel Hill and Carrboro. Purefoy Drive as it exists currently is sufficient to accommodate 500 trips per day and will accommodate the projected trips from the future Habitat for Humanity development proposed at Purefoy Drive.

The Task Force understands that new development in the study area may require expansion or upgrade of existing streets. The Task Force identified the need for additional access to the neighborhood and internal road connections. In particular it identified the need to have a north-south roadway connection through the study area to connect to Eubanks Road.

As Orange County owns approximately 70 percent of the property with frontage on Eubanks Road including the landfill site, the future operations center and the future animal shelter, the Task Force identified that Orange County needs to be an active partner in the small area planning process and in its implementation. The Task Force recommends that the Town of Chapel Hill and Orange County act cooperatively to secure a roadway corridor through the Orange County property to Eubanks Road.

Appendix 4 is a conceptual road network providing potential access to and internal connections in the study area. The Task Force

The Task Force considered options to provide an east to west road connection to the neighborhood through the Greene Tract. It identified that this would be constrained by the permanent preservation of the Greene Tract and the difficulty in securing a vehicular crossing of the railroad. The Task Force considers that a greenway connection should be explored through the Greene Tract.

### **Greene Tract**

The Task Force received information from Dave Stencil Director of the Environment and Resource Conservation Department at Orange County concerning the environmental

sensitivity and importance of the Greene Tract. The Greene Tract lies at the headwaters of three watersheds. Excepting the 18.1 acres of the Greene Tract which is identified by for housing development by the 2002 Greene Tract Concept Plan, the Task Force supports the placement of Conservation Easements on the Greene Tract.

The Task Force believes that the development of housing on the Greene Tract ought not proceed without providing current residents of the neighborhood the opportunity to be served by sanitary sewer.

### **Land Uses**

In March the Task Force took part in a land use visioning exercise, members expressed a preliminary preference for low-density residential, recreational, and small commercial land uses in the Rogers Road study area. Further exercises will be scheduled to identify preferred locations for uses within the study area.

### **Landfill and Establishment of Waste Transfer Center**

The Task Force has not actively discussed the operation of the County Landfill. This is because this matter is being addressed separately by the Orange County Historic Rogers Road Community Task Force. Members of the Rogers Road Small Area Plan Task Force have raised concerns about potential contamination of water from the landfill site and how contamination might affect future development. Members have also raised concerns about the proposed relocation of the Convenience Center.

### **Conclusion**

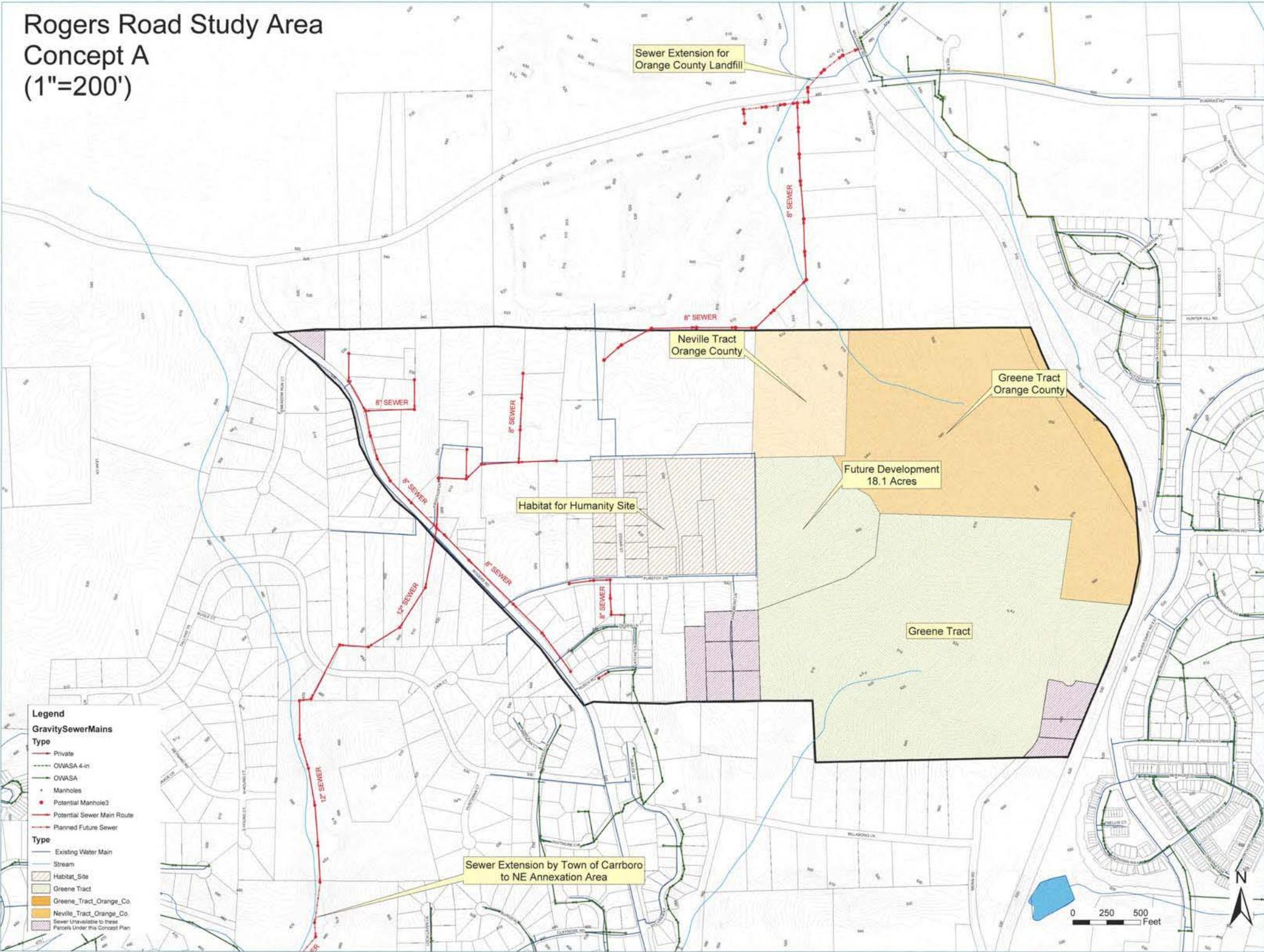
A small area plan for the Rogers Road Area is essential to coordinate the provision of infrastructure and services to the neighborhood. Additional transportation access and the provision sanitary sewer are needed to improve the infrastructure of existing residents and for the orderly development of housing on the Greene Tract.

The Task Force is greatly concerned about the cost of providing sanitary sewer to existing residents of the study area and recommends that the Town Council of the Town of Chapel Hill, the Board of County Commissioners, the Carrboro Board of Aldermen and the OWASA Board of Directors work together to provide sanitary sewer to the study area.

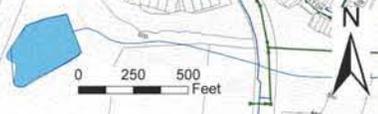
The Task Force believes that the development of housing on the Greene Tract ought not proceed without providing current residents of the neighborhood the opportunity to be served by sanitary sewer.

The Task Force also recommends that the Town Council of the Town of Chapel Hill and the Board of County Commissioners, work together to secure a roadway corridor through the Orange County property to Eubanks Road.

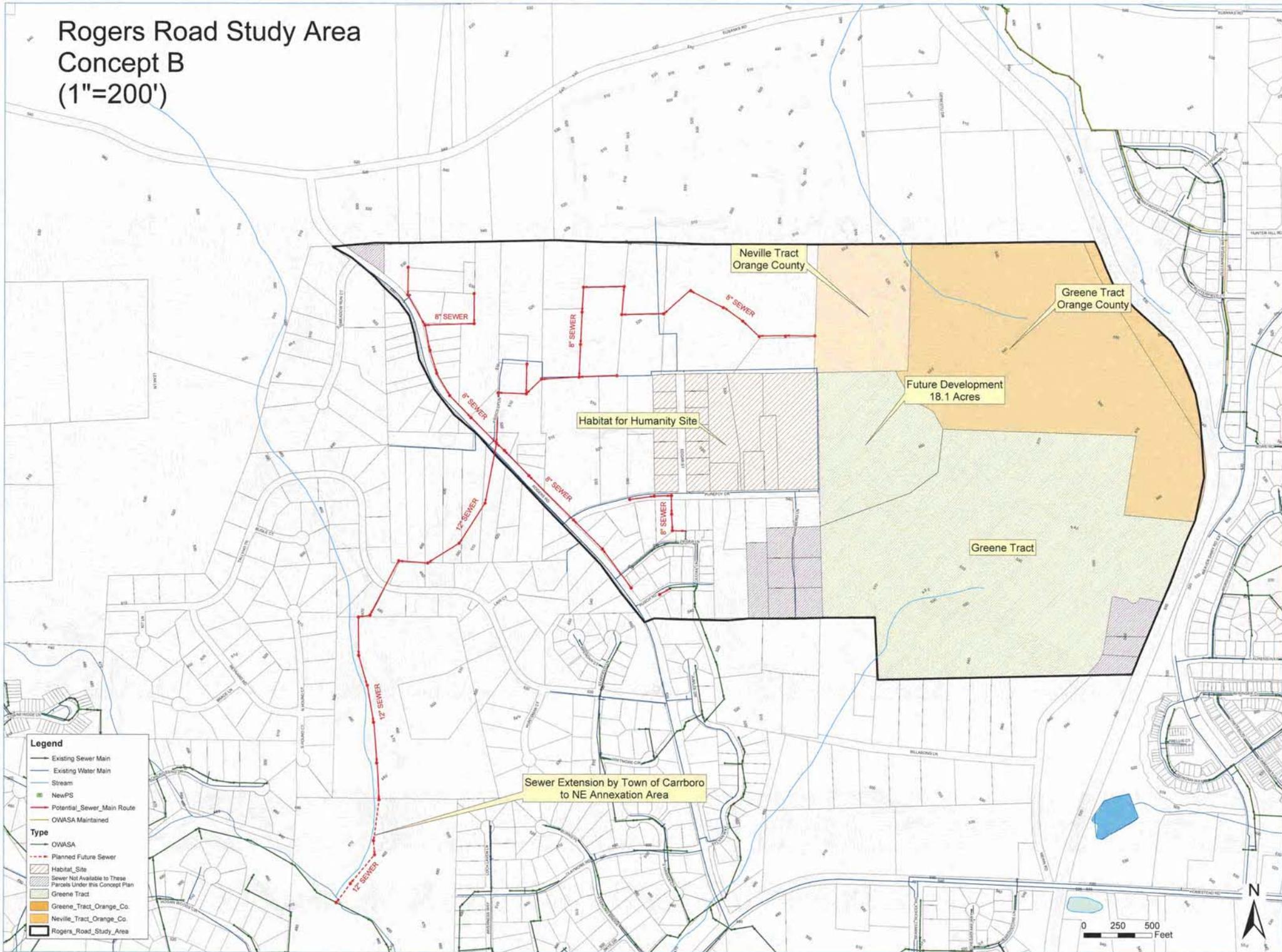
# Rogers Road Study Area Concept A (1"=200')



- Legend**
- GravitySewerMains**
- Type**
- Private
  - OWASA 4-in
  - OWASA
  - Manholes
  - Potential Manhole3
  - Potential Sewer Main Route
  - Planned Future Sewer
- Type**
- Existing Water Main
  - Stream
  - Habitat\_Site
  - Greene Tract
  - Greene\_Tract\_Orange\_Co
  - Neville\_Tract\_Orange\_Co
  - Sewer Unavailable to these Parcels Under this Concept Plan



# Rogers Road Study Area Concept B (1"=200')



## Legend

- Existing Sewer Main
  - Existing Water Main
  - Stream
  - NewPS
  - Potential Sewer Main Route
  - OWASA Maintained
- Type**
- OWASA
  - Planned Future Sewer
  - ▨ Habitat\_Site
  - ▨ Sewer Not Available to These Parcels Under this Concept Plan
  - Greene Tract
  - Greene\_Tract\_Orange\_Co.
  - Neville\_Tract\_Orange\_Co.
  - ▭ Rogers\_Road\_Study\_Area

0 250 500 Feet







## ORANGE WATER AND SEWER AUTHORITY

*Quality Service Since 1977*

### MEMORANDUM

**TO:** Gordon Sutherland  
**FROM:** Ed Holland  
**DATE:** June 22, 2007  
**SUBJECT:** Preliminary Concept Plans and Cost Estimates for Providing Sewer Service to the Rogers Road Study Area

#### **Background and Overview**

Per our recent meetings, OWASA staff has provided three concept plans and associated cost estimates (preliminary) for a sewer collection system that could serve the Town of Chapel Hill's study area east of Rogers Road. Virtually all existing parcels in the study area have access to OWASA water lines; therefore, this exercise focused on sewer service only. If the Town or others decide to pursue these or other sewer concepts, additional engineering and professional services will be needed to provide site-level detail and an overall determination of project feasibility.

The concept plans represent three potential gravity flow configurations. None incorporate sewage pumping stations, which OWASA only approves in unusual circumstances where property cannot be served by gravity options. We have found that pumping stations are expensive to maintain and less reliable over time, due to the greater risk of mechanical failure and resulting sewage spills, than are gravity systems. As shown in **Concepts A and B**, wastewater from most of the study area would flow toward the upstream portion of a sewer line that the Town of Carrboro is extending approximately 900 feet to an area that was annexed in 2006. According to North Carolina annexation laws, that facility must be completed by the end of January 2008.

Our concept drawings do not include portions of the sewer system that will be installed for properties within the study area that are being developed by Habitat for Humanity, nor do these concept plans anticipate service to most of the Greene Tract, which are intended to remain as permanent open space.

Under **Concepts A and B**, sewer service would not be available to 11 existing parcels in the study area, as indicated by purple cross-hatching on the drawings. Additional sewer lines near the southeastern portion of the study area would be needed to serve 10 of those 11 lots, as shown in **Concept C**. None of the three concepts plans could provide sewer service to the single small lot in the extreme northwest corner of the study area.

**Concepts A and B** are identical, except for the manner in which gravity service is provided to the several parcels immediately west of the Neville Tract. **Concept A**, which directs gravity flow northward to the new sewer line that will serve the Orange Regional Landfill, would be approximately 10 percent more expensive than **Concept B**, but would likely offer gravity service to a greater number of future lots. **Concept B** represents a slightly less expensive configuration, but may not offer sufficient flexibility if the two properties immediately west of the Neville Tract are subdivided for further development. These preliminary conclusions still need to be confirmed by engineering analyses and field surveys.

**Concept C** offers sewer service to the 10 existing lots within the study area that could not be served by either **Concept A** or **B**. **Concept C** would also provide service to approximately 20 additional lots in the Billabong Lane vicinity, which is outside of the delineated Rogers Road study area.

A combination of either **Concept A or B**, *plus* **Concept C**, would therefore be needed to serve all existing properties within the study area, except for the single lot in the northwest corner of the study area, which cannot be served by gravity sewer under any of the three configurations.

### **Preliminary Cost Estimates**

**Project Costs** – The table on the next page summarizes the preliminary estimated cost components of each concept plan. These were derived through the same methods used to estimate OWASA's own capital project costs. Further details are available on request. The following important caveats should be observed as these estimates inform the Roger Road Small Area planning process:

- If the Town or others decide to pursue these sewer system concepts, additional engineering and professional services will be needed to provide site-level detail and overall determinations of engineering feasibility.
- Construction cost estimates reported below are only preliminary and are not based on any assessment of field conditions. Cost estimates typically become more precise as detailed engineering design proceeds.
- Estimates are based on the best information available as of June 2007. OWASA assumes that project costs will escalate at a rate of 8 percent per year. We recommend that this inflation factor be used in any future interpretation of these estimates.
- The overall extent of these concept plans and the number of unserved parcels will change in the future if (or as) individual development projects extend new lines to currently unsewered properties.

- The table includes project costs only. Additional per lots costs for connecting individual properties to the sewer system are discussed in the section below.

<b>Estimated Project Costs of Three Sewer System Concept Plans for Chapel Hill's Rogers Road Study Area</b>					
	Concept A	Concept B	Concept C	Concepts A + C	Concepts B + C
<b>Engineering Design</b>	\$220,000	\$190,000	\$100,000	\$320,000	\$290,000
<b>Construction</b>	\$2,180,000	\$1,900,000	\$970,000	\$3,150,000	\$2,870,000
<b>Construction Administration</b>	\$110,000	\$100,000	\$50,000	\$160,000	\$140,000
<b>Construction Inspection</b>	\$110,000	\$100,000	\$50,000	\$160,000	\$140,000
<b>Contingency</b>	\$260,000	\$230,000	\$120,000	\$380,000	\$340,000
<b>Totals</b>	<b>\$2,880,000</b>	<b>\$2,520,000</b>	<b>\$1,290,000</b>	<b>\$4,170,000</b>	<b>\$3,780,000</b>

**Individual Connection Costs** – As noted, the preceding table only includes estimates of constructing the sewer collection system itself. Additional per lot costs for connecting to the new system would include the following:

**OWASA Service Availability Fee** – This one-time connection fee represents the proportional cost of “buying in” to OWASA’s existing facility infrastructure (main sewer lines, treatment plant, etc.) and is assessed according to the square footage of residential properties. The sliding scale of availability fees that will be effective as of October 1, 2007 ranges from **\$2,441** for homes of less than 1,300 square feet to **\$4,514** for homes of greater than 3,800 square feet. Fees for multi-family residences will be **\$2,645** per unit. A different scale of availability fees applies to non-residential sewer connections.

**Private Plumbing Costs** – The pipe that extends from a building to the OWASA sewer line is called a lateral. Unlike pipes in OWASA’s system, the lateral is part of the private property served by the public sewer. Installation and maintenance of the lateral is the responsibility of the property owner, who typically contracts with a private plumber for installation. Costs depend on several factors, especially the distance from the building to the OWASA sewer line. A recent telephone survey of several local plumbers indicated prices in the range of **\$25 per foot**. That is, installation of a 50-foot lateral would cost approximately **\$1,250**, a 100-foot lateral would cost approximately **\$2,500**, and so forth.

**Sewer Tap Charge** – This fee is for physically connecting the private sewer lateral to the OWASA sewer line. The base tap charge, effective as of October 1, 2007, will be **\$318**.

Preliminary Rogers Road Sewer Concepts

June 22, 2007

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**Monthly User Fees** – In addition to the one-time service availability fee, tap charge, and private plumbing costs, all OWASA customers pay monthly water and sewer bills that include a fixed service charge plus a water and sewer commodity charge based on the number of gallons used each month. The typical water plus sewer bill of a residential customer using an average of 6,000 gallons per month will generally range from \$60 and \$70 per month. Bills will vary according to the actual amount of water used.

OWASA staff has appreciated the opportunity of providing this information to support Chapel Hill's Rogers Road Small Area Planning process and will be glad to answer questions or provide further details as needed.

A handwritten signature in black ink, appearing to read "Ed Holland", written over a horizontal line.

Edward A. Holland, AICP  
Planning Director

attachments

cc: Mason Crum, P.E.

June 21, 2007

## **SAMPLE FINANCIAL ANALYSIS: Sewer Aseessment project with Town Assistance\*** **OWASA SEWER EXTENSION INTO ROGERS ROAD STUDY AREA**

\*To receive Town assistance calculation assumes property is in town limits

**CONCEPT A: ROGERS ROAD WITHIN TOWN LIMITS (ANNEXATION)**  
**COST DISTRIBUTION ON PER-LOT BASIS(excluding proposed Habitat project)**

EST. COST OF PROJECT FOR CONCEPT A	\$2,900,000			
# OF LOTS	50			
TOWN ASSISTANCE PER LOT (UPPER LIMIT)	\$4,500			
TOTAL TOWN REIMBURSEMENT (if funds were available)	\$225,000.00			
TOTAL ASSESSMENT COST AFTER ASSISTANCE	\$2,675,000.00			
TOTAL ASSESSMENT FEE PER LOT (AFTER ASSISTANCE)	\$53,500.00			
UPFRONT SEWER TAP FEE	\$318			
UPFRONT AVAILABILITY FEE (dependent on sq ft of house)	1000	1500	2000	2500
AVAILABILITY FEE (Oct1,2007)	\$2,441.00	\$2,949.00	\$3,001.00	\$3,677.00
UPFRONT PLUMBING EXTENSION COST PER LINEAR FT	\$25.00	\$25.00	\$25.00	\$25.00
ESTIMATED COST FOR 100 LINEAR FT	\$2,500.00	\$2,500.00	\$2,500.00	\$2,500.00
TOTAL COST TO CONSTRUCT & RECEIVE SERVICE PER LOT	\$58,759.00	\$59,267.00	\$59,319.00	\$59,995.00
Average Household Gallons Consumed/Month	6,000g			
Monthly Bill	\$59.00			

June 21, 2007

**CONCEPT A: ROGERS ROAD WITHIN TOWN LIMITS (ANNEXATION)  
COST DISTRIBUTION ON PER-LOT BASIS(excluding proposed Habitat project)**

Assuming 50 additional lots created by new development

EST. COST OF PROJECT FOR CONCEPT A	\$2,900,000			
# OF LOTS	100			
TOWN ASSISTANCE PER EXISTING LOT (UPPER LIMIT)	\$4,500			
TOTAL TOWN REIMBURSEMENT (if funds were available)	\$225,000.00			
TOTAL ASSESSMENT COST AFTER ASSISTANCE	\$2,675,000.00			
TOTAL ASSESSMENT FEE PER LOT (AFTER ASSISTANCE)	\$26,750.00			
UPFRONT SEWER TAP FEE	\$318			
UPFRONT AVAILABILITY FEE (dependent on sq ft of house)	1000	1500	2000	2500
AVAILABILITY FEE (Oct1,2007)	\$2,441.00	\$2,949.00	\$3,001.00	\$3,677.00
UPFRONT PLUMBING EXTENSION COST PER LINEAR FT	\$25.00	\$25.00	\$25.00	\$25.00
ESTIMATED COST FOR 100 LINEAR FT	\$2,500.00	\$2,500.00	\$2,500.00	\$2,500.00
TOTAL COST TO CONSTRUCT & RECEIVE SERVICE PER LOT	\$32,009.00	\$32,517.00	\$32,569.00	\$33,245.00
Average Household Gallons Consumed/Month	6,000g			
Monthly Bill	\$59.00			

June 21, 2007

**CONCEPT A: ROGERS ROAD WITHIN TOWN LIMITS (ANNEXATION)  
COST DISTRIBUTION ON PER-LOT BASIS(excluding proposed Habitat project)**

Assuming 100 additional lots created by new development

EST. COST OF PROJECT FOR CONCEPT A	\$2,900,000			
# OF LOTS	150			
TOWN ASSISTANCE PER EXISTING LOT (UPPER LIMIT)	\$4,500			
TOTAL TOWN REIMBURSEMENT (if funds were available)	\$225,000.00			
TOTAL ASSESSMENT COST AFTER ASSISTANCE	\$2,675,000.00			
TOTAL ASSESSMENT FEE PER LOT (AFTER ASSISTANCE)	\$17,833.33			
UPFRONT SEWER TAP FEE	\$318			
UPFRONT AVAILABILITY FEE (dependent on sq ft of house)	1000	1500	2000	2500
AVAILABILITY FEE (Oct1,2007)	\$2,441.00	\$2,949.00	\$3,001.00	\$3,677.00
UPFRONT PLUMBING EXTENSION COST PER LINEAR FT	\$25.00	\$25.00	\$25.00	\$25.00
ESTIMATED COST FOR 100 LINEAR FT	\$2,500.00	\$2,500.00	\$2,500.00	\$2,500.00
TOTAL COST TO CONSTRUCT & RECEIVE SERVICE PER LOT	\$23,092.33	\$23,600.33	\$23,652.33	\$24,328.33
Average Household Gallons Consumed/Month	6,000g			
Monthly Bill	\$59.00			

June 21, 2007

**CONCLUSIONS:**

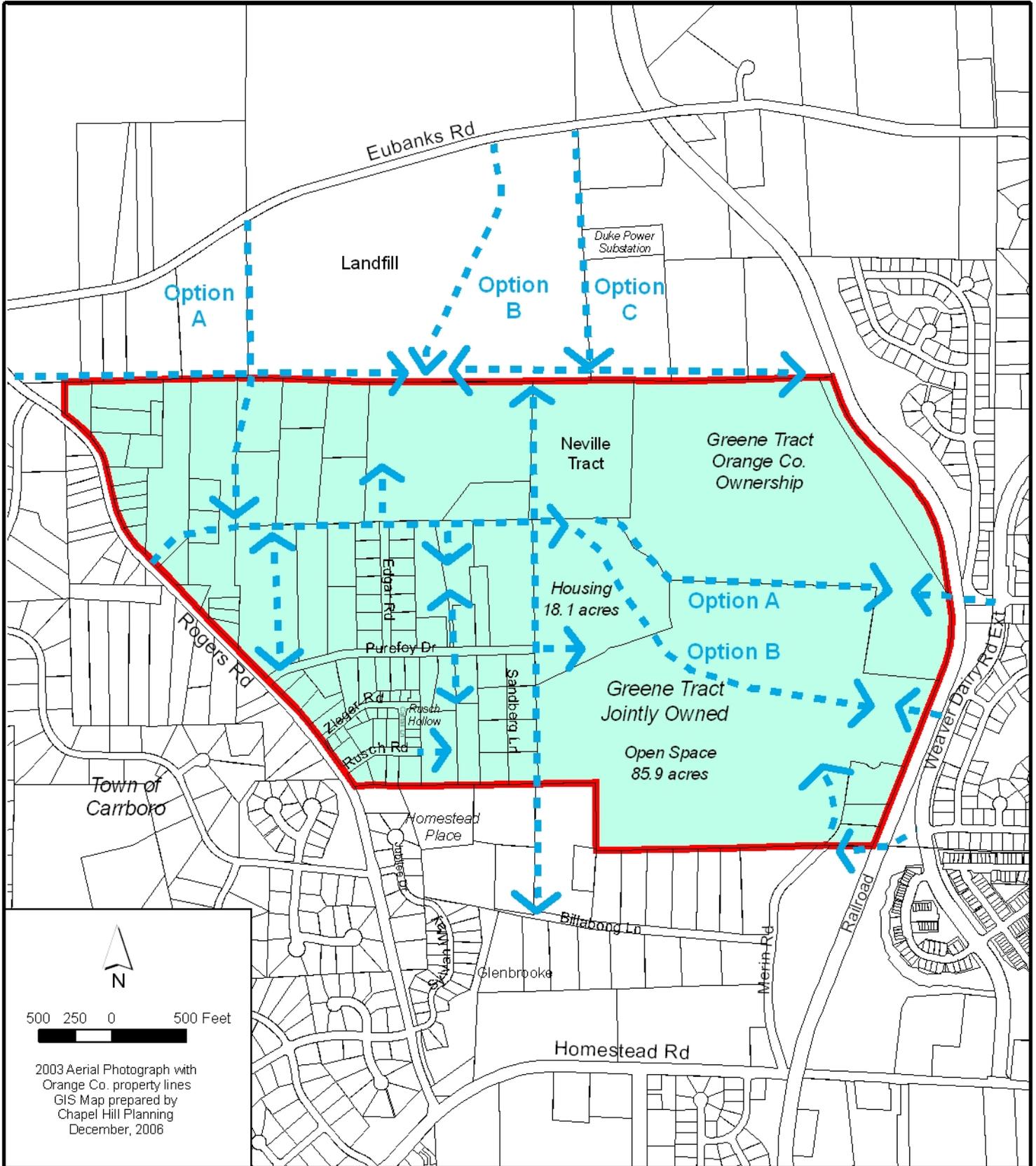
Concept A (50 existing lots) PER LOT COST WITH TOWN ASSISTANCE TO EXISTING LOTS:  
\$59,000 to \$60,000 + MONTHLY BILL

Concept A (50 existing lots + 50 new lots) PER LOT COST WITH TOWN ASSISTANCE TO EXISTING LOTS:  
\$32,000 to \$33,300 + MONTHLY BILL

Concept A (50 existing lots + 100 new lots) PER LOT COST WITH TOWN ASSISTANCE TO EXISTING LOTS  
\$23,000 to \$24,400 + MONTHLY BILL

\*\*\*THESE FIGURES COULD INCREASE OVER TIME WITH RISING CONSTRUCTION COSTS;  
OWASA ESTIMATES CONSTRUCTION COSTS COULD INCREASE 8% PER YEAR

# Map 1B Rogers Road Study Area with Possible Road Network Options



2003 Aerial Photograph with  
Orange Co. property lines  
GIS Map prepared by  
Chapel Hill Planning  
December, 2006

- Legend**
- Rogers Rd Study Area
  - Possible Road Network Options

