The western portion of Roseland, bordered by the Township of East Hanover, consists of County-owned lands. These lands are part of the Essex County Park System and serve as a buffer between business and residential zones in East Hanover and manufacturing and office zones along Eisenhower Parkway in Roseland. A portion of Roseland's manufacturing zone in the southwestern corner of the Borough is adjacent to residential zones in East Hanover.

To the east, Roseland's single-family residential zone abuts residential areas of the Town of West Orange.

The northeastern border of Roseland is bounded by the Borough of Essex Fells. Single-family residential areas form most of this boundary in both municipalities. North of the Morristown and Erie Railroad a manufacturing zone in Roseland is adjacent to municipal land of Essex Fells.

Roseland's southern border is bordered by the Township of Livingston. Along the eastern portion of this border are residential zones in both municipalities. The remainder of land along this border, in Livingston, is zoned single-family residential. Land in Roseland is zoned for manufacturing and office uses.

The review of adjoining communities in the 1978 Master Plan revealed that there is one area where it would be logical to adjust the municipal boundary. This area lies between the Township of Livingston and Route 280 in Roseland along the southeastern boundary immediately east of Livingston Avenue.

At the present time about one half of the southern municipal boundary between Livingston Avenue and Laurel Avenue follows the center line of Interstate 280. The balance of this boundary extends south of Interstate 280 resulting in a long narrow parcel of land to fall within the Borough of Roseland. This parcel is completely isolated by Interstate 280 and lands in the Township of Livingston. It seems logical for this area to become annexed by the Township, since access to and servicing of this area is possible only via lands lying in Livingston. The new municipal boundary should then extend along the center line of Route 280 from Laurel Avenue to Livingston Avenue. It was proposed in the previous Master Plan that officials of the two municipalities explore the feasibility of implementing this boundary change. At this time, the proposed boundary change is still under investigation.

PROPOSED ZONING

In addition to the annexation of the R-3 Zone lands to Livingston, a zone change is under consideration by the Borough. The subject parcel is currently zoned R-5 (single-family residential) and is proposed for professional and administrative office use (OB-3 Zone). The tract consists of approximately 33 acres and is bounded on the east by the proposed extension of Eisenhower Parkway (which now terminates at the tract boundary). A Public Service Electric and Gas easement and Essex County Parkland form the western border. The Borough's sewer pumping station is the northern most boundary and an existing office complex abuts the tract to the south.

An assessment of this zone change has been prepared to evaluate impacts of the change on present zoning conditions, utilities, environmental factors, traffic, and economic factors.* Initial analysis shows that the existing residential designation of the site is compatible with surrounding zones and land use policies of the Borough, however further investigation reveals other less favorable impacts. Two factors, the in-ability of the land to support sufficient residential units due to flooding constraints and revenues generated by office use rather than residential use are most in evidence. Based on this analysis it is recommended that the R-5 zone be changed to OB-3.

SUMMARY AND CONCLUSIONS

1. Zoning requirements of surrounding municipalities have shown only slight changes since the 1978 Master Plan and have generally remained compatible with those in Roseland.

2. The annexation of the R-3 zone between Livinston Avenue and Laurel Avenue, south of Route 280, to the Township of Livingston (as proposed in the 1978 Master Plan) is still under investigation by officials of both municipalities.

3. The proposed zone change from R-5 to OB-3, along Eisenhower Parkway, is recommended for approval. An analysis of the impacts of this change shows that fiscal benefits and inappropriateness of the land to support residential units makes the site more condusive for office development.

*"Zoning Re-Study," Block 20, Borough of Roseland, April, 1982. Richard Browne Associates

Energy Conservation

PART VII - ENERGY CONSERVATION

This chapter represents a new element in the Borough of Roseland Master Plan. Section C.40:55D-28b., Paragraph (9) of the Municipal Land Use Law has been amended by P.L. 1980, C.146 during the 1980 Legislative Session. Effective November 20, 1980,

> "An energy conservation plan element which systematically analyzes the impact of each other component and element of the master plan on the present and future use of energy in the municipality, details specific measures contained in the other plan elements designed to reduce energy consumption, and proposes other measures that the municipality may take to reduce energy consumption and to provide for the maximum utilization of renewable energy sources;"

must be added to the Master Plan at the time it is re-examined.

The following Master Plan elements will be evaluated in accordance with the above cited Law:

1. Environmental Considerations
2. Utilities
3. Existing Development & Land Use
4. Population
5. Land Use Element
6. Zoning

ENVIRONMENTAL CONSIDERATIONS

Part 1 of this Master Plan Update dealt with Environmental Considerations. Specifically, topography, excessive slopes, surface drainage and soil types were discussed. No way has been found to reduce energy consumption with respect to existing land uses. As such, there is little or no impact on energy consumption directly attributed to the four areas addressed in Part I either presently or anticipated for the future. There has, of course, been consumption of energy in the alteration of these elements (i.e. construction of storm drainage, regrading of land, etc.). Likewise, as new development takes place, additional energy will be consumed during both construction and occupancy/usage. Specific recommendations for energy conservation as it pertains to future development will be evaluated in a subsequent section.

UTILITIES

Part II of this Master Plan Update dealt with utilities serving the Borough of Roseland. However, only the sanitary sewer system and the water supply facilities were evaluated since these were the major areas of change.

While there has been significant development since the 1978 Master Plan, records of the past few years shown no significant increase in the demand for water. In fact, water purchase figures have slightly decreased. Likewise, although the Borough can be expected to develop further, it is not anticipated that significant increase in supply will be needed. Since the water supply facilities (with the exception of the transmission lines in the Borough) are

owned by the Essex Fells Water Company, it would be difficult to apply energy conservation standards at well sites and pumping stations not within the jurisdiction of Roseland. However, since the Borough does have its own water department and transmission capablities, every effort should be explored to use energy-saving devices where feasible. This would include the use of energy efficient pumps, solar energy components, water saving devices, etc. where practical.

Like the water supply facilities, the sewage treatment plant which serves the Borough is owned and operated by an adjoining municipality. The plant in West Caldwell, located near the Roseland border, also serves Caldwell, North Caldwell, Essex Fells, a portion of Fairfield, and a portion of West Orange. Due to the sewer extension ban on the Caldwell plant imposed by the State Department of Environmental Protection in January 1979, it is not anticipated that significant increase in capacity or operation will be necessary.

Since the sewage treatment plant is not within the jurisdiction of the Borough, it would be difficult to enforce energy conservation standards. However, the Borough does operate pumping stations and force mains which can be equipped with energy efficient pumps, solar energy components, and water saving devices for their operations. In addition, the Borough should adopt a program of preventative maintenance on all public facilities. Replacement of electric motors with energy efficient ones when the former become obsolete or inefficient should be of prime concern to the Borough.

EXISTING DEVELOPMENT & LAND USE AND POPULATION

Parts III and IV of this Master Plan concern themselves with EXISTING DEVELOPMENT & LAND USE and POPULATION, respectively. Since both of these sections deal with trends in both developments and population, they will be evaluated as a unit.

As revealed in these two sections, Roseland has experienced considerable growth in all land uses since the previous Master Plan. While professional and administrative office facilities have accounted for a large portion of recent development, the Borough remains predominantly residential. There is, however, over 25% of the total Borough land area still developable and, as such, can be expected to develop further over the years. The population of Roseland, although it has increased at a slower rate than was anticipated in the 1978 Master Plan, has increased by 877 persons over 1970's figures as revealed by the 1980 census. This increase is substantial when compared to the remainder of Essex County which experienced little or no increase. With the development of the remaining 25% of developable land, population can be expected to increase. Demand for energy will obviously increase as well, not only during construction, but during occupancy.

While the present total energy consumption within the Borough can be considered substantial, it is reasonable to assume that the types and quantities of usage are comparable with other municipalities. Without conducting an in-depth, door-to-door survey, it would be difficult to assess current energy conservation measures privately employed. Current public energy conservation measures are virtually non-existent.

For future development, energy conservation measures should be included with the objective of: Reducing automobile travel, minimizing the use of non-renewable resources, and the employment of solar energy components to reduce the consumption of fossil fuels. While these are broad objectives which the Borough should strive for, there are, of course, a wide variety of specific tools which the Borough could pick and choose from to accomplish these goals. The last section of this chapter will discuss in-depth these measures.

LAND USE ELEMENT AND ZONING

Parts V and VI of this update dealt with the revisions to the Land Use Element and an analysis of past and present zoning within the Borough. Since both comprise similar analyses, they will be evaluated concurrently.

As revealed in these two sections, minor adjustments in land use patterns have been made in this 1982 revision. Essentially, these revisions have been made to bring the Land Use Element into conformity with existing development patterns. Modifications to existing residential, business, office and industrial areas are not contemplated at this time. In addition, development densities in all residential zones will remain essentially the same. As evidenced in the analysis, approximately 602 acres or 25% of all Borough land remains to be developed. Of that, roughly 270 acres or 45% of remaining developable land is in the residential zones. It can be anticipated, therefore, that with future development, substantial energy for residential, commercial and industrial consumption will be needed.

As mentioned in previous sections of this chapter, it is safe to assume that there are few energy conservation techniques currently being utilized within the Borough, either publicly or privately. Furthermore, present municipal regulations lack a definitive program geared to energy conservation, and as such, any conservation techniques that are utilized are done so on a strictly voluntary basis.

This section of the report will detail specific measures designed to reduce energy consumption during the course of future Borough development. While it would be to everyone's benefit to encourage existing developments to practice conservation, new legislation enacted towards this goal cannot be retroactive. Therefore, while the recommendations set forth below may be applicable to the entire Borough, they are geared specifically for new development.

With the passage of the 1980 land use energy conservation amendments, Roseland, as does the other municipalities in the State, now has a wide variety of legal options from which they can pick and choose to promote conservation. The following offers the Borough a comprehensive shopping list of planning tools available to promote alternate energy within their borders. It should not be considered finite, but rather a partial listing of currently accepted approaches utilized throughout the country. Of course, as new measures prove to be effective, they should be incorporated into this list of tools and encouraged by the Borough.

TRADITIONAL ZONING TOOLS

With the passage of the Energy Conservation Amendment to the Municipal Land Use Law, not only are the municipalities obligated to include an energy

conservation element in the Master Plan, but the municipal ordinances must reflect an active pursuit in the goals established in the Plan. In most cases, unless the municipality already has an acceptable conservation ordinance, this would require rewriting the local zoning ordinances.

In Roseland's case, a comprehensive ordinance geared to conservation must be incorporated into existing regulations or traditional zoning tools can be modified to reflect conservation measures. These could include low density zoning, lower building heights, grade restrictions, and setback rules. These measures are geared to provide solar access protection for new and existing developments wishing to utilize solar energy.

SOLAR COMPREHENSIVE PLANS

Traditionally, comprehensive plans have been used to integrate various development goals and to guide community growth. The energy conservation element in this update is one such plan with the goal of increasing public awareness of solar energy. The solar energy components which are endorsed in this plan and which should be included in the zoning ordinance are: Orientation of streets to maximize the direct rays of the sun; prevention of structures including vegetation which may block sunlight to approved solar collectors; encouraging road construction which maximizes use of the sun for snow melt; encouraging various types of insulation; and mapping out specific areas of the Borough for special planned unit solar development policies. While the above are components of the overall plan, a clear set of objectives or goals should be established. This should include at a minimum: reducing automobile travel either through the concentration of densities or through the use of bikeways and mass transportation; minimizing the use of non-renewable resources; and the employment of solar energy components to reduce the consumption of fossil fuels.

SUBDIVISION REGULATIONS

Perhaps the most effective tools available to Roseland lie in their subdivision and site plan ordinances although shade tree ordinances and building permits can play a significant role in regulatory and/or enforcement procedures. Again, since present ordinances do not incorporate energy conservation measures, modifications will be necessary. At a minimum, all future developments should incorporate energy conservation techniques to the maximum extent practicable and should include, but not be limited to, the following:

a. All subdivisions and site plans shall, to the greatest degree possible, follow energy efficient design principles and maximize the use of renewable energy sources within the limits of practicability and feasibility.

b. Streets shall be so oriented as to permit the buildings to be constructed thereon to maximize solar gain. Where possible, streets shall run in an east-west direction.

c. Lots shall be so oriented as to permit buildings to be constructed thereof to maximize solar gain. Where possible, the long access of a lot shall run in a north-south direction.

d. The development shall take advantage of topographic features to maximize solar gain and afford protection from winter winds. Where possible, development shall be oriented to southerly slopes.

e. Maximum use shall be made of natural vegetation which will afford protection from winter winds and provide shading in summer.

f. Landscaping, including fences, walls and earthworks, shall be utilized to maximize protection from wind, channel breezes and shade buildings and pavement.

g. The site shall be designed to minimize pavement and afford efficient circulation. The use of footpaths and bike paths in multi-family housing developments, in order to reduce motor vehicle use, is encouraged.

h. Buildings shall be oriented to maximize solar gain. Where possible, building walls with the greatest number of windows or window area shall face in a southerly direction. The use of active and passive solar energy gain systems in buildings is encouraged.

i. Buildings shall be arranged to provide maximum protection to each other in terms of energy consuming elements.

j. The use of energy efficient building materials and colors is encouraged.

k. Solar-assisted domestic hot-water heating. This may include pre-piping of dwelling units to permit retrofitting of solar hot-water systems by future residents.

l. Use of greenhouses, courtyards and patio areas sheltered from the wind and designed to extend and enhance interior living spaces.

m. Incorporation of architectural features which promote naturally lighted living spaces, including clerestories, skylights, etc.

n. Use of low-energy use electrical appliances and low-water flow restrictive faucets and fixtures.

o. Incorporation of energy-conserving features, including increased insulation, double-glazed insulated glass, weather-stripped doors and windows and ventilated attics.

SOLAR ENVELOPES AND BULK PLAN ZONING

Solar envelopes are building height regulations that are predicated on the changing daily and seasonal positions of the sun. Traditional zoning regulations define building envelope as a rectangular box within which development is permitted. Solar envelopes, on the other hand, consist of more than one plane at the top of the envelope or box which slopes at different angles. The purpose of solar envelopes is to protect solar access on adjacent or nearby

lots. The size of solar envelopes will vary with the size, shape, slope, orientation of the lots, and of course, from zone to zone, depending on the existing or planned development within the zone. Naturally, the extent of solar access protection to be given will also be a factor.

Since Roseland does not have an energy regulation such as this, a modification to the municipal ordinances will be needed.

ZONING INCENTIVES FOR SOLAR USE

Incentive zoning is an acceptable and often used development practice within many municipalities. Essentially, density bonuses can be offered to builders for developments laid out for solar access. This allows the builder to increase the number of units (residential, commercial or industrial) when specific planning incentive criteria is met. It is a flexible approach to individual projects (i.e. Planned Unit Developments) rather than to the community as a whole. By encouraging a single, overall plan for a major development, bulk lot requirements can be relaxed with the sole objective of providing solar access and solar energy technologies for a large number of units. Once again, since Roseland does not have an ordinance of this nature, a modification to the existing regulations will be necessary. Standards should specify, at a minimum, the amount of solar access which must be available. Likewise, design, layout, and landscaping criteria should be clearly stipulated.

ENERGY IMPACT STATEMENTS

In addition to the previous conservation tools, Roseland can choose to enact energy impact ordinances which would require an analysis of energy demand imposed by any potential developments as well as the local and regional energy sources available to meet the demand. Specific mitigation standards detailing measures to reduce wasteful, inefficient, and unnecessary consumption of energy could encourage developers to utilize passive and active solar energy systems.