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Application of a Linear Programming Model for Estimating the Economic Impact of Tourism Development

Marvin W. Kottke
University of Connecticut - Storrs

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Marvin W. Kottke
Department of Agricultural Economics and Rural Sociology

Storrs Agricultural Experiment Station
College of Agriculture and Natural Resources
The University of Connecticut
Storrs, CT 06268

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Marvin W. Kottke*
The University of Connecticut
Agricultural Economics and Rural Sociology Storrs, CT 06268

*Professor, Department of Agricultural Economics and Rural Sociology, The University of Connecticut, Storrs, CT 06268.

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PREFACE

This study was part of Northeastern Regional Research Project NE-137 *Impacts of Tourism on Rural Economic Development* (9) and also contributes to Project NE-163 *Tourism Alternatives for Rural Development* (10). In the first project, which was conducted from 1981 to 1986, one of the objectives was to determine optimal patterns of tourism development in rural areas. With that objective in mind, the groundwork was laid for building a linear programming model of tourism in New London County. Subsequently, the second project, which started in 1986, aims to "develop, test, and refine microcomputer models that would enable local officials to evaluate the relative costs and benefits of future tourism development alternatives" (10). In line with these regional objectives, this report presents the structure and tests of a model which can be used to evaluate proposals for tourism development in a community.

INTRODUCTION

The Problem

Growth in tourism development in Connecticut coincides with growth in urban and industrial development. All three of these types of development compete with the agricultural industry for land resources. With a fixed supply of land in a physical sense and a somewhat limited resource base in terms of water and forests, careful economic planning of future development of all types is highly important. Growth in tourism in Connecticut is advocated as a state economic development policy and is promoted to bring out-of-state tourists into Connecticut. In some New England states tourism is a leading industry in terms of gross dollars spent.

At the community level, town planners need to take growth of tourism into account when dealing with plans for economic development. In doing so they may want answers to questions such as: What would the economic impact be if tourism increased 10% or 20% in the community? What types of tourism business or recreation centers would be most appropriate for the community? The purpose of this paper is to present an economic planning model that would be useful to researchers, local planning officials and community leaders in making decisions regarding tourism development proposals. Linear programming is used as the mathematical procedure to estimate the maximum revenue that could be generated by tourism, subject to given mixes of available resources.[1] The model can be applied on a microcomputer which would facilitate its use by municipal agencies, many of which are equipped with microcomputers.

Objectives:

1. To construct a linear programming model of the New London County tourism industry.
2. To apply the model to obtain a benchmark situation in terms of resources used and income generated by the tourism industry.
3. To apply the model by first specifying a set of projected tourism growth levels and then estimating the consequential impact each level of growth would have on land use, employment and income.

Need for an Alternative Approach in Economic Impact Analysis

Economic impact studies are growing in popularity for a variety of

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[1] For a general reference on linear programming see Baumol (1).

reasons of which several of the more common are as follows:

1. As economic growth occurs environmental side effects may also occur. Benefit of economic development may be offset by environmental losses, therefore, municipalities are finding it important to conduct economic impact studies to supplement environmental impact studies so that both types of impacts can be properly evaluated.
2. Legislation on industrial and business regulations pertaining to taxes, insurance, pricing, etc. may be restrictive to one industry while giving preferential treatment to another. Economic impact studies are useful to industries wanting to influence legislation through lobbyists by documenting the importance of an industry to a community, state or region's economic viability.
3. Community planners are in need of economic data and evaluation procedures such as an economic impact analysis to provide information to zoning boards which make decisions on developers' proposals.

Currently, there are basically two methods of evaluating economic impacts. They are:

1. Inventory/budget method
2. Input-output analysis (including economic base analysis)

The first is simply a summarization of the total value produced and the total resources used by a firm, industry, proposed project or whatever unit is being evaluated. It could be the only method used or it could be the first stage of the second method. Input-output analysis uses matrix algebra to find how much can be left over for consumption (demand) and how much output will be used up in productive activities to obtain a final net output.[2] Accordingly, an input-output model can be used to estimate the amount of income, employment and production that would be required to satisfy a given level of tourism demand. Additionally, an input-output model generates estimates of multipliers which have an appeal to users of the data who want to strengthen their case by including secondary impacts in the evaluation process. Input-output analysis has a long history of being used for economic impact assessment. However, the method has several drawbacks. One is that it deals with an aggregate of a whole industry rather than with a set of firms. Another is that results are not easily translated into applied recommendations. Multipliers, for example, are subject to misinterpretation unless qualifications are clearly stated. Moreover, the feasibility of using the method at a municipality level is questionable.

Another method which is used for purposes closely related to economic impacts analysis is benefit-cost analysis. This method applies primarily to evaluations of development proposals in the public goods and services sector. In most cases, especially in tourism and outdoor recreation developments, projects funded and operated by a governmental agency provide benefits in a non-market pricing activity. Costs are largely associated with capital expenditures by the government. Focus of benefit cost analysis is on the net benefit of a proposed project, therefore, the method has limited usefulness for economic impact analysis.

Rationale for Using Linear Programming for Economic Impact Analysis

As indicated in *The Problem* statement, municipal and regional planning officials are faced with making decisions on alternative tourism developments that may be good for the economy, but would strain a community's limited resources. Linear programming would seem to be an ap-

2 For a general reference on input-output analysis see Baumol (1).

propriate technique for modeling the problem, because it is a mathematical method of maximizing or minimizing a linear objective function subject to a set of linear inequalities. Choices faced by planning officials can be formulated as an objective function and the constraints on choice can be formulated as a set of linear inequalities.

One advantage in using linear programming is that with it the problem can be modelled to represent choices among types of firms or recreation centers, i.e., parks, campgrounds, motels, etc.[3] This is important because development proposals are usually made in terms of such units. Another advantage is that a variety of constraints such as limited resources, maximum capacities, controls and zoning regulations can be included to represent realistic situations.

By making a few assumptions, application of a linear programming model can be adapted for public administration purposes.[4] First a suitable objective must be chosen. For the problem at hand, an obvious objective would be to maximize something having to do with tourism. It could be gross income, tax revenue, number of tourists, maximum profit, etc. Planning officials can only influence private enterprise and public agencies to move in the direction of such objectives, but cannot directly achieve the objectives.[5] Therefore, it is necessary to assume that the model represents group behavior that would be consistent with the chosen objective.

Another useful assumption is that an actual existing situation provides a benchmark or base from which the change in development occurs and upon which the consequential economic impact applies. This assumption implies that the level of existing activities needs to be forced into a linear programming solution, which means that the results may be semi-optimal in a normative sense. In other words, the approach would be similar to that of recursive programming, a sequential procedure that determines a solution for time period $t + 1$, which is conditionally dependent on the solution for the preceding time period t.

While these assumptions and modifications may cause some concern to linear programming "purists," the advantages gained by enhancing the versatility of linear programming may be worth the effort. A linear programming framework would give economic planners at the local level an opportunity to monitor ongoing developments and to quickly assess a variety of development proposals by simply entering data pertinent to a proposed project. Examples of how this can be done are presented in this paper.

Procedure

Ordinarily, the first step would require taking an inventory of all public and commercial tourism-related parks, resorts, businesses, and museums in the community (region, county or town). Next, estimates would be made of the input-output coefficients for resources used in the various tourism-related centers and businesses. Fortunately, both of these steps had already been completed in a previous study (6) so that this study proceeded directly into the model formulation stage.

Construction of the linear programming model involved testing various formulations that would simulate the existing level of tourism business and use of resources. After the model was completed, a set of data representing

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[3] In this study, all operating units including public recreation centers will hereafter be called "firms" as a matter of convenience. Technically speaking, the meaning of "firm" as an economic unit is usually restricted to the decision-making unit of business.

[4] Usually, application of linear programming is to private enterprise situations (e.g., business management and market distribution problems). For an example involving a dairy farm see reference (8) and for one involving a ski market see reference (7).

[5] In other words, social goals may not be consistent with private goals.

the existing situation were applied to obtain a benchmark situation.

To achieve the third objective, four projected growth situations were designated. For each of these situations the linear programming model was modified to take into account the various projections and alternatives. Then solutions were obtained to determine what effect the changes would have on entry of new tourism firms and on resources used.

A LINEAR PROGRAMMING MODEL OF TOURISM DEVELOPMENT

In order to test the applicability of linear programming for studying economic impacts of tourism, a model was constructed so that it would be representative of a community's tourism industry and at the same time allow opportunities for controlled development. Given these requirements the model was formulated as follows with the objective:

To maximize

$$Y = \sum_{j=1}^{n} C_j X_j + \sum_{k=1}^{P} P_k V_k$$

subject to

$$\sum_{j=1}^{n} a_{ij} X_j + \sum_{K=1}^{p} a_{ik} V_k \leq B_i \qquad (i = 1, \ldots, m)$$

$$X_j = R_j \qquad (j = 1, \ldots, n)$$

$$X_j \geq 0$$

$$V_k \geq 0$$

where:

Y = total gross income attributable to tourism
C_j = gross tourism income per benchmark firm
X_j = number of benchmark tourism firms by type (j)
P_j = gross tourism income per new firm
V_k = number of new tourism firms
a_{ij} = input coefficients per benchmark firm
a_{ik} = input coefficients per new firm
B_i = quantity of resources available for use by the tourism industry or projected levels of tourist visits.
R_j = number of existing tourism firms by type (j)

As shown by the formulation, benchmark activities are separated from new activities. While this is not a necessary separation, it is done for purposes of accounting and comprehensiveness. It would be more efficient to construct a model by including only new activities, since the primary concern is with incremental (projected change) economic impacts of incremental growth. However, practitioners may find it useful to have an accounting of the total tourism industry readily at hand when making evaluations of development proposals; therefore, benchmark activities are included in the model. In practice, benchmark activities could be excluded after several introductory runs of the model. Their exclusion would provide more computer space for adding new activities and constraints.

A BENCHMARK SITUATION FOR NEW LONDON COUNTY

By design the benchmark situation was constructed to be similar to the New London County tourism situation reported for 1982 in a previous study (6). It consists of 81 recreation centers and 640 support businesses which generated an estimated $46.8 million in gross tourism income in 1982 (Table 1).[6] A total of 5535 acres of land were used for tourism developments, and a total of 3886 man-years (full-year equivalents) of labor were employed. Over three million tourist visits were estimated for the benchmark situation. Of these 2.18 million visits were at recreation centers (2,3) and .88 million were at support businesses.

In applying the model for the benchmark situation, ten activities and nine constraints were included.[7] In addition, ten equations were used to

TABLE 1. L.P. Solution for the Benchmark Situation for the New London County Tourism Industry

Name of Activity or Constraint	Quantity
Recreation Center or Support Business	(Number)
Private Campgrounds	25
Parks	4
Motels	52
Eating/drinking firms	370
Public campgrounds	5
Golf courses	8
Marinas	39
Sport shops	25
Auto service stations	181
Boat trans. firms	12
Land Used	(Acres)
Urban-Industrial	1,248
Coastal Suburban	1,700
Inland Suburban	1,360
Rural	1,227
Total	5,535
Employment	(Number of Employees)
Full-year	2,421
Seasonal	1,465
Total	3,886
Visits by Tourists	(Number in Thousands)
At Recreation Centers	2,183
At Support Businesses	876
Total	3,059
Gross Income	$46,825,000

[6] Included in the earlier study but not in this study were museums and minor parks.

[7] The model was applied by using T.C. Lee's linear programming computer program (LPQP Version 1-S) on a microcomputer (IBM PC).

force the existing number of tourism firms into the solution. As stated previously, the benchmark situation is not intended to be an optimal solution, rather it serves as a base with which to compare projected solutions.

Since the geographic scope for this analysis is a county rather than a town, decision making reflected by the model may be different than it would for town officials. Obviously, at the county or regional level, planning and decision-making would emphasize land use with less emphasis on gross income and town tax revenue.[8] However, the model would have a similar applicability for town planning situations.

L.P. SOLUTIONS FOR PROJECTED TOURISM GROWTH SITUATIONS

Four projected growth situations were specified for the purpose of testing the applicability of the model (Table 2). Two different tourism growth rates in terms of tourist visits were specified (10% and 20%). Then for each of these rates two location situations were specified — one offers no location alternative and the other offers a choice between two sub-areas.[9] Finally, in Situations A and B, entry of any of the 10 types of tourism firms depends upon the optimizing process, whereas in situations C and D, a new park is specified for entry while all other firms depend upon the optimizing process for entry.

TABLE 2. Projected Tourism Growth Situations

Projected Growth situations	Projected Growth in tourism visits	Location alternatives by county sub-areas	Development opportunities for tourism firm
A	10%	No alternative choice given	Open to all types
B	20%	Choice between two sub-areas given	Open to all types
C	10%	No alternative choice given	A new park specified; open to all other types
D	20%	Choice between two sub-areas given (except for the new park which was specified)	A new park specified; open to all other types

[8] An example of an agency concerned with regional planning is the Southeastern Connecticut Regional Planning Agency located in Norwich, CT (11). The S.E. region consists of New London County except for the towns of Old Lyme, Lebanon, and Lyme.

[9] New London County was divided into four sub-areas, namely, Urban-Industrial, Coastal Suburban, Inland Suburban, and Rural. A description of the sub-areas is presented in the appendix and in Research Report No. 80 (6).

Obviously, many more testing situations with a large variety of specifications could have been included. However, the four situations were considered sufficient to demonstrate the basic features of the model.

Situation A. This situation was designed to answer a question such as: What would be the economic impact of a 10 percent increase in tourist visits in New London County over a period of, say, five years? Suppose that we were working for a planning agency or research firm and we wanted to obtain an answer to that question. To begin with we would expect that a 10 percent increase in tourism visits would probably provide an incentive for some firms to expand and for new firms to enter the industry. For these tests we assume that new firms would enter and we would like to know how many and what types would likely enter. From a public interest standpoint, the objective would be to learn what combinations of new firms would generate the largest increase in gross income. To simplify the problem, location of new firms among county sub-areas was assumed to be predetermined in Situation A.[10]

Table 3 presents the results of the test for Situation A. It shows that two motels, nine eating/drinking firms, 31 marinas, 10 sport shops, and nine auto service stations could be added. The solution indicates that these are the number and type of tourism firms that would generate the greatest amount of additional gross income given the limits imposed by the projected level of resource constraints. Gross income would increase 11.6 percent and this would be obtained by using 2.4 percent more land and 9.8 percent more labor.

The only new recreation centers in the solution were marinas for which entry at a level of 31 new firms would be an unrealistic prospect. Nevertheless, results for Situation A provide useful information such as the relative resource-using efficiencies among the various types of tourist firms. For example, the solution shows that, out of the 10 types of tourist firms, five use combinations of land and labor most efficiently in terms of providing gross income.

Situation B. In this next case, we would be asking the same question as in Situation A except this time a 20 percent increase in tourist visits was projected to occur over a period of about 10 years. In conjunction with the greater tourism growth, two locational choices among county sub-areas were assumed. For example, new motels could be developed in either the Inland Suburban or the Rural sub-area (or both).

The solution for Situation B shows that the same five types of tourism firms in Situation A would enter but would double in number (Table 4). Also, the percent change in use of land, employment, and gross income would double. This doubling effect reflects the linearity characteristic of linear programming. Obviously, the designation of Situation B would not be of great usefulness except for the inclusion of locational alternatives. Given an opportunity to choose between two locations, the model chose a different sub-area for the location of all five types of firms except sport shops. New motels and auto service stations would be located in Rural instead of Inland Suburban towns. Development of new eating/drinking firms would shift from Urban-Industrial to Coastal Suburban towns and, conversely, development of new marinas would shift from Coastal Suburban to Urban-Industrial towns. This change in location reflects the commonly held expectation that economic development will tend to spread from

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[10] Location of new firms among the four sub-areas was arbitrarily selected for the first test. An attempt was made to choose those sub-areas that would likely be targeted as sites for future development. In Situation B location choice was extended to allow for an alternative location.

the more densely populated areas to the more sparsely populated areas. Of the five types of firms only marinas would shift in the opposite direction.[11]

Situation C. At this point we adjusted the model specifications to ensure that a new park would enter the solution and be located in the Coastal Suburban sub-area. Otherwise, the specifications are comparable to those of Situation A. Accordingly, we compare Table 5 not only with the Benchmark (Table 1), but also with Situation A (Table 3). In comparison to Situation A, gross income would increase less (11.2% vs. 11.6%), land use would increase more (5.4% vs. 2.4%), and employment would increase more (10.0% vs. 9.8%). Moreover, the composition of firms by type would

TABLE 3. L.P. Solution for Situation A for the New London County Tourism Industry (Ten Percent Projected Tourism Growth)

Name of Activity or Constraint	Location*	Quantity	Percent change from the Benchmark
New Recreation Centers or Support Businesses		(Number)	
Motels	IS	2	3.8
Eating/drinking firms	UI	9	2.4
Marinas	CS	31	79.5
Sport shops	CS	10	40.0
Auto service stations	IS	9	5.0
Land Used		(Acres)	
Urban-Industrial		1,258	
Coastal Suburban		1,804	
Inland Suburban		1,378	
Rural		1,227	
Total		5,667	2.4
Employment		(Number of Employees)	
Full-year		2,663	
Seasonal		1,612	
Total		4,275	9.8
Visits by Tourists		(Number in Thousands)	
At Recreation Centers		2,401	
At Support Businesses		964	
Total		3,365	10.0
Gross Income		$52,237,000	11.6

*Location by sub-areas which are abbreviated as follows:
UI = Urban-Industrial, CS = Coastal Suburban, IS = Inland Suburban, R = Rural.

[11] As mentioned previously, the level of marina development in the solution is unrealistic and suggest that the marina activity requires further refinement of constraint specification in the model.

TABLE 4. L.P. Solution for Situation B for the New London County Tourism Industry (Twenty Percent Projected Tourism Growth)

Name of Activity or Constraint	Location*	Quantity	Percent change from the Benchmark
New Recreation Centers or Support Businesses		(Number)	
Motels	R	5	9.6
Eating/drinking firms	CS	18	4.9
Marinas	UI	62	159.0
Sport shops	CS	20	80.0
Auto service stations	R	19	10.5
Land Used		(Acres)	
Urban-Industrial		1,436	
Coastal Suburban		1,740	
Inland Suburban		1,360	
Rural		1,263	
Total		5,799	4.8
Employment		(Number of Employees)	
Full-year		2,905	
Seasonal		1,758	
Total		4,663	20.0
Visits by Tourists		(Number in Thousands)	
At Recreation Centers		2,620	
At Support Businesses		1,052	
Total		3,672	20.0
Gross Income		$57,643,000	23.1

*See Table 3 for explanation of location categories.

change. Development of a new park would replace the development of marinas. More motels, eating/drinking firms, and auto service stations would enter, while fewer sport shops would be developed.

These changes in the solutions show that the introduction of a less efficient resource-using firm such as a park would result in a smaller increase in gross income for a community (under conditions of constrained resources).

Situation D. Again the model specifications were adjusted to ensure the entry of a new park, but this time the location chosen for the park was the Rural sub-area. Situation D is comparable to Situation B with regard to all other specifications, i.e., a 20 percent growth of tourism and an alternative choice of location for firms by type.

Results of this test show that, in comparison to Situation B, gross income would increase less (21.7% vs. 23.1%), land use would increase more (7.5% vs. 4.8%), and employment would increase the same (20%) (Table 6). Again the composition of firms by type would change and there would be a tendency for new firms to develop in the less densely populated sub-

areas, except for eating/drinking firms, marinas, and to some extent auto service stations. An important implication of these exceptions is that in some cases it would not be appropriate to generalize and say that all new firms should locate in less densely populated areas. For example, when a new park was specified for Rural towns in Situation D, location of eating/drinking firms shifted from Coastal Suburban to Urban-Industrial and some of the auto service stations shifted from Rural to Inland Suburban locations (compared to Situation B). As with most economic questions, the answer depends upon what underlying conditions prevail in specific situations.

TABLE 5. L.P. Solution for Situation C for the New London County Tourism Industry (Ten Percent Projected Tourism Growth; a Park Specified for Development)

Name of Activity or Constraint	Location*	Quantity	Percent change from the Benchmark
New Recreation Centers or Support Businesses		(Number)	
Parks	CS	1	25.0
Motels	IS	3	5.8
Eating/drinking firms	UI	35	9.5
Sport shops	CS	1	4.0
Auto service stations	IS	37	20.4
Land Used		(Acres)	
Urban-Industrial		1,289	
Coastal Suburban		1,913	
Inland Suburban		1,406	
Rural		1,227	
Total		5,835	5.4
Employment		(Number of Employees)	
Full-year		2,663	
Seasonal		1,612	
Total		4,275	10.0
Visits by Tourists		(Number in Thousands)	
At Recreation Centers		2,401	
At Support Businesses		964	
Total		3,365	10.0
Gross Income		$52,089,000	11.2

*See Table 3 for explanation of location categories.

TABLE 6. L.P. Solution for Situation D for the New London County Tourism Industry (Twenty Percent Projected Tourism Growth; a New Park Specified for Development)

Name of Activity or Constraint	Location*	Quantity	Percent change from the Benchmark
New Recreation Centers or Support Businesses		(Number)	
Park	R	1	25.0
Motels	R	7	13.5
Eating/drinking firms	UI	54	14.6
Marinas	UI	24	61.5
Sport shops	CS	10	40.0
Auto service stations	IS/R	42	23.2
Land Used		(Acres)	
Urban-Industrial		1,376	
Coastal Suburban		1,710	
Inland Suburban		1,393	
Rural		1,473	
Total		5,952	7.5
Employment		(Number of Employees)	
Full-year		2,905	
Seasonal		1,758	
Total		4,663	20.0
Visits by Tourists		(Number in Thousands)	
At Recreation Centers		2,620	
At Support Businesses		1,052	
Total		3,672	20.0
Gross Income		$56,968,000	21.7

*See Table 3 for explanation of location categories.

SUMMARY AND CONCLUSIONS

The purpose of this study was to construct a linear programming model of the New London County tourism industry and to test its applicability for estimating the potential economic impact of tourism growth in a community. Town and regional officials need to take tourism growth into account when dealing with plans for economic development. Often they are faced with questions such as: What would the economic impact be if tourism increased 10 or 20 percent in the community? What types of tourism enterprises would be most suitable for the community?

In order to provide planning officials with a method for obtaining answers to such questions, a prototype model was designed and tested in this study. First the model was formulated with a focus on a set of tourism firms representing various types of recreation centers and support

businesses. The objective function of the model was formulated to maximize gross tourism income. Opportunity for new firms to enter the tourism industry was assumed to be constrained by limiting availability of land and labor and by projected levels of tourist visits.

Application of the model was begun by constructing a benchmark situation to serve as a basis for comparison. Data for the benchmark situation were conveniently available from a 1982 study of tourism in New London county. By design, the benchmark included 10 different types of recreation centers and support businesses totalling 721 firms. As reported for a benchmark situation, the industry grossed an estimated $46.8 million in tourism income, used 5535 acres of land, and employed 3886 full-year equivalents of labor.

Next the model was applied to four different, projected tourism growth situations. For Situation A, with a projected 10 percent growth in tourist visits, results indicated that gross tourism income would increase 11.6 percent, land use would increase 2.4 percent, and labor would increase 9.8 percent. To accomplish this, the most efficient combination of new firms would be two motels, nine eating/drinking firms, 30 marinas, 10 sport shops, and nine auto service stations.

Variations in the other three projected situations included 20 percent growth rates, location alternatives, and predetermined entry specifications for selected firms. Each test provided additional information that demonstrated the usefulness of the model for identifying varying economic impacts due to varying conditions.

In most of the tests, solutions showed a tendency for economic development to shift from more densely populated towns to less densely populated towns. However, a generalization to that effect would not be supportable because the tests revealed exceptions, that is, some shifts were in the opposite direction. Moreover, since the situations used for this study were limited in scope, the empirical results are not intended for generalization.

The primary objective of testing the applicability of the model was achieved. Based on tests conducted the model shows promise of being an operational procedure for evaluating alternative tourism development proposals at a practical level.

APPENDIX

TABLE 7. Population, Retail Sales and Town Size by Towns, New London County

Towns by Development Density Groups	1980 Population[a]	1982 Retail Sales[b]	Town Size[c]
	(number)	(million $)	(square miles)
Urban-Industrial			
Groton	41,062	186.4	29.6
New London	28,842	183.9	5.5
Norwich	38,074	239.0	28.1
Coastal Suburban			
East Lyme	13,870	49.1	34.9
Old Lyme	6,159	9.7	24.4
Stonington	16,222	30.5	39.3
Waterford	17,843	41.1	33.4
Inland Suburban			
Colchester	7,761	30.0	47.8
Griswold	8,967	25.7	35.0
Ledyard	13,735	14.8	39.2
Lisbon	3,279	10.9	16.7
Montville	16,455	18.6	43.2
Preston	4,644	3.9	30.9
Sprague	2,996	2.3	13.2
Rural			
Bozrah	2,135	1.9	19.8
Franklin	1,592	4.8	19.6
Lebanon	4,762	2.8	55.0
Lyme	1,822	1.5	35.1
North Stonington	4,219	7.5	55.1
Salem	2,335	1.3	28.5
Voluntown	1,637	1.5	39.4

[a] Groff (5).

[b] Department of Revenue Services, *Connecticut Retail Sales, Calendar Year,* 1982 (4).

[c] Southeastern Connecticut Regional Planning Agency, *Land Use — Southern Connecticut Planning Region* (11).

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