ENVIRONMENTAL HEALTH IN COMMUNITY GROWTH*

AN ADMINISTRATIVE GUIDE TO METROPOLITAN AREA SANITATION PRACTICES

THIS REPORT, supplementing the committee report of 1959,† has been prepared to assist governmental officials, as well as public health workers, consultants, and others who are daily facing the many environmental engineering and health questions associated with community growth. It attempts to identify basic principles and makes suggestions for good practices in the solution or prevention of the environmental problems. The application of these principles will vary with the character of the local community, its problems, and capabilities. However, the essential ingredients are presented as the best judgment of this committee.

I. Guide Lines for Action

This study has explored demographic, governmental, legislative, planning, subdivision, financial, and community participation factors of environmental health problems associated with community growth. They are not simple. However, several basic elements for the prevention of recurring environmental health problems stand out. These are presented to the administrator and local official for easy reference and for application where indicated, dependent upon the character of the local community, its problems, and capabilities.

1. Establish and support an adequately staffed local health department with professional sanitary engineering direction of a comprehensive environmental health program to prevent, solve, and control environmental engineering problems.

2. Establish a metropolitan or county planning agency. A comprehensive plan to guide community development and improvement, supplemented by short-range detail plans, is required.

3. Authorize the preparation of regional or metropolitan area comprehensive engineering plans for public water supply and sewerage, air and water pollution control, traffic circulation, recreation, industrial expansion, residential housing, shopping centers, and so forth.

4. Adopt and enforce a modern sanitary code including control of realty subdivisions, air pollution, and ionizing radiation.

5. Adopt and enforce an up-to-date building code, plumbing code, fire prevention code, and zoning ordinance with full-time professional direction.

6. Adopt and enforce a modern minimum standards housing ordinance, and a taxing policy which encourages rather than penalizes housing conservation and rehabilitation. Retain, improve, and integrate useful parts of the community and guide desirable construction so as to strengthen and protect the character of the neighborhoods. Capitalize on good points; eliminate "foci of infection"; replan and redevelop. Professional guidance and direction are essential.

7. Provide parks, cultural and recreational facilities, and protect residential areas to promote a healthful environment.

8. Adopt a capital improvement pro-

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* Report of the Fringe Area Sanitation Practices Committee, Engineering and Sanitation Section, American Public Health Association, October, 1962.

† Fringe Area Sanitation. Report of the Committee on Fringe Area Sanitation Problems of the Engineering and Sanitation Section, American Public Health Association, October 19-23, 1959, Atlantic City, N. J. Pub. Health Rep. 76,4:309–314 (Apr.), 1961.

gram geared to needs and ability of people to pay. Step-construction programs based upon long-term comprehensive engineering plans, with a balanced allocation of the available income expected each year, make possible what appears to be impossible.

9. Provide an operating budget sufficient to meet all essential community services. Remember that in the long run good salaries attract good people. Large sums of money stand to be misdirected when administered by incompetent people. Evaluate budgetary requests and salaries on basis of services rendered rather than on gross amounts alone.

10. Encourage local research and continuing evaluation of local government programs. Apply new knowledge and seek out new methods and procedures.

11. Utilize available professional and technical skills in government, and in the community.

12. Finance initial community improvements and services, such as roads, water supply, and sewerage through the persons affected in proportion to the benefits received.

13. Keep the taxpayer continually informed of how his taxes and fees are being spent, of plans for future community improvements, and of the benefits and services rendered. Obtain and invite understanding and cooperation of taxpayers, business, and community organizations.

II. Problems Associated with Community Growth

The population of the United States has been increasing at the average rate of 2.8 million per year since 1950. The new families expected in the middle 1960's arising from the "baby boom" following the end of World War II will result in a continuing demand for housing, community services and facilities. This is in addition to the backlog of existing needs. Because of the population pressures, demand for housing has been so compelling that it has in many cases outweighed arguments for prevention of accompanying environmental engineering and health problems. The increased mobility of people, their greater demands arising from higher living standards, the increasing costs and inability or lag of government structure to provide the necessary services and facilities as needed compound the sanitation problems of growing areas.

Environmental engineering associated with community improvement and growth is usually recognized as encompassing the technical aspects of water supply, sewage disposal, refuse disposal, housing, ionizing radiation, and air pollution control. However, what is not generally understood is that the construction or improvement and maintenance of sanitary facilities, and adequate solution of the related problems, depends upon many social, economic, and governmental factors. These factors include legislative policy, comprehensive planning, and effective utilization of financial resources, together with public education and understanding.

Effective communication and cooperation among governmental and nongovernmental agencies are basic to proper community growth. Proper consideration must be given to preserving and enhancing the health, safety, convenience, welfare, and character of communities and developing to the fullest their economic, social, and cultural potential. It is necessary therefore that community planning agencies and highway, public works, urban renewal, health, hospital, education, welfare, and water resources planners and consultants, commercial, industrial, and residential developers, and health department sanitary engineers work in close harmony. In this way a more complete and balanced appraisal can be achieved in the plans and reports each prepares and

Table 1—USA Population Trends During Last Ten Years*

Population Area	Census Population in Millions		Census Diff. in Millions	Per cent Change
	1950	1960	1950 and 1960	+ or −
Total Population	151.326	179.323	+27.997	+18.5
Urban Population	96.847	125.269	+28.422	+29.3
Inside urbanized area		95.848		
Outside urbanized area		29.420		
Rural Population	54.479	54.054	− 0.425	− 0.78
Population in Standard Metropolitan Statistical Areas (SMSA's)	89.317	112.885	+23.568	+26.4
In central cities	52.386	58.004	+ 5.619	+10.7
Outside central cities	36.931	54.881	+17.950	+48.6
Population Outside SMSA's	62.009	66.438	+ 4.429	+ 7.1

* Data adapted from The Municipal Year Book 1961. Chicago, Ill.: International City Managers' Association, 1961, pp. 28–42.

upon which public policy decisions will be made. Such coordination is most important, not only to evaluate reactions to proposed plans and receive community support, but also to determine the best ways to implement individual plans and to secure effective operation of the facilities provided.

The problems of most cities are those of rebuilding and adjusting to social, economic, and technological progress. In contrast, the problems of suburbs are related to the provision of "city" services and facilities for the initial building before and during community growth, while at the same time avoiding the problems cities are trying to correct. It would seem that in many instances the solution or prevention of mutual problems could be expedited by cooperative and coordinated actions in the common interest by cities and contiguous suburbs. As a matter of fact, their problems are often inseparable.

Fringe areas cannot be permanently separated from the population centers they border. The urban core as well as the fringe areas, that is, the metropolitan region, must be considered in solving or preventing the associated environmental engineering problems. This is emphasized by the following paragraphs and by the 1960 Census which reports 212 metropolitan areas (SMSA)* in the United States with county urban and rural populations of 112,885,178, or 63 per cent of the total.

Table 1 shows that over 54 million people in the United States live in rural areas. An additional 29 million of the urban population† live outside the highly

* "Except in New England, a SMSA is a county or group of contiguous counties which contain at least one city of 50,000 inhabitants or more or "twin cities" with a combined population of at least 50,000. In addition to the county, or counties, containing such a city or cities, contiguous counties are included in a SMSA if, according to certain criteria, they are essentially metropolitan in character and are socially and economically integrated with the central city." United States Census of Population 1960, New York, PC(1) 34A New York, p VII.

† According to the definition adopted for use in the 1960 Census, the urban population comprises all persons living in: (a) places of 2,500 inhabitants or more incorporated as cities, boroughs, villages, and towns (except towns in New England, New York, and Wisconsin); (b) the densely settled urban fringe, whether incorporated or unincorporated, of urbanized areas; (c) towns in New England and townships in New Jersey and Pennsylvania which contain no incorporated municipalities as subdivisions and have either 25,000 inhabitants or more or a population of 2,500 to 25,000 and a density of 1,500 persons or more per square mile; (d) counties in states other than the New England states, New Jersey, and Pennsylvania that have no incorporated municipalities within their boundaries and have a density of 1,500 persons or more per square mile; and (e) unincorporated places of 2,500 inhabitants or more.

urbanized areas, in urban fringes, which also have many of the environmental problems associated with the rural countryside and growing communities. Hence a total of more than 83 million people or 46.5 per cent of the total population live in rural areas and "Outside Urbanized Area." An important sidelight of the population analysis is that according to a previous urban definition,* the 1960 urban population would be 113.056 million and the rural population 66.267 million. The definition of terms therefore can obscure, minimize, or magnify the size of the fringe areas and associated problems.

Table 1 also shows that 54.881 million persons live "Outside Central Cities" in SMSA's where the population increased by 48.6 per cent between 1950 and 1960. Another facet is that a total of 121.319 million persons (179.323 minus 58.004) or 67.7 per cent of the population does not live in the 254 central cities. It is significant to note in this connection however that whereas the housing and related problems of cities are receiving justified publicity and attention, the identification of needs in our future urban areas, which are now the fringes and contiguous rural areas, have by comparison been neglected. These are the areas where much of our present and future environmental health attention should be directed.

Regardless of definitions and interpretations of census data, the population of the United States has been increasing at a rate exceeding predictions. The tabulation shown here gives the census populations projected to the year 1980.

A major factor to be considered is the effect of this growth on existing and new communities. Increasing population produces the need for additional community services and facilities which are not immediately recognized as future expenses. For example, it has been estimated (1960) that, in addition to existing unsolved problems and needs, every 1,000 new people will require*:

Year	Population in Thousands
1900	75,995
1910	91,972
1920	105,711
1930	122,775
1940	131,669
1950	151,325
1960	179,323
1965*	194,454 to 196,217
1970*	208,931 to 214,222
1975*	225,963 to 235,275
1980*	245,736 to 259,584

* New York Times, August 6, 1962, p. 27.

(a) 4.8 new elementary schoolrooms at $24,800 each and 3.6 new high schoolrooms at $44,300 for a total capital expenditure of $278,520.†

(b) An additional school operating budget of $114,000 per year.

(c) 8.8 acres of land for schools, parks, and play areas.

(d) An additional 100,000 gallons of water per day, or 36.5 million gallons per year, at a cost of $9,125 per year; or, 300 new individual drilled well water systems at a first cost of $225,000, plus operation and maintenance.

(e) More streets to maintain and clean, snow to plow, garbage and refuse to collect, not to mention the cost of surfacing streets and providing for storm drainage. Refuse collection and disposal alone will require an additional $3,000 per year in the budget ($7,800 with private collection).

(f) 1.8 policemen at $9,900 per year.

(g) 1.5 new firemen at $8,250 per year.

(h) Payroll increases for new public service employees (public works, recreation, health, tax collection) from $45,000 to $57,000 per year.

(i) An additional hospital bed at a cost of $30,000 to $40,000.

(j) 1,000 new library books at a cost of $3,500 per year.

* Statistical Abstract of the United States 1961. U. S. Department of Commerce, Bureau of the Census.

* Adapted from the United States Municipal News 22:16 (Aug. 15), 1955. Washington, D. C.: United States Conference of Mayors, 730 Jackson Place.

† New York Times, Aug. 13, 1961, Review of the Week, Section 4.

(k) A fraction of a cell in the county jail. Operation $550 per year.

(l) An expenditure of $65,000 to control the effects of air pollution.*

(m) Sewerage and treatment for 170 pounds of organic (BOD) water pollutants per day, or 62,060 pounds per year from 36.5 million gallons of used domestic water, at a cost of $210,000, plus $5,000 for operation and maintenance per year; or 300 new septic tank leaching systems at a first cost of $135,000, plus an average annual maintenance cost of at least $3,000.

The part industry can play in the economic growth of an area, and incidentally in the financing of local improvements directly and indirectly, should not be overlooked. A United States Chamber of Commerce study shows that 100 additional factory jobs can mean to a community:

(a) An additional 296 people
(b) 112 more households
(c) 51 more school children
(d) $590,000 more personal income per year
(e) $270,000 more bank deposits
(f) 107 more passenger cars registered
(g) 174 more workers employed
(h) Four more retail firms
(i) $360,000 more retail sales per year.

Population growth also means more industrial wastes as well as air and water pollution as mentioned above; more concern with radiation hazards; a better highway system to facilitate the movement of goods and people; as well as public health, education, recreation, hospital and welfare services. Not to be forgotten is the need for epidemiological evidence and public understanding to support the need for environmental health engineering improvements, and study of the effects of trace amounts of chemicals in water, food, and air. There is a concurrent need for additional research to devise better and more economical means to treat drinking water, waste water and polluted air, to obtain better housing and land use, and to develop better technics to overcome the interpersonal and related obstacles to the application of available knowledge.

Although a maze of data has been published regarding the specialized environmental engineering and health aspect of community growth and associated industrial development, the material is not available in readily usable form. Much of it deals with explorations and specialized solutions. The purpose of this guide is to provide more information dealing with the broad or total environmental engineering and health aspects of community growth and the practical application of available knowledge.

The major difficulties in solving environmental engineering and health-related problems in expanding urban and metropolitan areas are not solely in the technical or engineering aspects of the work. They lie rather in the fields of demography, government, legislation, economics, planning and subdivision development, and community participation. It is in these areas that the emphasis will be placed in the sections that follow.

III. Elements in the Community Affecting Environmental Health

A. Demography*

Most problems of environmental health in post-war American metropolitan areas stem from the unprecedented and rapid expansion of the population. Any consideration of these problems must, therefore, begin with the study of the demographic aspect. The following

* Proceedings, National Conference on Air Pollution. Washington, D. C.: Dept. of Health, Education, and Welfare, PHS (Nov. 18-20), 1958, p. 273.

* Demography, according to Funk and Wagnalls New College Standard Dictionary "is the study of vital and social statistics in their application to ethnology, anthropology, and public health." Webster's Unabridged Dictionary defines demography as "the statistical study of populations, as to births, marriages, mortality, health, etc.;—usually restricted to physical conditions or vital statistics, though sometimes applied to studies of moral and intellectual conditions also."

highlights this facet of environmental health practices.

1. Contributing Factors

(a) Population will continue to increase and migrate.—The population of the United States continues to increase and migrate to the suburbs. Of the 28 million increase between 1950 and 1960, about 18 million took place in the suburbs and four million in the nonmetropolitan areas. These increases took place where many environmental facilities were lacking, where there was the least planning, and frequently outside of any single existing governmental service area. The line of demarcation between the city and its suburbs is invisible, and the line of demarcation between the suburbs and rural areas in a metropolitan area is a fluid one; but the governmental jurisdictions are usually firmly established and difficult to change.

(b) New families will demand housing and community services.—The Bureau of the Census reports 53,021,061 occupied housing units (families) in 1960. It estimates that by July, 1980, there will be from 60,032,000 to 63,209,000 families and from 69,382,000 to 73,000,000 households. These new families will demand housing and community services, and these demands must be superimposed upon the existing unmet needs and upon the replacement or rehabilitation of obsolete structures and facilities.

(c) Present facilities need to be greatly increased to keep pace with demands.—In view of population and dwelling unit projections for the future, present facilities will need to be greatly increased just to keep pace with demands. Much of the planning now being conducted for water supply, sewerage and sewage and waste treatment facilities, for incinerators and other refuse disposal methods, for air pollution control, for urban renewal including housing conservation and rehabilitation, for hospital and welfare facilities, and for other public health concerns will not be finalized and accepted for several years. Education and persuasion of the community to authorize bond issues to finance the above services represent a continuing difficult process which is not always successful.

(d) Change in living standards is more rapid than people's ability to adjust.—The desire for a "home in the country," the changing pattern of work and living, and increased leisure have caused a demand for city-type governmental services in growing communities. Since a large percentage of new home owners are first-time home owners, it is not surprising to find that they were not aware of the problems encountered in fringe areas and hence are slow in accepting the responsibility to pay higher taxes to finance the desired community services and facilities. In addition, the people very often have not been prepared to accept the need for governmental adjustments or new administrative organizations to solve existing and eliminate future community problems.

(e) People's demands may supersede necessary controls for the common good.—Most environmental problems are amenable to solution or preventive action. But, public demand for individual homes is often so compelling that it may temporarily overshadow efforts for the control or prevention of the related sanitation problems. This is particularly likely to happen where there are no forces to counteract and balance the pressures and efforts of vested interests. For example, some governmental, technical, and voluntary organizations as well as professional societies have been unwitting accomplices to the environmental engineering and health problems in existing and growing communities by failing to support sanitary engineering direction of local environmental health programs and realistic sanitary engineer, sanitarian, and technician ratios to pop-

ulation and population growth factors based upon comprehensive environmental programs and needs.

2. Indicated Solutions or Prevention

(a) Utilize all community resources to help obtain long-term corrections rather than temporary abatement.—Solutions of current deficiencies will require full utilization of all community resources and will call for greater attention to long-range over-all corrective measures rather than temporary abatement of problems. This can take the form, for example, of actively promoting bond issues for new facilities which can replace unsatisfactory stop-gap services. Certainly it will take a much greater participation on the part of the people and health agency because, in large part, the efficiency of local government (including the health department) is dependent on the success of these agencies with direct responsibility for construction, operation, and maintenance of services such as public water supply, sewerage, refuse collection, street cleaning, storm water drainage, building construction, housing maintenance, recreation, etc.

(b) Obtain and maintain structurally sound and healthful housing.—In 1960 the Bureau of the Census reported 73.0 per cent of the 58,323,672 housing units as sound, 8.2 per cent as deteriorating, and 18.8 per cent as dilapidated or lacking one or more plumbing facilities. It is expected that all new dwelling building codes will require adequate living space with at least one private bathroom (with flush toilet, wash basin, and tub or shower), adequate heating, and a kitchen sink with hot and cold running water, and refrigerator for the exclusive use of each family. In addition, this must be supplemented by a zoning and housing code to protect the character of a community and to require that all dwellings and premises be maintained to prevent their deterioration.

(c) Profit from past experiences of cities.—To date, most of the concern has been with the problems of urban areas. It should be noted that about 80 per cent of the 1950 to 1960 population increase of 28 million took place outside of the central cities. This trend in suburban growth is expected to continue. If time and money are not to be spent in just "putting out fires" resulting from uncontrolled growth, it will be necessary to institute controls early to prevent, in so far as possible, recurrence of the city problems in the suburbs—the urban areas of tomorrow. These controls should include planning and zoning, a building code including plumbing and fire prevention, subdivision regulation, a sanitary code, and a housing occupancy, maintenance and rehabilitation code, all under full-time professional direction.

(d) Guide community development to previously designated areas.—Local officials and civic leaders should plan now to guide the direction and character of community growth to locations which will provide the most desirable environment for work, home and recreation, and where the needed services and facilities can be most economically provided. Land-use and community facilities planning can be effective in accomplishing this.

(e) Continue research and apply new knowledge.—Environmental health problems are not static, hence a dynamic approach is vital to meet the ever-changing conditions in growing communities. This requires continuing research into the causes, prevention and economical solution of environmental engineering and health problems, and the application of new methods. Automatic data processing methods can be applied to environmental activities, program evaluation, and research.

(f) Integrate national, state, regional, and local planning.—General, broad reservation of areas for best use, such as national forest, parks and recreation,

with coordination and implementation on a state and local level, should be given serious consideration. Local land-use patterns, such as residential, commercial, industrial, or cultural, must be respected.

B. Government

Health hazards do not respect political boundaries. The health problems of cities and villages cannot be permanently and clearly separated from those of its suburbs, and the problems of the suburbs cannot be separated from the population centers they surround. The solution of environmental engineering problems cannot be accomplished without the active support of government. It is therefore necessary to understand, work with, and influence diverse governmental units and leaders. In metropolitan complexes, where the many government units wish to retain their political independence, fragmented approaches to common problems can be minimized by developing a feeling for one community for self-preservation. Getting cities, towns, and villages to work together involves politics. But little will be done by the public health worker toward solving metropolitan problems unless he recognizes and appreciates the part played by politics in decision-making. Conversely, the political leader will accomplish little of lasting value unless he utilizes the professional services available to him. Evidence that this can be done are the many successful solutions developed for water supply, sewerage, and refuse problems accomplished as a result of patient cultivation of the friendship and cooperation of public officials.

1. Contributing Factors

(a) Administrative practices are outmoded.—Many local governments have not adjusted their administration machinery to cope with the new and changing needs of their people. The rapid growth of urban areas and the skyrocketing demands for adequate sanitary facilities have placed many municipal authorities in a dilemma.

(b) There is no single solution.—There is no one form of government which can be applied as a panacea in solving all environmental engineering and health problems. What works well in one area may fail utterly in another.

(c) There is inadequate research.—There is need for continuing governmental study of rural, fringe, urban, and metropolitan area problems.

(d) Greater political statesmanship is needed.—Community sanitation and related facilities are part of a larger municipal operation, the improvement of which is dependent on informed political action. But this is either not being realized or is being willfully ignored.

(e) Inadequate local health department staffing permits the development of health hazards.—Studies show* that only a small percentage of city and county health departments have sanitary engineers to assist and guide in the control and prevention of environmental engineering problems. In addition, 73 or 40 per cent of the 212 Standard Metropolitan Statistical Areas (1960) have incomplete local health department coverage, principally in the fringes. Also, 40 per cent of the 207 counties containing cities of 25,000 to 50,000, which are potential Standard Metropolitan Statistical Areas, have no local health departments. Failure to provide and support full-time, adequately staffed local health services, including competent sanitary engineering direction of the environmental health services, and modern sanitary codes, aid and abet the development of metropolitan area sanitation problems. This makes prevention, cure, and control more difficult and distant.

* Sanders, Barkev S. Local Health Departments: Growth or Illusion? Pub. Health Rep. 74:13–20 (Jan.), 1959.

(f) Available resources are not fully utilized.—Federal, state, and local experts in metropolitan planning, governmental affairs, finance, health, hospital planning, conservation, etc., sometimes do not make their services readily available, or local officials are either reluctant to request their advice or do not know of their existence.

(g) Boundaries and provincialism hamper functional solutions.—Geographic and political dividing lines do not confine common needs for sanitary facilities. Interjurisdictional conflicts and parochial attitudes introduce unnecessary obstacles to "natural" solutions.

2. Indicated Solutions or Prevention

(a) Establish working relations among political subdivisions.—Solutions in the area of governmental relations are complex and time-consuming. The fact that progress depends so much on government, however, indicates that solutions must be sought. Recent reports of a state legislative committee on metropolitan area studies are very informative,* e.g.:

> "Answers to these problems in a metropolitan area almost invariably entail governmental adjustments and working relations among various political subdivisions which are not in every instance readily achieved. Waterworks engineers have complicated formulas for measuring 'friction loss' in the velocity of water delivered through mains. There is also 'friction loss' in arriving at satisfactory governmental arrangements for water supply and distribution in metropolitan centers."

(b) Coordinate solutions through available government and officials.—Basic ways to cope with the governmental aspects of metropolitan problems include understanding the nature of government, becoming personally acquainted with governmental arrangements and the government officials of the area in which one works, and assisting the governmental representatives of several communities to take cooperative action in obtaining environmental improvements of common benefit to all. Close coordination among governmental agencies and citizen participation are becoming necessities.

(c) Consider available methods of providing services and facilities.—Utilization of a governmental pattern new to the area may present a possible solution. The following arrangements and devices, singly or in combination, have been used in the United States with varying success:

(1) Annexation—acquisition by a governmental unit of adjacent territory outside its political boundary.

(2) Agencies, authorities, and special districts—an independent administrative unit with certain specified governmental rights to perform a special service or services.

(3) Mutual cooperation—informal working relationship among people in different political subdivisions to solve common problems.

(4) Extending city services—contractual arrangements between a municipality and adjacent territories to provide for the use of the municipal services and facilities in conformity with a regional plan.

(5) City-county amalgamation—integration of the functions of the core city with the county's; the latter retains a partial identity and the incorporated municipalities remain independent for local purposes.

(6) City-county separation—creation of a city-county of the core city and a new county of the outlying areas.

(7) Federation—establishment of a new level of government with responsibility for regional and area-wide functional services.

(8) Functional transfer—responsibility for providing a service or function is transferred to another existing level of government.

(9) Consolidation of smaller municipal service corporations.

Application to the area involved of one or more of the arrangements should be considered, in addition to contract for service, regional service, and so forth.

(d) Utilize informal governmental arrangements.—Encourage informal coop-

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* Municipal Cooperation, and Metropolitan Action. Albany, N. Y.: State of New York Legislative Committee on Metropolitan Area Study. 1959, 1960.

erative efforts by governmental people (such as special committees) on a regional or drainage area basis to prevent or minimize community problems. Cooperative devices have been found to be an effective way to initiate action.

(e) Understand and utilize executive, legislative, and judicial branches of government.—There should be awareness of the three functions of government (executive, legislative, and judicial) and their relationship to community development. Legislation is required to establish the legal framework within which metropolitan area problems can be attacked. It is the medium for expressing the will of the people. Legislation is needed at the state level to authorize the use of local forms of urban area government, as the state has sovereign power over municipalities within its borders. Local ordinances are required to permit the adoption of governmental forms. From the legislative proceedings stem the executive arrangements under which the method of choice or use is administered. Court rulings on contested legislation or executive decisions shape the plans chosen to deal with subsequent problems or in designing a new approach to solving a problem by the means first selected.

(f) Determine and utilize government at all levels—local, state, and federal.—Government can provide services, consultation, grants, loans, and technical assistance. Each, because of its position, can contribute to and supplement the efforts of the other in the solution or prevention of complex community problems.

(g) Work with and through key people.—Establish, develop, and maintain liaison with the key people in government, business, and community life who have an interest in community development. The community council and other community organizations, as well as key people, should be kept informed and their advice and active support requested to implement the solution or prevention of environmental health problems.

(h) Use area-wide community services where possible.—Promote organization and competent direction of programs relating to community development and operations, such as area-wide refuse collection and disposal, regional or drainage area water supply, sewerage and sewage treatment, and urban-suburban renewal. A minimum number of area-wide service systems operated and coordinated by a single governing body will generally provide better and more efficient service with less capital investment and less operating expense than a large number of small independent systems serving the same area.

(i) Promote official responsibility.—Every effort should be made to have county, city, village, and town authorities, or other public agencies accept their responsibility for providing adequate water supply, refuse collection, sewerage and sewage treatment facilities to serve adjoining areas as necessary health protection for the total community. The same principle applies to air and water pollution control.

(j) Give political leadership the facts.—Guide and inform political leadership to the recognition of environmental problems (as well as their correction or prevention), as possible forceful issues that may well determine the outcome of a political election or campaign.

(k) Keep the public informed.—The public official should utilize mass communication media to keep the public informed and get his points across.

(l) Establish a governmental board to review and approve all projects concerned with community development.—Establish a metropolitan or county board to review and approve or recommend approval of all community development and redevelopment projects including subdivisions. The board should include

representation from the planning, public works, and public health departments.

(m) Prepare needed legislation.—Interested governmental officials should prepare for adoption needed legislation to encourage orderly community development.

(n) Separate promotional and regulatory functions.—Governmental regulatory functions are sometimes incompatible with promotional functions. Since both are necessary, it may be desirable to separate them so that planning and promotional activities are not handicapped by the distaste that often accompanies any attempt at regulation.

(o) Obtain adequate environmental health staff on local and metropolitan health departments.—Promote area-wide, adequate health services with professional sanitary engineering direction of the environmental health program. The greater the competencies in local health departments, the more likely that environmental engineering and health problems in urban and metropolitan areas will be recognized and controlled by community leaders and the people. A surprising number of communities still do not have adequately staffed health departments with comprehensive environmental health programs. Many of the Standard Metropolitan Statistical Areas have incomplete health department coverage, and a large number of counties containing cities of 25,000 to 50,000 population or more have no local health departments. Adequate environmental engineering and sanitarian staffing at the local and metropolitan level is necessary before corrective or preventive measures can be instituted. If sanitary engineering services are not locally available then they should be secured elsewhere.

(p) Obtain competent professional direction of all municipal departments.—The success of a political administration is frequently judged by the efficiency with which governmental services and facilities are provided. Competent professional direction of all municipal departments greatly helps in the solution or prevention of health problems, assures efficient service, and the proper expenditure of budget appropriations. It is axiomatic that high salaries attract and hold the most competent professional personnel, thereby assuring continuity of long-term municipal programs with the least faltering and delay.

(q) Pursue research.—Governmental and nongovernmental study of rural, fringe, urban, and metropolitan area problems, to ascertain possible causes, solutions, and preventive measures should be a continuing process.

C. Legislation

Legislation affects the economic productivity, the financing of public services, and the comfort and convenience of the people in urban, suburban, and rural areas. In most instances there has been a lag between the recognition of the existence, or emergence, of environmental problems and the adoption of appropriate legislation to control or prevent the problems.

1. Contributing Factors

(a) Solution or prevention of environmental health problems is not always politically expedient.—Political expediency can hamper adoption or enforcement of control legislation dealing with urban, fringe, and rural area environmental health problems. Under such circumstances, legislation for regulatory agencies is not introduced or the regulatory powers may be so limited as to make the agency ineffectual. Budget limitations and lack of legal support contribute to the problem.

(b) Political statesmanship is often lacking.—Political courage and political leadership are scarce commodities; the courageous elected official is more often a dead statistic and less frequently a

surviving hero, unless he keeps his constituency thoroughly informed. Public apathy supports political inaction.

(c) Inadequate control legislation permits chaotic growth.—Inadequate or nonexistent uniform subdivision regulations, zoning ordinances, building codes, housing codes, fire prevention regulations, and plumbing codes impede the attempts to control sanitation problems.

(d) Health officials and consultants frequently do not participate actively in promoting health-related legislation.—The sanitary engineer, health officer, and sanitarian in public health, as well as the architect, consulting engineer, educator, and public administrator may often be influential in obtaining passage of legislation and should be familiar with all ancillary legislation affecting his field, such as planning and subdivision regulations, zoning laws, housing codes, and building codes.

(e) There is a lack of legislation permitting consolidation of small service districts.—In some states there is a need for permissive legislation to consolidate and establish multipurpose metropolitan and regional districts, federation of local units, and county districts. The multiplicity of special districts with individual bookkeeping tends to discourage local officials from considering formation of a new district each time a group of homeowners is in need of a particular service or facility.

(f) Federal and state assistance legislation sometimes overlooks the over-all objectives of local agencies.—A federal or state agency, in striving to achieve a specific goal in a municipality, may ignore other local agencies and thus actually hamper them in their objectives to remove the causes of the very conditions the federal or state governments intended to correct and prevent.

2. Indicated Solutions or Prevention

(a) Explain legislative needs.—An active continuing program of public information and education concerning legislative problems and needs of the community is essential to obtain support leading to adoption of legislation.

(b) Permit new methods to provide public services.—Laws that will allow private corporations to finance, construct, and operate sewerage systems and sewage treatment facilities under established criteria are examples of a new method of providing a community facility.

(c) Secure new or revised legislation when indicated.—Basic legislation by states, providing a framework and controls to assist mushrooming areas, is an important aid. Expert assistance to help solve local problems should be made readily available.

(d) Provide a central legislative reference.—A compilation of all local, state, and federal legislation in effect relating to or affecting the development, financing, or control of community facilities should be kept current and available to public officials and agencies, community civic groups, and appropriate professional people. Examples to include are:

(1) Planning and zoning laws and regulations
(2) Building, plumbing, heating, ventilating, electrical, and fire prevention regulations
(3) Urban renewal legislation
(4) Subdivision regulations
(5) Water resources control acts
(6) Housing occupancy, conservation, and rehabilitation codes
(7) Sanitary codes
(8) Air pollution control acts
(9) Related state legislation
(10) Federal and state acts concerning financial grants and loans.

(e) Support legislation affecting environmental health.—Public health workers and community leaders should be constantly alert for opportunities to explain and support legislation affecting environmental facilites for community growth.

(f) Provide permissive area-wide legislation to fit local needs.—Permissive

legislation should be available, where needed, giving county boards of supervisors powers to enact ordinances, establish a health department, planning board, building department, public works department, water agency, sewerage and sewage treatment agency, air pollution control agency, refuse collection and disposal agency, etc., for the entire county or a region, including or excluding cities, subject to general statutory limitations. Coordination and consolidation, within a political jurisdiction, should be mandatory. Some working arrangements are:

(1) Regional cooperation—an intercounty commission of supervisors of counties in a metropolitan area
(2) County, city-county, or regional sanitary districts
(3) Federation of local units of government
(4) Establishment of multipurpose metropolitan districts.

(g) Secure state legislation which requires the establishment of minimum standards.—State agencies should provide necessary minimum standards in the fields of health, subdivision control, water supply, storm water drainage, sewerage, highways, traffic, safety, police, zoning, planning, building, housing, air and water pollution.

(h) Control establishment of new agencies to reduce duplications.—Control the number of agencies to reduce overlap and periodically review functions of existing agencies to eliminate or consolidate services and functions where possible.

(i) Assure that grants and loans will provide balanced community services and facilities.—The release of federal and state grants and loans such as for highways, education, welfare, health, housing, recreation, public works, water supply, sewerage and sewage treatment, and urban renewal should be predicated not only on the adequacy of the particular program or facility, but also on the status of other community needs and the integration of the new program with plans under way, to achieve a favorable balance in total community services and facilities. Coordination among all affected agencies on a federal, state, and local level should be mandatory and documented.

(j) Assure that communities meet quality criteria in the allocation of federal and state funds.—Encourage the states and local communities to assume greater responsibilities for local planning, health, welfare, education, recreation, air and stream pollution abatement, storm water drainage, refuse collection and disposal, mosquito control, water resources planning and development, flood control, etc., through coordinated federal, state, and local programs. Although this is being done now in some areas, the approach could be strengthened by assuring that the administration of funds is under competent direction at the local level.

(k) Adopt and enforce modern laws.—Professional direction and enforcement of certain basic controls for orderly government are necessary to the prevention as well as the solution of environmental health and engineering problems. These controls include:

(1) A comprehensive modern sanitary code including the control of air and water pollution, sewage disposal, sources of ionizing radiations, refuse collection and disposal, water supply, milk and food, realty developments, rural and resort sanitation, and so forth.
(2) A state and county or regional subdivision control law designed also to protect the public health, prevent the installation of substandard water and sewerage facilities, and inadequate surface water drainage.
(3) A sound building code with sections on plumbing, heating, electrical requirements, ventilation, and fire prevention, in addition to space and structural requirements.
(4) A realistic zoning ordinance which recognizes such physical limitations as soil permeability, topography, prevailing winds, temperature and humidity, natural drainage, etc., as well as existing and future man-made factors such as major highways, natural industrial sites, commercial areas, etc.
(5) A minimum standards housing ordinance which takes into consideration the

neighborhood living environment as well as dwelling occupancy, supplied facilities, and maintenance.

(1) Adopt and enforce a "capped sewer" ordinance.—This type of ordinance requires preparation of a master plan for ultimate sewer development of a large area or total jurisdiction and the establishment of an approximate timetable for carrying out principal work. A subdivider within the area would be permitted to go ahead with residential construction utilizing individual sewage disposal installations (if practical as determined by soil percolation tests) provided he installed all sanitary sewers. These sewers would be capped at the property lines. They would be laid out to fit into the master engineering plan and would be connected when necessary to trunks or interceptor lines when installed to the connecting points in the subdivision. At that time, the individual sewage disposal installations, which would be considered temporary, would be abandoned (pumped out and filled) and the dwellings connected to the sewer. These latter operations would be done by the householder or individual premise owner.

D. Planning* and Subdivision

Depending upon one's particular interest, there is a tendency to emphasize one facet of planning. Examples of this are highways, schools, water resources, urban renewal, water supply, sewerage, flood control, recreation and natural resources, navigation, hospital, health, welfare, air pollution, and so on. Howes and Gray pointed out that "At the present time, major efforts to plan within the framework that is comprehensive both as to area and to subject matter are confined principally to cities and a few metropolitan areas. In most sections of the country, the possibilities for broad-scale planning are limited by fragmentation of governmental units and the dominance of planning by single-purpose agencies. In a few areas, regional planning commissions are following a comprehensive and coordinated approach to area development." However, Wurster cautions that "It is increasingly obvious that city and county planning is not enough, that voluntary regional planning is ineffective and that the multiplication of single-purpose authorities . . . is creating a new kind of anarchy."

The planning function in metropolitan areas has evolved to a point where today, in many places, it is one of the forces shaping community development. Particularly is this true of urban redevelopment. Here, there is opportunity, where areas have been cleared, to rebuild according to a modern plan which can avoid mistakes made in earlier building. This might be done provided the plan is well integrated with a comprehensive regional plan, and the community operations prevent repetition in the future of past and similar problems.

The planning function in a municipal government may be found in several places. In small communities (including parts of a metropolitan complex) it may be one of the duties of the city or county engineer. The larger county or city may have a professional planner with staff, while the still larger agglomerations may have a regional organization such as the North East Illinois Metropolitan Area Planning Commission. In many

* The term planning is used to denote the process of assembly of information, analysis of data, and formulation of documentary guides and plans by specialists, including civil engineers, for the establishment, arrangement, improvement, and redevelopment of physical facilities and land areas for the purpose of preserving and enhancing the health, safety, convenience, welfare, and character of communities and developing to the fullest their economic, social, and cultural potential. When applied to urban areas, this process is designated as urban planning or city planning. The terms metropolitan planning, regional planning, and county planning also are employed in accordance with the extent of area covered. From "Policy Statement on the Civil Engineer in Planning." Civil Engineering (Sept.), 1961, p. 82.

places there is no formal planning agency.

The planning process as usually presented includes the preparation of a comprehensive plan, a capital budget, a zoning ordinance, and subdivision control regulations. Community planning involves the preparation of a general plan for physical development of the community, including a public improvement program and controls to enforce the plan. The plan, to be effective, should also recognize the need for and part to be played by private planning and investment in order to achieve the maximum results.

The collection of facts requires special surveys and research. This includes obtaining and analyzing data pertaining to population trends, appraisal of economic potential and outlook for the community, housing factors, highways and transportation, utilities, recreation, and the collection of other data on related physical, biological, social, and political factors.

Sometimes overlooked are the environmental considerations which have a direct or indirect effect on man. Hence, in addition, careful consideration must be given to the space, land (including soil permeability), structures, and climate in which people work, live and play.

1. Contributing Factors

(a) Health departments have failed to act.—Many health departments have failed in the traditional water supply and sewage disposal areas of responsibility by default.

(b) There has been inadequate comprehensive planning and subdivision regulation.—The lack of comprehensive planning, zoning, and subdivision regulation encourages chaotic community growth, thereby making more difficult and expensive the solution of urban and fringe area water supply, sewerage, and other community problems. In some cases the result has been poorly laid out subdivisions with overflowing septic tank-leaching systems and polluted private wells, and also inadequately planned and operated community facilities such as roads, drainage, and water and sewerage systems. These situations have contributed to premature neighborhood deterioration.

(c) Building has been permitted on unsuitable soil.—Dwellings have been permitted to be built in subdivisions where there was poor drainage and where the soil was unsuitable for septic tank sewage disposal systems.

(d) Realty developments have not been controlled.—Large and small developments have been built with individual wells and sewage disposal systems in place of community sewerage and water systems because of failure to require predevelopment feasibility surveys and investigations, and sanitary engineering interpretation of basic data. The problem becomes more serious where communities have not adopted planning, subdivision, zoning, health, and building regulations.

(e) Sanitary facilities have not been integrated with a comprehensive engineering plan.—The design of sewerage systems and treatment plants to serve subdivisions without regard to future regional or drainage area sewerage system trunk line invert elevations makes integration of existing small treatment plants and sewerage systems difficult and expensive. Water systems for subdivisions usually do not provide for future expansion, extensions, peak hourly flows, or fire protection.

(f) There has been a lack of capital budgeting.—Too many communities are faced with almost catastrophic expenses for the extension or rehabilitation of community facilities because of failure to provide for planned capital improvements gradually on a year-to-year basis in accordance with a long-range plan.

(g) Lack of community planning con-

trols permits chaotic growth.—"Ribbon" development and "spatter" subdivision development, with no regard to drainage and the availability of public water supply and sewerage, compound the difficulty of achieving orderly growth.

(h) Independent highway planning is not desirable.—New and improved highways encourage "ribbon" and "spatter" developments. There is a need for greater cooperation and coordination between highway planners and community planners.

(i) Grants for comprehensive planning are not utilized.—Although federal grants up to two-thirds the cost of comprehensive planning are available to all communities, provided they meet established criteria, a relatively small number of communities have taken advantage of this outright grant.

(j) Planning and zoning is sometimes done in isolation.—The refusal or failure of adjacent communities to coordinate zoning and planning, particularly along mutual boundaries, defeats the purpose of planning. Sometimes zoning is used in an effort to restrict growth and sometimes lax zoning is sanctioned in an effort to encourage growth, thereby weakening the intent of the law.

2. Indicated Solutions or Prevention

(a) Establish a planning board.—Where a modern planning function is not part of a community organization, the establishment of such should be encouraged by officials. Laws should be passed where needed to encourage orderly community development and to obtain essential operating programs such as planning boards, water and sewerage agencies, etc. This should be supplemented by the establishment of metropolitan or regional planning, and water, sewerage, refuse, traffic, etc., agencies with jurisdiction (advisory or other) over the entire region or metropolitan area, irrespective of political subdivisions.

(b) Utilize capital budgeting. — Through the use of the planning process, especially the comprehensive engineering plan and the capital budget, arrangements may be facilitated to extend sewers or water lines, as well as other community services and facilities, into problem areas.

(c) Facilitate orderly community growth through comprehensive engineering planning.—Develop integrated regional and drainage area comprehensive plans for land-use, traffic circulation, storm water drainage, water supply, sewerage and sewage treatment, refuse collection and disposal, etc., to properly absorb the inevitable suburban growth overflow. More communities should take advantage of interest-free loans from the Community Facilities Administration of the HHFA for planning feasible specific public works projects, including the cost of engineering and architectural surveys, designs, plans, estimates, construction of water supply, sewerage, etc., before the needs for such facilities become critical. Repayment is required when construction is undertaken.

(d) Make environmental health surveys and implement them.—Environmental health surveys of city, county, or metropolitan areas should be conducted at intervals, and initially to establish a base of knowledge about existing conditions. From this data plans can be made for correcting bad conditions and preventing new problems. Some guides and tools for this process are "Environmental Health Planning Guide," Public Health Service Publication No. 823, Washington 25, D. C., and "Water Resources in Rensselaer County: An Environmental Health Study," Rensselaer County Health Department, Troy, N. Y.

(e) Integrate temporary facilities with comprehensive engineering plans. —Design sewerage systems and treatment plants to serve subdivisions based upon future regional and drainage area trunk-line invert elevations. Waste sta-

bilization ponds in many instances offer acceptable temporary or long-term solution. Design water systems for subdivisions to provide for future expansion, extensions, peak hourly flows, and fire protection. Adopt legislation, if needed, to support such requests.

(f) Assure best use of funds through planning.—Encouragement of local planning within the framework of a comprehensive regional plan can help assure the best use of federal and state allocated funds. And because of their intimate knowledge, the state and local communities should direct, guide, and implement federal decisions which may have local effects.

(g) Involve all agencies concerned in the preparation of a comprehensive plan. —It is necessary that community planning agencies and highway, public works, urban renewal, health, hospital, education, welfare, and water resources planners and consultants, commercial, industrial and residential developers, and health department sanitary engineers work in close harmony. In this way a more complete and balanced appraisal can be achieved in the plans and reports each prepares and upon which public policy decisions will be made. Such coordination is most important, not only to resolve reactions to proposed plans, and receive community support, but also to determine the best ways and means to implement individual plans and secure effective operation of the facilities provided.

(h) Encourage sound planning of facilities by feasibility study grants.— Federal, state, and private financial assistance to determine the most economical service area for needed public facilities (water, sewage, refuse) can stimulate public awareness and encourage community action to resolve environmental health problems and needs.

(i) Preserve what is good.—Integrate the still useful existing parts of a community with that to be built or rebuilt and protect it from degrading influences. Adjust and harmonize the character of a community.

(j) Install utilities in raw land before development.—The installation of the basic community utilities prior to the construction of homes, shops, streets, lawns, etc., will generally cost less per acre than the installation of similar facilities at a later date. Health departments should assist the planner and the developer more in showing the economic, engineering, and administrative feasibility of community water supply and sewerage. Health departments and planning agencies should have policy statements and perhaps legislation supporting such approach. Subdivision regulations which recognize the sanitary engineering factors can prevent the common sewage disposal and water supply fringe area sanitation and related problems.

(k) Maintain liaison between health department and planning board.—Establish, develop, and maintain effective liaison between the community health department and planning officials.

(l) Utilize scientific soils information.—Local health departments, highway and public works departments, school districts, consulting engineers, and architects can benefit by the use of scientific soils information. Federal agencies and their local representatives should help make available better and more usable soils information.

(m) Use lot size to guide character of development.—Permitting smaller lots, and a larger number, with public water supply and sewerage, and large lots (1.0 to 2.5 acres) with private wells and septic tank systems in rural areas, can be of use in helping to control fringe area sanitation problems. In any case, private wells and septic tank systems have no place (with rare exceptions) in predominately urban areas.

(n) Control housing construction in low land.—Stop developments of any type in recognized or legally established

flood plains or zones. Stream control flood lines should be established by an official agency, preferably a county or regional board, with representation from health, public works, and planning agencies.

(o) Zoning and planning can assist in air pollution control.—Zoning and planning for development can be used to reduce the concentration of contaminants in a limited localized area. The encroachment of residences on nuisance-type industries, and industries on residences, can be prevented or controlled to minimize neighborhood air pollution problems.

E. Finance

The financing of community facilities for community growth within the framework of sound planning, economic, and engineering feasibility is said to be difficult. It is essential therefore that the scope and disposition of public fiscal resources be clearly understood so that a community may plan intelligently for its present and future needs. There are two generally accepted ways by which a community may pay for capital improvements. One is by using funds on hand, if available, and applying a "pay as you go" financial approach. The second method is by borrowing. Quite naturally the first method is applied in the case of improvements which require limited expenditures. For costly projects as water supply or sewage treatment, long-term borrowing is usually involved. This long-term feature of community bonded indebtedness is a mandatory aspect of community planning which is frequently overlooked. It may be said that any community which has entered into a program of bonded indebtedness actually has started the foundation of planning for capital improvements.*

* Water Resources in Rensselaer County. Rensselaer County Health Department, Troy, N. Y., 1961, p. 227.

1. Contributing Factors

(a) The tax base is limited.—The tax base available in many existing urban and fringe areas would place a heavy financial burden on a few, if major improvements are needed. There is also a lack of area-wide taxing units with sufficient valuation to provide a sound broad financing base for sanitation facilities and services. Slowly developing areas cannot afford public water supply and sewers because they do not have a sufficient tax base to support bond issues for water line and sewer construction until after they are largely built up. But then the taxpayer is faced with the double expense of continuing to pay for his well water supply and septic tank system in his mortgage payments in addition to the annual cost in taxes to pay off the water and sewer bonds.

(b) Tax funds are limited.—The high demand of rapidly growing fringe areas for tax funds to finance public improvements such as schools, streets, parks, police, fire, etc., in addition to water supply and sewerage, intensifies the financing problem.

(c) School construction has captured a large share of the tax dollar.—The construction of new schools to serve the increasing population, and the construction of new central schools to replace existing inadequate small schools, has captured a large share of the tax dollar, thereby making more difficult the financing of other essential community services.

(d) Developers resist spending money for conveniences that cannot be seen.—Developers are reluctant to tie up large sums of money in low-return, long-range community facilities which lack eye-appeal.

(e) Banks cannot afford to gamble.—Banks and other lending agencies are reluctant to loan large sums of money for construction of community facilities in speculative fringe areas.

(f) The value of public improvements

is not readily measured.—The lack of acceptable methods for measuring the benefits accruing to various sectors of the metropolitan areas from the construction of a public improvement, and using such benefits as a basis for apportioning the costs, reduces acceptance of proposed bond issues.

(g) Municipal water and sewerage services are not usually operated as businesses.—The failure of municipalities to operate their water and sewerage utilities on a sound financial basis, that will produce capital for expansion of these services into new areas, adds to the problem. This also makes it difficult for a community to improve or expand service gradually on a year-to-year basis in accordance with a long-range plan, to avoid overwhelming catastrophic expenses. This may explain the reluctance or inability of the central city to finance the extension of municipal services into unincorporated fringe areas.

(h) Property decay causes devaluation.—Property decay due to substandard housing, lack of housing conservation and rehabilitation, land-use change, etc., sets the stage for property devaluation and hence reduced community income from property taxes.

(i) Construction costs increase each year.—Construction costs have been going up 8 per cent per year. Postponement of necessary capital improvements may result in increased costs.

2. Indicated Solutions or Prevention

(a) Establish a revolving fund.—Establish a revolving fund to provide loans for construction of basic community facilities in areas of rapid community growth with adequate safeguards to prevent use of funds in highly speculative areas and for uneconomic projects.

(b) Expand federal loan programs to include fringe areas.—Expand the present federal programs to include construction of basic community facilities in rapidly growing fringe areas. Use of these funds would be limited to trunk sewers, large water mains, treatment facilities, and similar high cost improvements.

(c) Combine financing of community facilities.—Combine financing of water, sewerage, and refuse facilities and use revenue from all services to retire bonds. This procedure would provide a sound basis for bond financing which, if coupled with a connection or service fee, would permit the major cost of facilities to be borne by those using the service.

(d) Enlarge the tax base for financing community facilities.—Establish metropolitan or regional sanitation agencies or districts to operate and finance water, sewerage, and other essential sanitation services on a metropolitan or regional area-wide basis. Provide for financing by service and tax revenue.

(e) Require benefiting property owners to pay for services.—Establish a system of "transfer fees" that would tax the appreciation in value of land accruing from the construction of community facilities such as water and sewers. This tax would apply only to the first transfer of title following construction of the public works and would be based upon appreciation in value in excess of certain amounts.

(f) Require developers to install water lines and sewers.—Require developers to install public water and sewerage services in their subdivisions, and pay for them as a part of their development costs. Such facilities should be built in accordance with an engineering comprehensive plan. Establish procedure to reimburse developer for the fair share of development, as required by the comprehensive plan, in excess of normal needs.

(g) Utilize existing federal and state grant programs.—Publicize and utilize existing federal and state grants for urban renewal, comprehensive planning and sewage treatment plant construc-

tion, and availability of interest-free loans for the planning and design of feasible community facilities.

(h) Assist homeowners.—Establish a "clinic" to assist homeowners finance projects for housing conservation and rehabilitation, public water supply, sewerage, etc. Advise new homeowners of possible future obligations for "city services."

(i) Develop a capital budget.—A sound revenue program should be followed to finance capital improvements based upon a balanced appraisal of the community needs and ability of the people to pay. One community facility or service should not be permitted to expand unduly at the expense of others.

F. Community Participation

In a democracy, public understanding and acceptance are essential ingredients for the success of any venture. Political decisions depend upon public attitude. Successful bonding programs result when the public agrees to accept an additional financial burden for a community benefit. Legislatures react to public demands for changes and additions to laws necessary for protecting public health and for improving the public welfare. Therefore, in metropolitan areas where demands are many and complex, where the tax dollar has become thinly stretched, and where the individual has become overwhelmed with various worthy causes, community participation in environmental engineering and health problems is a necessity.

1. Contributing Factors

(a) The public is often uninformed.—The need for the following services and resources is usually not recognized by the public during the early stages of community growth:

(1) Water and sewerage services
(2) Refuse collection and disposal
(3) Housing controls
(4) Planning of land use
(5) Clean air
(6) Clean water.

(b) Fragmentation hinders effective participation.—The existence of noncontiguous patterns of fringe area growth makes it very difficult for people to reach common objectives and take concerted action in securing necessary facilities.

(c) Community support is not solicited.—Many government officials fail to involve the total community to secure public acceptance of specific environmental health programs. Promoters of community projects often overlook an adequately planned public relations program, have little community understanding, and only a vague knowledge of the process by which government operates.

2. Indicated Solutions or Prevention

(a) Improve neighborhood identity.—A sense of community should be established to overcome the sense of isolation, of helplessness, and frustration which often haunt the residents of a modern community. Resources of service clubs and other civic organizations can be utilized.

(b) Overcome civic apathy.—Careful planning for citizen participation is necessary. Study and action committees, business, and neighborhood organizations represent potential groups to stimulate community interest.

(c) Present the facts.—Health leaders should participate in community activities so that accurate and essential information is disseminated. This will make possible informed decisions concerning environmental health programs within the total framework of community goals.

(d) Keep the people informed.—Community participation can be stimulated through the dissemination of information. The distribution of a monthly or quarterly newsletter to civic, professional, and business organizations is an

excellent approach. Mass media should also be utilized to the maximum extent.

(e) Know your subject and your people.—Public officials should know the characteristics of the various segments of the population so that they can reach and motivate the people.

(f) Clarify who does what.—Prepare and keep current a central reference pamphlet listing all official and voluntary community agencies, their basic functions and responsibilities to the people, annual budget, and sources of funds.

BIBLIOGRAPHY

Urban Sprawl and Health. Report of the 1958 National Health Forum, March 17, 18, 19, 1958. New York, N. Y.: National Health Council (Jan.), 1959; $1.75.

Coping with Suburban Sewage Disposal Problems, Conference of Municipal Public Health Engineers, November, 1956. (Request from Tom Gable, National Sanitation Foundation, University of Michigan, Ann Arbor, Mich.)

The City in Transition. J. Stanford Research Institute, Vol. 4, No. 4. Menlo Park, Calif.: Stanford Research Institute, 1960; $1.

Standards for Healthful Housing:
Planning the Neighborhood. 1960; $3.
Construction and Equipment of the Home. 1951; $2.
Principles for Healthful Rural Housing. 1957; $1.
Basic Principles of Healthful Housing, 1950; $1.
Proposed Housing Ordinance. (New edition in preparation.)
New York, N. Y.: American Public Health Association.

Environmental Health Planning Guide. PHS Publ. No. 823. Washington, D. C.: Public Health Service, 1962.

Water Resources in Rensselaer County: An Environmental Health Study. Troy, N. Y.: Rensselaer County Health Department (July), 1961.

Municipal Cooperation—A Digest of New York State Law; State—Local Relations—A Digest of New York State Law; Metropolitan Action—A Six-County Inventory of Practical Programs. Albany, N. Y.: State of New York Legislative Committee on Metropolitan Area Study, 1959, 1960.

Fringe Area Sanitation. Pub. Health Rep. 76,4:309–314 (Apr.), 1961.

Expert Committee on the Public Health Aspects of Housing. First Report, WHO Tech. Rep. Ser. No. 225. New York, N. Y.: Columbia University Press, International Documents Service; 60 cents.

Hill, Kermit. Publicity Program for a Bond Issue. J. Water Pollution Control Fed. Vol. 34, No. 7 (July), 1962.

Urban Fringe Sanitation: A Selected Bibliography. PHS Publ. No. 583. Washington, D. C.: Public Health Service.

Metropolitan Area Problems News and Digest. New York, N. Y.

The Technique of Municipal Administration. Local Planning Administration. Municipal Finance Administration. Municipal Personnel Administration. Municipal Police Administration. Municipal Fire Administration. Municipal Public Works Administration. Municipal Recreation Administration. Supervisory Methods In Muncipal Administration. Management Practices for Smaller Cities. Administration of Community Health Services. Chicago, Ill.: International City Managers' Association.

Loch, R. S. The Political Education of Community Planners. Adult Leadership Vol. 7, No. 6 (Dec.), 1958.

Sperling, T. Public Relations Aspects of Promoting a Bond Issue. J. Water Pollution Control Fed. Vol. 33, No. 6 (June), 1961.

Housing Codes, The Key of Housing Conservation. Vols. 1, 2, 3. New York, N. Y.: State Division of Housing.

Kline, N. Quiet Guardians of the People's Health. New York, N. Y.: Public Affairs Pamphlets; 25 cents.

The Municipal Year Book, 1961. Chicago, Ill.: International City Managers' Association.

Handbook of Federal Aids to Communities. U. S. Department of Commerce, Area Redevelopment Administration. Washington, D. C.: Gov. Ptg. Office.

Study of Needs for Sewage Works. Albany, N. Y.: Office of Local Government, State of New York (Feb.), 1962.

Taylor, F. B. Governmental Aspects of Sanitation in the Urban Fringe. Pub. Health Rep. 75,2:95–102 (Feb.), 1960.

Howes and Gray. "Planning in an Urban-Industrial Society." In Man and His Environment. (Proceedings of the Second National Congress on Environmental Health, 1961. Ann Arbor, Mich.: Continued Education Service, School of Public Health.

Wurster, C. B. "Framework for an Urban Society." In Goals for Americans. A Report of the President's Commission on National Goals, 1960.

Westchester County Health Department, New York, Sanitary Code. White Plains, N. Y.

The Community Education Project. San Bernardino Valley College, Calif.: Fund for Adult Education, 1958.

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