

SOCIAL CAPACITY INDICATORS

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In the application of social research to highway planning for improvements to I-264 in Louisville, the Urban Studies Center at the University of Louisville developed a concept and process for defining and applying social capacity indicators to the decision-making process. The social capacity indicators concept is based on the notion that the proper social analysis of urban settings can yield a basis for decision-making regarding the location and design of roadway facilities in kind and magnitude. It is possible to influence roadway capacities through the use of readily available, inexpensively generated indicators of the social characteristics of urbanized situations. Of major concern is a process whereby social capacity indicators (self-perception, behavior, community perception, identity with community and place, friendship patterns, social history, future intentions, and characteristics of the inhabitation) can be systematically organized into a form of direct use to roadway planners and designers. Two processes are discussed: computer overlay techniques (as used on an example expressway project) and cluster analysis.

•IT is not uncommon to find highway planning projects with mountains of relevant social information. Yet this vast potential is too often wasted because of the lack of procedures for organizing this information into a form directly usable in the process of roadway planning.

The Urban Studies Center of the University of Louisville has been assigned the responsibility for providing and analyzing social information as a basis for the design and evaluation of roadway improvements for 13 miles of I-264, a circumferential expressway running through heavily urbanized, socially diversified areas of Louisville. The total endeavor of which this work is a part is still in process, and advocacy of the total set of procedures would be premature at this point. This presentation is limited to one set of procedures—the Louisville example—with suggestions for the use of techniques common to psychology, yet largely unknown (and thus unused) in planning roadways.

THE LOUISVILLE EXAMPLE

The work described herein is part of a community consultation process designed by the Urban Studies Center for the I-264 project. The process includes interviewing members of communities located in different physical proximities to the existing facility (communities immediately adjacent, communities along interchanging arterials, community groups of city-wide or regional orientation). The process also included establishing citizen panels from each of the three areas interviewed.

To simplify this presentation and to avoid premature evaluation of those aspects of our work not completed at this time, we shall focus on one interview area and the processes developed in the creation of social capacity indicators. The area of focus contains the approximately 2,000 families who live within communities adjacent to the 13-mile length of I-264 under redevelopment. These families were interviewed (face to face) from January 1972 through April 1972. The interview contained 69 items, lasted approximately 20 minutes, and was designed to generate data for the following concerns:

1. Expressed difficulty in getting to the places "we like to go";
2. Expressed attitudes toward being a neighbor of the expressway;
3. Suggested improvements for the expressway facility;
4. Neighborhood identity or attachment, both physical and social;
5. Neighborhood issues (problems and perceived opportunities); and
6. Socioeconomic characteristics of the families and neighborhoods in the analysis area.

A variety of question formats was utilized in solicitation of these concerns, including semantic differentials, open-ended questions, and multiple-choice fixed responses. In analyzing the questionnaire responses, it was possible, using the computer mapping overlay processes developed, to combine the 69 items into the composites noted above and further to quantify social capacity indicators.

In working with community psychologists from the University of Louisville who were integrated with the Center's staff, it was also possible to define and quantify the social indicators of a "hard" and "soft" community. A "hard" community is a community whose composite responses indicate that the impact of expressway improvements on it should be minimized. A "soft" community is a community that can most easily sustain changes caused by the expressway improvement. The issues of concern for such a determination involve self-perception, community perception, behavior, friendship and extended family patterns, and characteristics of the inhabitation.

Other results obtained include the establishing of constraints in kind and degree regarding the physical characteristics of the facility and a clear delineation of neighborhood problems and opportunities that will be influenced by alternate planned improvements.

OVERVIEW OF IMPORTANT ASPECTS OF THE PROCESS USED

The process of moving from questionnaire responses to recommendations requires much more effort and care than merely summarizing answers. It is not enough to know what people who live adjacent to the expressway said. We must also know who said it, where he lives, what other things he has said, whether his neighbors agree with him, whether his opinion is representative of people in general or unique to his community, how what he said relates to other characteristics of his neighborhood, the physical setting, the setting of his home, his relationship to the expressway, etc.

Therefore, we chose, wherever possible, not to lump people together in general statistical summaries. This would have been a disservice to all by "half-truthing" the results. While statistical analysis is an important part of social capacity indicators, it is not—nor was it intended to be—the central thrust of our effort to move from questionnaire results to findings.

All of the procedures used were based on allowing each individual to express his unique point of view regarding his neighborhood, the community in general, and the expressway as it is now and as it should be. The procedures used were designed to avoid gross generalizations of peoples' views while generating clearly articulated and definitive descriptions of findings and recommendations.

The process used in this effort groups people according to their specific response to a specific question and does not use these groupings beyond that one question. This has been accomplished by computer mapping of the resources, one question at a time.

Combinations of responses are achieved through an "overlay" process. Only those who responded in an identical fashion to the question being summarized are grouped together. Those who agree with some items but not with others are not lumped together simply because they agree on a few points.

Generally, for example, a majority of people did not complain that the expressway disturbs their daily activities. However, there are specific areas where a great deal of disturbance occurs. The expressed disturbance varies with certain attributes of the physical context and socioeconomic characteristics of those interviewed. The spatial mapping of interview responses has allowed us to know where to make recommendations regarding actions that will alleviate the causes of disturbance in kind and amount.

If there is a consistency regarding the socioeconomic characteristics of families who

complain about a particular phenomenon and/or their location with reference to the expressway facility, then general rules may be defined and supported. Further, the technique described herein defines seemingly incongruous answers, such as individuals who recommend widening as an improvement for the total facility yet recommend not widening as best for their neighborhood.

As described in the next section, our approach has been to systematically relate each level of analysis and summation to the level preceding and succeeding it, so that the basis for the recommendations could quickly be traced to the original answers expressed during the interview or any level of its analysis or summation.

PROCEDURES

The following is a brief description of the process utilized:

1. Divide analysis area "A" into manageable subunits to facilitate analysis of both general characteristics of subareas and particular spatial distributions of responses (Fig. 1).
2. Codify property locations where interviews are to be administered.
3. Conduct and coordinate interview process, checking for the characteristics of dispersal regarding completed interviews (Fig. 2).
4. Codify interview results (answers/questions) with specified location of interviewee (Fig. 3).
5. Write and run computer programs to yield the spatial distribution of responses for each question for each of the 11 sections.
6. Analyze spatial distribution of answers to each question to ascertain if cohesive opinion clusters or socioeconomic clusters exist (Fig. 4).
7. Combine clustered responses to questions that cumulatively display citizens' points of view (Fig. 5) regarding (a) expressed difficulty in "getting to the places we like to go" (questions 11, 12, 13, 14, 15, 16, 52); (b) expressed attitudes regarding being a neighbor of the expressway (questions 45, 46, 47, 48, 49, 50, 51, 53, 54) (Fig. 6); (c) desired improvements of the expressway (questions 7, 8, 9, 10); (d) neighborhood identity or attachment (questions 20, 21, 38, 39, 40, 41, 42, 43, 64, 69); (e) expressed neighborhood issues, problems, and opportunities (questions 17, 18, 19, 55, 56, 57, 59, 60, 61, 62, 63, 65, 66, 67, 68); and (f) socioeconomic characteristics of families interviewed (questions 3, 27, 28, 34, 35, 36, 37).
8. Define and articulate results and draw conclusions (Figs. 7, 8).

SUMMARY OF THE LOUISVILLE EXAMPLE

Through use of the foregoing procedure, it was possible to organize the social information elicited into a format of direct use in planning for the expressway improvements while involving the public in a procedure that they could understand and use. Further, it is our belief that this process is applicable to any project that would have a major impact on existing urban environments.

This process was also designed as a means of organizing data in a form that will facilitate summarization of the social impact of alternative solutions. Once the social information has been digitized as prescribed, it is a simple matter of sorting all properties affected by a given design and then describing the socioeconomic and perceptual characteristics of the people and neighborhoods affected. This is critical. As noted in the Louisville example, some areas are less sensitive in terms of social damage to alteration or intervention than others.

Upon examination of the results from the Louisville example, it has become clear that the social impact of the project could not be determined by how many families were forced to move. Indeed, it proved unacceptable to determine social impact based on how many families of different income ranges were moved. To these considerations must be added all of the other factors discussed to determine the total set of factors influenced by intervention on the people themselves and the communities of which they are a part. If one does open this "can of worms", one will soon need a procedure to deal with the complexities of so many related factors that change in kind and magnitude

Figure 1.

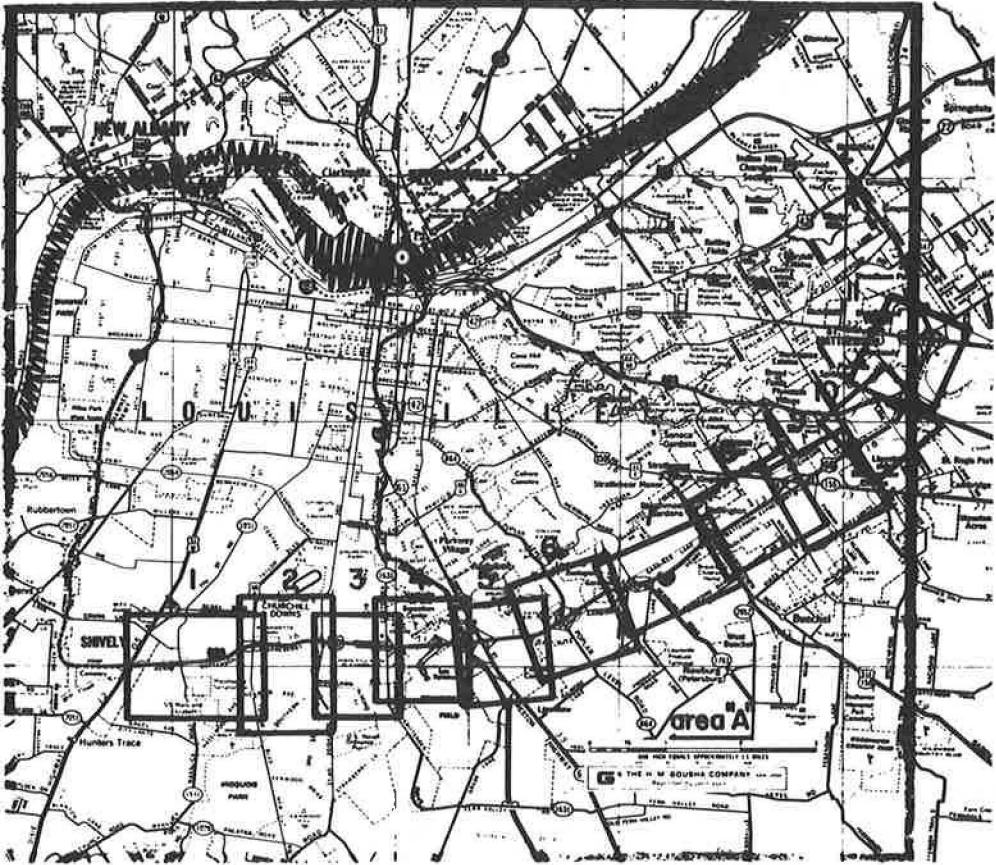
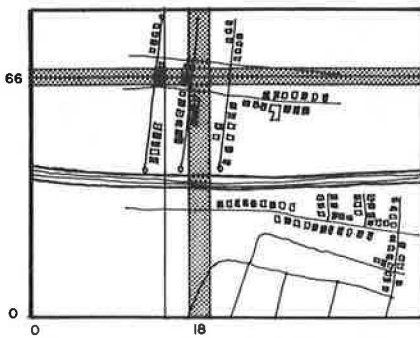


Figure 2.



Each property within each section was given a set of coordinates; one vertical, and one horizontal. This was done to facilitate interview encoding and decoding and to allow for the spatial mapping of results

Figure 3.

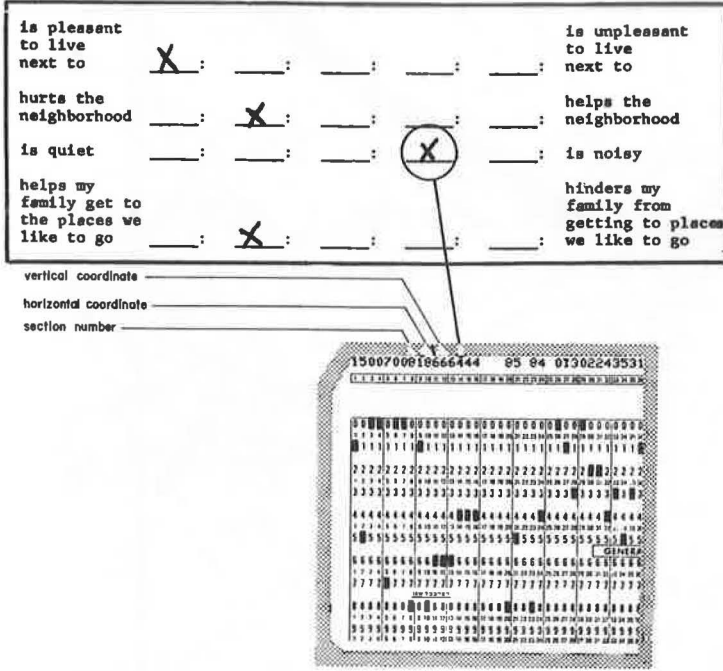
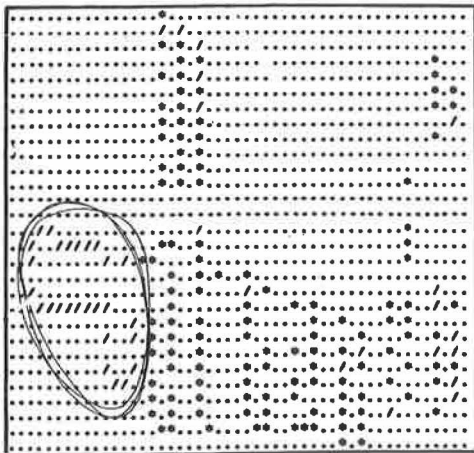


Figure 4.



The cluster circled represents a cohesive community in that all respondents herein answered the same question with the same answer. Thus, they represent an opinion cluster.

Figure 5.

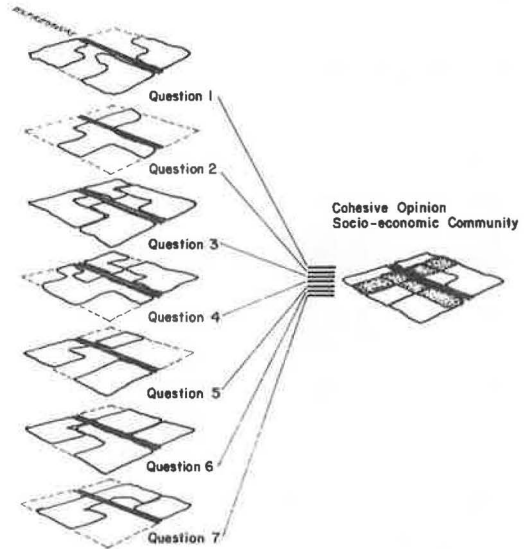


Figure 6.

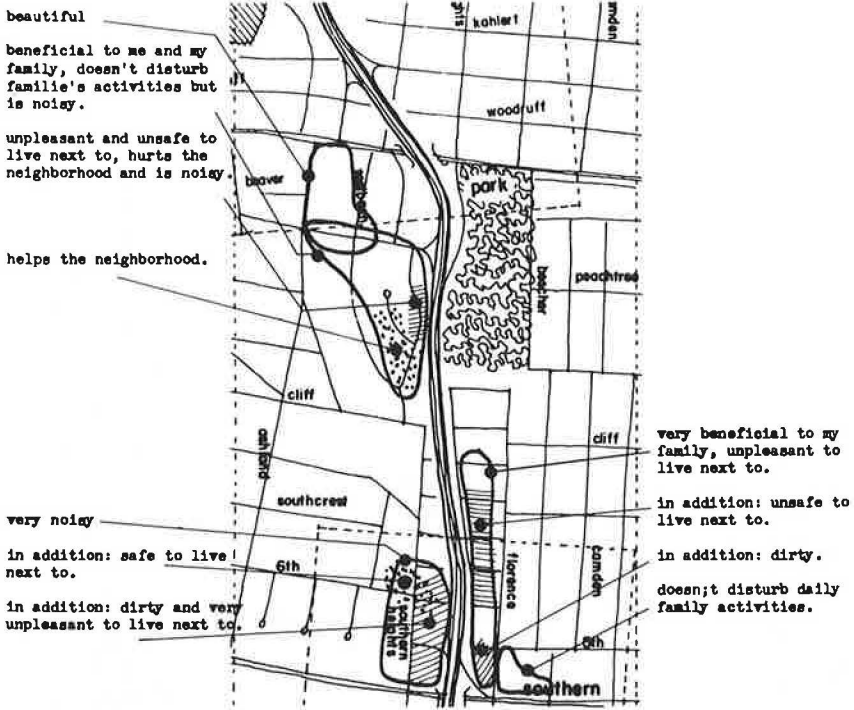


Figure 7.

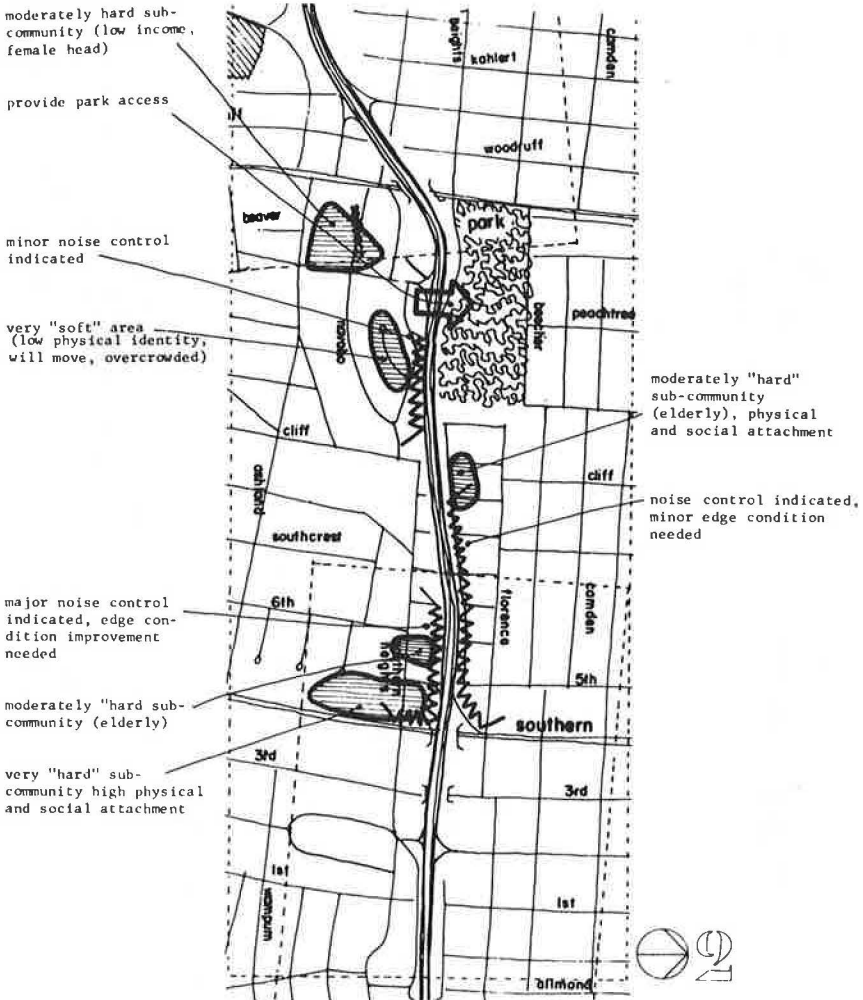
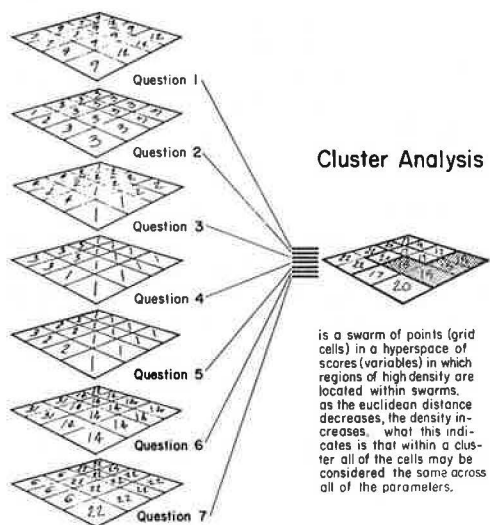


Figure 9.



from area to area. It is our hope that the Louisville example and cluster analysis, along with other investigation currently in the pipeline, can offer such procedures.

CLUSTER ANALYSIS

The Louisville example proved to be successful in this particular project and some of its procedure is replicable; yet when the number of variables (social indicators) and the number of families increase, then a more sophisticated procedure is indicated.

The procedure overview in our opinion is adequate when simultaneously dealing with less than 10 variables and 2,000 properties. The overlay process, however, has proved inadequate to handle the complexities involved when dealing with approximately 3,000 observations (questionnaires) across 15 or more variables. This complexity requires the use of another technique—cluster analysis—commonly used in psychology

since 1924. This technique is extensively covered in psychology texts so we shall limit this discussion to a brief overview only.

Given demographic and perceptual data (variables) for each property or subarea of the analysis area (cells), it is possible to combine individual observations into groupings (clusters) of cells that do not vary (within established constraints) across the variables. We may have begun with 3,000 observations and approximately 30 variables in the Louisville example and used cluster analysis to limit the differences between observations across variables to approximately 15 clusters. Once defined, each cluster may then be dealt with as a single unit. For example, instead of map overlays done by hand (a 6-week exercise in the Louisville example), the computer could have defined "hard" and "soft" subcommunities in degree, size, and location.

Figure 9 is a simplified graphical representation of cluster analysis procedure. Each variable represents a questionnaire response or any mapped social or physical observation. Each cell represents a geographic location or area (address, block, subarea). Detailed information regarding cluster analysis is given by Tryon and Bailey (1).

The basic steps in application of cluster analysis are the same as in the Louisville example, but the tediousness of the overlay procedure is replaced by a mathematical process of higher speed and accuracy.

CLOSING REMARKS

Social capacity indicators are based on the notion that social information can be generated and organized in a format of direct use in major roadway design. The information can be gathered at a moderate cost (less than 1 percent of total budget for the Louisville example). The issue is, How do we organize the information to maximize its use, replication, and communication? We believe that the Louisville example offers some insight into the potential of computer mapping and overlay procedures for use in simpler problem cases and cluster analysis in more complex problem cases. In a time when citizen involvement and socioenvironmental concerns are major areas of focus, procedures such as these can be quite useful. We must learn to deal with the "social" issues as systematically as other "physical" aspects of the total problem of roadway and community planning. Otherwise, each of us who are professionally involved in roadway planning and design will continue to be subject to criticism, not because of a lack of sensitivity but because of a lack of a means to deal with the social aspects of the problems we confront.

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REFERENCE

1. Tryon, Robert C., and Bailey, Daniel E. Cluster Analysis. McGraw-Hill, 1970.