

5-1-1972

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### Recommended Citation

C A. Doxiadis, *Preparing Ourselves for the City of Tomorrow*, 2 B.C. Env'tl. Aff. L. Rev. 180 (1972), <http://lawdigitalcommons.bc.edu/ealr/vol2/iss1/9>

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## PREPARING OURSELVES FOR THE CITY OF TOMORROW

*By C. A. Doxiadis\**

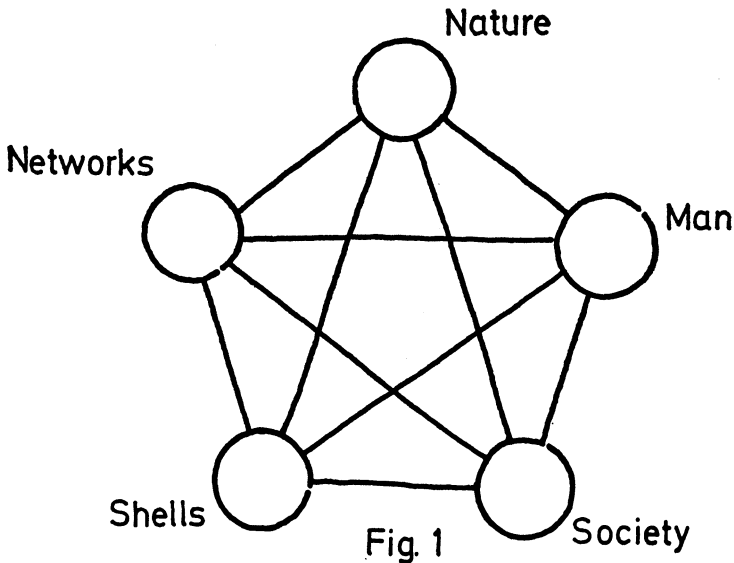
We celebrate a great deal about our present day cities, particularly about their degenerative conditions. Although we have also begun to consider the cities of the future, we have not yet specifically addressed the problem of how we should build those cities. In considering this problem, we must examine the city systematically, beginning with a look at its most fundamental elements, which are five: Nature; Man, as an individual; Society, as man collectivized; Shell-buildings, houses, and other man-made structures; and Networks, physical and managerial, through which our society operates (see Figure 1).

Man still experiments with his natural environment through trial and error. Society has functioned with some measure of stability for at least one hundred thousand years, and our Shells have been an element of our living for about eight thousand to ten thousand years. It is only the Networks which are young; they did not become operative until the first railroads began connecting cities about one hundred and fifty years ago. We shall find, after a proper analysis, that this youngest element, about which we know so little, is at the root of all the present urban troubles we endure. We have led our cities to an impasse because we have completely misunderstood the importance of the system of Networks that we have built.

### THE DETROIT CASE STUDY

We only recently completed a four year analysis of the urban area of Detroit. In our research, we examined the nature of urban woes as well as what might be done to remedy them. Any study of the city of Detroit and of its initial plans reveals that its planners simply did not conceive of a population of more than two hundred

**The city consists of five elements:  
Nature, Man, Society, Shells and Networks**



thousand people. Since its foundation, however, Detroit has been burdened with more and more pressures, until now it must serve, not merely two hundred thousand people, but seven and a half million people in its total urban area.

On the basis of our analysis, this urban area operates as one unit consisting of thirty-seven counties: twenty-five in Michigan, nine in Ohio (including the whole Toledo area), and three in Canada. People commute daily within this area and identify with Detroit, the nearest major city, through many functions of commerce, trade, and communications. It is in this way that the area of influence of any major urban system can be defined.

We simply cannot expect a structure initially designed for two hundred thousand people to serve seven and a half million people. Where Detroit's planners might have expected, for example, a given degree of pressure on the central city from transportation media, this pressure has been significantly enlarged because of the availability of the automobile to the area's seven and a half million people (See Figure 2). In the whole central system of Detroit, seventy-four percent of the land area has been taken over by cars,

### Cross-section of the forces operating within a central city

The inner curves show the normal growth of forces, the outer curve shows that after a certain point of growth, the center no longer grows, because of two major pressures it breaks, and instead of continuing its growth as the dotted line shows, it begins to decline

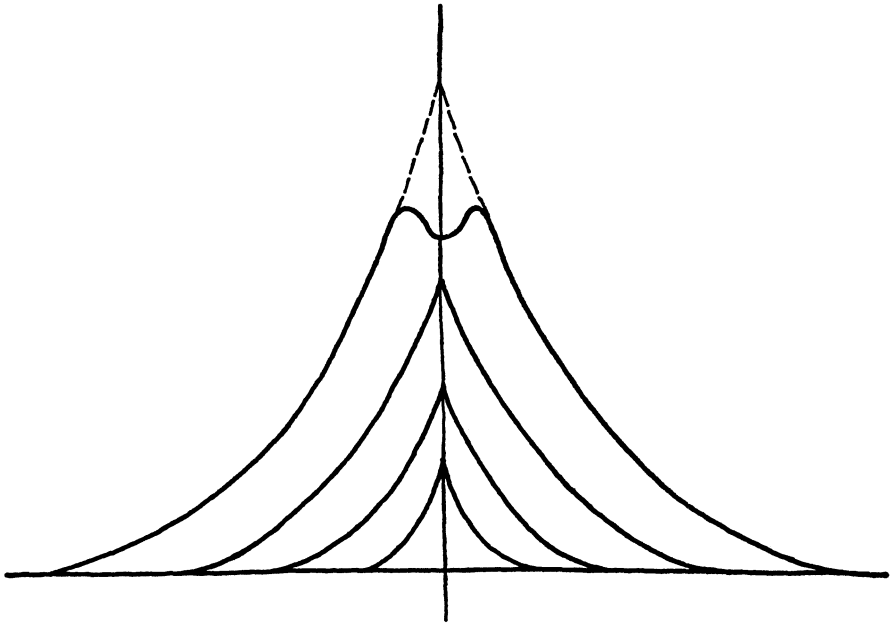


Fig. 2

leaving therefore only twenty-six percent as the built-up area. In some cases highways have been opened that are ten times wider than initially planned.

This complete inability of man to foresee or comprehend what fundamental changes are necessary in structure and in networks has allowed a physical decline of the central city and of the critical points in the more widely diffused urban system. This has become true world-wide, and not only in the United States. Physical deterioration, moreover, is followed by a change in the economic structure of the city. The city's income begins to decline slightly, though this is not always immediately apparent since suburbanites

often continue to utilize urban resources, such as the city's department stores, which receive higher income because of purchases by suburbanites. The income of the city's inhabitants, however, declines more precipitately. The economic problem is then followed by a social problem: the atrophying system attracts the weakest income groups, e.g., rural emigrants and others who create their ghettos in the central declining areas.

We can discern then a four-layer problem, beginning with the physical inability of the city to operate, and continuing with the superimposed difficulties created by the city's changing economic structure and the resulting social and racial distress (see Figure 3).

### The four phases of the decline of the urban system

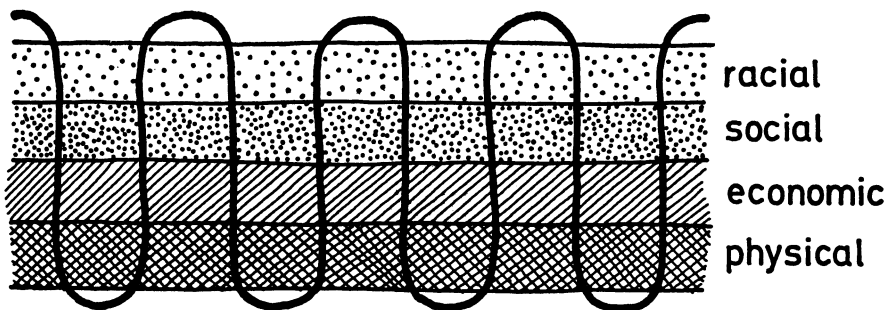


Fig. 3

It is erroneous to consider that these layers have remained discrete. They have been interlocked, though people often try, because of our tendency towards specialization in problem solving, to separate them. We simply cannot, however, expect to separate the layers and thereby resolve the dilemma. Rather, to remodel the system in accordance with the needs of our society, we must confront the system as a whole.

Figure 4 illustrates the dangers of the income drop in the city. If we present a cross-section of the city in 1950, a curve shows incomes to have been low in the country-side, higher at a distance of five miles from the center of the city, and lower in the middle of the city. By 1960, this phenomenon had changed so that there were higher incomes in the country-side, both near and far, and

Population movements from the city illustrate the weakening economic valley at the central part of the city

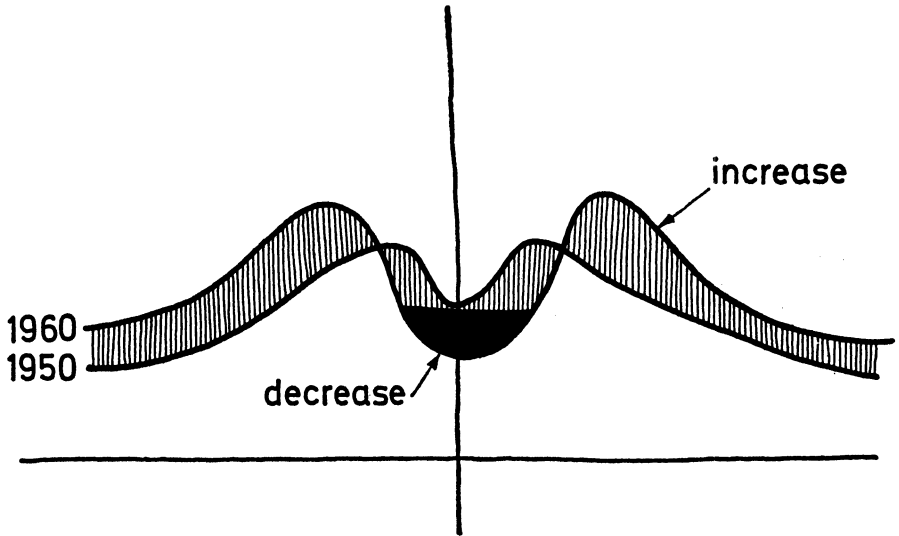


Fig. 4

much lower incomes in the central city. For the first time, income levels of the center had fallen below the levels of the farming area. Present calculations reveal that the wealthy people of Detroit move out from the central city at a rate of two yards per day. The situation is grave because as the whole system expands, the gap in incomes widens; moreover, those who suffer most this widening gap are already the weakest elements, economically and socially.

#### A LONG DECLINE

It is important that we pause to understand what recent research has laboriously documented: that the whole urban system of our society has, since the beginning of the nineteenth century, been in a state of dismal decline. This fact has been reflected for most American cities by the censuses after 1900, with their carefully framed census tracts.

Yet in spite of these degenerative processes, we continue, not only unimagnatively, but also dangerously to build on the decay.

Most of the projects in this country simply perpetuate past degenerative trends. This phenomenon is, moreover, international: for example, throughout the world we still build systems of highways leading to the central city, even though the central cities are egregiously overloaded. Discouragingly, such activity is analogous to treating a heart patient by causing him to gain weight. Certainly, no doctor would consider this reasonable, and most, of course, would insist on a weight-reducing diet before suggesting an operation. "Weight-reduction" in the urban context would be effected by limiting transportation accesses into the city.

A proper analysis of several American cities over the last years has indicated beyond any doubt that cities grow three times faster in area than in people (see Figure 5). We used three times more land per capita in 1960 in the average American city than we did in 1920. In communications and commerce (for example, in postal activity and service businesses), this means not only that we must attempt to serve many more people who have become dependent on cities that are already malfunctioning, but also that we must expend even more energy in order to reach these additional people, since they are more remotely situated from the urban cores. Thus to say only that the population of the United States will double over a certain number of years, without also saying that the urban population and *area* will grow even more, is to distort what the future holds. By the year 2000, we may well have to face the problem of serving urban areas ten to twenty times larger than those of the present.

A caveat should be made with respect to these extrapolations: they require much more elaboration, since densities are not equal over the whole urban area. Therefore, it is incumbent that we work out much more detailed analyses showing, for example, where the average citizen will be in relation to the whole system, and taking into account the likelihood that the outlying areas will continue to have lower densities.

#### APPROACH TO THE FUTURE

At this point I should like to offer some constructive suggestions with respect to salvaging our deteriorating system. It may be asked what approaches should we take today and how can we prepare ourselves for the future. As indicated above, we must, of course, research the past, the present, and the trends. Of these, perhaps the most significant are the trends.

Changes in area and population  
in urbanized areas of the USA • 1950 - 1960

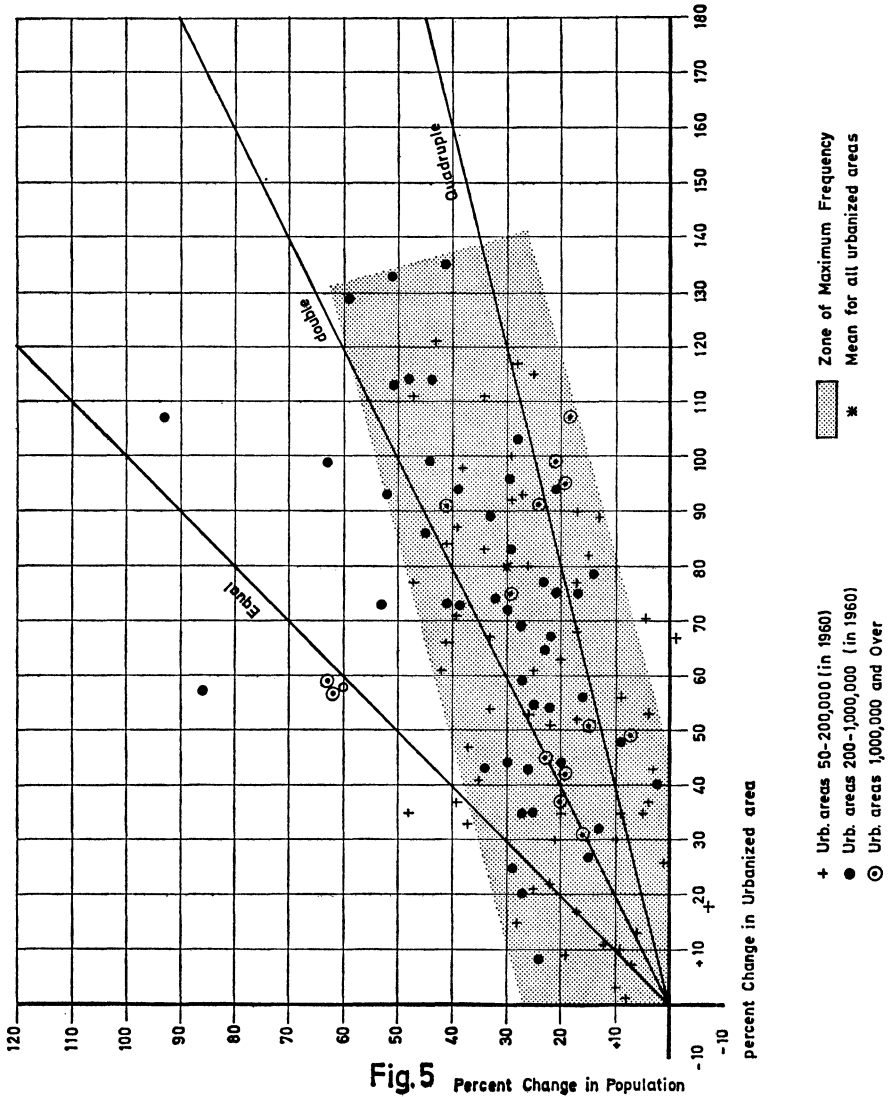


Fig.5 Percent Change in Population

There exist today trends which are easily perceived and about which we should have no doubt. It is quite safe to say, for example, that most of the street networks of present day cities will be here in the year 2000. It is very improbable that we will change all or even five percent of the streets now existing since many layers of interests, e.g., residential and commercial, have been superimposed



thereon. Even if we make the wildest assumption that the United States might become a communistic society by the year 2000 and that all the land therein would then become the Government's, the mundane matter of street structure would remain unchanged since so many rudimentary societal institutions would have been inextricably tied thereto. There is another basic factor which perpetuates our network of streets. Even if we must change our water supply system completely by the year 1990, the electrical and drainage systems that are connected thereto will continue as they exist presently, thereby requiring the new water supply system to follow the pattern of the other surviving systems and thereby prolonging the system as a whole.

Although it is imperative that we understand that existing systems, if they change at all, change only very reluctantly, we must certainly understand and prepare for more. There exist basic conceptual problems in attempting to define a city. To illustrate, when one flies over the city of Detroit, he may readily distinguish the heavily built-up area, which he will probably define as the city; in fact, however, the city of Detroit, and all its urban influence, spreads much farther, as the following scenario indicates. Fifteen years ago General Motors bought a piece of land on a highway outside Detroit. Ten years ago they started feasibility studies in order to determine whether this land might be used for a major corporate project. The feasibility studies revealed that since this land was in the corridor that extends from Detroit to Chicago, the greatest urban economic investments and labor forces would arise there, and that therefore the land should indeed be used for the project. Thus, seven years ago, General Motors hired a planner, five years ago an architect, and three years ago an engineer; a year ago they called for contracts. They were ready to start building after fifteen years' investment of money and careful research. But then the municipal planners quickly decided that they wanted a park in that area. Under these particular circumstances, should not General Motors protest?

Although these activities are often called "land speculation," such labeling frequently reflects naive oversimplification. As long as we are to maintain the economic well-being of millions of urban-dependent workers, we will have commercial interests in land which cannot be overlooked. A study of the same area has indicated that large tracts of land have already predetermined where the vital links between Detroit and Chicago will be. Detroit and Chi-

ago will be one city before the year 2000. In some not-so-remote areas more than eighty percent of the farming land is no longer farmed, suggesting that the land may already be committed to urban uses. In some other areas even farther removed from the urban core, ten to twenty percent of the land has been taken. As a second, summary illustration regarding the difficulty of defining a city, although a flight from Detroit to Flint might suggest that these are two different cities, more than fifty-five percent of the land between them has already been bought for urban purposes; there has thus begun a de facto merging of the two entities. It should be evident then from these brief examples that urban developmental speculation proceeds much more quickly than the physical construction of the city. And it is in this very anticipation of a city that a city begins.

What is happening today is much simpler than what will happen ten, twenty, and thirty years from now. As time passes, it is likely that the physical structure will be more degraded, the economic problem more pervasive, and the social problem, particularly in its racial context, more intractable. We must revise our thinking and start building for the future in a way that accommodates and makes best advantage of already clearly perceived positive trends. Therefore, with respect to the Great Lakes in particular, we must understand that we are heading for a Megalopolis, extending from Milwaukee to Chicago and Gary, to Battle Creek, to the expanding Detroit system which will encompass Flint and Toledo, to Cleveland and Pittsburgh, and finally to Buffalo, London, Ontario, and Toronto (see Figure 6). Land use, commercial activity, and communications systems should begin now to adopt to this ultimate reality.

#### SELECTION OF ALTERNATIVES

Wherever we look, we shall find an already existing system; we can conceive of its outline, analyze its critical areas, and forecast the difficulties in operating therein. Through an imaginative utilization of endemic resources, we can maximize the positive possibilities for the future. What choices would we normally have in this regard?

In Detroit we found we could not make any forecasts or recommendations until we specified the alternatives for the future. When we enumerated the alternatives we found that for the year 2000 they totalled forty-nine million. Thus we faced the problem of re-

### The Great Lakes Megalopolis

- main position of G.L.M. (1960)
- - - - - Canadian extension (future)
- · - · - Mohawk bridge
- · · · · Eastern megalopolis (1960)

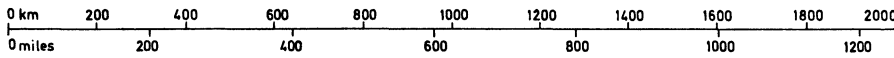
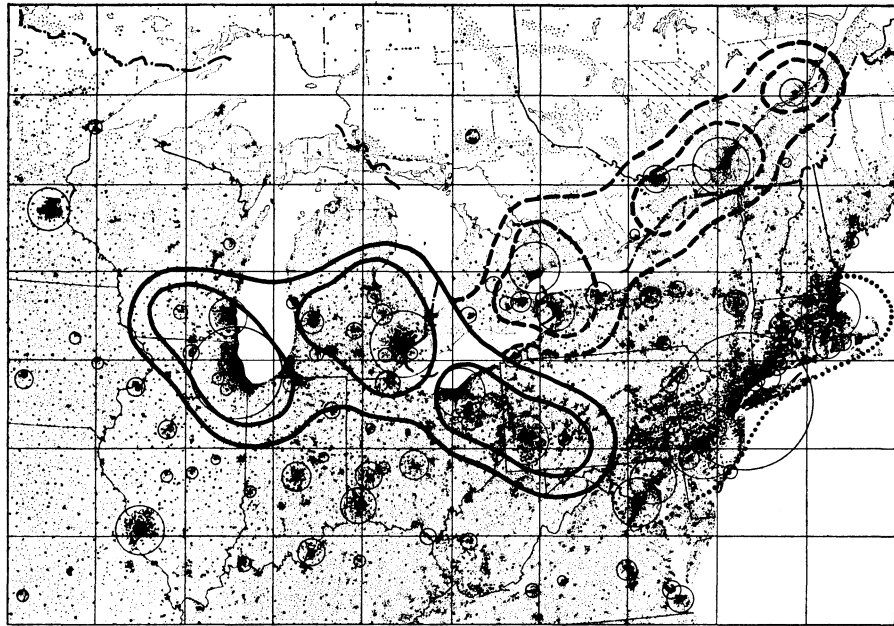


Fig. 6

ducing this quantity of alternatives to a manageable range. We employed a method called I.D.E.A. (Isolation of Dimensions and Elimination of Alternatives) which enabled us to eliminate the weakest alternatives.

Our experience has shown that the deciding factors are the location of the geographical center, central business districts, educational and research institutions, ports, airports, and the configuration of the transportation system—the last mentioned factor being the most important. By eliminating the weakest alternatives we reduced our alternatives to one-half million. We then reduced these half million alternatives to eleven thousand; and then repeated the process to reach three hundred and twelve, forty-seven, three, and finally one. Of course, twenty years ago this work without com-

putors would have been ridiculous. It would have taken us, we estimated, about two thousand years with the same team.

With modern techniques, however, we can begin, with efficiency, to tabulate our alternatives for the future, and to see ultimately where we are going. The existence of models allows us to change basic assumptions and to insert any new hypotheses we wish. In twenty-two minutes of computer time, including three minutes for designing, we are in a position to frame a new configuration, discern its advantages and disadvantages, and provide all alternatives to the governmental policy-makers.

Thus we hope that we have reached the point at which we can begin to present the highly intricate problem of the city in a form which permits objective, well documented decisions. It is fatuous to discuss these incredibly complex problems in terms of purely personal prejudices. The repercussions of the decisions in this regard are too enormous to be left to caprice or parochialism. We are dealing here with large numbers of variables over huge areas; the decisions that are made as to these variables will directly, and deeply, affect the lives of millions upon millions of people. Unless we continue to exploit new methods in order to conceive of new workable alternatives, the prospects for urban man will be less than sanguine.



\* President of Doxiadis Associates International Co., Ltd., Consultants on Development and Ekistics; Chairman of the Editorial Advisory Board of EKISTICS; Member of the Board of Advisors of ENVIRONMENTAL AFFAIRS. For further analysis, the reader is referred to EMERGENCE AND GROWTH OF AN URBAN REGION, THE DEVELOPING URBAN DETROIT AREA, a project of the Detroit Edison Company, Wayne State University, and Doxiadis Associates; the first volume was published in 1966, the second in 1967, and the third in 1970 by the Detroit Edison Company.