Proceedings 4th regional planning conference. May 12, 1965

Waukesha, Wisconsin: Southeastern Wisconsin Regional Planning Commission, May 12, 1965

1965

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PROCEEDINGS

4TH REGIONAL PLANNING CONFERENCE

SOUTHEASTERN WISCONSIN REGIONAL

PLANNING COMMISSION

P. O. BOX 769
OLD COURTHOUSE
WAUKESHA, WISCONSIN

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May 12, 1965

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INTRODUCTION

The 1965 Regional Planning Conference, the fourth such conference sponsored by the Southeastern Wisconsin Regional Planning Commission, can be considered a milestone in the Commission's progress since its creation in 1960. The one-day conference was held on May 12, 1965, at the Red Carpet Inn in Milwaukee and was attended by over 400 interested citizens, local officials, and professional planners and engineers from both within and outside the Region.

It was the purpose of this conference to present formally the factual findings of the many inventories which were conducted as the initial phase of the regional land use-transportation study. This study was begun in January 1963 and is scheduled for completion in July 1966. Workshop sessions provided full opportunity for those attending to learn first-hand how the data which has been assembled by the SEWRPC will be used in regional planning, how it can be used for local community planning, and how it can be used for watershed planning.

The SEWRPC released publicly at the conference Planning Report No. 7, Volume I, Inventory Findings, 1963, Land Use-Transportation Study. This 192-page report presents the major findings of the regional land use-transportation study, along with an existing land use and arterial street and highway map of the Region. The report summarizes the basic facts pertinent to long-range land use and transportation planning in southeastern Wisconsin and sets forth the basic concepts underlying the study. The report was distributed free of charge to all member municipalities and all public and university libraries within the Region.

The proceedings of this conference are being published both to provide a reference source for those attending the conference and to make the information presented at the conference available to those unable to attend, thus giving the conference an added, lasting value.

WELCOME ADDRESS

by GEORGE C. BERTEAU, Chairman
Southeastern Wisconsin Regional Planning Commission

On behalf of the Commissioners and the staff of the Southeastern Wisconsin Regional Planning Commission, I wish to welcome you to our 4th Regional Planning Conference.

This may not be the most important conference, as that distinction must belong to our first conference, held on December 6, 1961, only two days after the opening of these excellent facilities at the Red Carpet Inn. The significance of that first conference attaches not so much to the reports on the work programs and progress made but in the fact that it was even held. Created a year earlier in the fall of 1960, the Commission was early subjected to peripheral attacks and had to overcome allegations that a super-government was being created.

Added significance can now be attributed to that first conference, for there we early raised the question: "Can an organization such as a Regional Planning Commission, a wholly unappended, quasi-governmental agency aid in the solution of problems that are obviously of multi-governmental concern and wherein many diverse interests must be recognized and accommodated?" There, too, was established the first of several important policy determinations of this Commission. The first of these may be stated as:

Solution of Areawide Problems Through Voluntary Intergovernmental Cooperation

There has been no deviation from this core principle, and it is reflected in each action of the Commission irrespective of the nature of the factual circumstances requiring Commission action. The second of these important policy determinations can be stated as:

Solution of Areawide Problems Within the Existing Governmental and Legislative Framework

Although several State Legislatures have convened and adjourned and although there has been legislation proposed by others outside of this Commission relating to the construction and powers of regional planning commissions, this Commission has not on one single occasion departed from the second basic principle of acting wholly within the legislative and governmental framework into which it was thrust. The final policy determination can be stated as:

Collection and Analysis of Facts Prior to Offering Advice

Sound advisory planning services can only be offered on a sound foundation of basic planning data. In other words, the Commission believes that a "basal metabolism" must be done before a diagnosis can be made. The Commission very early in its life conceived and initiated a program of basic planning studies designed to provide a firm foundation upon which future regional planning programs could be built. Much credit for such foresight is due to Professor Henry Schmandt; Planning Committee Chairman Mike Meyer; Commissioners Cutler, Hollister, Blank, Egan, and LaPour; and to our Executive Director, Kurt Bauer, who guided the staff to a timely completion of this initial work program. Six reports were published as a result of this initial effort. These deal with:

1. Statistical programming and data processing,
2. The preparation of regional base maps,
3. The population of the Region,
4. The economy of the Region,
5. The natural resources of the Region, and
6. The public utilities of the Region.

In April of 1962, the seven County Boards approved a regional transportation-land use study intended to provide the first elements of an advisory development plan for the Region. The study has three broad phases, somewhat oversimplified in their statement here:

1. Collection, processing, and analysis of basic data,
2. Preparation of forecasts and preparation and testing of alternative land use-transportation plans, and
3. Preparation and selection of a final land use-transportation plan.

This morning the conference will be devoted to a report on the results of the first phase, basic data collection, processing, and analysis as your program indicates; that is, to a presentation of: "The State of the Region." This afternoon the program will demonstrate through three workshops how the data resulting from these completed inventories can be used:

1. In conjunction with regional planning,

2. For community planning at the local level, and

3. In the ever increasing important area of watershed planning.

STATE OF THE REGION--OVERVIEW

by J. ROBERT DOUGHTY, Study Director
Land Use-Transportation Study, SEWRPC

The first major work program of the Commission, which was actually directed toward the preparation of long-range development plans, was the regional land use-transportation study.

There were four principal reasons why the transportation problem was chosen as the subject of its first large-scale planning effort. First of all, the Commission was aware of the fact that providing for the movement of people and goods within the Region is one of the most complex and difficult problems facing public officials today.

Secondly, the Commission was aware of many local traffic and transportation problems which could only be resolved properly within the framework of a regional, transportation planning effort.

Thirdly, the Commission, through close liaison with the State Highway Commission of Wisconsin, anticipated the fact that the Federal Aid Highway Act of 1962 would restrict federal funds for new highway construction in large urban areas to those areas having established a comprehensive, areawide, continuing transportation planning program. The provisions of this act directly affect 32 of the Region's cities and villages which are a part of the Racine, Kenosha, and Milwaukee urbanized areas. The Federal Urban Mass Transportation Act of 1964 contains a similar planning prerequisite to the grant of federal funds for the development of mass transit facilities in large urban areas.

Finally, the Commission knew that a comprehensive approach to the transportation problem would provide much valuable information for the ultimate solution to drainage and flood control, sewerage, land and water use, and other resource-related planning problems.

The primary objective of the regional land use-transportation study, which began approximately 27 months ago, is to produce two of the key elements of a comprehensive plan for the physical development of the Region: a land use plan and a transportation plan. These plans, to be effective, must be amenable to cooperative adoption and joint implementation by all levels and agencies of government within the Region.

To this end, the Commission retained a staff and provided for interagency coordination through the establishment of advisory committees and through an interagency exchange of technical staff. The interagency

exchange was accomplished when the city and county of Milwaukee, the State Highway Commission of Wisconsin, the Wisconsin Conservation Department, and the U. S. Bureau of Public Roads assigned personnel to work with the Commission staff on the transportation study.

Interagency coordination was also established through an advisory committee comprised primarily of technicians in the employ of private enterprise, as well as local, state, and federal agencies of government. The functions of this committee have been:

1. To assist and advise the Commission staff on technical methods, techniques, and procedures.
2. To serve as a clearinghouse for the assembly and evaluation of planning and engineering data.
3. To recommend technical standards.
4. To exchange ideas for the solutions to technical problems.
5. To coordinate the technical staffs of agencies concerned with the development within the Region.
6. To place, insofar as possible, the experience, knowledge, and resources of the technical staffs of the agencies at the disposal of the Commission.

In addition, this interagency coordination has made it possible for the local units of government to become more familiar with the types of data collected and the numerous studies conducted by the Commission so that they can better take advantage of the vast amount of material available for their use.

The major findings and recommendations of the regional land use-transportation study are to be presented in three major planning reports. The first report, which is being presented today, sets forth the basic concepts underlying the study and presents in summary form the results of the inventories which have been completed.

Most of the data in Volume 1 relate to the conditions that prevailed in the Spring of 1963 so that a correlation can be established between the travel, socio-economic, and land use inventories. The soils, water quality, and the legislative inventories, which are more stable over time, which required a longer period to complete, or which required the inclusion of the latest changes in laws or their interpretation, have not been detailed in Volume 1 but will be documented in written, technical reports as they are completed.

Some of the major inventories which have been conducted during these past two years and documented in Volume 1 include:

1. Origin and destination survey - to obtain a complete and accurate inventory of travel so that travel patterns can be quantified and related to the existing land use.

2. Land use survey - to quantify the 1963 land uses within each 1/4 section of the Region and thus establish a base for the allocation of future land use demand.

3. Natural resource base - to quantify the amount and location of existing park and open space, woodlands and wetlands, fish and game habitat, water and sewerage facilities, and the remaining historic sites within the Region.

4. Population and employment - to determine where the people of the Region are living today and to relate the size and spatial distribution of the population to the jobs which are available.

5. Public financial resource base - to determine the amount and composition of local government revenues and expenditures. The amount of money available for transportation must be appraised in light of other service and facility requirements.

The second major written report of the study, which is scheduled for completion by the end of this year, will be concerned with anticipated growth and change in the Region during the next 25 years and will present forecasts (based on these inventories) of economic activity, population, land use, transportation, and natural resource demands. This second report will provide three alternative land use-transportation plans and thus will provide the basis for the selection of a final plan, which is to be further studied and detailed.

The approach being followed by the staff, which will be further detailed in Workshop A this afternoon, will include:

1. Forecasting population and employment on a regional basis and then by counties, civil divisions, and traffic analysis zones.

2. Preparing three alternative land use plans based upon regional objectives and standards, the inventories, and the population and employment forecasts.

3. Developing one or more transportation plans for each of the alternative land use plans, again based upon regional objectives and standards.

The third and final major written report, which is scheduled for completion in mid-1966, will detail the one land use-transportation plan selected from the alternative plans. It will provide for the staging of land use and transportation development in five-year increments and will set forth detailed plans in certain selected major transportation corridors.

At this time, we would like to thank those members of the Technical Coordinating and Advisory Committee who reviewed, made suggested changes, and approved each of the chapters in Volume 1.

STATE OF THE REGION

The following subjects were presented by those members of the Commission's staff who had a major responsibility in their development and graphic display. Their discussions, as well as additional information and materials, are available for perusal in the recently published Inventory Findings, 1963, Planning Report No. 7, Volume 1, SEWRPC, 1965.

Population, Economy, and Public Finance - Donald L. Gehrke, Population and Economic Analyst, SEWRPC.

Surface Water - Roy W. Ryling, Hydrologist, SEWRPC.

Soils and Open Space - Harlan E. Clinkenbeard, Chief Land Use Planner, SEWRPC.

Public Utilities - William T. Wambach, District Freeway Design Supervisor, State Highway Commission.

Land Use, Community Plans and Zoning - Eugene E. Molitor, Principal Land Use Planner, SEWRPC.

Highway and Transit Facilities - Eugene G. Muhich, Engineer, U. S. Bureau of Public Roads.

Travel Characteristics - Sheldon W. Sullivan, Administrative Officer, SEWRPC.

Trip Generation - Richard B. Sheridan, Chief Transportation Planner, SEWRPC.

LUNCHEON ADDRESS

WESLEY J. BURMEISTER, Director

Planning and Research Division

State Highway Commission of Wisconsin

THE NECESSITY OF COMPREHENSIVE REGIONAL PLANNING AS RELATED TO HIGHWAY PROGRAMMING

by WESLEY J. BURMEISTER, Director
Planning and Research Division
State Highway Commission of Wisconsin

Thank you, Mr. Berteau. Mr. Bauer, Distinguished Guests, Ladies and Gentlemen of the Conference:

It is indeed a pleasure for me to appear here this afternoon to speak to you for a few minutes about the necessity of comprehensive regional planning as related to highway programs. I bring you the greetings of the State Highway Commission.

I am sure it must be gratifying to all of you from the Southeastern Wisconsin Regional Planning Commission and to officials who in any way had a part in this program to be on the scene of the culmination of the work which has been carried on through the past several years. The reports this morning were extremely interesting. I am sure, as was mentioned to you, that as you use this information in your local planning operations you will find it of vast importance.

I was also very much pleased to hear Mr. Berteau read the telegram from Senator Gaylord Nelson. I say this because the program of the Southeastern Wisconsin Regional Planning Commission has received national recognition. I am sure that is evidenced by the interest of the Congress, particularly of Senator Nelson, in this work.

I have been associated with urban transportation planning through the Highway Research Board, through the American Municipal Association, through the National Association of County Officials, and through the American Association of State Highway Officials. I can assure you that all of these people individually and collectively are looking forward to the results of the Southeastern Wisconsin Regional Planning Commission work because it is outstanding in the Nation, and I am sure it is going to serve as a pattern for a great many other studies that will follow.

It is important to the state because it will become an integral part of the statewide plan. This latter plan is being developed by state agencies collectively, primarily under the sponsorship of the Department of Resource Development. The Highway Commission has a big stake in its preparation in that we are doing the highway transportation phases. Much of the work that has been done here by the SEWRPC staff will be of great value to us in that state planning function.

We are also currently involved in steps toward the formulation of a nationwide plan inasmuch as the Bureau of Public Roads has determined that there should be a state-by-state nationwide study of the adequacy of the federal aid systems and of the financing interest which the Federal Government will have in future highway programs. This study, commonly referred to as "what to do after '72," and more recently referred to as a "Continuing Study of Highway Needs," is to be reported to the Congress with the first stages due as of July 15 of this year. Initially, we thought we would have until January 1966 at least to get out the initial stages, the second stages being due on January 1, 1967. Somebody got anxious, and it was moved up to July 1, 1965. Fortunately, the work that has been done here in the Regional Land Use-Transportation Study will be of help to us in that operation.

Now if I may, I would like to regress a little to look into the background of federal aid for highways; this is set forth in what we know as the U. S. Code, Title 23. I think it would be of interest to many of you, at least, to have just a brief review, such as that in the preface of Title 23. It says:

> "The Bureau of Public Roads was created as the Office of Road Inquiry under authority of the Agricultural Appropriation Act of 1894. The Federal Aid Road Act of July 1, 1916...initiated federal aid for highways to be administered by the Secretary of Agriculture who functioned through the Office of Public Roads and Rural Engineering, and after July 1, 1918, as the Bureau of Public Roads. This authority was continued by the Federal Highway Act of November 9, 1921....Under the reorganization effective July 1, 1939, the Bureau was transferred to the Federal Works Agency and the name changed to the Public Roads Administration. On August 20, 1949, reorganization Plan VII...transferred the organization to the Department of Commerce and changed its name back to the Bureau of Public Roads. The Bureau, at the direction of the Secretary of Commerce, carries out the responsibilities and authority of the Secretary with respect to Federal and Federal-Aid Highway Construction Administration and Research more specifically described in the provisions of Title 23, U. S. Code....The Bureau administers federal legislation providing for the improvement in cooperation with the several states of roads on the federal aid primary, secondary, and interstate highway systems and urban extensions thereof."

Thus, we see that as early as 1894 the Federal Government got into the highway program; but it wasn't until 1916 that they really became active and began using a considerable amount of federal funds for that purpose.

It is also interesting to note "...that the Secretary of Agriculture is authorized to cooperate with the states through their respective highway departments in the construction of rural post roads." This is the basic concept of federal aid for highways: that the programs are administered by the State Highway Commission under the supervision and guidance of the Bureau of Public Roads.

There are a few other things that I think are of interest, and one is that the 1916 Act provided that you could not spend more than $10,000 for any one mile of highway. This is rather ridiculous today, of course. We would find difficulty doing half of the planning for an interstate route at this price. In 1922 they became very liberal and raised this to $15,000 per mile, and this amount was in effect until 1932.

In 1928 we saw the first aid for municipalities over 2,500 population. By 1960 the federal-state-county relationship, which has been very active in Wisconsin, was supplemented by its counterpart--the federal-state-municipal relationship. We were then beginning to see an evolution toward an interest in urban highways. Under the Freeway Act of 1956, commonly referred to as the Interstate Act, it became necessary for the highway planners to bore through cities; and I mean actually and literally bore through cities, because in many instances there was no other plan available to them.

It was about this time that planning, comprehensive, cooperative planning as we talk about it today, came into view. At that time we had the situation of the so-called "Cloud 9" planner who had a brand new development plan for the highway system; and we had the highway engineer back on Cloud 0, I believe, with an idea of just busting through and getting this thing done. This precipitated a lot of confusion and bad feeling between the planning profession and the engineering profession, which should never really have developed. An outstanding example of this, perhaps, was the City of Washington, D. C., where eventually the antagonism got to the point where the entire plan came to a standstill.

Then came the 1962 Highway Act. This was the act that in effect told the planners and the highway people to get together or else there isn't going to be any federal aid; and I would like to quote from that act, its intent and purposes:

> "It is declared to be in the national interest to encourage and promote the development of transportation systems embracing various modes of transport in a manner that will serve the states and local communities efficiently and effectively. To accomplish this objective the Secretary shall cooperate with the states as authorized in this title in the development of long-range highway plans and programs

> which are properly coordinated with plans for improvements and other effective forms of transportation and which are formulated with due consideration to their probable effect on future development of urban areas of more than 50,000 population. After July 1, 1965, the Secretary shall not approve under Section 105 of this title any program for projects in any urban area of more than 50,000 population unless he finds that such projects are based on a continuing comprehensive transportation planning process carried on cooperatively by states and local communities in conformance with the objectives stated in this section."

Now, what does this act mean? It meant that by July 1, 1965, which at that time seemed to be a long way off, the states and the local units of government must be engaged in a cooperative, continuing, comprehensive transportation planning process. Most importantly, it calls for the planning to be carried on cooperatively between the states and the local units of government.

At the time the Act was created, I had the privilege of serving on the "Steering Committee" for the American Association of Highway Officials, which attempted to interpret this statute. We felt then that we could arrive at this planning process by agreement in a rather summary form with the local units of government. More recently, however, the Bureau of Public Roads, which is charged with administering the Act, has come up with a directive which specifies in detail how this planning process should be entered into, the agreements that are necessary, and so forth. I will say more about that just a little bit later.

Now, how has Wisconsin fared in this whole course of events? Again if I may, I would like to go back a little bit in the story and tell you something about the early history of the State Highway Commission. The Highway Commission was organized in 1911. At that time the hue and cry was "Get the farmers out of the mud." I am not so sure that this was exactly what they meant to say. I believe what they meant to say was: "Get the people into town where they've got paved streets." At that time a good many of our communities were already beginning to exhibit some sort of a street paving--asphalt, concrete, or what have you. Obviously, there wasn't too much planning going into this highway expansion back in those days.

In the first place, we had rights-of-way that were pretty much established; and the funds that were available under the bond issues, and so forth, prohibited the acquiring of new right-of-way. I don't presume that roads on new right-of-way on relocations would have been acceptable if anybody had ventured the idea at that time. So the roads were built where the roads were then in existence, and without planning. On the subject of early planning, or lack of it, in my own instance, I recall a rather amusing situation when I first went to work for the State Highway Commission.

I arrived on a Monday morning and was directed to go down to the parking lot and go out with Ted Rundel, who today is a rather prosperous merchant in the City of Madison. Mr. Albert Hambrecht was the Division Engineer, and many of you people have met him at some time or another. He yelled out of the window and said, "Hey, Wes, how much do you want to work for us this summer?" Well, I said, "How about $125 a month?" He replied, "I can't pay you that much, man. We are only paying $110, but I'll go along with $115." So we made a deal right there, Mr. Hambrecht on the fourth floor and I down in the parking lot. Well, obviously, there wasn't much planning connected with that either; but, nevertheless, the deal was consummated.

Then we find as time went along that about 1947 the State Highway Commission was authorized to do a certain amount of work, based on dollar value, in municipal communities, urban areas, or anywhere on the state trunk highway system within the corporate areas. I know very well that Jim Law, who was Chairman of the Commission at that time, went out and begged some communities to enter into this highway program in which the state was furnishing 85 percent of the cost. And he finally got somebody to take a 100 percent project just to get the program started, but ever since that day we have been plagued with requests that we can't meet.

By 1960 we were in the interstate program, as I have mentioned to you; and by this time the Highway Commission began to recognize that we needed planning--long-range planning--urban planning--within the confines of the Highway Commission structure itself. I think this was brought home forcibly to me when I attended the Annual Conference of the American Institute of Planners in Philadelphia in the fall of 1960. It was obvious then that either the Highway Departments, nationwide, must go into the planning field or someone else was going to get into the highway planning field and do it for them. It was at this time that the State Highway Commission authorized the development of an urban transportation planning section within the Planning and Research Division of the Highway Commission; and it was at this time that Mr. Doug Haist, who now heads that department, was brought in from one of our district offices to head up the operation. I so well remember that, in preparing our budget for the next biennium, somebody said, "How big is this outfit going to be?" And I said, "Well, we've got Doug and perhaps he needs somebody to help him, and we may need somebody in the district office, but other than that I don't think it's going to affect the budget too much." And that wasn't long-range planning either, as it has now developed.

It was also about this time that a young gentleman came into my office and said that he was interested in writing his doctoral thesis, that he was a graduate engineer and a graduate planner working for the City of Madison, and that he would like to write a thesis in the Highway Department. All he asked was to be employed as an Engineering Aid I.

I am sure that's a lot cheaper than you people are getting Kurt Bauer today. But we took Kurt on; and he did an outstanding doctoral thesis, as you gentlemen from the universities recognize and as is recognized all over the country. It was entitled "Local Highway Planning in Wisconsin." I think we were rather optimistic and ordered 600 or 700 copies of this thesis, but they were exhausted in no time at all. Doug Haist is still writing letters today saying, "I'm sorry the supply is exhausted, but go to your State University or your public library and I think you will find a copy there." Kurt needed to work for the Wisconsin Highway Commission in order to have an entree into the various villages and cities throughout the state, to visit with people and see what was being done in highway planning in Wisconsin at the local level, and to determine their attitudes and how they felt about the Highway Commission.

One of the outstanding findings that he reported, I believe, was that local units of government in Wisconsin were looking to the Highway Commission for leadership in highway transportation planning. We assembled members of the Legislature and the State Highway Commission and reviewed this report in detail with Kurt. It was then that the Commission recognized more fully than ever before that transportation planning on its part was necessary and that we had better get into the process with both feet, and that we did. I believe today that the Wisconsin Highway Commission, working not alone, but with, planning commissions throughout the state and all the local people who have entered into this planning program, has made Wisconsin an outstanding state in this transportation planning function.

Now, back to the regional planning program. This also is a big step forward in planning operations as well as in planning legislation and in planning activity throughout the Nation. We have at the present time in Wisconsin a considerable number of regional planning organizations or commissions, if you will, one of which is headed by Mr. Gordon Bubolz, who was introduced to you a few moments ago. There are others scattered throughout the state, which are doing and will continue to do a very good job in the field of highway planning; this is all helpful to the Highway Commission in our total statewide operation, I assure you.

Many of the local plans will have to be adjusted. This is inevitable because the Highway Commission is looking at the overall picture. The Commission, however, is readily accepting the information and the tools that come from these local planning agencies to help with the development of a statewide plan. When I say statewide plan, I mean a comprehensive plan that takes into account all of the elements of planning which you heard described here this morning and from which the Highway Commission expects to develop the long-range plan for highway development.

This plan will assign various geometric values to these highways. Then, we will be in a position to design a road which can be built in stages toward its ultimate level of improvement. Now, obviously, where we feel that dual highways or freeways are going to be needed in 20 years, we can't build the entire highway at one time. There simply isn't enough money, and there really isn't a need for much of it at this time; but what is done will be done in such a manner that in the ultimate it will fit into the comprehensive highway network as planned. We are going to make mistakes. There are many things that can't be anticipated 10 to 15 years in advance, and just here and there an occasional local development will upset an entire area plan.

I think, too, that the fact that Wisconsin is recognized for its planning leadership is evidenced by the interest of the Bureau of Public Roads in sending staff members and trainees to Wisconsin for work assignments on planning studies. I know that they have provided several to the Southeastern Wisconsin Regional Planning Commission. Mr. Muhich, who talked here this morning, is one of them. We have also been favored with the assignment of personnel to our central office planning staff, on an almost full-time basis. The Bureau keeps rotating them to bring young fellows in here for training in statewide planning.

The need for the Southeastern Wisconsin Regional Planning Commission is many fold, and I will mention only some of its value. In so doing I would like to emphasize again that there will be value to you people at your local level for location of your local roads and that there will be value to the State Highway Commission in the more intense development of the arterial highways. We have before us now three major problems in this immediate area, and it would have been very helpful if we had already received the traffic assignments from the Southeastern Wisconsin Regional Planning Commission. This, of course, has not been possible. The planning has not progressed at the moment to the stage where these values can be furnished. As was indicated to you this morning by Mr. Berteau, the Regional Planning Commission is acting on facts; they don't want to make estimates until they have the facts before them. And this we certainly do not encourage them to do either. When we ask for and receive information from them, we expect it to be factual.

We have a current major problem in the City of Milwaukee relative to the terminus of one of the interstate system projects. The Bureau of Public Roads is quite insistent that we define the terminus and approaches in some detail; but a complete answer is simply not possible at present because of the lack of information, although it will be forthcoming within the next few months from the Regional Land Use-Transportation Study. In eastern Waukesha County, we also have a problem with which a great many of you people are well acquainted. Forecast data from

the study would be helpful there to determine at least the character of the facility which is under consideration.

We had a letter in our office the other day from a woman in Chicago who said she had a summer home in Wisconsin, as did many of her friends, and that they would just love to keep coming up here but they can't get through Highway 100 in Milwaukee. We told her, of course, that after 1966 she will be able to do this on the Airport Freeway and the Zoo Freeway. "But, good heavens, that's two years away. What's the matter with you people? Can't you get the road done?" Well, it takes time and it takes money. Of course, the alleviation for Highway 100 is the 894 route of the interstate system. But we have been able to accomplish only a part of it, piecemeal, as money is only available in yearly increments. Milwaukee County, it is true, is pouring some of their own money into this operation to speed it up; but progress is slower than everyone wishes, and as a result we constantly get this type of correspondence in our office. "What are you fellows doing all the time? Why don't you get something done?" We have problems in facts and figures, and the figures are money. There really isn't anything in the highway field that we couldn't fix if money was available to do it.

This problem is not only here in southeastern Wisconsin; it is statewide. We have statewide needs, and we are working on these in a constructive, progressive manner in order to build a good highway system. The information provided by your regional planning agency is extremely important.

Now a feature that I mentioned before, but which needs emphasis, is that when these regional plans are completed, at least when the initial phases are finished, your obligations under the 1962 Federal Highway Act are not ended. The Act says that the planning operation must be more than just areawide, comprehensive transportation planning. It must also be continuing and cooperative on an urbanized area basis. There are three of these 50,000 plus population areas within the Southeastern Wisconsin Region: Milwaukee, Racine, and Kenosha. We have another one at Madison, one at Green Bay, and still another in the combined Duluth-Superior area, which is a two-state function and as a result provides a lot of extra complications, believe you me, when considering all the ramifications of federal aid from both the Bureau of Public Roads and the Housing and Home Finance Agency. In a sense, you cannot blame the Federal Government for putting these restrictions in the 1962 Act. They have a shortage of money, too, although the taxes don't seem to indicate it. But they do, and they want to be certain that when federal aid dollars are invested in a highway that we will be getting the most for that expenditure and that we will be getting a facility that will continue to serve the public into the future.

There has been placed at your table a resolution form, which I hope you who are public officials would take with you for a matter of review. My apologies to those of the Southeastern Wisconsin Regional Planning Commission who at this time may not be aware that these resolutions were placed at your table for distribution. I am sorry, indeed, that it happened; and I certainly want to apologize to you, Mr. Berteau, and to the other members of the Commission.

This resolution has been discussed with your staff, has been approved by the Bureau of Public Roads, and will be discussed by our district engineers with you gentlemen who represent local communities in the urbanized areas of the Region. We are not asking you to give favorable consideration or to make a contact at all at this time. In the near future, we will formally distribute copies to each affected community, and if necessary meetings will be called in which this resolution will be fully explained to you. And if it should happen that adjustments are necessary, they will be made within the instructions as issued to us by the Bureau of Public Roads.

The Highway Commission has had the very finest of relations with the Southeastern Wisconsin Regional Planning Commission. We have men on the staff of your regional land use-transportation study, and we have a considerable amount of money invested in the study. As I mentioned before, I was on the Steering Committee of AASHO when the original interpretations were made of the Highway Act; we were hopeful and fairly certain at that time that the State Highway Commission's contract with the Southeastern Wisconsin Regional Planning Commission would be adequate to meet the requirements of the 1962 Act. It has now been determined that this is not entirely the situation; the Highway Commission in order to be working cooperatively with all of you people must have, in addition to the agreement with the Southeastern Wisconsin Regional Planning Commission, an individual agreement with each of you as set forth in this resolution. Let me emphasize that we will contact your local units of government either individually or collectively, by county or district, in an effort to have this agreement executed before July 1, 1965. In so doing, we may fully comply with the '62 Act and forestall any withholding of federal aid monies for highways because these agreements have not been executed and because we do not have formal evidence that we are planning comprehensively, cooperatively, and on a continuing basis.

Again, I want to assure you of the extreme interest of the State Highway Commission in this regional planning operation. The Commission is looking forward with a great deal of anticipation to the results of the initial work of this Southeastern Wisconsin Regional Planning Commission and to a continuing program to which the Commission and this Southeastern Wisconsin Regional Planning Commission will contribute. We must have a continuing contract in order to continue eligibility for federal aid financing.

I would like to pay my personal compliments to the staff of the Planning Commission. I will be leaving the Planning and Research Division as of the first of July to assume the position of State Highway Engineer, and I want to assure you in that position I will still have the warm spot in my heart for urban transportation planning. I will be extremely interested in continuing to watch the operations of your very fine Regional Planning Commission. Thank you, Ladies and Gentlemen.

WORKSHOP A

"How The Completed Inventories

Will Be Used For Regional Planning"

INTRODUCTION

by MILTON F. LAPOUR, Commissioner
Southeastern Wisconsin Regional Planning Commission

The Southeastern Wisconsin Region is comprised of seven counties covering 2,688 square miles, or about 5 percent of the total area of the state. This Region contains over 41 percent of the total population of the state and over 46 percent of all the tangible wealth of the state. These seven counties comprise one of the fastest growing urban regions in the United States and in the last decade accounted for 64 percent of the total population increase of the state. Planning in the past has often stopped at corporate limits and little areawide planning and engineering data has, consequently, been available. However, the need for planning data collected and developed on a uniform, areawide basis is as useful and necessary to sound local planning--both public and private--as it is to regional planning.

In the proper development of land, such as good subdividing, much information is required. This information includes data on sewer and water service areas, surface drainage, soil maps, aerial photographs, and many other materials. The Commission has collected much of this basic data, and in the following discussions its staff will present some of this accumulated knowledge and information and illustrate its relationship to regional planning. Its value to local planning, however, should not be overlooked.

REGIONAL PLANNING PROCESS

by J. ROBERT DOUGHTY, Study Director
Land Use-Transportation Study, SEWRPC

During this morning's session, brief summaries of the inventories accomplished in the land use-transportation study were presented. The inventories, which are further detailed in Planning Report No. 7, Volume 1, of the land use-transportation study, are a necessary basis for the preparation of long-range plans. However, the presentations did not indicate how the inventories will be tied together and used in the preparation of the alternative, 1990 land use-transportation plans. The year 1990 was selected by the Commission for the target year, as traffic forecasts must be made to new transportation facilities at a period twenty years after they are scheduled to be open.

In this workshop, each of the following speakers will present a brief outline on the processes which will be followed in developing the alternative plans. But first of all, let us review the basic principles underlying the planning process and review the overall planning process itself which will be followed by the Commission in the development of the plans.

The four basic principles include:

1. An individual highway or transit line cannot be planned in isolation, since the total urban transportation network acts as a system in which every element affects the use and effectiveness of other elements of the system. This means that the capacities of the sections and intersections of the transportation system, studied as a whole, must be carefully fitted to future traffic loads by careful quantitative analysis.

2. Highway and transit systems must be planned together, and each mode of transportation should be assigned that part of the total travel demand for which it is best suited.

3. Transportation planning must be areawide in scope, in that it cannot be accomplished successfully within a single community if that community is part of a larger urban complex.

4. Transportation planning cannot be separated from land use planning, since the land use pattern determines the amount and spatial distribution of travel within an urban area.

and since the transportation system that is planned and built will be one of the most important determinants of the future land use pattern.

Based upon these foregoing principles, this study employs a planning process by which the Region and its functional relationships can be accurately described both graphically and numerically, the movement of people and vehicles over highways and transit facilities simulated, and the effect of different courses of action with respect to land use and transportation development evaluated.

The nine main steps which are being followed by the Commission, before reaching the final land use-transportation plan, have been itemized down the center of Figure 4,* with the primary inputs for each step located to the right or left of the specific step to which it primarily applies.

The first step includes the inventories, which have been discussed earlier. The discussions during this workshop will, therefore, center on the balance of the steps in the planning process through the development of the final land use-transportation plan. The sequence of the following speakers is such that they will lead us through the plan formulation much as it will be followed by the staff during the balance of 1965.

The planning process, as shown in Figure 4,* is for the development of one land use-transportation plan. However, it should be remembered that there will be three alternative land use-transportation plans developed and that each planning step (other than the inventories, the regional employment and population forecasts, and the determination of the aggregate future land use demand) will be followed three times.

The staff is currently finishing steps 2 and 3 of the planning process and developing the first alternative land use plan for step 4. This first plan will be a "Controlled Existing Trend Plan" and will reflect a continuation of recent development trends within the Region. However, certain basic regional development objectives will be used to modify the trends. An example of such a development objective could be "the provision of an efficient spatial distribution of the various land uses which will result not only in a compatible land use arrangement but which will be adjusted to the supporting resource base." This first plan would, therefore, spatially distribute future urban development much the same as during the past few years but would exclude such planned development on the poor soils and in the flood plains of the Region.

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* SEWRPC Planning Report No. 7, Volume 1, Land Use-Transportation Study, Inventory Findings, 1963, page 14.

The second plan, as envisioned by the staff, will be a "Corridor Plan," which will depict the spatial concentration of urban development in such a manner as to achieve the conservation of prime agricultural and other open-space lands while at the same time locating these open lands in close proximity to new development, as well as to the older central cities. Such urban development will be concentrated along major routes of transportation. The rural areas encompassing agricultural lands, forests, wildlife habitat, rivers, streams, lakes, and wetlands will form a wedge of open space between these urban corridors.

The third alternative plan will be a "Satellite City Plan," which will reflect the decentralization of future urban development to either existing outlying communities or to entirely new communities. The assumption here is that there are certain advantages to concentrating urban development in small individual units rather than being distributed on the periphery of an existing major urban complex.

For each of the alternative land use plans, there will be one or more transportation plans developed supporting the needs of the spatially distributed land uses and the resulting population distribution. Each such transportation plan will include an arterial street and highway system and a mass transportation system, which should function in a coordinated rather than in a competitive manner. It might be noted here that one of the transportation plans to be developed will be a transit oriented plan.

As each of the land use plans and transportation plans are developed, they will be submitted to a series of tests to determine if they do meet the regional objectives, do not have an adverse effect on the resource base, and if they are financially feasible. The results of these tests, along with the plans themselves (as presented in Volume 2 of the land use-transportation study), will make it possible for the selection of the one best plan for the Region that is to be further detailed in 1966 and presented in Planning Report No. 7, Volume 3.

USE OF RESOURCE AND UTILITY DATA

by HARLAN E. CLINKENBEARD, Chief
Land Use Planning Division, SEWRPC

Time does not permit a detailed description of the mechanics involved in the utilization of all natural resource and related utility base information in the preparation of long-range, regional land use-transportation plans. I would like to touch briefly, however, on the use of each individual natural resource element in the hope that you will have questions on each later in this session.

SURFACE WATER QUALITY

As indicated in this morning's session, the level of stream water quality is very important to the uses made of the stream water. If a stream is heavily contaminated with chemical and bacteriological pollutants, it may no longer be suitable for water supply, swimming and fishing, or even for agricultural uses.

The Commission is making an effort to link stream water pollution to major contributors to that pollution, such as municipal sewage treatment plants, certain industries, and agriculture. If surface water quality can be linked to the existing uses, we will be able to develop relationships between the 1990 land use-transportation plans and the 1990 stream quality based on the location of various planned land uses within each stream watershed. With this knowledge adjustments in the plan can be made which will result in the preservation of stream quality and those uses made of the streams.

SOILS

In the preparation of long-range land use plans, it seems logical that only those land areas physically suited for a particular use be set aside for that use. On the other hand, land areas physically unsuited for certain uses should be set aside for some other uses for which the land is best suited. Such differentiation can lead to the wise and efficient use of the land.

Detailed soil information plays a key role in making the determination of whether or not land is best suited for one use or another, Consequently, the soils information will be a prime input into the preliminary phase of land use plan preparation.

PUBLIC UTILITIES

Millions of dollars have been (and are being) invested in public sanitary sewer facilities and public water supply facilities. It is doubtful that such an investment will be abandoned. Therefore,

the most efficient and economical location of future development will be within the planned extension of these existing public utilities or within the gravity drainage area of such facilities in the case of sanitary sewer.

In a region where 50 percent of the land area is poorly suited for septic tank disposal systems, long-range regional land use planning must logically take into account the importance of the existing public utilities.

RECREATION AND OPEN SPACE

The lakes and streams, significant terrain, prime forests, prime wildlife habitat, historical sites, and exceptional potential recreation areas which now exist must last the inhabitants of southeastern Wisconsin for all time. Once destroyed they can never be replaced. They cannot be manufactured or imported. It is extremely important, then, that these areas not be inadvertently destroyed by urban and rural development.

In the preliminary phase of regional land use plan preparation, these recreation and open-space areas will be delineated. Subsequent delineation of urban and rural development areas on the plan will be oriented to this recreation resource base.

TRANSPORTATION PLANNING

by RICHARD B. SHERIDAN, Chief
Transportation Planning Division, SEWRPC

STARTING POINT FOR PLANNING A FUTURE TRANSPORTATION SYSTEM

For purposes of developing a transportation plan to fit with each of the land use plans, we will use as our point of departure the arterial highway system as it will exist upon completion of all current highway projects. We are calling this the system of existing plus committed arterial highway facilities, and we are now in the process of drawing and coding a network diagram based on this system.

The rationale for this is as follows.. Facilities now under construction, or for which contracts have been let or funds committed, are going to be built. Our recommendations for the alternative 1990 transportation systems, which will be developed in the next year, can have little or no effect on such projects. These highways will be there, and for planning purposes should be considered just as much a part of a given or existing system as the streets and highways which you used to drive here today.

Another way to describe this system is to say that it is the arterial street and highway system which would result if all present street and highway projects were completed, but no new ones started. By beginning our analysis of future trips with this system, we can then ask ourselves, "Given this arterial system and a pattern of future land use:

1. What will the travel demand be?

2. Will the arterial system accommodate the indicated traffic; and if not, where is the system deficient?

3. Is the interaction between travel and land use more or less desirable than would be expected from an alternate land use plan?"

NETWORK ADDITIONS TO TEST ROUTE PROPOSALS

From that point we can proceed to test and evaluate proposed additions to the arterial system. While we expect our staff to develop some route proposals to be tested, we are already aware of a number of such proposals that have been formulating in the minds of local

planners, public officials, and highway engineers. We expect to be able to quantitatively test a number of these proposals and to evaluate them in cooperation with their proponents.

PLANNING PROCESS

So much for an indication of where we are heading. In order to get there, we must start from a land use plan and related planning data. As I said this morning, this land use planning data will provide the transportation planners with information on the type, intensity, and location of land use as depicted on a map and with information on population and employment data. From this we must calculate the number of trip origins and destinations per zone expected on an average weekday in 1990. This calculation is described as trip generation and was the subject of my remarks this morning. Next, we must calculate the distribution of trips between these origins and destinations. We expect to deal with all person trips and then with truck trips. Thirdly, we must designate part of the person trips as auto driver trips and part as transit trips. This apportioning is termed "modal split." Finally, we must assign the auto driver trips and truck trips to the network of arterial streets and highways and the assigned transit trips to the transit network.

Let me go back over these four steps.

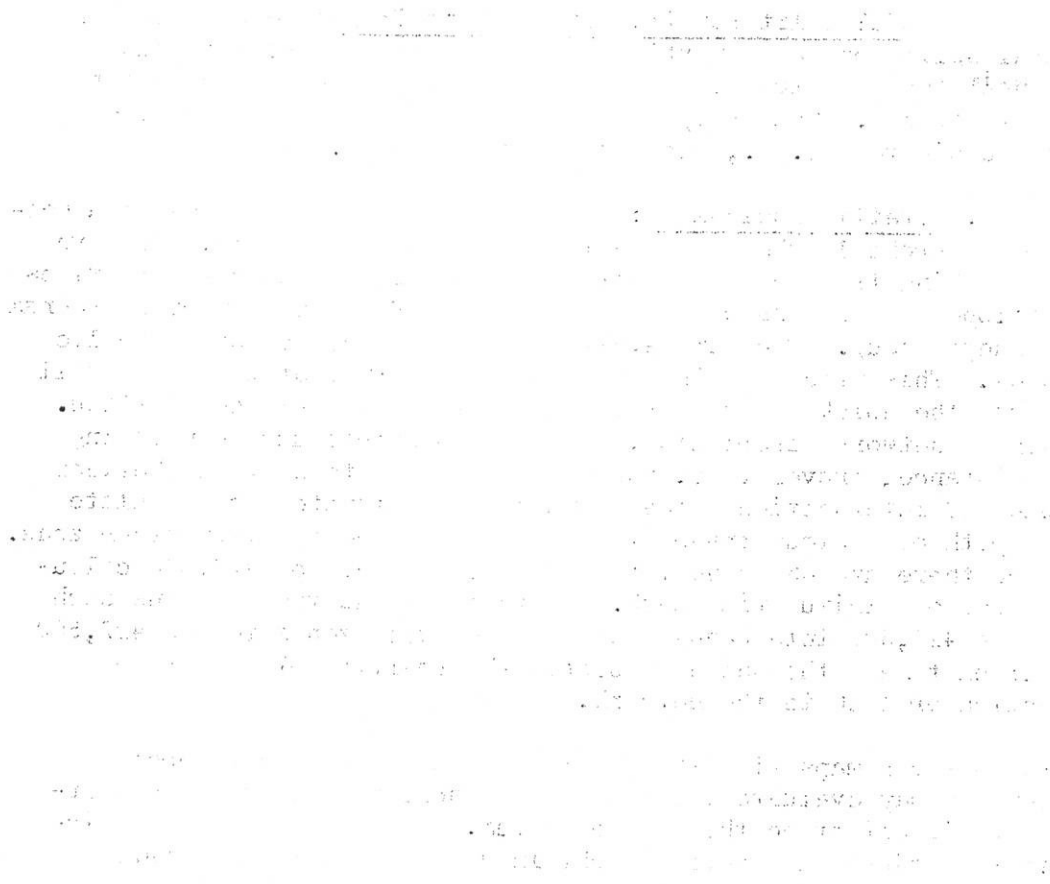
1. Trip Generation: For trip generation we are trying to develop a three-phase procedure which will go from residential densities as shown on a plan to a number of residential structures in each of several types. From this distribution of housing types, we would calculate, in the second phase, a distribution of household types which could be expected to occupy each of the housing unit types; and in the third phase, for each household type we would calculate the trips produced. The non-home end of home-based trips would be called "trip attraction" and will probably be a function of employment for work trips; retail and service employment for shopping trips; population or households for social trips, etc. Non-home-based trips will have to be separately calculated, probably as a function of other trip attractions in each zone.

2. Trip Distribution: Trip distribution is the allocation of trips originating in each zone to destinations in various zones. We expect to use the gravity model which was developed initially by Alan Voorhees and used in many transportation studies, including Washington, D. C., and Baltimore. This model considers all trips of a given type originating in a zone and distributes them to each other zone as a function which is directly proportional to the number of trip attractions in each other zone, and is inversely proportional to an exponential power of the travel time to get there.

3. Modal Split for Transit and Auto Trips: Techniques for modal split, or the apportioning of some person trips to mass transit and some to auto driver trips, have been developed for other studies. Some very good work in this area has been done for Washington, D. C., and for Canadian cities.

4. Traffic Assignment: Assignment of vehicle trips to a network is probably the best developed tool in this field. We have been making traffic assignments, using available computer routines developed by members of the Transportation Planning Computer Program Exchange Group. They are available through the Bureau of Public Roads. This procedure is based on the theory that travelers will choose the quickest path from their origin to their destination. Using a network description, given as numerical data consisting of distance, travel time, and capacity of route sections between numbered intersections, the computer is instructed to calculate the path of minimum travel time from each zone to every other zone. Since there are 650 zones, this amounts to 650^2 or 422,500 calculations of minimum time path. Another routine then assigns each of the 422,500 interchanges of trips between zones to the 422,500 minimum time paths and accumulates the traffic volume for each section or link in the network.

From network maps with the results of such assignments posted on them, we may evaluate transportation facility proposals by testing their effect on the entire system. We can then make any indicated adjustments until we obtain an optional transportation network.



PLAN TEST AND EVALUATION

by KENNETH J. SCHLAGER
Chief Systems Engineer, SEWRPC

PLAN TEST AND EVALUATION IN THE LAND USE-TRANSPORTATION PLANNING PROCESS

Regional land use plans must be tested to determine their feasibility for implementation. Land development is the result of a multitude of decisions by private individuals and business enterprises, as well as public agencies; and there is no assurance that the overall end result of these decisions will be a land pattern compatible with the desired land use plan. A vehicle is needed to test the effects of public works programs and land control policies on the developing land use pattern.

In the regional planning program in southeastern Wisconsin, a land use simulation model has been developed to test the feasibility of proposed land use plan designs. The application of this model to land use plan test is the central topic of this presentation. Land use plan test using the land use simulation model is similar in principle to the use of trip distribution and traffic assignment models in testing transportation network plans.

Plans must also be evaluated to verify their agreement with the original plan objectives. Plan objectives are detailed in a set of design standards which provide the criteria for plan evaluation. Plan evaluation is really the inverse of plan design since it involves the comparative analysis of a completed plan based on the original objectives and design standards, while plan design requires a synthesis of a spatial pattern to correspond with the plan objectives and design standards. Plan evaluation will usually precede plan test in the planning sequence since it is not logical to develop programs and policies to implement a plan if it does not satisfy the plan objectives.

Although plan test, as defined here, requires the use of a mathematical model and a digital computer, plan evaluation may be performed manually on a qualitative basis. If mathematical models are used to design the plan as well as test the plan, plan design and plan evaluation merge into one function since a plan design model is formulated to automatically satisfy the design standard inputs.

The objective of the land use simulation model is to provide a means of testing regional land use plans for feasibility of

implementation. The emphasis is not on forecasting but on plan implementation. The model is intended to test the effectiveness of certain controlled variables in achieving a given target plan in the presence of many uncontrolled variables. Controlled variables will represent the implementation tools of land use planning; public land use controls, public facilities construction, and public land acquisition. Uncontrolled variables will include the behavior of households, private land developers, and builders and exogenous inputs, such as population growth and employment.

Although the primary use of the land use simulation model will not be in forecasting, one of the applications of this model in southeastern Wisconsin will be a simulation of current trends in the regional land use pattern given the existing public works programs and land use controls in the Region. In one sense, such a simulation is a forecast since none of the public control variables would be affected by the regional plan. The purpose of this simulation is to present for public consideration the desirability of the emerging land use pattern without a comprehensive regional plan.

Most of the land use simulations, however, will be concerned with the experimental design of policy to implement a target land use plan. The end product will be a set of public works programs and land use regulations needed to achieve the regional land use plan.

The land use simulation model is a dynamic behavioral feedback simulation model and is classified into five primary sectors:

1. Residential
2. Industrial
3. Services
4. Special
5. Agricultural

In the residential sector, the decision-making behavior of "household-type" units are simulated in conjunction with the related decisions of land developers and builders. Variables influenced by the land use planner, as later reflected in governmental policies, are programmed to achieve the desired land use pattern. These controls tend to constrain or modify the behavior of households, land developers, and builders.

The industrial sector in current model tests is being treated exogenously, with industrial employment in each zone being programmed in the light of the land use plan. A second experimental endogenous version of the sector is now being tested for later incorporation in the model. In this latter approach, "firm types"

determined from an industrial classification select new industrial sites based on their particular requirements and the costs of land and taxes. Although the endogenous approach to industrial location simulation has a certain appeal in that it provides a behavioral explanation of industrial location decisions, the exogenous approach may be more in keeping with the planning approach described earlier in this report. If the sites of industrial employment are a powerful influence on residential and service-related land development, then implementation of the target plan will probably require a governmental influence on these decisions. If such influence can take the form of providing land with the characteristics needed by the various industrial groups at prices they are willing to pay, then the exogenous and endogenous versions of industrial land development should be similar.

The service sector of the model embraces all land uses, the location of which are primarily dependent on accessibility to residential and industrial land. Such land uses include not only local retail and service establishments but also schools, local streets, and neighborhood parks. A dual interdependency exists for some of the land uses in this category, such as retail trade and schools since their location is dependent on residential and industrial land use; but they also influence this same residential and industrial land use pattern in a feedback fashion.

The special sector includes all nonindustrial exogenous inputs to the model, most of which are the result of governmental decisions. These include the major freeway and arterial network, regional park and open-space areas, and rail-utility rights-of-way and terminals.

Agricultural land use is treated in a residual manner in the model, with such land being transferred to other land uses during the simulation period. Such a representation does not imply an endorsement of the gradual disappearance of agricultural land in the Region. In fact, such representation is intended to emphasize the need to consider the relative economic and aesthetic worth of such land in the land use plan design to provide the need for the formulation of policies to prevent this conversion of agricultural land should it prove undesirable.

MODEL CHARACTERISTICS

It is convenient at this point to review some of the characteristics of the land use simulation model, particularly those that differ from other land use models being developed under the auspices of other agencies. The differences enumerated below should not be interpreted as a criticism of other model development in this field. The current experimental state of land use model

development does not permit anyone to assert the absolute validity of his conceptual approach. Then too, planning objectives differ; and the land use simulation model under discussion may not be ideal or even useful in other programs. In the current embryonic state of land use models, alternative approaches, even if ultimately unsuccessful, should add to the store of research knowledge in the field.

The dynamic nature of the model has been explained previously and will not be belabored again except to point out that many land use models are static in nature having been formulated to determine a land use pattern at a single point in time. Such a static approach, it is admitted, has usually resulted from data deficiencies rather than any basic disagreement about the desirability of a dynamic model.

A second important feature of the model is its degree of disaggregation. A more detailed model is consistent with a behavioral decision-making approach to model formulation. Since households differ considerably in their income, education, age, and other characteristics, the use of an aggregate household in the model is subject to question. For this reason, households have been classified into types with common characteristics with the hope of obtaining stability in the model parameters. Further disaggregation has been accomplished by the subdivision of household relocational behavior into a number of subdecisions. Although disaggregation has its penalties in terms of additional data requirements, additional model segmentation was felt necessary to be consistent with the formulation of behavioral decision rules.

A sampling approach to parameter estimation was used in the land use simulation model. To implement this sampling approach, new data sources were required, including special household history data collected in the home interview part of the travel surveys. The use of this new household data will be described in a later section concerned with parameter estimation in the land use simulation model. Another important new data source, the soil survey, also plays a critical role in the site selection decision of the land developer in the residential sector of the model.

Finally, the all encompassing characteristic of the model lies in its emphasis on the control rather than the forecasting function. Such emphasis is consistent with the generally accepted primary use of simulation models as vehicles for policy formulation. This "if-then" usage of a simulation model requires less information concerning the uncertain future values of exogenous variables than an equivalent forecasting usage. For this reason, conclusions may be drawn from model results with a higher degree of confidence.

Model Pilot Tests

The same 1950-1962 period of historical land development in the City of Waukesha and its environs, previously used for the test of the land use plan design model, was also used for the tests of the land use simulation model. Only the residential sector and its associated service land uses were simulated in initial tests, since the Waukesha area was too small for a realistic industrial land use simulation test. In the simulation tests, the measure of model effectiveness was quite different from that for the design model. Instead of developing a plan design consistent with a given set of objectives, costs, and constraints, the simulation model was expected to "act like" the actual land development process over time.

In the program of model tests, two types of simulation were performed. In the first type, the actual land-housing demand was provided as the land developer's forecast, thereby bypassing the household as a synthetic demand generator and the land developer as a forecaster. The purpose of this artificial type of simulation was to test the accuracy of the land developer's decision simulation with a perfect demand forecast input.

The second type of simulation involved the complete model with an internal generation and forecasting of land-housing demand. This two-part simulation permitted a separation of model inaccuracies caused by incorrect household demand from those of the land developer's site selection decision.

The initial test results were quite encouraging. The perfect demand simulation provided a model accuracy performance of 90.3 percent. Stated another way, 90.3 percent of the actual land development was accounted for in the land use simulation. The accuracy of the model varied somewhat from zone to zone. Some zones were perfect while others varied significantly from the actual development. In general, the zones with the more extensive development in terms of the number of lots were simulated more accurately, while those with fewer lots were less accurately portrayed. Such a result is understandable in any simulation since the statistical law of large numbers results in an averaging of random errors in the simulation. This same effect occurs in traffic assignment simulation models where links of low volume are less accurate than links of high volume.

Evaluated on a statistical basis, the zones with perfect results would seem difficult to explain; but these results are easily understood in the light of the constrained obtimization nature of the land developer's decision. The use of a recursive programming algorithm for this decision simulation means that some

zones will be developed to the limit of some physical or legal constraint. This is precisely what happened in the zones in question.

The measure of model accuracy was obtained by dividing the summation of the absolute value of the errors in each of the zones by the total number of lots actually developed. A similar result may be calculated by dividing the average absolute value of the error in each zone by the average size of each zone. Another measure of model accuracy is the statistical correlation coefficient which was 0.9679 for this simulation test run.

The perfect forecast simulation run is really a test of the basic theory of the model relating to the land development process. This theory, as previously discussed, states that a land developer will seek out the lowest cost areas within the physical and legal environment in which he must operate (land developer's site selection subdecision). While more extensive tests of this theory in a number of regional areas will be required before it can be accepted universally, the theory has found some support at least in its application to southeastern Wisconsin.

A second aspect of the model and its supporting theory were tested in a second series of runs of the complete model in which the demand for land and housing was internally generated within the model. The land developer bases his plans for development on forecasts of land demand generated within the model. Model inaccuracies are now increased by the errors in the model simulation of the land-housing demand for the area. These new errors reflect primarily the accuracy of the data used to determine the household housing-land demand generator used in the model. Parameter errors in the land developer's lot quantity subdecision will generally influence only the timing rather than the total amount or the size distribution of the lots developed.

The errors introduced into the model by the internal generation of demand provide a comparison of the error effects of the site location of land supply as opposed to the total quantity and lot size distribution of land supply. Test results would indicate that site location rather than total supply is the key factor in the effectiveness of a land use simulation model.

The validity of the above test results can be appreciated only if the source of the data used to estimate the model parameters is clearly understood. Most land use models previously developed have used some form of regression analysis to estimate the model parameters. Such regression analysis involves the use of time histories of the variables being simulated. Because historical

data is used to estimate the model parameters, this same history cannot be used to validate the model. The parameters of the land use simulation model were not estimated from regression analyses of time series but from independent estimates based on surveys, such as the household history of sampled households or the engineering estimates of costs based on the type of soil. This independence between the time series history of the model variables and the samples used to estimate the model parameters provides a sound basis for model validation tests.

Leaving the world of statistics for a moment, it is important to consider the practical usefulness of the land use simulation model in relation to the land use-transportation planning process. Although the simulation model might be employed for a variety of purposes, three primary functions predominate in the current regional planning program.

1. Forecasting the future land use pattern based on a given aggregate forecast of population and the continuance of existing and committed public works programs and land use control policies.

2. Testing the feasibility of land use plans and providing a vehicle for the experimental design of land use control policies and public works programs to achieve these plans.

3. Providing the land use pattern (forecast or plan) for the determination of spatially distributed travel demand (trip generation), which serves as the input to the transportation planning process.

Each of the above functional requirements involves a determination of the structure of the land use pattern. Pilot test results would seem to indicate that the simulation of the land use pattern will probably be more accurate than both the input and the output of land use simulation. The input forecast of 1990 population will do well to achieve an accuracy of 90 percent. In fact, it is quite likely that only a continual monitoring and adjustment of this forecast will provide the accuracy necessary for the continuous planning process.

The output of land use simulation (from the viewpoint of transportation planning) is trip generation. Experience to date in trip generation analysis indicates significant difficulties in developing accurate relationships from current data, much less from forecasts of future activity. The accuracy of the simulated land use pattern should not seriously restrict future trip generation forecasts.

Given the goals of the regional planning program in southeastern Wisconsin, the predominance of the second of the above three functions, land use plan test, is obvious. It is in this function that the model is at its best. Experience to date with simulation models in both industry and government have confirmed the usefulness of such models in policy design. Test results of the land use simulation model reinforce this general conclusion in land use planning applications.

BASIC PLANNING TOOLS

By EUGENE E. MOLITOR, Principal Planner
Land Use Planning Division, SEWRPC

The primary objective of the Regional Land Use-Transportation Study is to produce two of the key elements of a comprehensive plan for the physical development of the Region. These are: a land use plan and a transportation plan. I'd like to discuss briefly how five of the basic inventories which Mr. Doughty just outlined are to be utilized in the preparation of these two plan elements. The five inventories and their basic findings which were outlined this morning are: a population inventory, an economic activity inventory, a public financial resources inventory, an existing land use inventory, and an inventory of the land use development objectives implicit in adopted community plans and zoning ordinances.

The first two inventories of population and economic activity provide the most valuable data inputs for the forecasting of future demands for the various categories of land use, for local public utilities and facilities and transportation, and for the overall demands which will be exerted upon the natural resources of the Region, such as water supply and soils. Future population levels are, in fact, the result of two basic forces: cumulative population growth and the level of economic activity. When population growth is estimated for some future date, this estimate must be expressed in terms of size, composition, and spatial distribution. The inventories just completed have provided us with the information needed to prepare estimates of total population growth to the year 1990 by age and sex and for various geographic units which generate travel demands.

The economic inventory has two applications in the planning process. One is to provide the basic information necessary to prepare an estimate of the size of the future labor force. This estimated employment level also implies a certain range of population which can be reasonably supported by the work force. Consequently, a check can be made of the reliability of the population estimate.

The other application of the economic inventory findings is to provide an estimate of the probable future demands for the commercial and industrial facilities which house the various economic functions. Also, other economic information, such as retail sales, value added by manufacturing, and personal income, when projected into the future, are input requirements for many traffic and travel demand estimation techniques.

An inventory of historic and current public financial resoures is necessary for the preparation of conditional forecasts of the possible or probable levels of future public revenues and expenditures. These forecasts, when coupled with cost estimates of the public facilities associated with alternative plans, are used to make a determination of the financial feasibility of the plans. Another less obvious application of the findings of this public financial resources inventory is to identify possible alternative revenue sources for municipalities which would want to implement segments of a regional plan.

The inventory of existing land use serves many purposes. In addition to supplying basic physical or spatial location data and information about the various categories of land use, the knowledge of how much land is presently being utilized for various functions, such as living, working, learning, and leisure time activities, is a primary tool for plan preparation. By relating the existing population and economic activity levels to the existing amount of land in various categories, a point of departure is obtained for the preparation of a plan. For example, the existing population level of 1,674,000 people "use" 160,000 acres of residential land, 20,000 acres of governmental and institutional land, 25,000 acres of recreational land, and 1,000,000 acres of farmland. An analytical ratio is derived from these numbers--what planning jargon calls the people-use ratio--and a first "guesstimate" of possible future land use requirements is formulated; that is, if the existing population requirement of, say, 81 acres of residential land per 1,000 population were to be held constant into the future, a projected 1990 population of 2,700,000 people would require about 300,000 acres of residential land--approximately 140,000 more than we now have. The next task would be to make a trial distribution of these 140,000 acres to the land areas which are best suited to residential development.

The next ratios which are derived relate the amount of acres in commercial and industrial use to the number of employees in these activities. These employee-use ratios can be used in the same manner as the people-use ratios. For example, the existing ratio of 27.7 employees per acre of commercially used land can provide an estimate of possible future commercial land requirements by projecting retail and service employment to some future date and filling in the ratio with the number of acres needed to "employ" 27.7 employees per acre. Again, the next step is to make a trial distribution of additional commercial land area to the best suited or most logical areas.

After the people-use ratios and employee-use ratios are applied on a preliminary basis, a gross land use requirement is obtained for selected future points in time. These requirements are then

used as guidelines for trial allocations of land area. The requirements can be altered by varying the assumption implicit in the ratio. For example, if the trend in the number of retail employees per acre is decreasing, a different assumption might be used which would lower the existing 27.7 employees per acre ratio to 25 employees per acre for 1990. This assumption would result in an increased commercial land requirement for the projected number of employees. A similar result would be obtained if the trend towards larger residential lots were to be reflected in the people-use ratio, which is applied to the future population level to derive a future residential land requirement.

As noted earlier, however, it is important to realize that these ratios merely provide guidelines for the preparation of a plan. All plans must ultimately reflect the land use development objective of the people of the Region. These objectives, as articulated by the Regional Planning Commission, are then translated into the principles and standards which the technician uses to prepare alternative plans. The key elements in the determination of just how much land is to be allocated to each use on the alternate plans and where it may be best located, at least on a trial basis, are the land use planning standards. These standards, which express the amount of land required in each use category in relation to the population base, employment base, or some other land use requirement, are also strongly dependent upon the information obtained in the land use inventory.

To over-simplify the concept, the existing people-use ratios and employee-use ratios might be construed as "current standards ; and it is a part of the task of the planning process to appraise these "current standards" in light of established planning objectives and, with professional and technical judgment and experience, to modify the existing relationships on a trial basis to achieve acceptable alternative plan designs.

The fifth basic inventory discussed this morning was concerned with the development objectives of the local communities in the Region. The expression of these objectives, as contained in the locally prepared and adopted land use plans and comprehensive zoning ordinances, are construed to be the best available documentation of local physical development objectives. These local land use development objectives provide another input to the plan preparation process in that these objectives will be incorporated into the various alternative regional plans to the maximum extent possible.

SUMMARY

The land use planning process, therefore, utilizes the five basic planning inventories of population, economic activity, public financial

resources, existing land use, and proposed future land use in the following manner:

1. Population - To provide data needed to forecast future population levels and distribution;

2. Economic Activity - To provide information needed to forecast future employment levels and future economic activity factors;

3. Public Financial Resources - To provide basic information needed to prepare conditional forecasts of probable future levels and sources of public revenues and expenditures;

4. Existing Land Use - To provide the information needed to relate current and future population levels to the existing and probable future demands exerted for the various categories of land use; and

5. Proposed Future Land Uses - To provide an aggregate current expression of how the Region might develop if the existing local land development objectives were to be carried out.

These few brief comments have tended to over-simplify the highly complex relationship of applying existing information to future conditions, and I'm sure I've raised more questions that I've answered.

WORKSHOP B

"How The Completed Inventories

Can Be Used For Community Planning"

INTRODUCTION

by MERVIN L. BRANDT, Commissioner
Southeastern Wisconsin Regional Planning Commission

An enormous amount of data has been collected by the SEWRPC in the form of aerial photographs; base maps; population and economic studies; utility and land use inventories; traffic and transportation inventories; soil and water data; and park, forest, and wildlife data.

This data has been collected for the purpose of preparing regional land use and transportation plans, but it also has great value for community planning and can be immediately used by local officials.

In keeping with the ever increasing life expectancy and the increase of leisure time due to automation and the trend to a shorter work-week, it behooves us to plan now to enjoy the overtime of our lives.

The workshop participants this afternoon will present how this data can and has been used for community planning. In fact, I believe the title of this session should be changed somewhat; rather than using "How the Completed Inventories Can Be Used for Community Planning," I would like to substitute "will" for "can." Frankly, I have enough confidence in the elected officials of this Region to feel sure they will insist on getting value received for tax monies expended for these studies.

HOW SOIL SURVEYS CAN BE USED FOR COMMUNITY PLANNING

by M. T. BEATTY, Soil Science Department
Wisconsin Geological and Natural History Survey
University of Wisconsin

Soil surveys are detailed scientific inventories, based on careful field and laboratory studies, of an important and complex natural resource. Details of how they are made and used in southeastern Wisconsin have been described by Mr. Silliman (1963) in the Proceedings of the 3rd Annual Regional Planning Conference, by Mr. Bauer (1964) in the Commission Technical Record and Newsletter, and by Mr. Clinkenbeard on the morning program.

There is a growing consensus that soil surveys are a valuable source of facts for land use planning. Their value for this purpose comes, first, from thorough study classification and mapping of the soil itself and, second, from careful observations of how a known soil responds to a given kind of land use or combination of land uses and treatments. Such observations can then be applied to closely related soils. The excellent soil survey program being carried out in this Region by the Soil Conservation Service and cooperating agencies is very helpful in furthering the usefulness of soil surveys for land use planning and treatment, both here and elsewhere.

Soil survey information can be of value to community planning which is carried out either informally or formally. It is applicable to a wide range of land areas and contains an inherent system for refinement if more detailed soils information is needed on certain tracts of land.

Informal land use planning, based in part on soil surveys, has been carried out for many years by farmers who cooperate with agencies assisting county soil and water conservation districts to establish a planned program for conserving the soil and water resources on their land. This informal, individual farm planning has frequently led to more formal rural community planning on a group or neighborhood basis. For example, formal local watershed organizations have emerged in many rural areas where informal conservation planning is widespread to help sponsor development of local flood control and watershed improvement projects under Public Law 566.

The subdivision control program of the Wisconsin State Board of Health is an excellent example of informal planning within portions of urbanizing communities which involves soil surveys directly. The Board has for the past five years used soil surveys to aid in subdivision plat

evaluation with considerable success. Thirty proposed subdivisions in the Southeastern Planning Region were rejected in 1964 on the basis of soil survey information provided by the Soil Conservation Service and by Board engineers. It is estimated that 450 homesites were deleted from these proposed subdivisions. The cost of 450 septic tanks and seepage fields which might have gone on these homesites, and which would have been very unlikely to work well, is at least $270,000. This is more than the entire cost of the soil survey field mapping for the seven-county Region. Application of soil surveys to waste disposal problems may encourage formal community planning programs. Subdivision plat rejections based on poor soil conditions have served as an impetus to several community planning programs within this Region.

The method by which soil surveys are used in the subdivision control program by the Board of Health is a good illustration of how this information can be used in a variety of community planning situations. This method includes the following steps:

1. Development of a legend which interprets the limitations of soils in the area concerned for a given land use, in this case, on-site sewage disposal.

2. Preparation of an interpretative map from the original soil survey and the interpretative legend. This step may include massive enlargement of the soil map. Translations from a scale of 1 inch = 1,320 feet to 1 inch = 200 feet are common in subdivision plat evaluation. In other cases, the map scale may be reduced during generalization.

3. Utilization of the interpretative soil map in planning or evaluating the proposed land use or the land use alternatives and in planning for special practices needed to overcome soil limitations.

4. Field checking of the final plan in relation to localized soil conditions. This is done on subdivision plats by a Board of Health engineer, often in consultation with a soil scientist. It is an essential refinement of the investigations in cases where large investments may or may not be made in a small tract of land on the basis of soils information. It is an example of the use of the mechanism for precise refinement of information on soil characteristics on particular tracts of land which is inherent in soil surveys.

5. Development of colored soil maps to show either basic differences in soil characteristics or differences in the limitations among soils for a given use.

Witwer (1964) has described a similar sequence of steps for utilization of soil survey information in community planning in Pennsylvania. This approach is likely to be adopted widely in community planning situations where: (1) soil surveys are available, (2) soils with limitations for a given use are common, (3) land use is in a state of flux, (4) land uses can be adjusted to fit soil and landscape patterns, and (5) soils can be made suitable for a given land use by application of special practices or treatments.

By similar sequence of transformations, soil survey information can be utilized in the development of community land use controls. For example, Buffalo County, Wisconsin, recently made the detailed county soil survey published by the Soil Conservation Service in cooperation with the University of Wisconsin an integral part of their land zoning ordinance. The soil survey served as a zoning base map and as a means of delineating zoning districts for flood plains, wet soils, and steep soils, all of which have appropriate land use restrictions.

It is obvious that introduction of detailed sources of facts on land, such as that provided by soil surveys, water resources surveys, wetland inventories, and topographic maps, can have a direct and important part in improving the quality of community land use plans. While there will doubtless be many improvements, the basic mechanism for using the soil survey as a resource inventory is in successful operation in numerous community planning programs.

One of the most important by-products of the use of these inventories in planning is only now beginning to emerge. It is the increased acceptance of the resultant land use plans or land use controls by the local residents. An amazing aspect of utilization of the soil survey in the Buffalo County Zoning Ordinance was its role as a rational basis for explaining to county citizens some of the facts behind the land use controls. The County Extension Agent and the Soil Conservation Service personnel who appeared at public hearings noticed that much of the anticipated opposition simply disappeared when questions were answered with reference to the soil survey, and the ordinance was passed unanimously by the County Board of Supervisors.

Quay (1963) expressed the same idea when he stated: "The right soils information at the right time can prevent a lot of idle talk. Arguments about physical problems at a given site can go on for hours due to defects in memory, differences in vantage points, and lack of understanding. Precise soil descriptions and interpretations can be an immediate conservation-stopper at many conferences...." Closer to home, a quote from Mr. R. P. Hanson, Town of Bristol, Kenosha County, points out the feeling of a layman on a community planning board regarding soil survey. "We have just started our planning program for the town and everyone on the planning board feels the soil survey is as indispensable as a hammer to a carpenter. The job of planning could not

be done right without the survey and this board is most grateful to the services that have made it available. It has given this layman board an aura of authority that makes it possible to shut off some of the petty objections that changes always invoke."

These reactions indicate clearly the value of accurate and well-interpreted land inventory data, such as a soil survey, to both the development of, and the public acceptance of, community land use planning. When these inventories are used carefully in planning and when the results are explained clearly to local people, community planning can apparently expect to be well received and, I hope, fully heeded and implemented both immediately and for many years to come.

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USE OF WATERS, WOODLANDS, PARK AND WILDLIFE INVENTORIES IN COMMUNITY PLANNING

by CY KABAT
Wisconsin Conservation Department

In preparing this presentation, I assumed that a community included counties, towns, villages, and cities. I further assumed that my presentation should include those resources under the Conservation Commission's statutory responsibilities which were inventoried as a cooperative effort with the Southeastern Wisconsin Regional Planning Commission. It, thus, seems appropriate to identify these resources and how they are grouped for planning purposes.

RESOURCES AND DEFINITIONS

The resources which the State has delegated varying degrees of responsibilities for protection, use, and development to the Conservation Commission are forests; state parks; lakes and streams; scientific areas; fish, game, and other wildlife; and certain plants. These responsibilities were covered in a report I gave at the 3rd Annual Southeastern Wisconsin Regional Planning Conference (Kabat, 1963).

It is apparent that the resources, just named, vary in characteristics. Some are land and water units. Others, such as fish and game, occupy land and water units. For management purposes, which includes planning, it is more practical to group all of these resources under land and water units. Thus, my presentation will cover lakes, rivers, and streams; wetlands; parks; private and state forests; and scientific areas. While some of these resources have obvious distinguishing characteristics, they overlap in others. Therefore, it seems important at this time to define them. For this purpose, I will use a report recently submitted to the Southeastern Wisconsin Regional Planning Commission entitled, "Planning Elements -- For Some Of The Basic Natural Resources Of Wisconsin" (Mimeograph report by the Wisconsin Conservation Department, 1965, filed in SEWRPC and WCD).

The following are definitions of the resources as used in the report on Planning Elements, together with a few selected values of each.

Inland Lakes and Impoundments

All waters excluding streams which are navigable, meandered, or public which contain water nine out of ten years. Inland lakes are of three general types.

1. Drainage lakes - have an outlet, large drainage area.

2. Seepage lakes - landlocked, small drainage area.

3. Spring-fed - have an outlet, small drainage area.

Impoundments are drainage lakes which have been created by damming a watercourse so that 50 percent or more of its depth can be ascribed to the damming.

Selected Values

They may provide flood storage and thereby help stabilize streamflow.

They enhance real estate values of overlooking or adjoining land due to their esthetic and water use features.

A 100-acre lake has a potential use of 5,000 man-days of fishing per year, as well as 200 man-days of duck hunting and fishing in bays and associated marshes.

Lake Michigan

All areas of Lake Michigan within the outer harbors and breakwaters and open water out to a distance of three miles from the shoreline.

Selected Values

It is a major source of domestic and industrial water in southeastern Wisconsin.

It offers commercial opportunity for service to various lake users.

It has a high esthetic value.

River and Streams

Rivers and streams are water masses normally flowing in one direction by gravity and characteristically having a channel at least partly natural with pools and a zone of overflow or flood plain. They include those of permanent flow and, in addition, those of intermittent or seasonal flow which have a significant recreational value.

Selected Values

In natural channels rivers and streams have pools and flood plains which provide valley storage and stabilize water levels and flows.

Rivers and streams may be used as limited sources of water supply.

Rivers and streams serve for spawning activity and provide sport fishing largely for warm water species.

Wetlands

Wetlands are all areas having either surface water or a high enough water table to preclude cultivation which are not called lakes or streams. They include types commonly referred to as meadows, sloughs, marshes (brush, grass, sedge, bulrush, and cattail), brush swamps, bogs, and small potholes. Timber swamps are excluded here and are covered under forests.

Selected Values

Wetlands provide sediment deposition areas during flood stages along the watercourses.

Wetlands have significant esthetic qualities which may enhance adjacent land value.

Wetlands provide vital nesting, roosting, and wintering cover to pheasants and rabbits and, in part, to other species as deer and raccoon, as well as waterfowl and other migratory game birds.

Forests

Any land used for the natural growth of trees and shrubs. Forests include, in addition to what is ordinarily termed "forest or forest plantations," shelter-belts, areas in woodland species for wildlife cover, stream and other banks with woodland cover, and gullies and roadsides with permanent woodland cover. It also includes those parts of farmlands or other lands requiring reforestation. Forests of primary concern in southeastern Wisconsin are:

1. All woodland areas of desirable quality over 40 acres in size.
2. All second quality areas that are not on soil types nor in locations suitable for urban development, industry, or agriculture and are at least 20 acres in size.
3. All woodlands on slopes greater than 19 percent and in flood plains.

Selected Values

Woodland areas are an important factor in the infiltration, percolation, and ground storage of water.

Woodland areas provide a source of timber for lumber and other wood products.

Woodland areas provide a variety of plant and animal life as an esthetic setting for recreation uses, such as camping, picnicking, and hiking.

State Parks, State Park Recreation Areas, and State Forests (Recreational)

State Parks - State parks are areas which contain within their confines outstanding features of statewide significance, such as scenery; plants and wildlife; or historical, archeological, or geologic points of interest, and shall present vistas of consistently unspoiled landscape.

They are generally large in size so that they may be used by large numbers of people without destruction of the very qualities most essential to their purpose.

State Park Recreation Areas - State park recreation areas offer the best natural attractions available where the absence of scenic values of statewide significance may be compensated for by very unusual recreation values. State recreation areas shall have scenic qualities, be of sufficient size to prevent their destruction through overuse, and contain some water for recreation. Consideration shall be given to recreation needs in selecting these areas.

State Forests - State forests are acquired for the purpose of growing timber, demonstrating forestry methods, protecting watersheds, or providing public recreation. Recognizing multiple-use principles, lands acquired should have high recreational potential for both intensive developments and extensive outdoor recreation, such as hiking, nature study, public hunting, and fishing, as well as timber production.

Selected Values

Park and recreation areas, where not intensively developed, permit a desirable natural community of plants and animals (wildlife habitat).

State park and recreational areas often provide opportunities for private commercial recreation-oriented service and supply enterprises in areas immediately adjacent to park or forest boundaries.

State parks, state park recreation areas, and state forests provide excellent facilities for interpretive programs, nature study, outdoor classrooms, and scientific areas.

Scientific Areas

A scientific area as used in this context is any area having unique natural plant and animal communities and geological formations

typifying southeastern Wisconsin and which is preserved or is potentially preservable under Section 23.27 of the Wisconsin Statutes.

Selected Values
They are necessary for the purposes of scientific research, teaching of conservation and natural history, and for the preservation of rare or valuable plant and animal species and communities.

AVAILABLE INVENTORY MATERIALS
In this section of the report, I will list the basic types of available inventory material and present very brief descriptions of their contents and usage in community planning. They are not presented in order of importance since their usage depends on the planning needs. Generally, more than one should be consulted even when planning usage for a specific need because of the interrelationships of these resources, which will be emphasized later.

Detailed Aerial Photos (1 inch = 400 feet)
All of the resources previously cited, except parks and scientific areas, but including different wildlife habitat types, are plotted together with their importance ratings on a three-category quality scale on these maps. Each map covers four square miles. The methods used in plotting these resources are contained in a report I gave at the 3rd Annual SEWRPC Conference.

Regional Maps (1 inch = 8,000 feet)
The information from the 1 inch = 400 feet aerial photos was plotted on these maps with the exception of specific wildlife habitat. The regional maps, which are 28" x 40", provide an opportunity for comparing the general distribution and abundance of these resources. This comparison is important to community planners because it enables them to evaluate what their community has to offer to its own people from resources located within its own borders or what they can expect in use opportunities from other communities.

Planning Elements--For Some of the Basic Natural Resources of Wisconsin
This report (cited on page one) is based on the procedure used by the SEWRPC for guiding the usage, among other things, of inventory information in developing land-use plans. These planning elements contain definitions, objectives, principles or values, and standards. In other words, they define the resource, tell why it is important, what needs to be done about it, and how much of each type of resources, where known, is needed to meet the demands of the people in the Region.

Potential Parks and Related Open Spaces Report
This is Technical Report Number 1, published by the SEWRPC in 1964. It was cooperatively prepared by personnel of the Wisconsin Conservation

Department, particularly by Karl Holzwarth, and the SEWRPC, as part of the regional land-use transportation study.

Files of local park officials and certain interested groups in the Region were also used for this inventory.

It contains the location and value determinations of the remaining potential park and related open-space sites throughout the Region and is summarized on a county-by-county basis. The general location of each potential site is mapped and classified as to value. The criteria and specific ratings used for classifying each site are contained in the files of the SEWRPC.

Since this report was prepared especially for community, regional, and state planning use, I will not comment further on this aspect.

County Surface Water Resources Reports

These reports contain maps with descriptions and information on the usage, quantity, and quality, as well as the problems concerning all surface waters for each county in the SEWRPC. They were prepared and published by the Conservation Department. One of their important values lies in immediate accessibility of relatively complete data on quantity and quality, expressed on a comparative basis for all of the surface waters in each county. From this basic information, it is possible to prepare a complete plan (lake and stream classification) for each body of water.

County Wetland Inventory Reports

These reports show the loss of wetlands between the mid-1930's and 1950's and contain maps supplemented by information on classification and descriptions of existing wetlands. They are primarily concerned with vegetation having wildlife values but also can be used for general information on water table relationships and locating certain types of scientific areas.

Unique Natural and Man-Made Sites and Corridor Pattern Maps

The Wisconsin Department of Resource Development assisted by the Wisconsin Conservation Department, which identified and classified these sites, prepared maps showing their locations, importance values, and occurrence in the form of environmental corridors for the SEWRPC. In addition, the Department of Resource Development has prepared "corridor" maps for their seven state planning areas. The corridors primarily owe their existence to the natural distribution of higher and lower land elevations into which the resources defined earlier in this report intertwine. The pattern of these unique sites provides natural units which though generally smaller, are relatively comparable in value to those of watersheds for basic land-use planning.

GENERAL USAGE OF INVENTORY MATERIALS

The first prerequisite of the use of completed inventories in land-use planning, whether for community, regional, or state planning purposes, is to become intimately familiar with them. The next prerequisite is to make the necessary associations with other related inventories, such as soils, and then the needs for facilities, such as transportation, utilities, residential, industrial sites, etc. In many instances specialized assistance will be necessary to make the proper interpretations and decisions.

It is important to realize that the use of surrounding lands and waters may greatly affect the quality of any one unit. For example, unless roads, building developments, and certain other intensive land-use facilities are deliberately constructed and located to protect or enhance wildlife and other specific resource values, they can segregate, disturb, or destroy the very values desired. The quality and quantity of water in lakes and streams are also highly dependent upon all of the uses of surrounding lands. Soil erosion results in sedimentation. Also in this process, mineral enrichment occurs in affected waters. This condition, along with accumulation of various waste materials and deliberate physical destruction, is an example of problems that render water quality and quantity below desirable levels.

CONCLUSIONS

Communities have similar responsibilities to those of the state and region for the protection, wise use, and development of these resources. These resources can be compared to bank accounts. They can be cashed in or kept in reserve. By cashing them in as rapidly as possible for additional space to create building sites, such as on forested slopes or lakeshores, sewage disposal for dwellings, or road locations, we can solve some economic problems bringing instantaneous income to a community. Simultaneously we will, however, destroy their natural values and create other problems. If, however, they are protected and kept in reserve or developed for their natural values, they will continue to yield interest on these investments. This interest while at a lower rate at least in some instances will be constant. Also, the resource will be available for more essential use at a later date.

We need to always remind ourselves that these natural resources required millions of years for their development, and man already in little over a hundred years has destroyed or irreparably reduced the original value of most of them. We are now faced with protecting and wisely using and developing the existing remnants of formerly abundant natural resources.

HOW THE COMPLETED TRAFFIC AND TRANSPORTATION INVENTORIES CAN BE USED BY LOCAL COMMUNITIES FOR STREET AND HIGHWAY PLANNING

by DOUGLAS F. HAIST, Chief, Urban & Advance Planning
Wisconsin State Highway Commission

The basic objective of the regional land use-transportation study is the preparation of an areawide plan to guide regional development in southeastern Wisconsin. Such a plan will be most specific in terms of proposals for public facilities of a multi-community or regional nature, thus essentially those public facilities of particular interest to county and state government. Though being less specific about local community facilities, it will, nevertheless, establish a logical and balanced framework whereby community planning and development actions can be made consistent with regional facility improvements.

This statement would imply that the value of the regional land use-transportation study to individual community planning efforts must await the development of a regional plan and even then will be somewhat indirect. The opposite is actually the case, at least in the aspect of street and highway planning, and, according to the statements of my colleagues on this panel, in many other aspects of planning as well.

Actually the transportation data already gathered has immediate and major value in both current and long-range community planning activities. In fact, its immediate uses are four-fold, including, in addition to current and long-range planning, application to street and traffic operations and to general research. Such uses are not limited to local communities either, for the inventories serve equally well the interests of county and state highway agencies. Any southeastern Wisconsin communities which are not already making use of such data are frankly missing the boat.

As the panelist with transportation interests, I want to try briefly to answer two questions, namely:

1. What transportation inventories and facts are of greatest immediate local community use, and what are some of the applications?

2. What non-transportation inventories are immediately useful to street and highway officials?

As described by Gene Muhich, Sheldon Sullivan, and Dick Sheridan this morning, the transportation inventories relate principally to the physical characteristics of the highway and transit facilities, to

the volume and pattern characteristics of travel on these facilities, and to the trip-causing characteristics of the people and land uses of the Region. They include such bits of information useful in the day-to-day current planning and operational tasks of community officials as:

From the Traffic Volume and Classification Surveys:
The numbers of cars, trucks and buses daily using numerous local, as well as regional, streets and highways.

From the Street Inventories:
The pavement and right-of-way widths, surface types and condition, traffic controls, etc., of such streets and highways.

From the Street Use Surveys:
The relative function of such roads in serving non-local vs. local traffic.

From the Travel Time and Capacity Studies:
The practical operating speeds of vehicles on these roads and the capacity of the roads to serve the current volumes of traffic using them.

From the Origin-Destination Surveys:
The numbers of trips generated by various land uses in various parts of the Region, as well as the distance range of trips attracted to certain land uses and the amount of travel between any two areas of the community or the Region.

Many other forms of useful information exist in the transportation inventories; but rather than try to enumerate them, let's look at some of the local applications of the above listed items.

In terms of long-range planning, these completed inventories form the basic transportation data requirements of any community planning program, just as they are essential to regional planning. Because of the foresight of the study staff, they are in most cases of sufficient detail so as to obviate the need of costly local inventories, although some supplemental data may be required in certain areas.

Our Highway Commission staff attempts to maintain direct contact with every community comprehensive planning program in the state, and in the past 4-5 years about 100 such local plans have been underway. We pay particular attention to the street and highway portion of these long-range plans and have, as a result, resolved some pretty definite ideas on the kinds of data which are necessary to produce

a workable transportation plan for a local community. What do we automatically look for? We look for a survey of the present street system that indicates the function, location, dimensions, condition, and capacity of at least the more heavily used streets. We look for an indication of the volume of traffic using such streets. We look for an indication of the character of such traffic in terms of its origins and destinations and trip length. We look for a record of the factors which tend to affect the capacity of the street system and the adequacy of parking or storage areas. We look for a record of the factors affecting tripmaking, including the vehicle ownership of the community and the trip generation of different land uses. All of these records are necessary for community planning if realistic plans for future travel service are to be developed. All of these records are available, in one form or another, to any community in the Region as a result of the Regional Planning Commission's inventories. Thus, local communities in this Region can immediately receive a significant return on their investment in regional planning in the area of long-range community planning.

In terms of current planning, the study inventories provide local planning commissions and planning staffs with excellent supporting data for such matters as the evaluation of rezoning requests and for subdivision plat review.

For example, the increased traffic which would result from a proposed land development can be quantitatively estimated by comparison with similar developments covered by the regional O-D survey. And the effect of such additional traffic can be weighed against the function and capacity of the adjacent streets and against the possible community cost of improving them for the extra traffic. A second use of the O-D data would be the determination of the drawing power of a community shopping area. Such an examination might reveal the need to improve accessibility to the area. Affected private interests may use the data in determining whether to initiate or expand provided services.

In terms of local day-to-day street operation, data available from the road inventory, traffic volume, and street capacity studies may be used for:

1. Evaluating the need for, and the planning and design of, intersection channelization and other localized street improvements.

2. Evaluating the need for, and the planning and design of, traffic control devices.

3. Planning of maintenance operations.

4. Speed zoning of arterials.

5. Capacity-volume comparisons and studies.

6. Utilization by the community and by commercial interests in connection with the development of abutting lands.

Turning to the subject of "non-transportation" inventories useful to street and highway officials, I would suggest that the most immediately and universally useful are the aerial photographs, the base maps, and the detailed soil surveys. The Highway Commission is among the agencies and communities which have already used these materials and data to a considerable extent. The aerial photographs provide not only the most current large-area coverage in the Region but having been taken prior to spring foliage also provide the clearest possible record of surface features. We have used them for a variety of purposes, from route location studies to subdivision plat and access control review.

The detailed soils data, described by Marv Beatty, have already served many street and highway planning needs, ranging from selection of highway alignments, which avoid particular poor road-supporting soils to the determination of base and pavement design and thickness requirements for new roads. The soil surveys are also useful in pointing out potential areas for roadway borrow materials and construction aggregates.

No county or community in the Region should be ignoring the usefulness in street or highway development of these photographs, maps, and facts about the soils. They are just as applicable to the improvement of local streets as they are to state highways.

This has been a hurried suggestion of a few of the immediate applications of the regional land use-transportation study inventories to highway and community planning. These are rather obvious applications but, nevertheless, are not yet being utilized often enough by local communities.

Of course the greatest benefit to all the communities of the Region and to the state will result when the study produces a regional plan. The Highway Commission, as Mr. Burmeister indicated this afternoon, has placed its faith in the study to provide the best long-range state highway planning answers for the Region. The local communities of the Region are almost unanimously evidencing a similar faith. In the interim, much valuable data and information is available for use by all. Your community or agency should be taking full advantage of these for local street and highway planning.

HOW SEWRPC DATA HAS BEEN USED BY THE TOWN OF CEDARBURG

by RALPH J. HUIRAS, Chairman
Town of Cedarburg, Ozaukee County

I feel like a fish out of water; I don't know what I am doing up here with all these experts. I am the Chairman of the Town of Cedarburg in Ozaukee County. This Town lies north of the City of Mequon, and we are experiencing urbanization problems. The Town is presently a rural one with some estate development.

The Town of Cedarburg adopted its first zoning ordinance in 1951 and realized in 1963 that comprehensive revisions were necessary. The Town had established a Plan Commission composed of good men, but we realized that we had certain limitations. Various sources of assistance were considered; and after hearing Mr. Bauer present the programs of the SEWRPC at an Ozaukee County Board meeting, we decided to solicit help from the SEWRPC Community Assistance Division. This is in accordance with Town policy whereby we like to take advantage of good things at bargain rates, in this case, at no direct cost to the Town. The first materials that we utilized were SEWRPC aerial photographs, taken in March 1963, at a scale of 1 inch = 400 feet. These photographs were obtained for the entire Town, mounted on masonite panels, and then used to familiarize the Town Plan Commission with the location and extent of existing land uses.

The SEWRPC base maps, originally compiled at 1 inch = 2,000 feet, were enlarged to a scale of 1 inch = 1,000 feet and were used as a base for a composite soils map and also for the preparation of a detailed zoning map.

The detailed operational soil survey maps prepared for the SEWRPC by the U. S. Soil Conservation Service were collected and combined into a composite soils map for the entire Town of Cedarburg. Suitability ratings for certain uses were selected and placed upon this map by the Community Assistance Division with the assistance of the Ozaukee County Work Unit Conservationist. Soils with very severe limitations for soil absorption sewage disposal facilities and soils subject to flooding were differentiated on this map. These maps were then used for land use analysis by the Town Plan Commission.

The model zoning and land division ordinances prepared by SEWRPC were utilized and adapted to the Town of Cedarburg's needs. The

Town of Cedarburg usually knows how to take advantage of a good thing, and we generally do quite well. In this case, we wound up with assistance from the Southeastern Wisconsin Regional Planning Commission.

USE OF SEWRPC INFORMATION AND MATERIALS IN THE KENOSHA PLANNING DISTRICT

by PAUL G. JAEGER
County Agricultural Agent
Kenosha County

A comprehensive planning program covering that portion of Kenosha County east of Interstate Highway I-94 is now underway. It was begun on June 1, 1964, and is scheduled for completion by June 1, 1966. It is a unique program in that a city--Kenosha--and two adjoining towns--Somers and Pleasant Prairie--which are rapidly urbanizing, have joined together in a comprehensive planning program. The Kenosha Planning District consists of an area of approximately 85 square miles lying between I-94 and Lake Michigan. The $92,000 program is sponsored and partially financed by the three units of government and receives two-thirds of its financing from the Housing and Home Finance Agency under the "701" federal planning program.

The planning work is being performed by a consultant, Candeub, Fleissig and Associates of Chicago, Illinois, under contract to the SEWRPC. In approving the "701" grant, the Housing and Home Finance Agency specifically required that a multi-community planning program being financed with federal funds should be carried out under the supervision of the Regional Planning Commission to ensure use of the data previously collected by the Commission and to ensure incorporation of the regional plans now in preparation. This is being done in the following ways:

Preparation of Base Maps

The SEWRPC base maps, at a scale of 1 inch = 2,000 feet, were used. These required relatively minor updating by the consultant when the planning program was begun.

Aerial Photographs

The SEWRPC aerial photographs, at a scale of 1 inch = 400 feet, have been used for general orientation and are being used in delineating the property and street boundary lines. This information is being used in the preparation of the detailed land use inventory. Each parcel is being assigned coordinates for electronic data processing.

Resources Inventory

All resource maps and reports, including park, forest, and wildlife inventories, which had been prepared by or collected by the SEWRPC, were utilized in the preparation of the District's natural resources report.

Soil survey information and soil suitability ratings prepared by the U. S. Soil Conservation Service for the SEWRPC, as well as ground and surface water information, will become a very basic part of the natural resources report. The Preliminary Natural Resources Report has been published, and the soils information will be published as a supplement by mid-year.

Population and Economic Reports

The population report and the economic report previously published by SEWRPC were used in the preparation of the recently published Preliminary District Population Report and the soon to be published Preliminary District Economic Report. The members of the plan commission, town boards, and city council will review these two reports in a joint meeting late this month.

Existing Land Use Inventory

Data prepared earlier by and for SEWRPC on existing land uses were made available to the Kenosha Planning District for transfer to inventory work sheets for updating plans.

The information gathered for the regional planning transportation study and preliminary regional land use and transportation plans, now being prepared by SEWRPC, will be made available to the consultant for incorporation into the Kenosha Planning District's plans.

Ordinances

Full use is to be made of both the model zoning ordinance and the model subdivision ordinance, which have been prepared by SEWRPC, as general guides for the preparation of these implementation devices for the Kenosha Planning District.

The SEWRPC has provided the Kenosha Planning District with large quantities of invaluable data, thus enabling the consultant to bring together a collection of more precise and detailed data for the development of the comprehensive Kenosha Planning District plan.

The quality and value of the final plans will certainly be greatly enhanced by the availability of the data previously prepared and collected by the SEWRPC.

PROPOSED DATA BANK FOR SOUTHEASTERN WISCONSIN

by HAROLD A. McMILLER
Executive Director
Waukesha County Park and Planning Commission

For many years there has been a feeling among some of us in southeastern Wisconsin that a great need existed for a central agency to function as a research and data gathering unit and as a coordinating agency to help solve conflicting development policies between communities and counties. Such an agency is needed to provide guidance for the development of the Region in the form of a regional development plan within which the individual governmental agencies, communities, and counties can define their local land use policies, transportation systems, park and recreation areas, education facilities and related governmental services in a coordinated and intelligent manner. The responsibility for these functions presently rests with the Southeastern Wisconsin Regional Planning Commission, and it is our belief that this is where it should be.

It is evident from the presentations this morning, the remarks of the other panel members, and the numerous reports that have been published that a great amount of information about the Region has been assembled by the staff of the Regional Planning Commission. While the primary purpose of assembling this information was for the purpose of preparing a regional land use and transportation plan, there are numerous by-products which can and should result from this vast and timely study.

One of the more important by-products, we feel, is the so called "data bank," which is coming into prominent use throughout the United States and in many foreign countries. The data bank is very simply the assembly and recording of various kinds of information in such a form that it can be processed through high-speed computers and retrieved in a useable form by the participating units of government or copies of charts, graphs, maps, and other desired information can readily be reproduced and made available to agencies needing this kind of information.

We have been advised by staff members of the Regional Planning Commission that much of the land use and transportation data is in sufficient form that it can be made available to the participating units of government in a relatively short period of time. Other kinds of information on file in the regional office can be made adaptable to high-speed computer processing if the participating units are willing to spend the money to have the data processed in useable form for computer

operation. Data not readily adaptable to computer operation has been recorded in map or graph form and is readily reproducible upon request.

To realize the importance of this kind of information and its availability, one has to look back only a few short years to the time when it was virtually impossible to exchange information between some units of government in the Region either because the information did not exist, was not in reproducible form, or the collection and assembly of the information would have required many months of work and a negative response was the easier course of action. Today through the efforts of the Regional Planning Commission, many kinds of information can be exchanged, compared, or manipulated to the satisfaction of the user. It is to be hoped that an economical system can be developed by the regional staff to keep the available data current in order that this service will continue to be useful and be expanded to include many other kinds of data which would be valuable to the various agencies within the Region.

Some idea of the importance attached to the data bank concept can be discerned from a brief examination of what has happened in Alexandria, Virginia, and the Metropolitan Data Center System established as a joint venture by the cities of Denver, Fort Worth, Little Rock, Tulsa, and Wichita. For purpose of illustration, let us briefly examine the report on the Alexandria, Virginia, system since it can readily be translated to a regional application of data needs and their usefulness to communities and governmental units in our rapidly urbanizing southeastern Wisconsin.

About one year ago, the City of Alexandria, Virginia, decided to use a central computer system to help reduce duplication in the collection, storage, and processing of data and to increase the accessibility and usefulness of the information contained in the many files of city departments. This system is presently in operation under the title of "Urban Management Data System" or "Data Bank," as it is commonly known. This system is designed to serve all major departments and agencies of the city, and accurate detailed information of wide variety will be readily available in almost any combination and format desired.

For example, their report states that their Parcel File when completed will contain 60 items of information for each of the 20,000 or so parcels of land in Alexandria. In addition to information about the location, size, zoning, use, value, ownership, and improvements, these items include such information as number of school children, number of off-street parking stalls, off-street loading, and number of dwelling units.

Every parcel containing one or more buildings has a separate sub-record for each building. Twenty-one items of information about each building are contained in the sub-record, including structure condition, number

of floors, gross floor area, and year built. Where a building contains one or more business or institutional establishments, ten items of information about the location, type, and size of the establishment are provided in an additional sub-record.

The Street Section File of the Alexandria system contains 120 items of information keyed to each of the approximately 3,500 individual street sections and intersections in the city. Eight of the items relate to classification, such as Planning District, Census Tract, and Neighborhood. Forty-eight of the items contain such Public Works and Traffic Department information as right-of-way, traffic lanes, capacity, parking meters, mass transit, sidewalks, sewer facilities, and date of last resurfacing. Twelve of the items provide information about street lights, fire alarm boxes, and fire hydrants.

The remaining 52 items, collected continuously and entered periodically, contain information about current activities of the Police, Fire, Health, and Welfare Departments. Among the items included are birth count, arrests, police and fire calls, auto registrations, and each category of welfare assistance.

Needless to say, this kind of information readily available is invaluable, not only to the planning agency itself, but to all departments of government involved in the decision-making process. It is also apparent that data of the kind being recorded for the City of Alexandria, Virginia, is a great step beyond what we can presently envision for a Central Data Bank serving the Southeastern Wisconsin Region. However, the steps taken thus far by the Southeastern Wisconsin Regional Planning Commission in assembling data for the Region that can be retrieved and used by all units of government in solving their problems are major steps that someday may result in a complete data bank for the Southeastern Region of Wisconsin.

HOW THE COMMUNITY ASSISTANCE DIVISION HAS UTILIZED THE DATA AND MATERIALS PREVIOUSLY COLLECTED BY THE SEWRPC

by WILLIAM J. KOCKELMAN, Chief
Community Assistance Division, SEWRPC

The Southeastern Wisconsin Regional Planning Commission provides, as part of its overall planning program, general planning assistance to local communities upon request. This assistance takes many forms, such as:

1. Attendance at, and participation in, regular and special local plan commission meetings.

2. Specific studies made in response to requests for special assistance.

3. Provision of planning and engineering data from the Commission's files, along with assistance and illustrations as to its use.

4. The preparation and distribution of local planning guides on land development, official mapping, zoning, and the creation and organization of planning agencies.

These services have been provided to city, village, town, and county officials within the Southeastern Wisconsin Region, as well as to school boards, private developers, municipal engineers, planning consultants, and various state agencies.

A good example of this type of service is the request we received recently from the director of an elementary school board in western Waukesha County. This example may be related to any number of similar planning problems, such as the size and location of proposed libraries, churches, shopping centers, and industries. His school board was preparing to construct new school facilities and desired to know the future pupil loads so as to guide their architect. The architect needed to know not only the projected pupil load for the district but the ultimate pupil load as well. In preparing the pupil projections, we proceeded in the following manner:

1. Base Maps
We placed the elementary school boundaries upon the base maps previously prepared by the Commission (see Figure).

2. Residential Structure Count

We then computed the number of dwellings for the district which had been previously compiled by quarter-section as a portion of the land use inventory. The district contained 138 residential structures, which housed 470 people.

3. Population Projections

The SEWRPC has computed preliminary population projections for each county by five-year increments to 1990. Waukesha County's preliminary population projections are as follows:

1960	158,300
1965	182,000
1970	228,000
1975	271,000
1980	322,000

Assuming that the school district would grow at the same rate as projected for Waukesha County, we computed the district's population to be:

1960	470
1965	570
1970	680
1975	800
1980	940

Census Tract No. WC-0029, of which this school district is a part, had 17 percent of its population in the elementary school-age group. Assuming that the district has the same percentage as the census tract and will remain the same as the county and the district's population grows, we made the following elementary school-age ratioed projection:

1960	80
1965	100
1970	116
1975	136
1980	160

Assuming 25 pupils per classroom, four, five, six, and seven classrooms would be required, respectively, over the next 20 years.

Since it is extremely difficult to foresee exactly what the future population will be for any one area because of innumerable variables, such as changes in birth and death rates, changes in the immigration

and emigration, the availability of public facilities, and the accessibility to new freeway routes, we prepared an estimate of the number of elementary school-age children that the district might hold if completely developed. We did this in the following way:

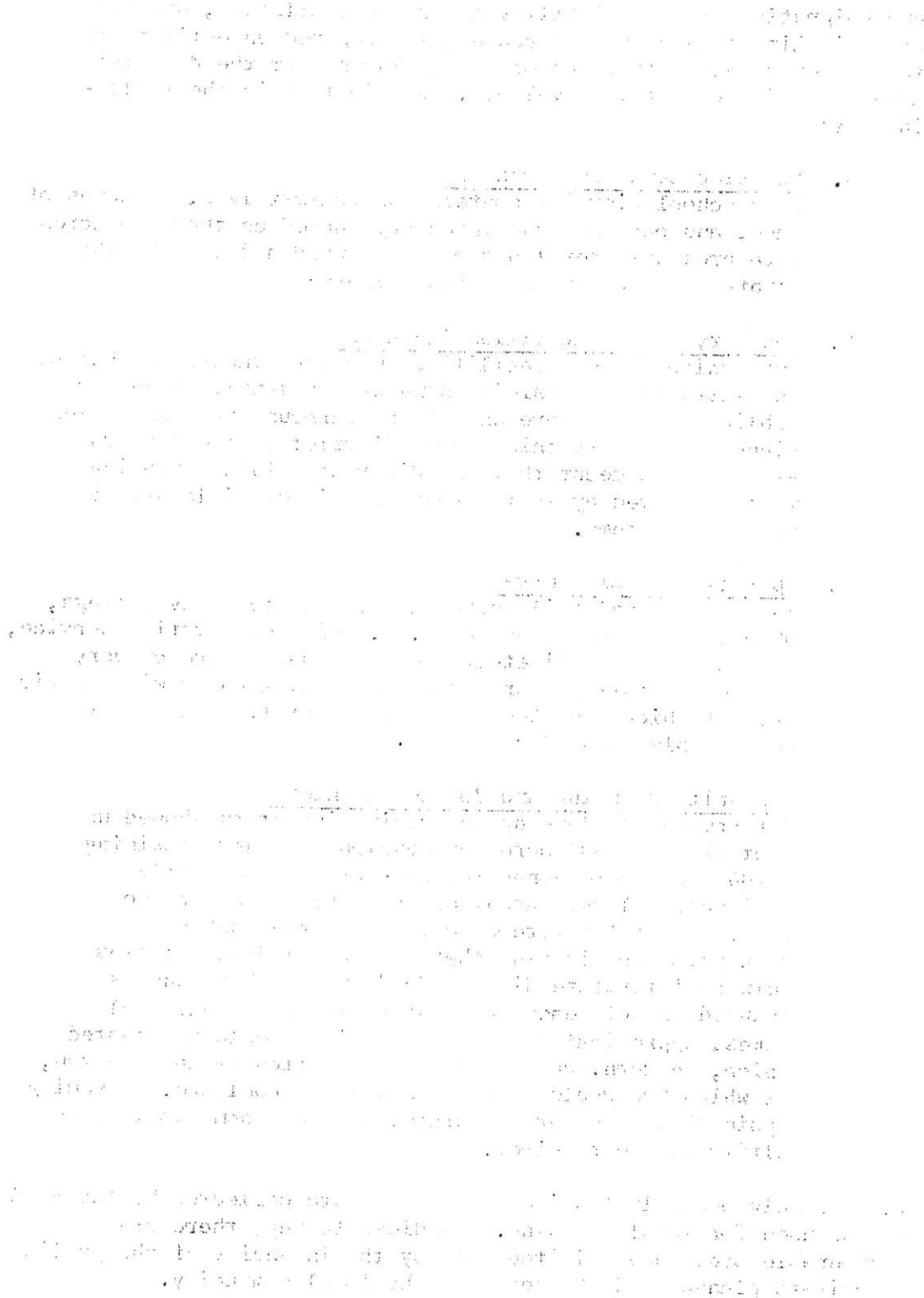
4. Existing Land Use Inventory
   This school district contains approximately 2,250 acres of land, and our land use inventory showed us that 270 acres were presently developed or were owned and used by the county for park purposes (see Figure).

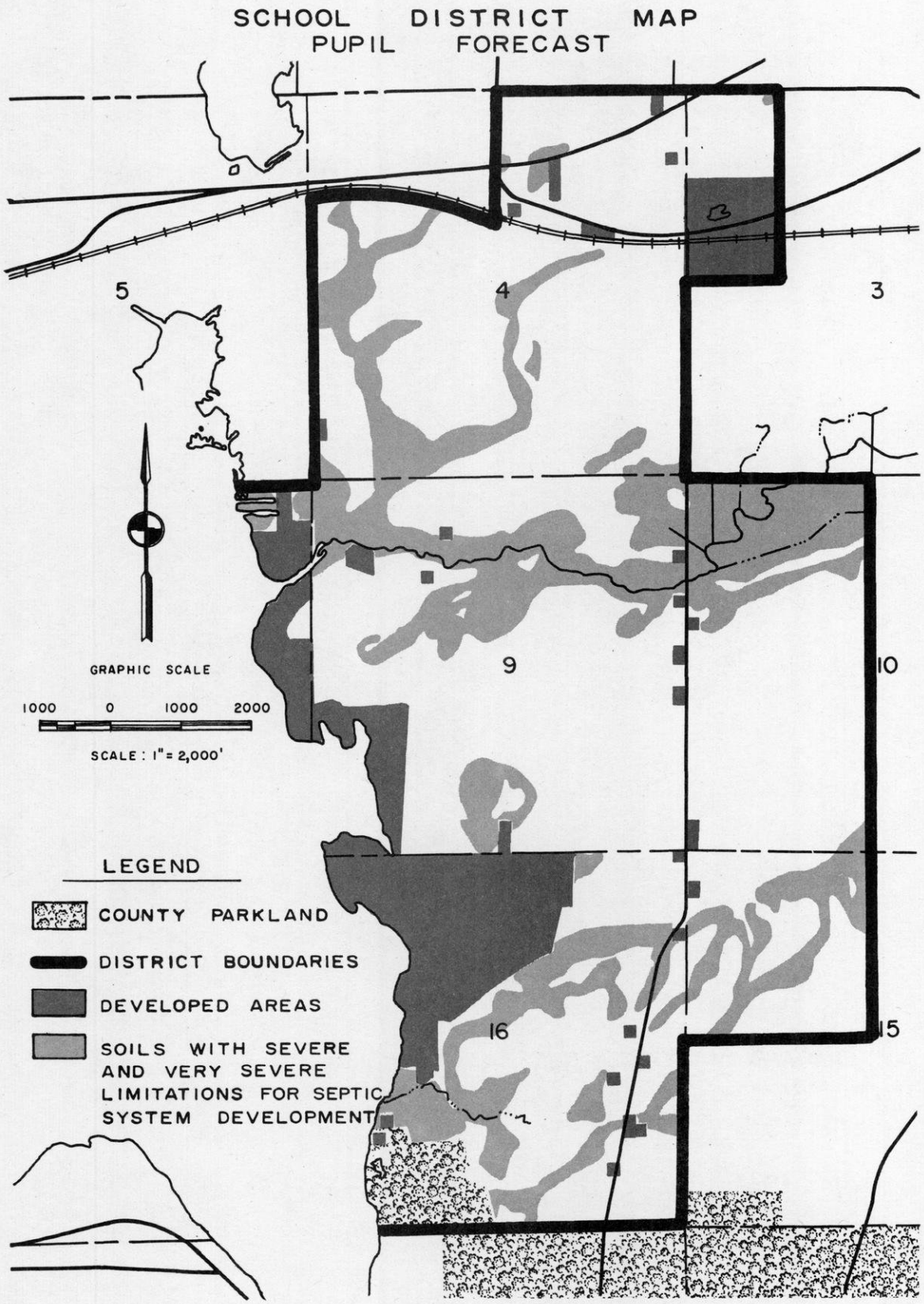
5. Sanitary Sewer Facilities Inventory
   Our sanitary sewer facilities inventory showed us that of the 1,980 acres remaining none was presently served by public sewer nor were any of the surrounding communities planning to serve this school district in the next 25 years. This meant that the district's future housing must be served by septic tank and filter field sewage facility systems.

6. Operational Soil Survey
   The operational soil survey and its suitability ratings, prepared for SEWRPC by the U. S. Soil Conservation Service, showed that approximately 580 acres had severe or very severe limitations for residential development with septic systems which resulted in a balance of 1,400 acres of developable land (see Figure).

7. Community Planning and Zoning Inventory
   Our community planning and zoning inventory showed us that of the 1,400 acres of developable land remaining 1,200 acres were zoned for one-acre single family residential lots. Assuming that this land were so developed in the future, which is a reasonable assumption considering that the school district lies between Interstate Highway "94" and USH "16" and is bounded on both east and west by large recreational lakes, approximately 1,000 home sites would be created which, in turn, would house a population of about 3,400, of which 580 would be of elementary school age. Assuming again 25 pupils per classroom, 25 classrooms would then ultimately be required.

This is only one illustration of how the data collected by the SEWRPC can be used for local planning. Needless to say, there are innumerable other uses limited only by the ingenuity of the public or private planner and the needs of the local community.




SCHOOL DISTRICT MAP
PUPIL FORECAST
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4
3
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16
15
GRAPHIC SCALE
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SCALE : 1" = 2,000'
LEGEND
COUNTY PARKLAND
DISTRICT BOUNDARIES
DEVELOPED AREAS
SOILS WITH SEVERE AND VERY SEVERE LIMITATIONS FOR SEPTIC SYSTEM DEVELOPMENT

WORKSHOP C

"How The Completed Inventories

Can Be Used For Watershed Planning"

INTRODUCTION

by RICHARD W. CUTLER, Secretary
Southeastern Wisconsin Regional Planning Commission

The workshop participants this afternoon will discuss the need for solutions to watershed problems, the watershed planning process, and integration of local and watershed plans.

The Root River watershed planning program is underway, and alternate plans will be completed and tested this year. A final plan will be selected in 1966. The Fox River watershed planning program is in the financing stage, and a committee for the Milwaukee River watershed program is being selected.

The plans and implementation programs that will be prepared as a result of these watershed planning program efforts will be invaluable to those communities within the watersheds.

BACKGROUND

by WILLIAM H. BEYER, Mayor
City of Racine

I was the Chairman of the Racine County Board at the time this seven-county area created the Southeastern Wisconsin Regional Planning Commission. Governor Nelson was the Governor of Wisconsin then, and we envisioned large-scale planning assistance to all the municipalities in the Region so that orderly development would take place. At that time we had not envisioned a separate planning study of the Root River and its flood plain. However, the need for, and the importance of, such a study became apparent; and the valuable work being performed by the Southeastern Wisconsin Regional Planning Commission and its transportation study convinced us that a river study conducted by the Commission would be of invaluable assistance to us in resolving particular problems of the Root River.

The first problem that became apparent was the polluted state of the river waters as they flowed through the City of Racine. Many field trips were taken; the location of open drain tiles, draining agricultural and residential lands, were checked; and the effluent from these tiles was analyzed to determine the type of pollutants.

In addition, we were much concerned about the flooding of this particular river in the springtime when the runoff and the ice jams caused water back-ups and flooding of residential properties.

The watershed study now underway is approximately 50 percent complete. We now have maps showing the area which was actually flooded in 1960 and the information which designated the actual drainage basin of the river and the proper flood plain of this river.

We further recognized that the continuing urbanization of the entire basin served by the Root River would cause more and more problems as agricultural land was developed with buildings, paved streets, and paved playgrounds.

We can envision the time when any severe thunderstorm will cause rapid fluctuations in the height of the river waters. This is of particular concern to the City of Racine, since our city receives the total amount of the runoff before it enters Lake Michigan. We hope that several things may be accomplished by a planned program for the development of the Root River watershed.

Number one is that suitable holding basins may be created, so that the water flow may be regulated in some orderly manner. We also envision the time when the Root River again may carry clean unpolluted water and the holding basins may be used for recreational areas for the citizens of our communities.

We also envision the time when all of the flood plain land will be properly zoned as such, and no one may be permitted to build or develop commercial developments in the flood plain area.

I wish to speak particularly of a land use plan for the whole area. Without a comprehensive land use plan that can actually be carried out by the municipalities involved, there will be continued pressure to develop or correct a particular local problem which may or may not have any overall effect upon the entire development plan.

I refer to the particular problem of Horlick's Dam at the edge of the City of Racine. This dam, owned by private individuals, is in a very sad state of repair. The owners have petitioned for abandonment to the Public Service Commission; and residents of the communities of Racine, Mount Pleasant, and Caledonia have pressured for the repair of this dam, feeling that it would control the river as it runs through the Town of Caledonia and the City of Racine. It is very difficult to convince them that this is not a logical solution to the overall problem, and no convincing argument will ever prevail until they become aware that their problem is only a part of the overall problem.

The City of Racine, in another instance, owns Johnson Park through which the Root River flows. We have recently obtained an additional 25 acres along the Root River north of Johnson Park. This land is presently separated by a small parcel of farm land which the City of Racine is attempting to purchase. The local real estate developer continues to refuse to sell this flood plain land to the city, which we could use, maintaining that it is a proper residential site. Nothing could be farther from the truth, but this type of situation will continually arise until the overall flood plain zoning is actually done by the various municipalities. At the same time, when all of this land is zoned as flood plain land and the building upon it is restricted, it should be properly assessed as such and the uses of these areas should not be permitted to be tampered with. Without this type of zoning, no community can plan for orderly growth.

I am very anxiously awaiting the completed program for this river; and I also feel that there may be a tendency to disregard the advisory plans that will be prepared, unless there is an intention among all of us who govern the municipalities within this area to actually carry it out to completion.

In this respect, I feel that there must also be developed an economic feasibility plan. I have seen many plans prepared by many consultants covering many subjects of proposed developments; but they are in many ways only the beginning and cannot be implemented unless they can be staged with the economic feasibility plan showing all of us how this plan can actually be accomplished, at what price, and at what time.

I feel that these plans and programs can be prepared by the Southeastern Wisconsin Regional Planning Commission and will be invaluable to the communities of this area, and it is my sincere hope that all of this time and effort will not have been wasted but will be only the beginning point of the actual development of these plans to the betterment of all of the communities.

NEED FOR WATERSHED PLANNING

by JOHN MARGIS, JR., Chairman
Town of Caledonia, Racine County

Having lived on the Root River for all of my life, I can recall that as a boy I swam in the river and caught many fine fish at any time of the year. Later in my life, I can remember when the swimming wasn't so good but fishing still held up for a number of years until the river became more polluted and silted up to the extent that all the recreational values of the river were gone.

We, as local officials and citizens, have come to realize over the years that the problems of the Root River cross over local boundaries and that we cannot solve the problems, for example, of the Town of Caledonia within only the Town of Caledonia. During the summers we are getting runoff in larger proportions from Milwaukee County than we ever got before; and we are receiving pollutants both from the canal area and from Milwaukee County, which never became apparent until the last decade.

This is one of the reasons why we have entered eagerly into the regional planning program for a comprehensive study of the Root River watershed. We look to the regional planning efforts to provide us with a practical means of solving problems which we cannot solve alone at the local government level.

A few years ago we went to the State Legislature, and it took two sessions for us to establish a utility district for the Town of Caledonia. This enabled us to bond to the extent to finance a conversion of sewer connections from old farm drains to a trunk sewer connecting to the City of Racine's sewage treatment plant.

This means very simply that sewage which formerly overloaded inadequate field tiles and seeped out into the river now gets treated in Racine and doesn't contribute to the pollution in the river. Not all of the Township of Caledonia is being sewered in this manner; but a significant part of it is, especially in the Franksville area.

Being a long-time resident public servant in the Town of Caledonia and also a dairyman-farmer of many years, I have developed a great interest and a great appreciation of the Root River watershed and have investigated the history of the watershed. The first explorer to look at our river was Father Marquette seeking a passageway to the Mississippi River. He reported the Root River as a clear,

beautiful river set in a lovely landscape. Of course, we can't go back to the days of the Redman; but, hopefully, we can through united action correct the increasing problems of the watershed and recapture many of the natural features which we have admired about the river.

METROPOLITAN PROBLEMS REQUIRE A COMPREHENSIVE APPROACH

by RAY D. LEARY
General Manager
Metropolitan Sewerage Commission

In order to intelligently approach any watershed planning program, it is necessary to review all of the complex problems that have been created and accepted over the past years, analyze the present and future needs of the people living in the drainage basin, and to adopt a plan of action that will enhance the welfare of the people. A watershed study must be made on its merits to benefit all the people and should not be subject to political or minority group pressures or special consideration to areas separated by man-made boundary lines.

Therefore, the need for comprehensive watershed planning in the seven-county Region is long past due and should be undertaken immediately, as there are many serious interrelated problems that exist in many of these areas. Solutions to the most pressing problems facing some of the communities in area watersheds are as follows:

1. Stream pollution, water quality and quantity.

2. Drainage and flood control, both urban and rural.

3. Land use development in relation to the stream and its floodways and flood plains.

4. Recreation and public open-space reservation.

The water pollution problem is a subject that will continue to be controversial; however, with the emphasis on pollution by the United States Public Health Service, there is evidence that the public is finally aroused to a point where solutions are demanded.

None of us can stay entirely on the sidelines during these times which challenge us to find solutions, and we must resist the temptation to insulate ourselves from the less agreeable aspects of total responsibility. We must be responsive to the need for appraisals of the future, adjustments in area concepts, the influencing of public policy, and the need for bold stands on political issues affecting the field of pollution abatement and watershed planning.

The two facets of watershed planning that are the direct responsibility of the Metropolitan Sewerage District are pollution abatement and flood control. The inventory items that are useful and necessary for proper pollution abatement and flood control are:

1. Land use inventory.

    a. Sewer and plant design.
    b. Run-off data.

2. Soil inventory.

    a. Suitability for septic systems.
    b. Rate of infiltration.
    c. Rate of run-off.

3. Stream quality inventory.

    a. Measurement of pollution.
    b. Receiving streams for sewage treatment plant effluent.

4. Stream flow inventory.

    a. Low flow.
    b. High flow.
    c. Flood flow.

5. Channel characteristic inventory.

    a. Hydraulic capacity.
    b. Types of improvements indicated.

6. Existing structures inventory.

    a. Bridges.
    b. Culverts.
    c. Dams.

POLLUTION ABATEMENT

The early history of the City of Milwaukee's sewage disposal problem dates back to the time a decision was made to install the combined sewer system, which was designed to carry both sanitary sewage and storm water; and prior to 1911, the city had completed the installation of about 420 miles of such combined sewers, draining approximately 57 districts. These sewers discharged directly into the navigable parts of the three rivers, and the continuous diverting of the polluted wastes caused offensive conditions in the rivers as the population increased.

It is to be noted that the City of Milwaukee sought the best sanitary engineering advice before undertaking the construction of a combined sewer system. It was the engineering practice at that time, especially in larger cities where the removal of storm water was a major problem,

to utilize the combined system as it was more economical, particularly in that dilution could be obtained by discharging into the three rivers.

An evaluation of the Milwaukee sewage problem was made in 1911 by the outstanding sanitary engineers, who stated: "Milwaukee, we think, wisely adopted the combined system for its district sewers and there is in our opinion, no change to be made in the present system in any way save to extend it as required and add an intercepting system of sewers."

The Common Council of the City of Milwaukee considered the 1911 engineering report and recommendations of its three-member Sewerage Commission and finally decided that the matter of sewage collection and disposal and the protection of the public water supply was a matter of public health, welfare, and safety; and in that so vital a health problem should not become involved in local politics, it was recommended that the State Legislature create a Sewerage Commission for any city of the first class (500,000 population or over) to provide the necessary sewage disposal works for such cities.

Therefore, Chapter 608 of the Laws of Wisconsin for 1913 was created, which provided for the establishment of a Sewerage Commission of the City of Milwaukee, charged with the duty of projecting, planning, constructing, and establishing a sewerage system for the collection, transmission, and disposal of the house and other sewage and drainage of any such city, including either, as a combined or separate feature of said system, the collection, transmission, and disposal of storm and ground water, respectively, and clothed with every and all powers which may be necessary for or proper for these purposes, or either of them.

It is interesting to note that up to 1921 the City Sewerage Commission had constructed approximately 30 miles of intercepting sewers and 85 regulating devices for controlling the flow in the combined sewers of the City of Milwaukee into the Commission's collection system.

Some of the complex sanitary problems and pollution that exist in the Metropolitan Sewerage District today may be traced back to the period between 1913 and 1921 when a decision was made to construct the intercepting sewers large enough only to serve the City of Milwaukee on a projected expanded basis; no consideration was given to collecting and treating sewage outside the city area that was in the same drainage basin as the Milwaukee, Menomonee, and Kinnickinnic Rivers. On February 14, 1921, the State Board of Health, at the request of the Sewerage Commission, held a public hearing on the pollution problems in the entire drainage area of the three rivers.

Shortly thereafter, it was recommended that the sanitary drainage area of the City of Milwaukee be expanded to include the outside territory within Milwaukee County that was in the same drainage basin as the City of Milwaukee.

Therefore, the Wisconsin Legislature adopted Chapter 554 of the Laws of Wisconsin, 1921, which created the Milwaukee County Metropolitan Sewerage Commission, and empowered this commission, in its discretion, to project, plan, construct, and maintain in such county outside the city limits of the City of Milwaukee, but within the same drainage area, main sewers, pumping and temporary disposal works, and other plants for the collection and transmission of house, industrial, and other wastes into the sanitary sewerage system of the City Sewerage Commission.

It is to be noted that, from about the time the Metropolitan Sewerage District was created, no more combined sewers were approved for construction by the Commission and that the separate sanitary and storm sewer program was adopted by each municipality in the sewerage district.

In 1955 the State Board of Health and Water Pollution Committee completed a three-year study of the Milwaukee Metropolitan pollution problem and issued orders, conclusions of law, and findings of fact that generally directed the district to take such means as were necessary to abate pollution in the district and to give consideration to the construction of a second sewage disposal plant, as well as expanding the district limits to include all of Milwaukee County.

In 1956 the Joint Sewerage Commission engaged a consulting firm to study the district's sanitary problems and in 1959 submitted a final report with recommendations on the design of a South Shore Waste Water Treatment Plant and extensions to the main intercepting sewer system, as well as a relief system which would provide sanitary facilities for the entire Milwaukee Metropolitan drainage basin to the year 2000, at an estimated cost of $75 million.

The new and relief sewer systems are approximately 35% complete and the major remaining portion is programmed for completion in 1975. The South Shore Waste Water Treatment is scheduled for initial operation in the latter part of 1966.

FLOOD CONTROL

In 1943 the Sewerage Commission, recognizing the effect of rapid urbanization on storm water runoff and recognizing the effect of inadequate drainage in sanitary sewer and sewage disposal operation, directed its staff to study possible watercourse improvements and flood control projects for all of the major streams in what was then the district, except the Milwaukee and Menomonee Rivers, which were wholly or partly under the jurisdiction of the United States Corps of Engineers.

In 1944 a master plan for flood control was prepared and made available for use in possible improvement programs. At that time the Sewerage Commission had no authority to deepen, widen, or improve watercourses but were an advisory agency only, similar to the role of the Southeastern Wisconsin Regional Planning Commission.

In 1951, after very little construction was undertaken by the several municipalities, Chapter 59.96 was amended to authorize the commissions to deepen, widen, improve, relocate, and to enclose watercourses.

Since embarking on this program, the commissions have improved 15 miles of watercourses at a cost of approximately $7 million. It is estimated that projects presently planned will cost an estimated $45 million.

Some of the factors affecting watershed planning are:

1. Land use.

   a. Runoff from urbanized areas.
   b. Flood plain zoning.

2. Hydrology.

   (Hydrology is sometimes defined as a treatment of the laws of the occurrence and distribution of water over the earth's surface and within geological strata and of its sanitary, agricultural, and commercial relations.)

   a. Regional rainfall.
   b. Watershed Characteristics.
      (size, slope, soil types, degree of urbanization, etc.)
   c. Channel Characteristics.
      (size, slope, flood plain conditions, etc.)

METHODS OF FLOOD CONTROL

1. Hydraulic improvement to the channel.

2. Proper land use and zoning.

There are five main categories that must be considered for a watercourse improvement program:

1. Planning.

   As in all engineering projects, preliminary planning and studies are a critical element in the design of flood control projects. These studies are important because ultimate stream

development is directly dependent upon the extent of preliminary studies and upon the extent of the implementation of these studies.

2. Hydrology.

Hydrology is also the science relating to the disposition of all precipitation falling on land. Two phases of the Hydrologic Water Cycle are of prime concern in a flood control project: Normal rainfall and runoff.

3. Hydraulics.

The basic hydraulic data and criteria used are the same as specified in the Rules of the Sewerage Commissions for the design of storm sewers, with some additions, as follows:

1. Kutter's Formula (Results checked against Manning's.)

2. Frictional Coefficient.

   0.025 for improved earth channels.
   0.013 for concrete lined channels.

3. Maximum Velocities (6 f.p.s. for earth channels and concrete lined channels determined by backwater gradient, velocity, head loss, etc.)

4. Channel Side Slopes (4:1 for earth channels and 2:1 for concrete lined).

5. Freeboard (3 ft. minimum).

6. Minimum Radius Curve of 500 feet.

4. Structures.

Structural design in flood control projects covers all the ordinary phases common in engineering projects such as reinforced concrete, structural steel, steel sheeting, and both rigid and flexible conduits.

5. Economics.

The commissions, in designing watercourse improvement projects, attempt to balance costs, flood control, and aesthetics, and to provide protection for the least cost with the least disturbance to the people.

In closing, I wish to state what I have been saying is we attempt to get a drop of water to walk rather than run.

BASIC DATA REQUIREMENTS

by ED. A. IMHOFF, Chief
Natural Resources Division, SEWRPC

THE WATERSHED PLANNING PROCESS

The process of comprehensive watershed planning is now being applied in various stages to the solution and avoidance of problems in three important watersheds: the Milwaukee River Watershed, the Fox River Watershed, and the Root River Watershed. The combined area of these watersheds within the Southeastern Wisconsin Region comprises 1,570 square miles, or about 60 percent of the total seven-county area.

The watershed planning process begins with citizen concern over problems directly relatable to the surface water drainage courses and water bodies. In a real sense, in southeastern Wisconsin the gripes to City Hall over flooded basements, stinking water, and dead fish energize watershed planning. Especially is this true if the local officials receiving complaints come to realize that the problems presented to them transcend local political boundaries and are too big for any one municipality to tackle alone. Once undesirable conditions motivate enough people to action, experience has shown that it is only a matter of time until formal action is taken by the local governmental unit or units to petition the SEWRPC for relief through the design and execution of a study to recommend workable solutions to the problems cited. The Planning Commission's first response to a local request is to appoint a watershed committee, consisting of persons who can make a contribution to: (1) the identification of the principal problems of the watershed, (2) the possible organization for a planning program, and (3) the most feasible method of financing. Committee appointees represent a broad cross-section of the local and regional scene, including businessmen, scientists, governmental leaders, and various professional fields. Because watershed planning is largely oriented to problem solving, committee membership has been purposefully strengthened with professional problem solvers--engineers, soil scientists, county agents, conservationists, and professional administrators. This is the first "savings" in the watershed planning process; thanks to those who serve on these committees, a vast contribution of cumulative experience and diverse skills is obtained at no cost to the project.

A possible Milwaukee River watershed planning program is now at the committee selection stage of development. Thus, in an organ-

izational sense, the Milwaukee River watershed is the most embryonic of the three watershed planning programs of the southeastern Region.

Once organized, the watershed committee works very closely with the Commission staff in designing the program which it feels will get the job done inexpensively, quickly, but thoroughly. This study design is presented in a form called a prospectus. Last Fall a prospectus was completed, setting forth the study design of the Fox River watershed planning program.

The proposed Fox River watershed planning program is now in the funding stage. Recently the Planning Commission applied to the Federal Housing and Home Finance Agency for two-thirds of the estimated project costs of the proposed planning program.

The Root River watershed planning program has advanced successfully through each of the necessary steps just described and has become a "live" project now 50 percent complete. The necessary data pertaining to such items as soils, streamflow, waterway openings, and flood damages--to mention a few items--have been collected and analyzed; and the planning operations phase is now underway.

Simply expressed, planning operations consist of three steps: (1) determining what the physical facts foretell for the probable future users of the watershed's resources--both the foreseeable problems and the opportunities, (2) offering to local governmental units various reasonable alternative plans for their study and comment, and (3) acting upon the recommendations of local government in designing a final plan.

THE BASIC DATA PROBLEM

A hindrance to any eventual success, a tendency to failure, can creep into a planning process at any stage. Certainly a poorly designed planning program[1] has little chance for eventual success, and even a good plan can be voided by lack of implementation. But flaws which will eventually lead to the "bust" of a plan are usually due to the insufficiency or inadequacy of basic

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[1] Often the study design stage is neglected by planners, usually to their eventual embarrassment. As an example of the emphasis placed by SEWRPC upon study design, consider that the Root River Watershed Committee members contributed some 800 man-hours of labor, in committee action alone, to the development of a prospectus!

information. For example, a flood plain land use plan to be implemented by zoning would have little chance of success if it were presented upon maps of such inadequacy that no practical means existed for relating accurately in the field the probable height of floodwaters to private properties in the flood plain. Yet, the designers of many planning programs risk eventual failure because the gap of missing data is so wide that it cannot be spanned with the funds reasonably available.

Fortunately, in southeastern Wisconsin the "climate" of basic data is favorable for detailed comprehensive planning. This is so for two reasons: (1) the willing cooperation of public and private sources in supplying valuable information,[2] and (2) the availability of much valuable information from other planning studies mounted by SEWRPC--especially the land use-transportation study.

In preparing estimates of the costs of the Root River and Fox River watershed planning programs, the staff calculated that $68,000 and $248,000, respectively, were "saved" by the availability, largely from the land use-transportation inventories, of the following kinds of information: base maps, aerial photographs, streamflow and water quality inventories, standard soil surveys, land use inventory, economic and population inventories, public utility inventories, and inventory data on parks and recreation.

Experience to date has validated the estimate of the financial value of the land use study to the Root River project.

THE RE-USE OF LAND USE INVENTORIES IN THE ROOT RIVER WATERSHED PLANNING PROGRAM

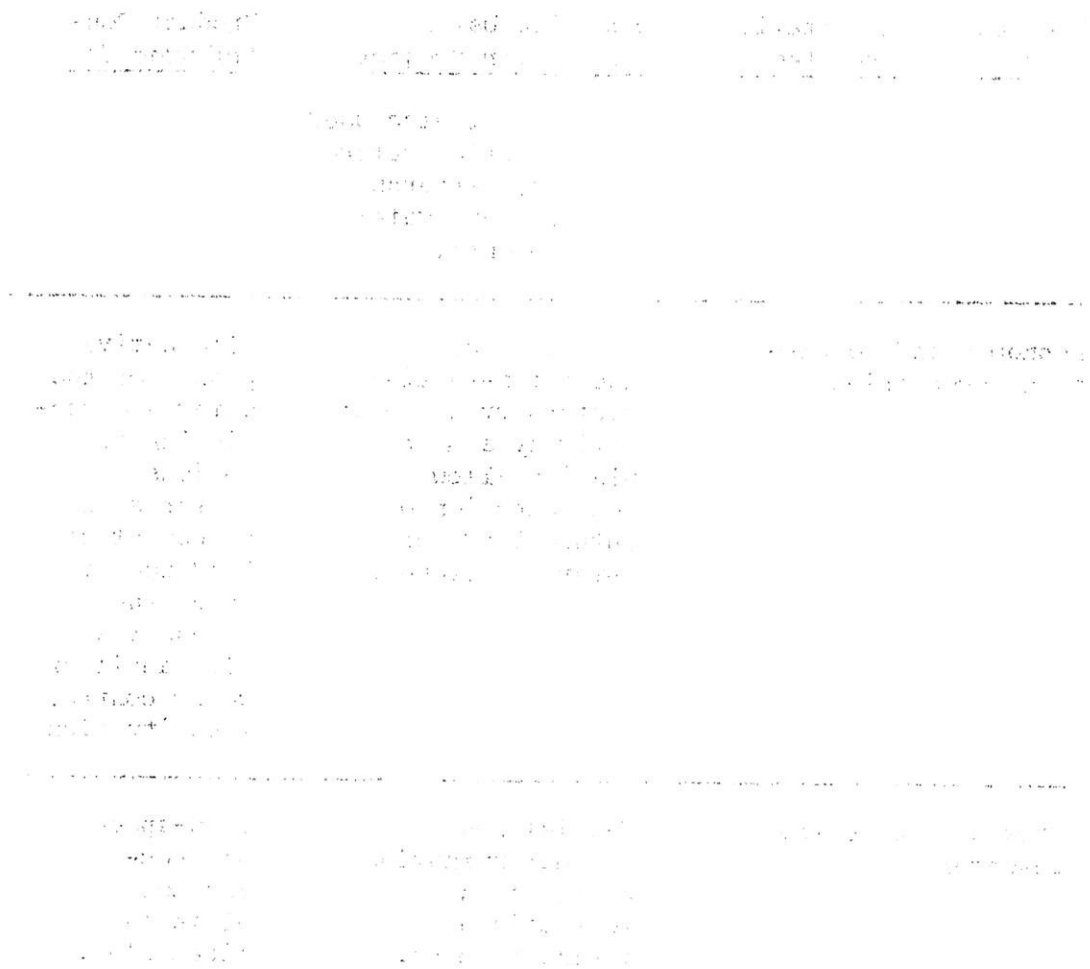
Land Use-Transportation Study Inventory Item	Specific Use In Root River Project	Product Contributed To
Aerial Photographs	Used as a field map for the recording of flood damage characteristics and as a base map for soil surveys.	---

[2] To date, in the Root River watershed planning program, significant data has been contributed directly to the study by some 400 private individuals, 8 state agencies, 8 federal agencies, and some 35 local agencies representing 16 separate political subdivisions.

Land Use-Transportation Study Inventory Item	Specific Use In Root River Project	Product Contributed To
Streamflow and water quality inventory	Used as the primary authority for establishing present water quality conditions and probable pollutional load on the Root River system	An element of the final plan setting forth those land use patterns or those water quality control facility plans needed to allow the desired uses of the perennial waterways.
Soil Surveys	Used with climatological data in determining the runoff from summer rainfall and the resultant flood potential; will be used in detailing final facility plans--for example, in selecting a structure site; is also being used in determining suitabilities for various types of land use.	Land use plans for flood prevention and any plans for water control facilities.
Land Use Inventory	Used in runoff studies as a base for determining probable future flooding caused by summer storms (unfrozen ground	Plans for flood control, flood prevention, and water quality control facilities.[3]

[3]Please note, however, that it is not always practical or desirable to achieve water quality standards by regulating land use. Water quality standards in a waterway are often best achieved by facility measures, such as dilution, treatment, or exportation of wastes.

Land Use-Transportation Study Inventory Item	Specific Use In Root River Project	Product Contributed To
	condition); also used in projecting future land use patterns and land and water requirements.	
Economic and Population Inventories	Knowledge of the inter-related factors of economic activity and population allows a determination of future land and water requirements.	Alternative plans for the watershed consisting of various patterns of placement of land use by types and intensities with auxiliary water control facility plans.
Park and Recreation Inventory	Partial basis for determination of additional recreational facility needs.	Open-space and recreation elements of final plan.



PARKWAYS & FLOOD PLAINS

by HOWARD W. GREGG, General Manager
Milwaukee County Park Commission

Shortly after the creation of the Milwaukee County Park Commission in 1907, planning for a comprehensive park system was begun. This work placed particular emphasis on the acquisition and preservation of all major stream flood plains in the County. Mr. Charles B. Whitnall, a charter member of the Commission, sometimes referred to as the Father of the Milwaukee County Park System, long dreamed of a travelway plan which envisioned the preservation of all natural watercourse flood plains. This policy permitted the conservation of native flora and fauna and the accommodation of open storm water channels at much less cost than underground sewers. The natural pattern of these channels permitted the development of scenic drives along them, which, in turn, linked the larger parks in a grand circumferential pattern around the outer perimeter of the County. Ultimately, a person will be able to drive through a naturalistic environment from one large park to another.

Experience has shown that the lands adjacent to these parkways have become most desirable for residential development, and hundreds of high quality homes have been built in these areas, thus increasing the tax base.

We in our County are now the beneficiaries of this early comprehensive planning, but we still are in need of additional basic data so the continued growth of our park system can be accomplished in an efficient, economic, and desirable way.

Since the early 1920's we have benefited from the planning concepts of such outstanding technical people as Al Boerner and Gene Howard. Boerner was County Landscape Architect for many years and designed many of our outstanding park facilities. He served as General Manager from 1953 to his death in 1955. Gene Howard, who is in our audience today, served as Regional Planning Director and County Highway Commissioner for many years and until his retirement a few years ago. These and many other talented people implemented the sound policies set up by the park commissioners.

During the development of our park system, we were obliged to gather the basic data ourselves, in order to establish planning criteria and to develop plans; and this could only be done within our own County.

Four of our river systems have either their headwaters and/or their outlets outside the County. This situation has in the past effectively prevented the solving of the many water-related problems. With the creation of the Southeastern Wisconsin Regional Planning Commission, we finally have the vehicle with which to bring comprehensive planning to bear on a whole watershed. This will permit the extension of parkways and parks throughout the Region in an orderly and effective way. The necessary basic planning data, such as topography, land use, aerial photos, surface water inventory, hydrology, quality and quantity, plus soil study information are available on a regional basis to all units of government.

Topography and land use determines the amount of runoff, which, in turn, permits the designing of channels and water retention facilities, and amount of flood plain lands necessary to adequately accommodate flood stages. The streamflow volume also relates to these factors.

Water quality and quantity determines the amount and types of fish and wildlife habitat that can be preserved and the recreational uses that can be placed on, and adjacent to, the water. Another most important problem that can be solved through the use of inventories is pollution. Most of our streams carry various degrees and types of pollution, which are identified in the inventory. This information can then be used to design facilities and programs to eliminate this undesirable condition.

The soil study data permits the planning of a restoration program and indicates the best uses to be made of any particular area; that is, should any area be reforested, put into turf, or perhaps just be allowed to return to its natural state, without control of any kind.

We are now engaged in work on three watersheds:

1. Root River
2. Fox River
3. Milwaukee River

Because the Root River Committee was the first appointed, it obviously is farthest along in its work. Harza Engineering Company has been engaged to prepare the study. The preliminary draft on alternate plans is scheduled for October 1965 with the final one before October 1966.

The Fox River Committee has completed a prospectus setting forth a technical study program to be accomplished by a mixed team of consultants and state agencies coordinated by the SEWRPC staff.

The Milwaukee River Committee will shortly be appointed by the Chairman of SEWRPC.

These committees exemplify real progress in the area of intergovernmental cooperation, with strong citizen participation--a movement which has been long overdue in this area.

We are now, for the first time, in a position to study and develop solutions to the many complex problems relating to stream watersheds; and I am sure that mutually agreed, open plans will result which can be implemented. These actions will eliminate undesirable and detrimental conditions and will create an orderly, economic, and beautiful environment for the citizens of the Region.

CONSERVATION OF SOIL AND WATER RESOURCES

by WILLIAM D. ROGAN, Agri-Business Agent
Waukesha County

Conservation of soil and water resources has received a great deal of attention in the last two or three decades. Much emphasis has been placed on better farming practices and on land treatment. Much of this was carried out on an individual farm basis; however, we have seen a movement from an individual to an area program or a watershed type of approach. Community leaders discovered that it is important to consider the farm, ranch home, or a town lot or business in the city all as a part of the watershed.

In 1953 in a letter to all Soil Conservation District Supervisors, Henry L. Ahlgren, Chairman of the State Soil Conservation Committee wrote:

> "Experience has shown that one of the most decisive factors in the success or failure of watershed development work is the cooperation of the people living in the watershed. Normally, the active, informed participation of the residents is essential to successful management. They own the property, control the institutions, originate the tradition, create the cultural atmosphere, determine the goals, and execute the practices of management. They pay directly for some or all of the improvement required. Unless they understand the need for watershed development and regard themselves as a functioning part of the watershed, little of lasting value is likely to be accomplished."

I would like to reemphasize the last sentence in this quote as I believe this is very important if we are to talk about "How these Inventories Can Be Used for Watershed Planning." The need for an informed, educated public is, I believe, one of the keys in its success. Our job as Agents representing the Extension Service will be to:

1. Assist in developing local conservation leadership within the area.

2. Provide local groups and cooperating individuals with information as to agencies and programs that are available.

3. Carry on the educational phases of the program through meetings, demonstrations, circulars, and bulletins, the use of press and radio, and in some instances personal contacts.

4. Assist in any way to help in the success of a watershed development program.

In developing local conservation leadership, again I emphasize the importance of the educational process. In many communities we have people capable of providing this leadership if they understand the need and importance of conserving our natural resources. In many cases we have ready-made leaders who have helped in many of our programs and will do so again if asked.

In regard to agencies which are very interested in watershed planning, there are many--federal, state, county, and local--all of which can be of assistance. To name a few and their functions:

1. U. S. Soil Conservation Service

   a. Prepare necessary soil surveys to be used in the development of basic plans.

   b. Assist landowners in developing and applying conservation plans.

   c. Provide technical assistance for surveys, designs, and construction of works of improvement.

2. Agricultural Stabilization and Conservation Agency

   a. Provide cost sharing to eligible landowners through the Agricultural Conservation Program to promote the desired conservation practices.

   b. Encourage landowners to participate in programs, such as Soil Bank, Feed Grain, and A. C. P., thereby placing more land under effective cover to conserve soil, water, and wildlife resources.

3. Farmers Home Administration

   a. Encourage their borrowers and applicants to show an active interest in watershed development.

   b. Provide financial assistance in their operating loans, within authorized and practical limits to finance planned and approved conservation practices.

4. Soil and Water Conservation Districts

    a. Each of the counties in the Region are organized as districts with an active district board whose main function is to develop and supervise the soil and water conservation programs and plans of their district.

These are just a few of the agencies which are ready and willing to assist farmers and landowners in the development of soil and water conservation plans.

From an agricultural standpoint, the information obtained from the inventories can be used in many ways:

1. Importance of soil conservation practices to control the loss of soil and water.

2. Determine priority of lands to be used.

    a. Agricultural.

    b. Forests and Wildlife.

    c. Flood plain zones.

    d. Highway needs.

    e. Recreation.

    f. Flood prevention and control.

3. Economic value to farmer.

I suggest the third one as being of importance because in some instances it could make a unit uneconomical for a farmer to continue its operation as a farm.

There is considerable understanding now with respect to the better farming practices and land treatment. As of now, this work usually involves only the farm on which it is applied, even though the benefits often may be classified as providing off-farm values. By that I mean it can be applied to one farm without the participation of the owners or operators in an area or watershed. Other property owners are not expected to pay. Taking an area such as the Fox River watershed brings new elements into the picture. We believe, as has been pointed out in our prospectus, that we need a comprehensive plan. This requires full participation of local people in the planning, construction, and maintenance if it is to be accepted

and looked after. Such planning needs to be done by communities and for the watershed as a whole. The local people will have to show initiative and draw on all technical and administrative help available.

I believe farmers are interested in the need for watershed planning in southeastern Wisconsin because they realize this will provide a wide range of improvement opportunities and a correspondingly wide range of potential benefits, both private and public.

I can assure you of the active support of the Extension Agents in the educational program as it applies to the use of the inventory information in the watershed planning.

I believe representatives of the other agencies mentioned will also be active in their support.

We are all very interested in making southeastern Wisconsin an area where the natural resources can be used to the best advantage of all residents. We believe a complete inventory of these resources will provide the proper land use on every area in the Region regardless of farm, suburb, or city.

INTEGRATION OF LOCAL AND WATERSHED PLANNING

by FRANK A. WELLSTEIN, City Engineer
City of Franklin

The Planning Commission of the City of Franklin is developing a new comprehensive plan, and the data and materials prepared by the SEWRPC have been and are continuing to be of great value in this effort. While our planning consultants have had to make more detailed local studies in many instances, the regional planning inventories have been utilized as data sources in the study of socio-economic factors, as a general check on existing land usages, and as important aids in the development of a land use plan.

Some of the questions that arise during the process of developing a comprehensive plan are:

1. How will drainage problems be solved and flooding problems avoided?

2. What use should land adjoining river tributaries be planned for?

3. What and how much land will be affected by flooding problems?

Complete answers to these questions and the problems they pose are beyond the control of any one community when it is part of a large watershed, such as the City of Franklin. A coordinated approach to the problems by responsible agencies and the communities affected, such as the Root River Watershed Planning Program undertaken by SEWRPC, promises to provide the basis for integrated and consistent planning and efficient and long-term solutions.

The acquisition of floodways along the main channel of the Root River by the Milwaukee County Park Commission for the development of the Root River Parkway is an excellent example of a major element of a watershed plan that will drastically reduce the problems with flooding that would otherwise have to be controlled or solved by local communities. This forward-looking program will minimize the impact of land development in the upper Root River basin upon the City of Franklin.

Local plans, of necessity, must be related to a regional watershed plan. As an example, if a local plan for a tributary drainage channel provided for a floodway at a certain slope to be 100 feet wide, but the watershed

plan indicates that such a slope cannot be developed because of a high flood level in the main channel, it is apparent that the 100-foot wide floodway will be inadequate and detrimental to the lands that adjoin it. The end result of integrating local and watershed planning will, among other things, provide the means for the solving of many practical problems, as illustrated by this example.

OLD COURTHOUSE
P. O. BOX 769
WAUKESHA, WISCONSIN
53187
PHONE 542-8083