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**DEVELOPMENT IMPACT ASSESSMENT METHODOLOGY: A CASE STUDY OF THE ROCK CUT ROAD AREA, TOWN OF NEWBURGH, ORANGE COUNTY, NEW YORK**

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DEVELOPMENT IMPACT ASSESSMENT METHODOLOGY:  
A CASE STUDY OF THE ROCK CUT ROAD AREA,  
TOWN OF NEWBURGH, ORANGE COUNTY, NEW YORK

By

John B. Degele

A RESEARCH PROJECT SUBMITTED IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF  
MASTER OF COMMUNITY PLANNING

UNIVERSITY OF RHODE ISLAND  
1990

MASTER OF COMMUNITY PLANNING  
RESEARCH PROJECT  
OF  
JOHN B. DEGELE

Approved:

Major Professor

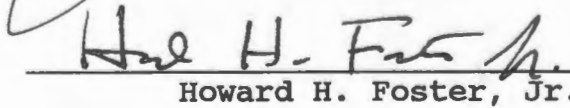


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John J. Kupa

Acknowledged:

Director



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Howard H. Foster, Jr.

## ABSTRACT

This report presents a development impact assessment methodology for an analysis of development possibilities in a rural area. The methodology was used to determine conclusive statements about the Rock Cut Road study area in the Town of Newburgh in Orange County, New York with which to base recommendations for growth management.

The methodology involved (1) the examination of existing conditions of an area such as the degree and type of existing development, zoning limitations, and environmental sensitivities; (2) the development of various development scenarios; (3) the disaggregation of development impacts into several distinct impacts relative to each scenario; (4) the projection of their relative effects on existing conditions; and (5) the comparison of each scenario within the existing conditions. From this is determined a best growth option and finally recommendations to put it into action.

The study considers development impacts within four different scenarios:

- (1) Without municipal sewers (the current practice) under existing zoning;
- (2) Without sewers but under a soil-based zoning concept whereby soil capacities determine adequate minimum lot size;
- (3) With sewer extension to the study area under

existing zoning but dominated by single family detached type units; and,

- (4) With sewer extension under existing zoning but dominated by townhouse type dwelling units.

The analysis shows that opportunities exist for development under each of the four scenarios used in the analysis. Development in three of the scenarios could overburden infrastructure and have an adverse effect on the natural drainage of one of the drainage basins. This was particularly significant in the two sewer development scenarios. Ultimately, the study showed that a more moderate range of development for the study area can best respond to environmental and infrastructure sensitivities.

## PREFACE

This report originated as a supporting document of a larger master plan project undertaken by the Town of Newburgh in Orange County, New York in January of 1989. The impetus for this study was the Town's concern for the possibility of a tremendous increase in density from two proposed large developments; High Ridge, a clustered 304 unit development, the The Commons At Orange Lake, a 509 clustered development. Although the study area is rural (predominate lot size is at least one acre except for a small subdivision fronting Orange Lake), current zoning permits medium density development (2 units per acre) to high density (up to 12 units per acre). The two proposed developments would result in a density of up to 6 units per acre.

The Town of Newburgh in Orange County, New York is currently experiencing significant development pressures in both of its suburban/urban and rural areas. As a result of its newly developed sewer system and the anticipated expansion of its water system, development potential of much of the Town will increase. It is clear that there is a critical need for the Town to take an inventory of existing conditions and to improve its land use policies regarding manageable and timely growth.

The Town of Newburgh, recognizing the importance of managing its growth, entered into a contract with Garling Associates in March of 1989 to develop a master plan for the

Town. This researcher, as part of that firm, was responsible for all studies for the Town regarding the Master plan project. Additionally, smaller area studies were to supplement the master plan. The present Rock Cut Road Area Study is the most significant of these studies.

It must be noted that although Garling Associates was formally responsible to the Town for this study and is mentioned as the primary source of the tables, all research, graphics and analysis was done by this researcher while working with the firm. The one exception was the determination of runoff calculations in the drainage impact chapter of this report. Those figures were graciously provided by the Town Engineer's office, Valdina Consulting Engineers.

A master plan is founded on studies of past, present, and future development conditions. Small area development studies are the basis for master plan goal formulation, analysis and the courses of action. This study is no exception. It is a study intended to address several Town policy issues and to help determine the priorities and courses of action towards growth management.

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**DEVELOPMENT IMPACT ASSESSMENT METHODOLOGY:  
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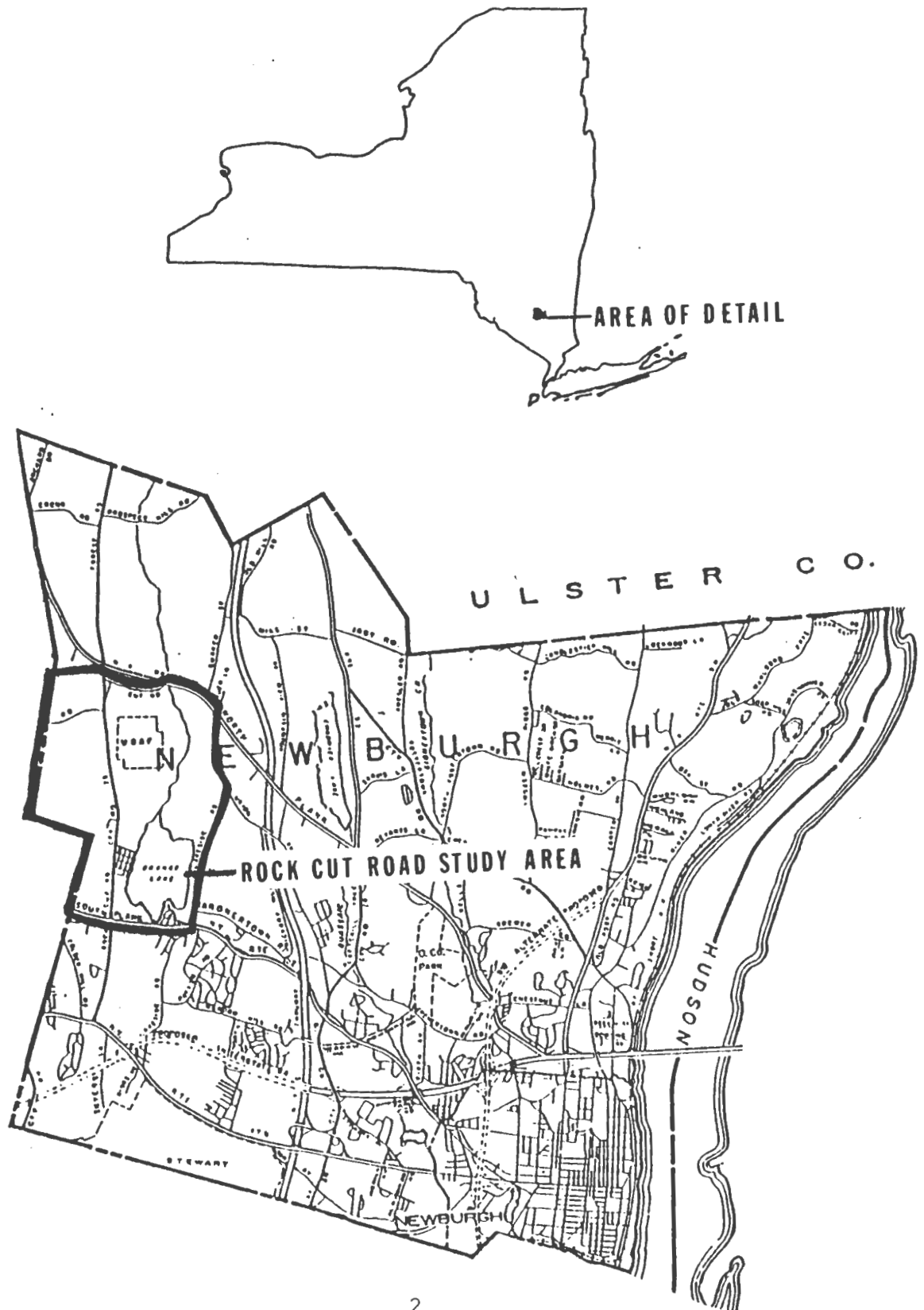
**I. INTRODUCTION**

The Town of Newburgh in Orange County, New York, like nearly every town in Orange County, is currently experiencing significant pressures for development. While open space amounts to over 50 percent of the land area, the more rural areas confront an ever quickening pace of development without a strategy for growth management. Therefore, an imminent need exists for a growth management strategy not only for the Town but especially for the rural areas of the northern and western quadrants.

The following study is an analysis of the impacts from potential development of vacant land in one the larger rural areas in the Town of Newburgh; the Rock Cut Road study area. (see Map 1) The analysis considers existing, proposed, and potential developments throughout the Rock Cut Road study area and attempts to highlight the minimum and maximum development impacts that could realistically be experienced.

The underlying concern for the study is the perceived inadequacy of the current zoning law and subdivision regulations in response to existing conditions of more rapid growth. Last changed in the 1960's, these control measures have been superseded to some extent with the advent of the

MAP 1  
LOCATION OF ROCK CUT ROAD STUDY AREA



New York State environmental regulations (State Environmental Review and the Wetland Regulations) in addition to a 20 percent growth in population, the development of a municipal sewer system, commercial air service at Stewart International Airport, and tremendous growth over the last 5 years.

The problems to be addressed by this study relate to growth management. Present land use controls are inadequate regarding impacts of rapid development on environmentally sensitive lands. The Town needs policies that can guide growth at rates sustainable by the environment and existing infrastructure.

A fundamental goal of the study is to determine and assess the range of impact from potential development on the infrastructure and environment. This is illustrated by four scenarios. The study includes an analysis of existing zoning and implications for rezoning of the area based on findings within this report. The determination of the most appropriate zoning for the study area will likely have tremendous significance not only throughout the study area, but also for the Town as a whole in terms of the preparation of the subsequent master plan.

#### **A. SCOPE AND METHODOLOGY**

Four development scenarios are used throughout the study to provide a range with which to gauge the impacts of the variables on various densities. These scenarios include two with municipal sewer and water services and two without. The

study area is currently unsewered but bordering the Town sewer and water districts. Two developers propose these services to be extended.

Vacant land has been analyzed in this report to determine the potential for development showing both non-sewered and sewer development schemes based on current zoning requirements of the R-2 and R-3 zoning districts as well as a soil-based zoning presently under consideration by the Town Board. Density is also analyzed to determine zoning implications for the master plan given the various development scenarios.

Both of the sewer development scenarios, each with 1,601 units, are possible under current zoning and subdivision regulations. Further, the sewer scenarios examine a mixture of townhouse and single family detached dwelling units. Scenario 1 assumes townhouse development of only the two currently proposed developments (High Ridge and The Commons) while all other development will be single family detached style units. Scenario 2 assumes development will result in primarily townhouse units with far less single family units.

The two unsewered scenarios include development under existing zoning and non-sewered whereby all development would be single family including the two currently proposed projects and a soil-based zoning concept whereby lot size is determined by soil capabilities for septic and well systems.

Methodology for this study will include the examination

of five variables of impact relative to each of the four development scenarios. The variables being examined are:

1. Traffic impacts;
2. Total water and sewer demand;
3. Drainage impact into the Quassaic or Tin Brook Basins;
4. Increase in population and public school age children;
5. Tax implications to the Town and County and to the School and Fire districts.

The analysis also considers the potential for a Critical Environmental Area (CEA) designation and an analysis of current zoning. These impacts will then be compared to determine conclusions and recommendations for action by the Town.

The study will analyze the increased demand on the infrastructure, environment, and the impacts that the increased population will have on the local public school system. Together, the parts will provide a rational basis for concluding which development scenario may be most appropriate for the present and future growth of the study area as well as the Town as a whole. In this sense, the study will help the Town to understand how it can develop the goals for growth management.

## II. EXISTING CONDITIONS

The Rock Cut Road study area encompasses 2,717 acres in the western most portion the Town. Orange Lake accounts for 380 acres of the total study area. Presently, only 20 percent (467 acres), of the land in the study area is developed and only in residential or farming land use. While vacant land comprises the remaining 1,870 acres, only 694 acres (37 percent) of the vacant land is developable.

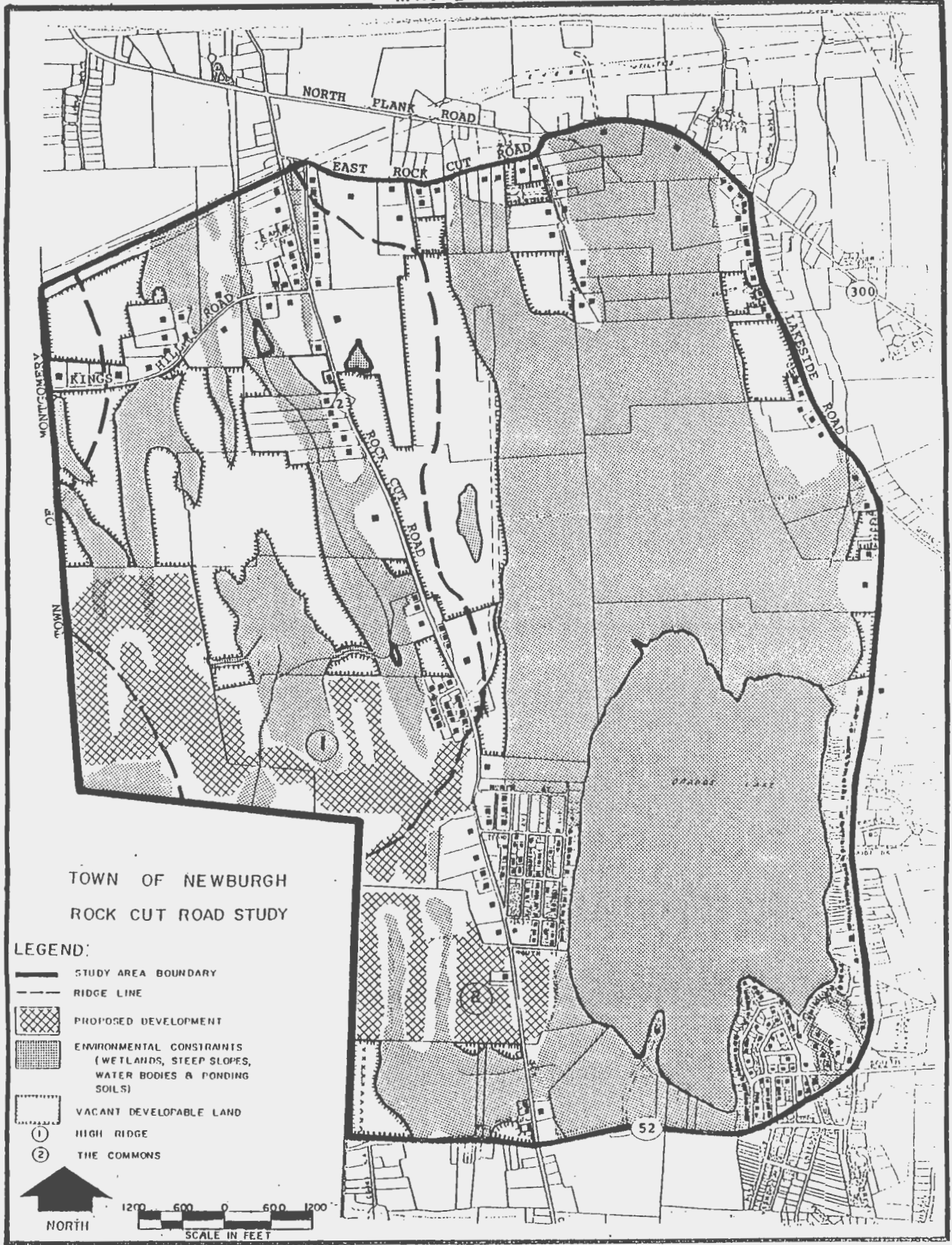
The remaining 1,114 acres are non-developable\* due to environmental constraints including steep slopes (+15 percent), designated wetlands, ponding areas, and poor soil elements. The majority of the vacant developable land (575 acres) is in the R-2 zone while 119 developable acres are in the R-3 zone. (see Map 2) Vacant developable land is defined in this study as totally vacant detached or contiguous lots that could yield at least five dwelling units.

There are four vacant parcels of at least 25 acres in size, other than the two proposed residential developments (High Ridge and The Commons at Orange Lake), that could have significant development impact within the study area. The largest parcel, 137 acres with a 4,000 foot frontage on Rock Cut Road, could yield from 49 to 298 units depending on the availability of municipal sewer service. However, none of

\* Present town zoning and subdivision regulations do not discount for these environmental factors, however, in the determination of number of units per acre.



# MAP 2



the vacant parcels could produce the number of units currently proposed by either the High Ridge (304 units) or The Commons (509 units) development.

The study area is divided by two zoning districts; R-2 and R-3. The southern portion, zoned R-3, requires a minimum lot size of 15,000 square feet while the northern R-2 portion requires a minimum 20,000 square foot lot for residential development. Adjacent lands to the study area have different allowable densities. The lands to the north are zoned AR (Agriculture Residential) requiring a 40,000 square foot lot size, R-2 to the northeastern portion, R-3 to the southeastern and southern areas, and 2 acre zoning to the western side of the study area (in the Town of Montgomery).

Several external trends are influencing growth of the study area evident. Stimulation of growth despite the increasing property values is due to the development of interstate road corridors (Interstate 84 and Interstate 87) is leading to increasing development of distribution and warehousing. Expansion of commercial air service recently at the nearby Stewart International Airport is leading to an increase in number of jobs, demand for housing, traffic, and noise from increasing number of flights. Town contracts with the adjacent City of Newburgh and the City of New York to supply sewer and water services is expected to promote growth of mixed types of housing, business, and industry. The shrinking size of households is expected to reduce the number of school age children for all types of dwelling units

resulting in decreased, or at best, stabilized student populations. Due to consistently favorable cost-benefit analysis results, townhouse structures can be expected to be more prevalent than single family detached residences.

**A. PROJECTION OF TOTAL NUMBER OF UNITS**

As previously stated, developable acreage within the study area amounts to 694 acres. Two developments, High Ridge and The Commons at Orange Lake, have been proposed which would use 267 of the total 694 acres, 174 in the R-2 zone and 93 in the R-3 zone. The remaining vacant potentially developable land consists of 401 acres. Table 1 outlines the acreage and number of units proposed by the two developments.

**TABLE 1**

**NUMBER OF UNITS FROM PROPOSED DEVELOPMENTS**

	<u>Developable Acres*</u>	<u>One Fam. Units</u>	<u>Townhouse Units</u>	<u>Total Units</u>
HIGH RIDGE	192	255	49	304
THE COMMONS	<u>75</u>	<u>-0-</u>	<u>509</u>	<u>509</u>
TOTAL	267	255	558	813

\* This is the acreage set aside for all development including buildings, lots, and roads.

Source: Development plans

As Table 1 demonstrates, the High Ridge project would result in 1.5 units per buildable acre while The Commons would result in 6.8 units per acre. This is in contrast to the current zoning which would allow 2.2 units per acre for

High Ridge and 6 units per acre for The Commons.

Approximately 90 percent of the High Ridge development is in the R-2 zone accounting for 255 single family units. The R-3 zone, which permits townhouse units, accounts for 10 percent of the High Ridge development (49 units) and 100 percent of the proposed The Commons project (509 units) resulting in 558 townhouse units.

Determination of number of units for the study area is based on various density parameters representing current non-sewered and potentially sewerred densities. Table 2 below presents the potential number of dwelling units possible within the entire study area based on current zoning requirements. All non-sewered development is assumed to be single family detached dwellings.

Lot size and subsequent number of units, as suggested by the Soil Conservation Service relative to soil limitations, are also included here and throughout the study to signify the comparative impact for development based upon soil-type zoning. The soil-based development scenario is also non-sewered. For purposes of analysis, completed development, or buildout, of the study area is expected to occur in 20 years.

TABLE 2

TOTAL POTENTIAL NUMBER OF DWELLING UNITS

	Developable <u>Acres</u>	Number of Units		
		<u>w/sewer</u>	<u>w/out sewer</u>	<u>Soil-based</u>
R-2 Zone				
Vacant Land	401*	850	314	173
Prop. Devlpmt	174	255	49	49
R-3 Zone				
Vacant Land	26*	102	56	48
Prop. Devlpmt	<u>93</u>	<u>558</u>	<u>49</u>	<u>49</u>
TOTAL	694	1,765	468	284

\* Represents developable acreage discounted 25% for roads and for lots which, by design, would be larger than the allowable minimum size.

Source: Garling Associates analysis

New York State Department of Health regulations limit the number of residential units to 49 in all unsewered developments. Development of 50 or more dwelling units requires tie-in of all new units to either an existing system or the creation of a new system. All developments of more than 49 units within the study area are assumed to tie-in to the Town of Newburgh's newly constructed Crossroads sewer district.

As shown in Table 3 above, the 427 net developable acres plus High Ridge and The Commons developments could yield up to 1,765 units, or 2.5 units per acre, if sewers were extended to the study area. These units are expected to be a combination of single family and townhouse units. A maximum allowable density of six units per acre on lots of at least ten acres would be expected in the R-3 zone if municipal sewer were to become available.

The number of townhouses, via clustering, could reach 686 in the R-2 zone while 639 could be generated in the R-3 zone (allowed by site plan review). These 1,325 units would account for 75 percent of the total units within the study area.

If single family detached units dominate development of the study area and the only townhouse developments were the two that are currently proposed, the number of townhouses would be held to 558 while the number of single family units would approach 1,207 units. On the other hand, if townhouse development dominates, 1,325 townhouse units and only 440 single family units would be the likely result.

If sewers were not extended to within the study area, existing zoning would permit a total of 468 units, a quarter of the number in a sewerred scenario, which would all be single family detached units on a minimum lot size of 1.5 acres. A soil-based zoning scenario would permit only 284 units resulting in a density of one unit per 2.5 acres.

### III. TRAFFIC IMPACT

Six existing roads within the study area will experience increased traffic levels as a result of new residential development. Traffic impacts from large developments within the study area are expected to be greatest on the collector roads, Rock Cut Road (County Route 23) and N.Y. State Route 52. Rock Cut Road leads directly to U.S. Interstate 95 while Route 52 provides the only direct access to the commercial areas of the Town of Newburgh from the western portion of the Town. Roads of secondary importance are local roads; North Plank Road (N.Y. State Route 300), Lakeside Road, Kings Hill Road, and East Rock Cut Road.

Rock Cut Road is expected to experience tremendous traffic impacts from any large development fronting the Road. Presently, there are 364 residential units within the study area. Rock Cut Road services 128 of these units directly or indirectly, for example, the Orange Lake West subdivision, bordered by North Street and South Street which both intersect Rock Cut Road.

It is estimated that 664 usable vacant acres would use Rock Cut Road as a primary access route. The vacant developable parcels that would have direct frontage on Rock Cut Road include the proposed High Ridge and The Commons projects, the 149 acre parcel on the eastern side of the road, and four smaller parcels. Three parcels totalling 178 usable acres would also be expected to use Rock Cut Road as

an access to N.Y. State Route 52.

Four scenarios are analyzed in order to provide a description of traffic impact that various housing types and densities may be expected to generate. The two proposed developments, High Ridge and The Commons, are include as proposed in the sewerer sewerer development scenarios. In the non-sewered scenarios, these two parcels will reflect single family detached dwelling units with reduced density. A twenty year period of total expected buildout, 1990 to 2010, will be the point of analysis for maximum traffic impact.

#### A. TRAFFIC GENERATION

In order to determine the impact on the traffic levels along Rock Cut Road that the development scenarios might generate, the following multipliers in Table 4 were used to determine the number of daily trips and peak hour rates per unit type.

TABLE 3

#### TRIP GENERATION RATES

<u>Unit Type</u>	<u>Aver. Annual Daily Trips*</u>	<u>Total Aver. AM Peak Hour</u>	<u>Total Aver. PM Peak Hour</u>
Single Family	10	.76	1.0
Townhouse	5.2	.41	.51

\* A trip is one vehicular movement; i.e., from a home to a store or school, the return movement is a second trip; thus a round trip from home to store and back is considered two trips.

Source: Trip Generation, 3rd ed., Institute of Transportation Engineers (ITE).



There is a considerable range in traffic generation from the various development scenarios. As Table 4 below demonstrates, the average annual daily traffic (AADT) level from predominately townhouse development is considerably less than single family units in a sewerred development scenario, approximately 32 percent less. This is still 220 percent greater than a non-sewerred scenario and 427 percent greater than the soil based scenario.

TABLE 4

PROJECTED TRAFFIC GENERATION FROM BUILDOUT OF VACANT LAND

<u>Unit Type</u>	<u>Number</u>	<u>AADT*</u>	<u>AM Peak Hour</u>	<u>PM Peak Hour</u>
1. <u>Sewered - 1,043 Single Fam. &amp; 558 Townhouse</u>				
Single Fam.	1,207	12,070	917	1,207
Townhouse	558	2,902	229	285
TOTAL	1,765	14,972	1,146	1,492
2. <u>Sewered - 1,244 Townhouse &amp; 357 Single Fam.</u>				
Single Fam.	440	4,400	334	440
Townhouse	1,325	6,890	543	676
TOTAL	1,765	11,290	877	1,116
3. <u>Non-Sewered - 367 Single Fam.</u>				
Single Fam. (No townhouses)	468	4,468	356	468
4. <u>Non-Sewered/Soil-based - 253 Single Fam.**</u>				
Single Fam. (No townhouses)	284	2,840	216	284

\* AADT volume based upon the average of a seven day count.

\*\* Lot size based on soil limitations.

Source: Garling Associates analysis

The highest expected generator for the study area would be the total completion and occupancy of 1,207 single family units and 558 townhouse units provided with central sewer service. The expected AADT increase, 14,508 vehicles, on Rock Cut Road represents an increase of 159 percent over the 5,606 vehicles anticipated to be generated on an average weekday on Rock Cut Road at a point north of N.Y. State Route 52 in the year 2010. Kings Hill Road could experience a tremendous increase in traffic volume. The projected 144 to 388 units would generate an AADT volume ranging from 1,440 to 3,880 vehicles.

The lowest increase in traffic would occur if the study area were to develop under a soil limitation based concept without central sewer service. In such an event the total increased AADT volume would be 2,840 vehicles with 2,530 vehicles assignable to Rock Cut Road for a 45 percent increase over the projection of existing levels of traffic.

#### **B. TRIP DISTRIBUTION**

In determining directional distribution rates of all proposed and potential development within the study area, the rates are assumed to be substantially the same as those of existing developments. Current average annual daily traffic counts are projected 20 years to the year 2010 for existing development, as shown below in Table 5, and represent a scenario of no development within the boundaries of the study area. These locations represent the direct and approach

areas affected by development. The use of a 2 percent annual growth rate for existing levels of traffic was suggested by the N.Y. State Department of Transportation.

**TABLE 5**  
**GROWTH PROJECTION OF EXISTING AADT VOLUME**  
**ON ROCK CUT ROAD**

<u>Location</u>	<u>Current AADT</u>	<u>Year 2010 AADT</u>
Rt. 52/Rock Cut Road	5,550 (1987)	8,580
300' North of Rt. 52	3,699 (1988)	5,606
300' South of Rt. 52	4,120 (1988)	6,369
300' South of Rt. 300	2,486 (1983)	4,160

Source: Current figures are from N.Y. State Department of Transportation; 2010 figures are Garling Associates analysis.

Table 6 below illustrates total future trip distribution by existing together with future potential development on Kings Hill Road, East Rock Cut Road, and Rock Cut Road. It is assumed that these developments will use Rock Cut Road for access to N.Y. State Route 52. The other potential developments within the study area are anticipated to use Lakeside Road or N.Y. State Route 52 directly. The distribution is based on existing PM peak hour distribution found in the High Ridge draft environmental impact statement (DEIS) which indicated that 95 percent of all traffic on Rock Cut Road travels south to N.Y. State Route 52. Of this level, 40 percent turns on N.Y. State Route 52 while 60 percent continues south on Rock Cut Road.

TABLE 6

TRIP DISTRIBUTION: 20 YEAR PROJECTION  
FOR DEVELOPMENTS EXPECTED TO USE ROCK CUT ROAD  
- 4 DEVELOPMENT SCENARIOS -

1. Sewered - 1,043 Single Fam. & 558 Townhouse

Location on Rock Cut Road	2010 AADT			TOTAL	% Inc.**
	Exist.Dev.*	+	Pot.Dev.=		
Intersection w/Rt.52	8,580	+	12,665	= 21,245	148%
300' North of Rt.52	5,606	+	12,665	= 18,271	226%
300' South of Rt.52	6,369	+	7,599	= 13,968	119%
300' South of Rt.300	4,160	+	667	= 4,827	16%

2. Sewered - 1,244 Townhouse & 357 Single Fam.

Location on Rock Cut Road	2010 AADT			TOTAL	% Inc.**
	Exist.Dev.*	+	Pot.Dev.=		
Intersection w/Rt.52	8,580	+	9,536	= 18,116	111%
300' North of Rt.52	5,606	+	9,536	= 15,142	170%
300' South of Rt.52	6,369	+	5,722	= 12,091	90%
300' South of Rt.300	4,160	+	502	= 4,662	12%

3. Non-sewered - 367 Single Fam.

Location on Rock Cut Road	2010 AADT			TOTAL	% Inc.**
	Exist.Dev.*	+	Pot.Dev.=		
Intersection w/Rt.52	8,580	+	3,486	= 12,066	41%
300' North of Rt.52	5,606	+	3,486	= 9,092	62%
300' South of Rt.52	6,369	+	2,092	= 8,461	33%
300' South of Rt.300	4,160	+	183	= 4,343	4%

4. Non-sewered/Soil based - 253 Single Fam.

Location on Rock Cut Road	2010 AADT			TOTAL	% Inc.**
	Exist.Dev.*	+	Pot.Dev.=		
Intersection w/Rt.52	8,580	+	2,403	= 10,983	28%
300' North of Rt.52	5,606	+	2,403	= 8,009	43%
300' South of Rt.52	6,369	+	1,442	= 7,811	23%
300' South of Rt.300	4,160	+	126	= 4,286	3%

\* Refers to existing level plus 2% annual increase to the year 2010.

\*\* Increase of development scenario over non-development scenario.

Source: Garling Associates analysis

Significant traffic increases are evident along the southern portion of Rock Cut Road within the study area. The most significant increase in traffic evident in all of the scenarios would occur along Rock Cut Road 300 feet north of the intersection with N.Y. State Route 52 as well as at the intersection of Rock Cut Road and Route 52. These levels are especially pronounced in the two sewer scenarios which would experience an increase of between 170 percent to 226 percent just north of Route 52 and between 111 percent to 148 percent at the intersection. If single family units predominate development and sewers are extended to the study area, the increase in daily traffic levels at the intersection of Rock Cut Road and Route 52 would be 76 percent more than the level projected for development under existing conditions. Further, the degree of increase would be twice as much at the point 300 feet north of the intersection given these conditions.

With sewer service to predominately townhouse development, the AADT at the intersection of Rock Cut Road and Route 52 would increase 111 percent over a no-growth scenario, 50 percent over a non-sewered scenario, and 65 percent over a soil-based scenario. The greatest increase at this intersection, 148 percent, would result from development of predominately single family detached dwelling units provided with central sewer service.

The substantially reduced number of units resulting from the non-sewered scenarios reflect the greatly reduced AADT

levels at all points along Rock Cut Road. While in the sewerred scenarios most locations would experience greater than a 100 percent increase in traffic volumes, the greatest increase is only 62 percent in the non-sewerred scenarios. Moreover, the increases from existing levels would outpace the increases generated by new development.

### C. PEAK HOUR VOLUMES

The PM peak hour volume on the segment of Rock Cut Road between Route 52 and Route 300 (which is essentially the entire length within the study area) is approximately 14 percent greater than the AM peak. However, surges in peak hour volumes are most evident at the intersection of Rock Cut Road and Route 52. The AM and PM peak hour volumes account for 15 percent and 18 percent of the AADT of this intersection respectively. Significantly, the PM peak hour volume shows much greater surges (25 percent) than the AM peak hour volume at the intersection of Rock Cut Road and Route 52 while the AM peak hour volume is substantially greater (75 percent) than the PM peak hour volume at the point 300 feet south of Route 300 and 86 percent more than the PM peak hour volume at 300 feet south of Route 52.

The peak hour volumes at the other three locations range from 3 percent to 9 percent of their respective AADT volumes. The PM peak hour volume at the point 300 feet north of Route 52 is slightly greater than the AM peak hour volume by only 7 percent. The AM peak hour volumes are far greater than the

PM peak hour volumes on Rock Cut Road at the point 300 feet south of Route 52 and 300 feet south of Route 300.

Projections of traffic assignment from the High Ridge Development draft environmental impact statement (DEIS), illustrated in Table 7 below, show that 95 percent of the PM peak hour traffic volume from existing development along Rock Cut Road travels south to Route 52 while 80 percent heads to the same intersection during the AM peak hour. These observations will be used for the projection of peak hour volumes from proposed and potential developments within the study area.

TABLE 7

20 YEAR PROJECTION OF PEAK HOUR VOLUMES  
EXISTING DEVELOPMENT

<u>Location on Rock Cut Road</u>	<u>Existing AM Peak</u>	<u>2010 AM Peak*</u>	<u>Existing PM Peak</u>	<u>2010 PM Peak*</u>
Intersection w/Rt.52	833	1,238	1,036	1,539
300' North of Rt.52	314	466	336	499
300' South of Rt.52	226	335	121	180
300' South of Rt.300	199	296	114	169

\* These figures assume a 2% annual growth rate.

Source: Existing are from High Ridge DEIS and The Commons DEIS; 2010 are from Garling Associates analysis.

Projections of total AM and PM peak hour volumes that could be expected to occur along Rock Cut Road from both existing development in addition to buildout of the vacant developable land within the study area are depicted on Tables 8 and 9 below.

TABLE 8

TOTAL AM PEAK HOUR VOLUMES FOR ROCK CUT ROAD  
- 20 YEAR PROJECTION OF 4 DEVELOPMENT SCENARIOS -

1. Sewered - 1,043 Single Fam. & 558 Townhouse

Location on Rock Cut Road	2010 AM Peak			TOTAL	% Inc.**
	Exist.Dev.*	+ Pot.Dev.	=		
Intersection w/Rt.52	1,238	+ 973	=	2,211	79%
300' North of Rt.52	466	+ 973	=	1,439	209%
300' South of Rt.52	335	+ 681	=	1,016	203%
300' South of Rt.300	296	+ 320	=	616	108%

2. Sewered - 1,244 Townhouse & 357 Single Fam.

Location on Rock Cut Road	2010 AM Peak			TOTAL	% Inc.**
	Exist.Dev.*	+ Pot.Dev.	=		
Intersection w/Rt.52	1,238	+ 624	=	1,862	50%
300' North of Rt.52	466	+ 624	=	1,090	134%
300' South of Rt.52	335	+ 437	=	792	136%
300' South of Rt.300	296	+ 156	=	452	53%

3. Non-Sewered - 367 Single Fam.

Location on Rock Cut Road	2010 AM Peak			TOTAL	% Inc.**
	Exist.Dev.*	+ Pot.Dev.	=		
Intersection w/Rt.52	1,238	+ 223	=	1,461	18%
300' North of Rt.52	466	+ 223	=	689	48%
300' South of Rt.52	335	+ 156	=	491	47%
300' South of Rt.300	296	+ 56	=	352	19%

4. Non-Sewered/Soil-based - 253 Single Fam.

Location on Rock Cut Road	2010 AM Peak			TOTAL	% Inc.**
	Exist.Dev.*	+ Pot.Dev.	=		
Intersection w/Rt.52	1,238	+ 154	=	1,392	12%
300' North of Rt.52	466	+ 154	=	620	33%
300' South of Rt.52	335	+ 108	=	443	32%
300' South of Rt.300	296	+ 38	=	334	13%

\* Refers to existing level plus 2% annual increase to the year 2010.

\*\* Increase of development scenario over non-development scenario.

Source: Garling Associates analysis



TABLE 9

TOTAL PM PEAK HOUR VOLUMES FOR ROCK CUT ROAD  
- 20 YEAR PROJECTION OF 4 DEVELOPMENT SCENARIOS -

1. Sewered - 1,043 Single Fam. & 558 Townhouse

<u>Location on Rock Cut Road</u>	2010 PM Peak			<u>TOTAL</u>	<u>% Inc.**</u>
	<u>Exist.Dev.*</u>	<u>+ Pot.Dev.</u>	<u>=</u>		
Intersection w/Rt.52	1,238	+	1,521	= 2,759	123%
300' North of Rt.52	466	+	1,521	= 1,987	326%
300' South of Rt.52	335	+	913	= 1,248	272%
300' South of Rt.300	296	+	80	= 376	27%

2. Sewered - 1,244 Townhouse & 357 Single Fam.

<u>Location on Rock Cut Road</u>	2010 PM Peak			<u>TOTAL</u>	<u>% Inc.**</u>
	<u>Exist.Dev.*</u>	<u>+ Pot.Dev.</u>	<u>=</u>		
Intersection w/Rt.52	1,238	+	742	= 1,980	60%
300' North of RT.52	466	+	742	= 1,208	159%
300' South of RT.52	335	+	445	= 780	133%
300' South of Rt.300	296	+	39	= 335	13%

3. Non-Sewered - 367 Single Fam.

<u>Location on Rock Cut Road</u>	2010 PM Peak			<u>TOTAL</u>	<u>% Inc.**</u>
	<u>Exist.Dev.*</u>	<u>+ Pot.Dev.</u>	<u>=</u>		
Intersection w/Rt.52	1,238	+	349	= 1,587	28%
300' North of Rt.52	466	+	349	= 815	75%
300' South of RT.52	335	+	209	= 544	62%
300' South of Rt.300	296	+	18	= 314	6%

4. Non-Sewered/Soil-based - 253 Single Fam.

<u>Location on Rock Cut Road</u>	2010 PM Peak			<u>TOTAL</u>	<u>% Inc.**</u>
	<u>Exist.Dev.*</u>	<u>+ Pot.Dev.</u>	<u>=</u>		
Intersection w/Rt.52	1,238	+	240	= 1,478	19%
300' North of Rt.52	466	+	240	= 706	51%
300' South of Rt.52	335	+	144	= 479	43%
300' South of Rt.300	296	+	13	= 309	4%

\* Refers of existing level plus 2% annual increase to the year 2010.

\*\* Increase of development scenario over non-development scenario.

Source: Garling Associates analysis

By a wide margin, single family detached units generate the most traffic. This is partially explained by the typical family profile associated with this type of dwelling unit; larger families with more school-aged children. Sewered development of primarily singler family units would generate 338 percent more vehicles at both the point 300 feet north of Route 52 and at the intersection of Rock Cut Road and Route 52 during both peak hours than the non-sewered development of only single family units. If sewerred development were to be mostly townhouse units, the increase over non-sewerred development would be only 61 percent for the AM peak hour and 114 percent greater during the PM peak hour. The greatest increase in peak hour volumes in all scenarios is expected to be at the point 300 feet north of Route 52 particularly during the PM peak hour.

#### D. LEVEL OF SERVICE

Level of service (LOS) is an averaged value reflecting traffic conditions and driver satisfaction with a number of factors that influence the degree of traffic congestion. Six levels of service to describe traffic flow conditions are widely used. The six levels are:

LOS A: The highest level, describes a condition of free flow with low volumes and little or no delay;

LOS B: Affords above average conditions, stable traffic flow;

- LOS C: Measure of average condition, movements are somewhat restricted due to higher volumes;
- LOS D: Acceptable during short periods of time, queues and delays may occur during short peaks;
- LOS E: Represents actual capacity, delay to all motorists at peak hours, very long queues;
- LOS F: Complete congestion, volume exceeds capacity.

Volume to capacity ratios ( $v/c$ ) are used to indicate the level of service and vary according to road type. The level of service (LOS) C volume for a two-lane two-way highway, without signals, for both directions totals 1,400 cars per hour according to the Highway Capacity Manual from the Highway Research Board dated 1965. Both Route 52 and Rock Cut Road fall into this category. The LOS E volume for this type of roadway is represented by approximately 2,000 vehicles per hour in both directions. A base volume to capacity ratio ( $v/c$ ) of 1.00 in this analysis represents LOS E, or the theoretical capacity.

Route 52, a major arterial for the study area, has substantial remaining capacity to handle traffic from increased development within the study area. From Rock Cut Road to the western border with the Town of Montgomery, Route 52 has a  $v/c$  ratio of .3, according to the New York State Department of Transportation's Highway Sufficiency Ratings, dated 1988. In other words, the rated capacity of this section of Route 52 is approximately three times the level of the design hour traffic volume (the largest hourly volume

experienced on a typical day) and suggests that congestion along this roadway segment is one third the level as would be found if operating at capacity (LOS E). For the segment east of Rock Cut Road, the v/c ratio is .5 based on 1987 figures indicating that congestion is approximately half of what it would be while operating at full volume capacity.

Existing levels of service, computed in 1987 for the High Ridge DEIS, depict the following conditions in Table 10.

**TABLE 10**  
**LEVELS OF SERVICE FOR ROCK CUT ROAD**

<u>Location</u>	<u>Segment</u>	<u>Level Of Service</u>	
		<u>AM Peak Hr</u>	<u>PM Peak Hr</u>
Rock Cut Road	Between High Ridge and Route 52	C	C
Rock Cut Road/ Route 52	EB Left turn	A	A
	WB Left turn	A	A
	NB All mvtments*	B	E
	SB All mvtments*	D	E

\* Refers to travel from Rock Cut Road onto or across Route 52.

Source: High Ridge DEIS, May 1988.

The level of service along Route 52 is one of free flow even during peak hour. A level of service A exists for this segment. Both turns from Route 52 onto Rock Cut Road show a condition of free flow (LOS A) during both peak hours. This supports the existing low v/c ratio of between .3 and .5.

The southern portion of Rock Cut Road within the study area, on the other hand, operates at a level of service of no greater than C during peak hour traffic. During both peak

hours, the segment of Rock Cut Road between the proposed High Ridge development and Route 52 operates at a LOS C. Turning onto Route 52 from Rock Cut Road is difficult especially during PM peak hours. The volume of turning movements from Rock Cut Road onto Route 52 deteriorates to LOS D during AM peak hour and reaches capacity level (LOS E) during evening peak hour traffic. Similarly, a LOS E occurs during PM peak hour for all traffic crossing or turning onto Route 52 from Rock Cut Road. This suggests that for all development under current zoning, the full signalization plus four or five lanes and left turn lanes at the intersection could be anticipated.

#### IV. SEWER AND WATER DEMAND

Currently there are no municipal sewer or water services within the study area except for a small portion of the Orange Lake East subdivision located on the eastern shore of Orange Lake. This area is in the Consolidated Water District but has no sewer service. That subdivision is under consideration by the Town of Newburgh for tie into the Town's Crossroads Sewer District.

However, extension of the sewer and water districts to the study area is under consideration by the Town Board. If sewers were extended, buildout of the study area could generate up to 1,765 dwelling units. In addition to these potential dwellings, it is also estimated that 70 additional existing residences in the study area would tie into such services over the next twenty years.

As a result, the daily sewer and water demands, based on the 200 to 250 gallons per day per household estimated by the New York State Department of Environmental Conservation, would range from 353,000 to 441,250 gallons per day based upon full development with a mix of housing types over the next 20 years. (The level of demand on the sewer system is assumed to generally equal the demand level on the municipal water system.) Additionally, an average infiltration and inflow rate of 20 percent would generate an additional 70,600 to 88,250 gallons per day into the sewer system. The demand on the sewer system would then range from 423,600 to 529,500

gallons per day.

As previously stated, there is no municipal sewer or water systems within the vast majority of the study area. Existing dwellings, concentrated primarily around Orange Lake, rely on individual well and septic systems. A water quality test of sample wells in the Orange Lake West subdivision, undertaken in 1988 by the office of the Town Building Inspector, indicated that septic system failure is a significant problem for the area. The test results of none wells showed six wells had water below adequate sanitary quality due to an overabundance of fecal coliform, two wells had adequate water but were treated with chlorine and/or ultraviolet disinfection, and one well, located on a large lot, had adequate water quality. That subdivision, previously summer residences only, currently has 72 dwelling units on a total of 53.4 acres for an average of one dwelling unit per .74 acres, each dwelling unit with its own well and septic system. In addition to the residential lots, there are 168 vacant lots in assorted sizes within that same 53.4 acres that serve to lower actual density.

## V. DRAINAGE IMPACT

Runoff within the study area affects the Tin Brook tributary and the Quassaic Creek drainage basins. Within the study area, the total gross acreage draining into the Tin Brook basin is approximately 810 acres while nearly 1,255 acres empty into the Quassaic basin.

Together the two basins within the study area offer 694 vacant usable acres discounting wetlands, floodplains, ponding areas, and steep slopes. The Tin Brook basin has a development potential of 437 buildable acres within the study area that could generate 236 to 818 dwelling units. Approximately 15 acres are inaccessible and are considered non-usable. The Quassaic basin has a development potential of 257 buildable acres that could yield 232 to 947 dwelling units.

These two drainage basins are to some degree bisected by town zoning districts R-2 and R-3. Approximately one half of the total R-2 zoned land, 473 acres, drains into the Tin Brook basin while the other portion drains into the Quassaic basin. In terms of zoning, the R-2 district, with a total potential of 575 developable acres, has a buildout potential of from 363 to 1,105 dwelling units given the availability of municipal sewers. Of these 1,105 units, 788 would be located in the Tin Brook basin while 317 would be in the Quassaic basin.

All 810 acres of the R-3 zoned land within the study



area, of which 119 are vacant developable acres, drain into the Quassaic basin. The potential number of units would range from 105 to 660 depending on the extension of municipal sewers to the area. Although 10 percent of the High Ridge project would normally drain into the Quassaic basin, the developers propose to direct drainage from this area to the Tin Brook basin.

The following table shows potential runoff in cubic feet per second (cfs) and percent increases to the existing levels of runoff in the two drainage basins within the study area. Runoff is determined assuming buildout with maximum density (1,765 units with sewer service) and under existing zoning and infrastructure conditions (468 units with no sewers). The soil based development scenario is not analyzed here since drainage impact from that scenario would be very insignificant. For analysis, it is assumed that half of the units in developments bisected by a ridge line would fall on each side of the ridge line.

TABLE 11

## DRAINAGE IMPACT FROM TOTAL BUILDOUT OF VACANT LAND

<u>Drainage Basin/Zone</u>	<u>Acreage Total/Undev.*</u>	<u>No.of D.U.s**</u>	<u>Runoff*** Pre-dev./Post-dev.</u>	<u>% Inc.</u>
<u>With Sewer Service</u>				
Tin Brook R-2	810/437	818	1,076 cfs/1,277 cfs	18.7%
Quassaic R-2/R-3	1,255/257	947	2,525 cfs/2,561 cfs	1.5%
<u>Without Sewer Service</u>				
Tin Brook R-2	810/437	236	1,076 cfs/1,129 cfs	4.9%
Quassaic R-2/R-3	1,255/257	232	2,525 cfs/2,533 cfs	0.3%

\* Undev. acreage is dicounted by steep slopes, floodplains, ponding areas, and wetlands.

\*\* Includes proposed and potential developments.

\*\*\* Figures were determined by the Town Engineers office using the Soil Conservation Service Technical Release TR-55, Urban Hydrology for Small Watersheds, June 1986. Figures represent the high level of the range for a storm frequency of 50 years.

Source: Garling Associates analysis

As indicated in Table 11, the level of runoff from the development of vacant land in the Quassaic drainage basin would have an insignificant, if any, adverse impact on the Quassaic drainage basin. Even with the maximum buildout with municipal sewer service, the net increase of runoff would only amount 1.5 percent for the drainage basin. This is underscored by the fact that the runoff from this area would peak well in advance of the rest of the Quassaic basin

discharge.

Relative to on-site impacts, the 257 developable acres in the Quassaic basin have a predevelopment runoff level of 163 cfs and post development peak discharge of 200 cfs, a 22 percent increase. Although the on-site increase is 22 percent, the 36 cfs would increase the entire basin runoff by only 0.3 percent to 1.5 percent.

Without mitigation measures, runoff from development in the Tin Brook basin could be a significant problem not only for the immediate area but for all areas down stream. The increase in runoff would range from 4.9 percent to 18.7 percent depending on density levels.

Drainage concerns for the study area are the limitation of runoff and the ability to convey runoff, for example, transporting the runoff from The Commons project on the west side of Rock Cut Road to Orange Lake. Retention and detention measures, particularly for development in the Tin Brook basin, are necessary to maintain the zero increase runoff policy of the Town of Newburgh's Planning Board for a design storm of 50 years.

This section of the report was prepared based upon information supplied by Valdina Consulting Engineers who act as the Town Engineers for the Town of Newburgh.

## VI. POPULATION AND PUBLIC SCHOOL-AGE CHILDREN IMPACTS

### A. POPULATION

Development of the study area could result in a wide range of demographic impacts relative to availability of municipal sewers and type of dwelling unit. Extension of municipal sewer service would not only result in an increase in the gross number of dwelling units but a greater residential mix would likely result; in other words, townhouse and single family detached dwelling units. A larger proportion of elderly and young unmarried persons traditionally settle in townhouse rather than single family dwelling units. Additionally, household size and number of children are, on the average, relatively smaller in townhouse units resulting in less demand on the school system.

Increases to the population level of the study area resulting from total buildout would range from 1,584 persons for non-sewered development of the area to 5,446 persons if sewerred and predominately (68 percent) single family detached dwelling units. Sewered development of mostly townhouse units (75 percent) would produce 4,723 people, or 15 percent less than single family dominated development.

Differences in the number of public school children generated from the four scenarios would range from 240 public school children from soil based development, to 396 children if developed as non-sewered with current zoning densities, to 880 children for the sewerred development of predominately

townhouse units, and to 1,236 children if sewerred and mostly single family detached units. These differences are outlined in Table 12 below. If townhouse units dominate development of the study area, the number of units will increase by 277 percent over non-sewerred development but the number of public school aged children would increase by only 120 percent. Conversely, if single family units dominate the developments in the area, there could be a 212 percent increase in the number of school aged children. By comparison, if all of the projected 1,765 units in a sewerred scenario were to be single family units, the resulting growth in population would be 5,973 additional people including 1,495 school aged children. In all scenarios, impact on the Kindergarden (K) through 6th grades are expected to be greatest while the high school grades (10th through 12th) would be expected to experience the smallest increase.

TABLE 12

DEMOGRAPHIC PROJECTIONS\* OF DEVELOPMENT OF VACANT LAND  
- 4 DEVELOPMENT SCENARIOS -

	<u>Population</u>	<u>Total Sch.Age Child.</u>	<u>K-6</u>	<u>J.High School</u>	<u>High School</u>
1. <u>Sewered - 1,207 Single Fam. &amp; 558 Townhouse</u>	5,446	1,236	771	267	198
2. <u>Sewered - 1,325 Townhouse &amp; 440 Single Fam.</u>	4,723	880	540	197	142
3. <u>Non-Sewered - 468 Single Fam.</u>	1,584	396	249	84	63
4. <u>Non-Sewered/Soil-based - 284 Single Fam.</u>	961	240	151	51	38

\* Demographic multipliers are derived from the 1980 Census of Population and Housing as found in The New Practitioner's Guide to Fiscal Impact Analysis by Burchell, Listokin, and Dolphin dated 1986 and represent a blended number of bedrooms per unit.

Source: Garling Associates analysis

B. SCHOOL AGE CHILDREN IMPACTS

Students within the study area are serviced by two school districts, the Wallkill Central School District and the Valley Central School District. Currently private schools account for 5 percent of total school enrollment in both districts.

## 1. Valley Central School District

The Valley Central School District has five elementary schools, one middle school, and one high school. The middle school is presently at or above the rated capacity of 1,274 students. This school would not be able to handle any increase from the potential developments within the Rock Cut Road Study Area. This is underscored by any development within the school district outside of the study area. The high school, on the other hand, has an existing remaining capacity for 65 percent more students (549). This suggests a tremendous potential for shifting grades between these two schools to accommodate overcrowding in the middle school.

Since 1975, enrollment in the K through 12th grades has remained fairly constant but with a minimal 3.7 percent decrease in student population. Despite this decrease, enrollment projections by the Valley Central School District show increases to elementary grades of 13.5 percent, middle grades by 30.5 percent, and to the high school by 20.3 percent.

The parcels that would noticeably impact the Valley Central School District are the proposed The Commons project, an 18 acre vacant parcel, and an 8 acre vacant parcel. The number of school age children from these parcels could range from 50 to 493 as shown in Table 13 below.

TABLE 13

INCREASES TO PUBLIC SCHOOL ENROLLMENTS  
VALLEY CENTRAL SCHOOL DISTRICT

	With Sewer (Predominately)		Without Sewer	
	<u>S.Fam.</u>	<u>Townhouse</u>	<u>S.Fam.</u>	<u>Soil Based</u>
K-6	325	148	56	32
J.High Sch.	111	56	19	12
High Sch.	<u>83</u>	<u>40</u>	<u>14</u>	<u>9</u>
TOTAL	519	244	89	53
Private Sch.	26	12	4	3

Source: Garling Associates analysis

The East Coldenham Elementary School (K-5) would experience the greatest increase in school population in all development scenarios. The current rated capacity (594) would allow an increase of 40 percent in further enrollment. The acreage of this school site (48 acres) could provide necessary room for expansion.

2. Wallkill Central School District

The Wallkill Central School District would be hardest hit by development within the study area. The vast majority of the study area lies within this school district. The Leptondale Elementary School (K-5), located in the Town of Newburgh, was at 93 percent of functional capacity in 1988. The middle school and high school were also close to functional capacities, 96 percent and 97 percent respectively. Actual enrollment in 1988, 2,601 students for



the entire five schools in the District, reached approximately 90 percent of the total functional capacity of the district, 2,914 students.

Since 1975, enrollment for the district (K-12) has remained stable except with a 28 percent increase in the middle school population. Enrollment projections to 1991 by the school district show increase to elementary grades (17 percent), middle grades (33 percent), and high school (8 percent). This district, like the Valley Central School District, faces the greatest increases in the middle school.

Buildout of vacant land lying within this school district could generate 187 to 717 new school aged children into the school district as outlined in Table 14 below. Development of this portion of the study area under existing conditions would effectively put the school district at maximum functional capacity by adding 307 new students. If this area were provided with sewers, buildout would bring the student population of the district from 11 percent to 14 percent over the functional capacity of the district. However, if this were to occur, it would be expected to occur over at least 20 years.

TABLE 14

INCREASES TO PUBLIC SCHOOL ENROLLMENTS  
WALLKILL CENTRAL SCHOOL DISTRICT

	With Sewer (Predominately)		Without Sewer	
	<u>S.Fam.</u>	<u>Townhouse</u>	<u>S.Fam.</u>	<u>Soil Based</u>
K-6	446	392	193	119
J.High Sch.	156	141	65	39
High Sch.	<u>115</u>	<u>102</u>	<u>49</u>	<u>29</u>
TOTAL	717	635	307	187
Private Sch.	36	32	15	9

Source: Garling Associates analysis

The calculated increases of the number of school age children may in reality be less than projected since several studies show local multipliers for new housing to be smaller than widely used regional multipliers. Studies done by the Orange County Planning Department consistently show local multipliers for new housing to be smaller than regional figures. Further, growth studies done in 1987 for the Valley Central School District and the Tuxedo Union Free School District, also located in Orange County, show that between 1979 and 1986 a decrease in school population was correlated with an increase in the number of single family housing units. Additionally, demographic analysis by Burchell and Listoken suggest that there is a trend toward smaller household size. Thus, while new dwelling units are added, the average existing household and school aged children numbers per existing household decrease.

VII. REAL PROPERTY TAX IMPACTS

Presently, residential land use accounts for 29 percent of the total real property tax generated in the Town of Newburgh, according to the Tax Assessor. The current tax structure for property in the Rock Cut Road study area is shown in Table 15 below.

TABLE 15  
 TAX RATES FOR ROCK CUT ROAD STUDY AREA  
 FISCAL YEAR 1989

<u>Category</u>	<u>Rate/\$1,000 Assessed Value</u>
Town of Newburgh	
General	1.97
Highway	2.90
School Districts	
Wallkill Central	25.61
Valley Central	18.34
Fire District	
Orange Lake	1.43
Orange County	8.26

Source: Tax Assessor for the Town of Newburgh, personal conversation Oct. 17, 1989.

The average assessed value of older homes in the Town of Newburgh is approximately \$55,000 while newer homes have an average assessed balue of between \$65,000 and \$75,000, according to the Tax Assessor for the Town. If an average assessed figure of \$70,000 were to remain constant\*, and

\* The present residential assessment rate is 55.1 percent of full market value.

representative of new homes built in the Rock Cut Road study area, the annual tax generated from buildout of the vacant developable land in the Valley Central School District (61 to 611 new homes) would range from \$136,586 to \$1,346,033. The annual tax generated from new homes in the Wallkill Central School District (222 to 1,154 units) would vary from \$602,064 to \$3,129,648. The total annual tax generated from the study area would then range from \$738,650 to \$4,475,681.

These totals of potential annual tax revenues generated from buildout would be divided in the following ways. The Town of Newburgh would receive from \$96,844 to \$601,865 while the County of Orange would receive between \$164,152 to \$1,020,170. The Orange Lake Fire District would receive between \$28,400 to \$176,500. The Wallkill Central School District would receive from \$398,046 (while adding 178 additional school aged children into the district) to \$2,069,122 (and 681 new school age children). For new development within the study area, this translates to a range of between \$2,236 tax dollars to \$3,038 per new school aged child. Thus, development of larger homes in the Wallkill Central School District would break even or realize a positive cash flow for the district.

The Valley Central School District would experience a much different degree of tax generation. The levels of annual tax revenue generated to the district would range from \$64,200 (adding 50 additional school aged children) to \$633,012 (while adding 493 new school aged children into the

district). This would result in a student/tax ratio of between \$1,284 tax dollars per child to \$1,276 tax dollars per child.

## VIII. CRITICAL ENVIRONMENTAL AREA (CEA) DESIGNATION

A specific geographic area of exceptional or unique character can be designated by a municipality under the New York State Environmental Quality Review (SEQR) provision as a critical environmental area (CEA). Qualities of a CEA would include inherent ecological or hydrological sensitivity to change which could be adversely affected by any change (including groundwater aquifers). A proposal for CEA designation must be submitted to the New York State Department of Environmental Conservation (DEC) for notification, and must be the subject at a public hearing, and after 30 days, the area could receive a CEA classification. As a result, all development or actions within and adjacent to the CEA would be considered a Type 1 action by the DEC under the SEQR requirements and would then require an indepth environmental analysis before any project approval can be given.

The Orange Lake area, most of which is within the Rock Cut Road study area, could be considered unique since it is supported by the largest wetland system, approximately 1,461 acres, within the Town of Newburgh and sits on top of the largest aquifer in the Town of Newburgh. However, it is currently not, nor is it expected to ever become, a source of drinking water in addition to being too shallow to qualify for reservoir status.

Boundaries for a CEA should be easy to justify and

understand. They must be in functional terms in order to promote management; in other words, they must be directly related to the factors contributing to their sensitivity.

Several alternative boundaries are viable. The watershed of Orange Lake crosses into the adjoining Town of Plattekill and may therefore be impractical in a jurisdictional sense. If streets are used, the boundaries could be roughly outline the watershed; Rock Cut Road northward to the border with the Town of Plattekill, Quaker Street, Leptondale Avenue, Lakeside Street, East Coldenham Avenue, and finally N.Y. State Route 17K. A floating buffer of 100 feet around Orange Lake and the supporting wetland may be most justifiable and practical in conjunction with other development constraints.

Although designating an area as a CEA causes any action, either private or public, within the CEA to be considered a Type 1 action, the designation does not place any controls on land use within the CEA. The designation is therefore a less restrictive option for environmental protection than special zoning.

The greatest impact from the use of a CEA could be anticipated to occur on existing development. Any action or development, for example an extension or rebuilding, would be restrained. Ultimately, this would create a limiting factor on the resale value of these units.

If a CEA is to be seriously considered as an alternative to special zoning, for example 5 acre zoning or soil based

zoning to control growth, it may be best facilitated as a recommendation in a Master plan. Subsequently, zoning changes within the study area would be based on these recommendations and other plan recommendations.

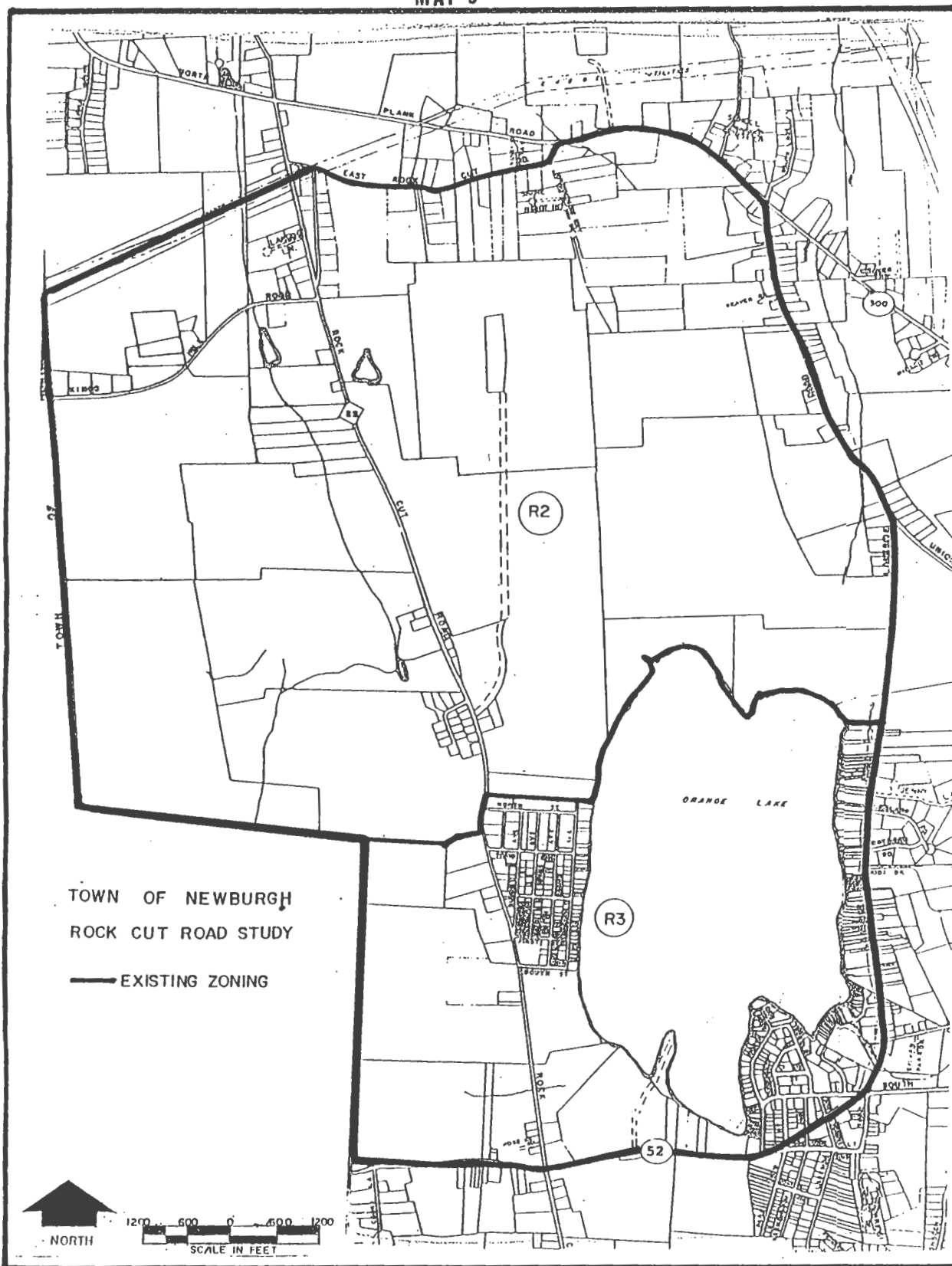


## IX. ZONING ANALYSIS

The Rock Cut Road study area, presently without municipal water or sewer services, is divided by R-2 and R-3 zoning districts. (see Map 3) As such, the R-2 zone requires a minimum 20,000 square foot lot and the R-3 a 15,000 square foot minimum lot size for single family dwelling units. Maximum lot coverage is 25 percent in both zoning districts. The utilization of municipal sewerages would allow reduction of these minimum lot sizes by 30 percent to 15,000 square feet in the R-2 zone and 12,500 square feet in the R-3 zone. This brings the sewerred R-2 density up to the density of the unsewered R-3 zone.

The R-2 zone within the study area is a relatively undeveloped area of the Town of Newburgh where perceived low density is the result of the lack of municipal sewer and water services and a tremendous amount of designated freshwater wetlands and poorly draining soil. Most lots (64 percent) are at least one acre in size. There are 116 developed lots in the R-2 zone covering 420 acres. Within the developed portion of the R-2 zone, approximately 99 of the lots (85 percent of the total) are at least 20,000 square feet in size. Although 64 percent of the lots are one acre or more in size, the average lot size for this area is 3.6 acres. The 17 remaining lots are between 15,000 square feet and 20,000 square feet. The 34 vacant lots in the R-2 zone are at least one acre. Of these, 19 (56 percent) are at

MAP 3



least ten acres in size.

The R-3 zone would permit higher densities than the R-2 zone. Multi-family residential development, or attached dwelling of three or more units, is allowed in the R-3 zone on lots of at least ten acres in size. Single family attached dwellings with four units per acre and low rise dwellings allowing six units per acre are also permitted in the R-3 zone. Further, high rise development with twelve units per acre is currently allowable in the R-3 zone, however, very unlikely to receive Town Board approval.

Clustering and planned unit development (PUD) is permitted in both the R-2 and R-3 zones. However, minimum lot sizes must be 25 acres and 100 acres respectively. The maximum lot coverage for both is 15 percent. Although clustered developments and PUDs have been permitted in the zones since adoption of the Zoning Law in 1967, none have emerged in the Town. Only recently have a few such developments even been proposed.

The 694 acres of vacant developable land within the study area has a potential for 1,765 dwelling units. This would increase the current net density of the developed portion of the study area from approximately .8 units per acre up to 1.7 units per acre. The build portion of the study area would then amount to 1,161 acres. Higher density levels are likely to be characterized by cluster development. If development of the vacant areas were to occur without sewers, the sizes of the new lots could be expected to be

larger than existing sizes (many are small converted summer homes on very small lots) and which would in effect reduce the net density of the developed portion of the study area.

Adoption of the Soil Conservation Service suggestions for lot size relative to soils limitations would result in tremendous downzoning; in other words, much larger minimum lot sizes and reduced density. The soils capable of supporting dwellings and septic systems throughout the study area would require a minimum lot size of 1.5 acres per dwelling regardless of zoning. If this minimum lot size were used in place of current minimum lot size requirement of 20,000 square in the R-2 and 15,000 square feet in the R-3 zones, the number of dwelling units and subsequent population, school aged children, and traffic levels would be tremendously reduced. The number of units allowed would amount to 284; 222 in the R-2 zone and only 62 in the R-3 zone. This includes the areas of the proposed High Ridge and The Commons developments.

The Town of Newburgh is currently amending its zoning ordinance as a result of the recommendations of a zoning commission under the guidance of a planning consultant. The proposed zoning revisions would limit development of The Commons project to 430 dwelling units rather than the applied for 509 units. This would be more in keeping with the existing conditions of the area. Thus, adoption of revisions to the zoning ordinance is an expeditious way to effect more realistic residential densities.

## A. IMPLICATIONS FOR REZONING

A master plan indicates what Town officials project as acceptable future development and a zoning ordinance carries out the intent of the master plan's land use policy. The plan is based on past and present conditions and attempts to conserve and improve existing conditions. With enough sewer and water potential for complete buildout of the Town, as projected in Master Plan Report No. 1, the Town of Newburgh has numerous options to encourage and direct growth not only within the study area but throughout the Town.

How the Town justifies any rezoning of the study area must be soundly defensible not only within the parameters of the study area but in terms relative to the Town as a whole. If maintaining or reducing present density levels becomes the primary conceptual goal; in other words, held above all other goals, then the extension of sewer service should not be implemented. Rather, the use of soil-based zoning separately or in conjunction with a CEA designation would be most effective in attaining the lowest possible density for the study.

The sole use of a CEA would have little development impact on land that does not have significant hydrological influence on Orange Lake which includes most of the developable land within the study area. If preserving open space and designating a CEA becomes the primary conceptual goal, implications for increased development pressures in other areas of the Town must be understood in order to

justify open space preservation with the study area. Concern for the environment as an underlying rationale for any zoning change must be equally applied to all areas with regard to special geographic features and ultimately must respond to the interdependency of problems and potential throughout all areas of the Town.

## X. CONCLUSIONS AND RECOMMENDATIONS

### A. CONCLUSIONS

This report has presented an analysis of development possibilities in the Rock Cut Road study area of the Town of Newburgh, Orange County, New York. Study elements included impacts from traffic, sewer and water demand, drainage, population and school age children, real property tax, and an analysis of zoning and the potential for a CEA classification of the area. Each variable, described through four development scenarios, defined the limitations of the existing infrastructure and environmental constraints concomitant with tremendous growth pressures and outdated zoning. Under these circumstances, the appropriate land use must be balanced with future expected growth.

The analysis has attempted to describe the range of impacts from a minimum to a maximum development potential. All of the four scenarios represent situations that are not far removed from realization; in other words, implementation could be brought about by only a zoning change and/or extension of municipal services.

It has been shown throughout the analysis that opportunities exist under current zoning to develop the study area enough to overburden the infrastructure. This includes roadways during the peak hours and the capacity of the middle school grades. The scenarios with sewered development would also adversely affect drainage on land located within the Tin

Brook tributary drainage basin.

The evidence leads to support a moderate range of development. This includes sewered development with R-2 densities within the southern portion of the study area. Low intensity development in the northern portion of the study area would be realized by unsewered soil-based lot sizes with AR designation. Density would be further reduced in both by discounting the current allowable number of units for environmental constraints.

Conclusions include:

1. The Rock Cut Road study area is a combination of rural and suburban. It is an area on the fringe between suburban development served by central utilities to the south and east and rural development and conservation areas dependent on individual wells and septic systems to the north and west. Densities of 6 units per acre, whether gross or net are excessive for this area. Multi-family dwellings, while needed in the Town, should be planned for in more urbanized serviced areas.
2. Excessive densities from potential developments could be expected especially in the R-3 zone. This permits 6 dwelling units (12 if high rise) per acre undiscounted for environmental constraints.



3. Orange Lake faces continued pollution from failing septic systems built on small lots located in close proximity to the lake and on soils with poor percolation. Wells have been and are likely to continue to be polluted. Therefore health hazards are likely to worsen. Clearly, municipal water and sewer services are needed to serve the Orange Lake West subdivision and the existing homes along the southern portion of the lake.
4. Erosion may become an environmental concern with larger developments due to increased amount of unchannelized stormwater runoff deposits into Orange Lake.
5. The designated freshwater wetlands north and south of Orange Lake may preclude massive development of this area and will help to protect Orange Lake.
6. Existing roads are capable of handling existing traffic and some levels of future development. However, large development areas to the north and west of the study area will add extensively to the traffic loads on Rock Cut Road and Route 52 over the next 20 years. Drastically reducing existing densities will reduce future traffic loads, but after 20 years, even with no development within the study area, traffic increasing at 2 percent per year will double from current levels.

7. Multi-family units are inappropriate for the study area. Even though they appear to be a benefit to the Town of Newburgh in terms of less traffic, fewer school age children, and less water and sewer demand, this remains an area with little public transportation. The general community desire is to limit such uses in the study area and relegate them to the more urbanized areas of the Town where they presently exist and where transportation services are in place.
8. The future development of Stewart International Airport will increase the number of flights over the southwest portion of the study area. Thus densities in this general area should be reduced. Flight paths from the nearby by Stewart International Airport may place limitations on height and may require noise-proofing of existing and future development.
9. Present zoning could exacerbate problems in the study area due to inadequacies. Currently, environmentally sensitive lands are treated the same as readily buildable land. The zoning law does not discount for environmental factors in the determination of units per acre, and has inadequate procedures for validating allowable number of dwelling units that may be clustered.

## B. RECOMMENDATIONS

The general land use strategy proposed for the Rock Cut Road study area outlined below calls for several changes; amendments to the current zoning law and the subdivision regulations, expansion of infrastructure, preservation of open space, and completion of the currently on-going master plan project. Further, a CEA designation is suggested for the area surrounding Orange Lake and its supporting designated freshwater wetlands as part of the mechanism to improve the environmental quality of the area.

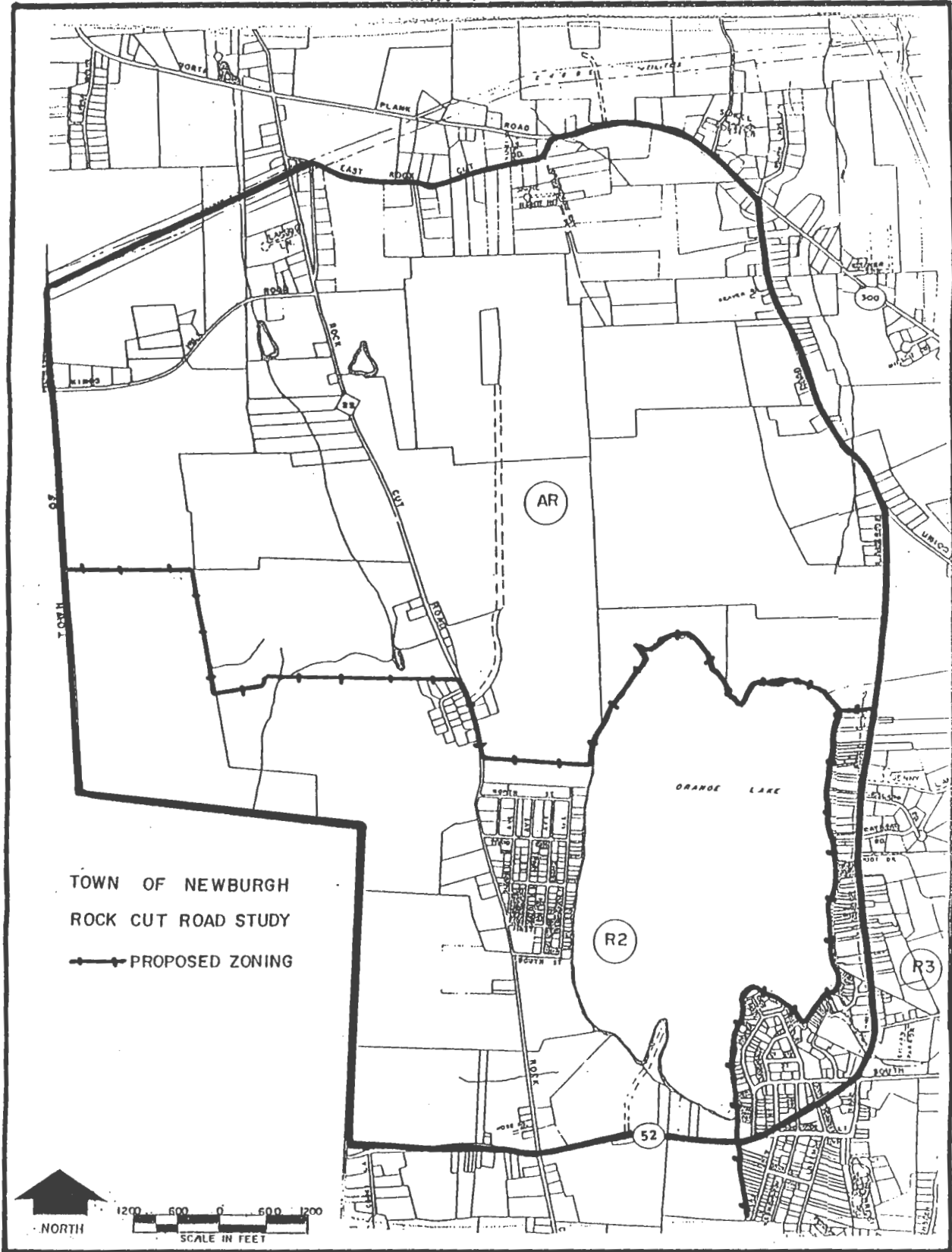
The recommendations are based on the primary conclusion that intensity of development within the study area should be reduced to permit more accommodating growth. Although on-site septic and water use is recommended for the northern portion of the study area (the current practice) with lot sizes based on soil limitations, the extension of municipal sewer and water is recommended to the southern portion of the study area. Both of these recommendations are an attempt to maintain and, in the case of the southern portion of the area, to improve the environmental quality of the ground and surface waters.

Recommendations for the Rock Cut Road study area include:

1. Changes to the Zoning Law

- a. Reduce densities in the Rock Cut Road study area.
  - i. Eliminate the R-3 district and its multi-family uses at densities up to 6 dwelling units per acre in the southern portion of the study area and replace it with R-2 (Residential) which requires a minimum lot size of 20,000 square feet unsewered or 15,000 if sewerred. Maintain the R-2 housing types (single family, two-family, and semi-detached dwellings) unless clustering is used, in which case the same number of units would be permitted in a variety of housing types.
  - ii. Eliminate the existing R-2 zone (with a minimum lot size of 0.5 acre) north of the the High Ridge project and replace it with AR (Agriculture Residential which requires a minimum lot size of 1 acre) in addition to overlaying a soil-based zoning. (see Map 4)
- b. Utilize soil characteristics to determine the size of unsewered lots.
- c. Increase lot widths along N.Y. State Routes 52 and 300 and Rock Cut Road (County Road 23) to reduce the number of curb cuts in the area.
- d. Adopt clarification of clustering provision, discounting of lands with environmental constraints, and all other text clarifications as prepared and recommended by the zoning commission.

MAP 4



## 2. Changes to the Subdivision Regulations

- a. Increase distances between new roads entering upon Rock Cut Road to limit interruptions of traffic flow.
- b. Limit new road cuts to encourage a roadway hierarchy in subdivisions.
- c. Incorporate the table of soil groups as outlined by the Soil Conservation Service and subsequent limitations on septic systems located on certain soil types.
- d. Maintain the present policy of zero runoff which requires new developments to contain added stormwater runoff and release it from stilling basins at a rate no greater than existing runoff patterns to prevent erosion and flooding.

## 3. Expansion of Infrastructure

- a. Expand the municipal water service boundary (Consolidated Water District) and the municipal sewer service boundary (Crossroads Sewer District) to include developments in the existing R-3 district within the study area, including the High Ridge and The Commons projects. Services should be brought to the existing nonsewered units on the west side of Orange Lake at the expense of those developers. This will prevent further degradation of Orange Lake, eliminate failing septic systems and prevent the possible spread of disease.

- b. Widen Rock Cut Road at the intersection with N.Y. State Route 52 to provide for a separate right-hand turning lane.
- c. Introduce signalization at the intersection of Rock Cut Road and Route 52 as volumes dictate.
- d. Lobby the New York State Department of Transportation for a new interchange with New York State Thruway (which runs in a north/south direction approximately one mile east of Orange Lake) which would allow connection to interstate highways more directly from northern points.

#### 4. Preservation of Open Space

Promote clustering to achieve permanent open space. The same number of dwelling units that are accommodated under conventional siting would be concentrated on the developable portions of the site in return for keeping the balance of the land in permanent open space.

#### 5. Designate Orange Lake as a Critical Environmental Area

- a. Designate Orange Lake and supporting designated freshwater wetlands and the 100 foot buffer for each as a Critical Environmental Area (CEA) which would require stringent environmental review for any activities (a Type 1 action under SEQR).
- b. Provide for an additional 100 foot buffer around these areas (100 feet above the DEC

buffer area) in which septic systems will not be permitted and drainage will be controlled through the use of stilling basins to prevent erosion and siltation.

#### 6. Completion of the Master Plan

The town has a critical need for updating and improving its land use plans and policies. This should include an understanding of the relative impacts that development would have on the rural versus suburban/urban areas town-wide. From this, priorities for preservation and development can be understood and formulated into goals. Equal attention should be given to opportunities and constraints in all areas of the Town resulting in a balanced plan for both conservation and growth.



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