

## THE IMPACT OF NEW TECHNOLOGY: NEW PRESSURES ON URBAN AND REGIONAL PLANNING

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The decade of the Eighties has so far been characterized by a surge of media and general interest in the future - or futures. The First Global Conference on the Future, held in Toronto in August 1980, was a good example of this. Planners themselves, whether land use planners, social planners, economic planners or corporate planners, are by definition future-focused; the very nature of planning requires that the planner must fix one eye on the present while simultaneously peering into the future with the other. "Planning is what one does while getting on with life" is a remark attributed to the late John Lennon; planning for the future is something planners do while struggling with the present.

For those planners who must both cope with the present and seek to foresee the future - and perhaps even influence its direction - it is useful to examine some current trends emerging in Canada and to speculate on how they might interact with the emergence of the post industrial society, or information age, heralded by both the popular press and academic writings. The revolution in microtechnology and telecommunications and its impact on the labour force, on the concept of work itself, and on society as a whole is a good starting point for "future think." The immediate question which arises from such an examination is directed at the adequacy of our current planning mechanisms, forums, and instruments to cope with societal change of the magnitude foreseen, when even the emergence of current trends has created a climate of divisiveness and discontinuity within which any planning initiative is hard

pressed to claim effectiveness. For urban, regional and social planners, the issue becomes one of redefining planning and its relationship to societal goals and objectives.

This paper, therefore, will discuss some significant trends which are already beginning to have an impact on society. These are: (a) the state of the economy; (b) the pervasive lack of confidence in governments at all levels; (c) the (less obviously discernable but more pervasive) women's movement; and (d) the technological revolution in the work place made possible by advances in microtechnology (the chip), telecommunications, and robotics. The technological revolution will be examined in some detail, as its implications for the future of human settlement patterns, public policy, and planning practice are of major importance to the planning profession.

A brief review of that ongoing dialectic between social planners and land use planners will be used to illustrate the inadequacy of current forums, mechanisms, and procedures of planning for any comprehensive long range and integrated planning such as will be necessary to meet the changing social conditions.

### State of the Economy

Across both Canada and the United States, as well as in Europe and Britain, high inflation and high unemployment combine to create a new phenomenon - stagflation. There are as many complex and conflicting reasons offered for this as there are proposed cures. However, one effect already evident is the cutbacks in soft or human services. While Western Canada enjoys a boom which is reflected in new construction and population movement to new jobs, Eastern Canada, along with states on the U.S. eastern seaboard, is suffering from a decline. Unemployment levels soar; new construction is down. This has resulted in Ontario now being classified as a "have-not" province, where the regional municipality of Toronto and the surrounding centres, which make up what used to be referred to as the Golden Horseshoe, are suffering from the decline in the economy. According to data gathered by the Labour Council of Metro Toronto [9], permanent layoffs and percentages by industry from January, 1979 to June, 1980<sup>1</sup> are shown in Table 1.

Metro is also facing (along with several other Ontario municipalities) a decline in revenue from the growth of new assessment and in Provincial transfer payments which do not keep up with the rate of inflation [13]. The only other revenue source available to municipalities is the property tax - and in Metro Toronto from 1971 to 1977

<sup>1</sup>Quoted in the Business Section of *The Globe and Mail*, Toronto, April 13, 1981.

Table 1

Industry	Number	% of Total
Manufacturing	10,841	8.8
Transportation, Communications, and Other Utilities	695	5.6
Community, Business and Personal Services	787	6.4
Public Administration	18	.15

this rose by 51.3 percent. The corresponding rise in the price of all consumer items was 60.8 percent in the same period [13].

Since wages in general have not kept pace with inflation, the average wage earner does not have the financial leeway to absorb further increases in taxes (of any nature). Indeed, in a declining economy, job security is valued higher than income rewards which might allow for increased ability to pay higher taxes.

### Lack of Confidence in Government

There appears to be an erosion in people's confidence in government intervention at any level. The government is still seen as a social safety net when the so-called free market fails (as in the recent case of Re-Mor Investors or in unattainable house prices), but this is as a last resort. Government is perceived by many as being intrinsically inefficient and profligate with other people's money, and itself the main cause of inflation.

In part, this erosion was encouraged by such landmark reports as the Henderson Report on Government Productivity, which resulted in the reorganization and centralization of many government functions and the acceptance (without proof) of the notion that private enterprise could manage more effectively and efficiently. "Re-privatization" became the catchword.

Statements attributed to various ministers, both federal and provincial, suggest that the good old days of neighbours helping neighbours were much more satisfying, and cheaper. The assault on

the human service system is furthered by speeches such as that of the Hon. Keith Norton, then Minister of Community and Social Services, stating that there is a "professional tidal wave; the family is drowning in too much help," and that "professionalism is creating a lack of competence in normal people to do things [10]. These sentiments pave the way for public acceptance of cuts in government spending, especially for human services. The economic climate and a tacit acceptance of the theory that government spending fuels inflation is resulting in less money, both in the voluntary and the government sector, for spending on a range of human services.

Thus, there is an urgent need to better utilize the resources available to get more from the same dollar. Although this might have a salutary effect on the field of human services and social planning, increased levels of deprivation, hardship, and social dislocation can only result from such a policy. Clearly, the framework in which this dollar is allocated is in need of radical review.

### The Women's Movement

Without undertaking any examination of the women's movement itself, its effects on employment patterns and community and family life is clearly discernible. Settlements which were designed for nuclear families of two parents (one working at home housekeeping and childrearing), 2.5 children, and adequate incomes to provide private transportation and purchase needed services are no longer adequate for the needs of today's families [14]. Voluntary services lack the needed volunteers (traditionally women); neighbourhoods are deserted during the day and the need for child care and recreational activities (or custodial after school programs for older children) grows beyond the capacity of the funding base available.

A parallel growth in the service sector of the economy has complemented this increased female labour force participation rate, as women have traditionally predominated in this sector [3]. The emergence of an information or knowledge-based society in post-industrial Canada can only intensify this realignment within the labour force and its concomitant effect on family and community life. Within the family and the community, the traditional male/female role divisions are breaking down, either through necessity or choice; the implications of this for community and house design are as yet unclear, but it does suggest that a more realistic (and efficient) way of structuring community design and the provision of goods and services (both public and private) will be a consequence of the changing demands of two-career families and of living patterns which necessitate the availability of services and transportation beyond the conventional nine to five with late hours Thursday and Friday.

Increased female labour force participation, the rise of the service sector and information industries, and the changing consciousness and expectations among women as a result of the women's movement are forces which will both challenge and transform society as we know it. The advances in technology mentioned earlier and their implications for work and the workforce (and with it the economy) challenge one of the basic ethics of Western Society since the Industrial Revolution - the work ethic.

### Microelectronics and Telecommunications

For the purpose of this paper, the technical properties of the new systems made possible by microchip and telecommunications will not be examined. Rather, their impact on work, the workforce, and society will be discussed. However, to put the discussion into some context and to illustrate the rapidity and enormity of this "revolution," a quote from a recent conference on the subject is noteworthy:

The first electronic computer, the ENIAC, was demonstrated in 1946. It weighed 30 tons, required 15,000 square feet of floor space and contained 19,000 vacuum tubes. Now we have the equivalent computer available for \$10 and smaller than a Chiclet! [5]

The speaker went on to point out that the cost of computer memory was declining at a compound annual rate of 40 percent per year, computer logic by 25 percent, and communication by 11 percent per year. In contrast, the net cost of labour after productivity improvement has been rising at 6 percent per year.

The main areas of application for the new computers and communication technology are:

- i) Consumer home services - information retrieval, banking, shopping, alarm systems, two-way interactive services via cable T.V. (The value of this industry is estimated at \$125 billion by the late 1980s.)
- ii) Education systems - educational courses on computer tape and disks rather than textbooks, computer games to teach spelling, arithmetic, etc. These will also have application for job retraining and job enrichment.
- iii) Office automation - word processing and data processing will combine to create information processing which will create the "paperless office," where electronic memos will be the mode of communication within a company and eventually between companies, regardless of how geographically diverse their location is. (This is the area in which the greatest gains will occur; the productivity of the office worker has only

increased 4 percent over the past two decades and a desk, chair, and typewriter have been the only capital investment. This compares to a productivity increase of 85 percent for factory workers, with an investment of approximately \$85,000 in capital equipment per worker.)

- iv) Intelligent communication systems - computer handled message switching services. [5]

The growing information processing industry will require, by the late 1980s, that 15 percent to 20 percent of the labour force have some knowledge of informatics, and that 65 percent of the labour force will be in some way dependent on its use. An important potential of these advances for urban and regional planning is the opportunity they offer for work to be decentralized, or performed at home on a personal computer terminal, or at a local community computer centre.

The possibility of working at home has been hailed as the great liberator of the rush-hour commuter and those people who wish to combine paid employment and raising a family. The detractors warn of the emergence of an electronic cottage industry, with piecework again becoming predominant for workers near or at the bottom of the office hierarchy. They point to previous abuses made possible by this system, and warn that the rights and benefits of workers won by unionization could be dissipated if workers have no opportunity to come together collectively. Also, the isolation of women raising children at home would be compounded if their avenue for paid employment meant performing this work at home. In addition, it is unlikely that proponents of this scenario have ever tried to watch a toddler and simultaneously operate a sewing machine, let alone a word processor.

More likely is the scenario of neighbourhood or community centres with a number of terminals to which people would go to work, rather than commuting downtown. This would provide people with the opportunity for social interaction, and, it has been suggested, might create patterns of living where local community identity and affiliation became stronger, as union or professional associations declined. The gap between home and work would be diminished as the distance separating the two narrowed. This would also have implications for the reintegration of the male parent into child care and household day-to-day maintenance.

Another possibility offered by such decentralization of work is the resurgence of smaller rural communities, small towns, and outlying suburbs. These could become more self-sufficient and their quality of life improved if the range of services and amenities available in urban centres was available in smaller communities.

The potential for the re-use of existing space, especially schools

becoming vacant by declining enrollment and community and recreation centres where money is no longer available for programs, presents exciting possibilities. Facility planning, transportation, residential construction, and small town renewal are all areas of opportunity and research by planners.

The growing field of robotics (utilizing the same technology), also has profound implications for the future of work. Robots are already working on industrial assembly lines in several industries - and in many cases taking over dangerous, unpleasant or repetitive jobs - and will soon be capable of seeing, feeling, walking, and supervising other robots on assembly lines. In fact, Hitachi Limited of Japan has claimed that "in five years, we expect all blue collar workers to disappear from the assembly line. Factories will be manned only by clerical staff and a few maintenance technicians."<sup>1</sup>

Predictions regarding job displacement, employment erosion, and unemployment (both in the industrial and office sector) vary. Initially, new technology and the information sector will create many new jobs. One problem in attributing job loss to new technology and the information society is in the definition of the information industry, as information itself is a somewhat elusive product - you can't drop it on your foot; therefore, it is very difficult to specify what part of a company's output is information and what is traditional goods or services. Clearly, however, there will be dislocations in the structure of the workforce and the content of jobs.

Robotization and microelectronics will cause the labour content of jobs to decrease rapidly and drastically, while productivity will increase. These trends, coupled with slow economic growth, will create a situation where insufficient new jobs will be generated to absorb workers displaced by technological change. This leads to the phenomenon of jobless growth [11].

In occupations such as bank teller, telephone operator, and office worker, where 90 percent of the labour force is female, it is estimated that 30 percent to 40 percent of the jobs will disappear if present trends continue [12]. Further, these jobs and others in administration, as well as being predominantly female, are usually concentrated in major urban centres where where "office workers are highly concentrated into the civil service, local government, and the major towns. Any unemployment will not only be distributed non-uniformly across the population but also geographically and between public and private sectors" [11].

In addition to jobless growth, with unemployment concentrated in the female labour force, the third concern is with de-skilling and dehumanization of the job itself. This describes the process whereby a machine takes over an activity which was previously done by a skilled craftsman. The printing trade is an example, with phototypesetting taking over from traditional typesetters. Thus, segments of

the workforce are de-skilled to machine minders, while other segments are required to have more sophisticated programming, research, policy and decision making capabilities. Supervisory jobs, traditionally the medium by which a worker could be promoted into management, are being eroded as machines take over this function by means of monitoring the keystrokes per allotted time period. Less upward mobility is likely to be possible, with the workforce becoming more stratified between decision-makers and machine-minders, or workers whose only attribute is time and strength. The middle ground will gradually disappear.

### Social Trends and Planning Linkages

The pressures discussed above do not exist in isolation. They are intricately linked, each feeding on one another and affecting one another. In this section we show some of the links between technological change, incomes, land use, and urban development to further illustrate how social trends, social planning concerns, and urban land use planning are linked.

The disappearance of the middle ground in the workforce is paralleled by the residential construction industry, where the sale of new houses is strongest in the higher price ranges - where space, privacy and "exclusiveness" are at a high premium. Even in the condominium market, which has been functioning as a "starter investment" for many first time buyers or previous renters, this trend is now strong. Despite the current reluctance of federal and provincial governments to intervene directly in the provision of housing, it is becoming clear that the supply of accommodation is drying up for all but the top income brackets, which will put the governments in the position of having to fill the gap left by the private residential construction industry by building low cost housing as a last resort. This will result in a housing market of private housing for those of upper incomes and public housing for most of the others; the current middle ground of medium priced private houses will gradually be eroded in much the same way that a middle grouping in the workforce will be disappearing.

Trends in downtown renewal, especially in large urban centres, are to upgrade the quality and thus the price of homes, offices, warehouses. Neighbourhoods are gentrified and shopping areas serving low income people are renovated to attract a more affluent consumer. New shopping centres are decidedly upmarket; the urban structure (while frequently more visually attractive) becomes less supportive of low income people. The tourist trade clearly benefits, but the jobs generated by this industry are mainly minimum wage service jobs.

The erosion of the middle class and the increasing spatial separa-

tion of high and low income groups does not bode well for social stability in the future; the cost of this social unrest will have a very heavy impact on an economy already hard pressed to maintain reasonable levels of assistance and public welfare.

A real problem arises with the prospect of higher unemployment and a serious decline in family incomes. A dollar earned is also a consumer dollar which can be recirculated into the economy - a fact clearly understood by Henry Ford when he doubled his workers' pay and halved the cost of his cars.

While new technology can increase productivity (creating more goods and services), if consumer purchasing power is similarly decreased a serious problem of purchasing power arises. Jobs and purchases are traditionally the medium through which money is circulated through society. As Wassily Leontief recently stated:

The history of technological progress over the last two hundred years is essentially a story of the human race working its way slowly but steadily back into Paradise. But what would happen if we suddenly found ourselves in it? With all goods and services provided without work, no one would be gainfully employed, and being unemployed means - receiving no wages. Consequently, unless new income policies were appropriately formulated to fit the changed technological conditions, everyone would be starving amid plenty [8].

The income policy Leontief was referring to was a complex of social and economic measures, radically different from the social safety net provisions such as welfare, unemployment benefits, medical insurance and certain provisions of the tax system already in place in Canada today.

Work, as well as having obvious economic value, also confers identity and status upon a job-holder. The social disruptions which would be caused by a denial of these sources of self-actualization to all except a very favoured few would be immense. Roy Jenkins, in Britain, examines these possibilities in his recent book and calls for immediate action on two fronts: "preparations for the ever-increasing unemployment levels and the setting-up of mechanisms to ensure that the collapse of work is transmitted into a policy of leisure" [6].

At the micro level, the changes created by the technological revolution will have an impact in five areas.

- i) Increased Leisure Time: People will have more time available (but not necessarily more financial resources) for a broad range of recreational and leisure time activities. Indeed, even our definition of leisure will have to be re-evaluated.
- ii) Education and Retraining: Massive retraining of the workforce in the skills and knowledge necessary to survive in the information age. Greater emphasis on numerical skills and

quantitative techniques, with special streaming of schoolgirls and mid-career women to technological and scientific courses to mitigate higher female susceptibility to displacement by technology.

- iii) **Transportation Demand Changes:** As mass commuting becomes a thing of the past, and the wired city decreases the need for face to face business contact, priorities will shift to inter-neighbourhood movement, with adequate, accessible transportation for all a social objective.
- iv) **Settlements Pattern Shift:** As more work is performed at home, or at a community computer terminal, the convenience and merits of small town living (without the long commutation to an urban centre) will dramatically increase the development potential of small towns on the fringe of urban areas. The trend towards upgrading the downtown areas, referred to previously, could also result in the elite of the workforce remaining in downtown locations, enjoying the amenities of their clubs and exclusive shops and restaurants, while the machine (albeit microprocessor) operators, live and work in suburban and exurban settlements.
- v) **Human Services:** Although there may be a far greater pool of volunteers (predominantly women forced back into traditional roles by unemployment), the need for publicly financed human services is not likely to decrease; rather, in a society undergoing the profound transformation implied by the collapse of work, the need for crisis and support services will expand rapidly. Further, social services have traditionally been a way of ensuring social stability. In a society polarized between upper and lower classes (with no mediating middle class) social stability will be severely threatened.

#### **Adequacy of Current Planning Mechanisms**

The unresolved, although currently quiescent, debate on the relationship between social planning and land use planning, which in Ontario has taken the form of the appropriateness of social objectives in Official Plans, illustrates the quantum leap that planning must take if it is to cope with the scale of societal change envisaged by the above.

A discussion of social planning, and its relationship and legitimacy in the existing planning process will be examined first. Before that, however, a definition of social planning is offered.

#### **Social Objectives**

Objectives, principles, ideals, goals, are words which are used interchangeably by different writers. Different hierarchical models place principles ahead of objectives or vice versa, and the same with ideals and goals. For the purpose of this paper, we are using the term principles (or ideals) as the base from which more specific objectives (or goals) are determined. Thus, principles might refer to universal ideals of the "good life," equality, justice, or other moral values, while objectives deal more specifically with social content, consequences, and strategies of various plans. However, it must be borne in mind that the phrase "social objectives" is coming into use as a catch-all term for the values, assumptions, and hopes underlying both the content and the implicit and explicit expectations of various planning processes and modes.

The definition of social objectives most useful from the pragmatic viewpoint is that provided by Berger and Frisken:

1. The social assumptions and goals implicitly imbedded in the planning process itself. These include the predominant values of society, the political and social structures through which these values are made explicit, and the intellectual heritage of (municipal) planners themselves.
2. The social consequences which flow from planning decisions - both intended and unintended, short and long term [1].

Planning itself is more easily defined. The most appropriate definition is that of John Friedmann, who refers to planning as a form of "societal guidance [which] encompasses both the maintenance and change of social systems" and "these two facets of societal guidance - maintaining a complex social system in balance, and simultaneously including new performance characteristics through changes in some of the structural relations - interpenetrate in many ways" [4].

Land use planning, however, is generally what is meant by "urban and regional planning," as few, if any, municipalities or regions have a comprehensive plan beyond the Official Plan or master plan, which, while being concerned with the "health, safety, convenience or welfare of the inhabitants of the area" [17] is confined to the development and regulation of land within the statutory framework of the Planning Act. The public works programs to support this activity are set in the legislative framework of the Municipal Act.

Citizen participation, through public hearings or by deputation at various points in the process, is required by the Planning Act in Ontario. This public involvement usually tends to be in an adversarial role - objecting to change. It is important, however, to distinguish between citizen participation as "a political process (bearing a

genuine impact on the decision) and as a consumer process - where the marketability of the product is tested with a small and known sample of consumers" [18]. This latter is really what is understood to be citizen participation in land use planning by most professional planners.

Planning, as was pointed out by Eli Comay in 1973, is in fact "development control," exercised in a highly circumscribed legal and judicial process, where the main actors are lawyers, developers, planning professionals, politicians, and perhaps, finally, the public. Such planning can regulate and deter, but cannot create. "Pushing on a rope" [15:30] is how it was characterized at a recent conference, at which another speaker suggested renaming the Planning Act the Development Control Act; "then we could forget it and get on with some real planning" [2:13].

### **Social Planning**

Social planning, by contrast, can be referred to as that part of planning which is not part of the Official Plan process. It can also be referred to as conspicuous by its absence.

The concept of social planning emerged in relation to charity work. It had to do with the raising and distributing of private charity dollars, and was therefore voluntary and non-governmental. Various agencies and organizations "planned" for their particular service domain according to what their budget and their voluntary boards deemed appropriate.

From these beginnings, public (governmental) involvement and funding of both services and planning has grown until it is now estimated that 58 to 60 percent of the municipal tax dollar is spent on human or soft services [22]. Provincially, this proportion is estimated at 64 percent [21]. At the level of federal spending, an O.E.C.D. report for 1974 found that of the G.N.P. in 1974 19 percent went into human services. This figure excluded recreation, corrections, manpower services, and some housing services; if these were added it would increase by approximately 5 percent, bringing the total expenditure up to nearly one quarter of national spending [19].

Despite this heavy investment, a framework and process as clearly defined (legally, judicially) and practical as that of land use planning has yet to emerge. Indeed, even definitions of what social planning is vary from narrow service delivery planning to the sentiment expressed by the Government of Ontario that "from the broadest perspective, social planning is seen as concerned with all aspects and consequences . . . and even with society as a whole" [16]. Social planning can most usefully be defined as a five step continuum from welfare services planning to broad human development/social well-being.

The jurisdiction and mandate for this planning continuum ranges between the federal government, the provincial governments, regions, municipalities, voluntary agencies and community groups, and, in Ontario, comes under some sixty-two separate Acts. What passes for "planning" is carried out by service review mechanisms, which function at the federal, provincial, regional, municipal, and voluntary/private level.

As can be imagined from this description, Stephen Lewis' characterization of service planning delivery is shared by many: ". . . a discombobulated shambles . . . so complex that Einstein himself would have sought assistance. The jurisdictional tangles are positively Byzantine [9]." Further, this covers only that part of the continuum of social planning which is concerned with its more specific aspects. The quality of life that social planning seeks to ensure for all can hardly be assumed to be present in what results from the "discombobulated shambles." Compared to this, land use planning seems as simple as playing snakes and ladders.

### **The Relationship Between Social and Land Use Planning**

Despite the distance between the two planning disciplines - a distance of process, practice and tradition - there are clearly links. Land use patterns and the built form are never neutral; they either facilitate or impede the quality of daily activities carried out by residents and users. There are social consequences which flow from built patterns. For example, low density suburban development can create a sense of loneliness and isolation, especially for transit dependent populations (teenagers, the poor, the elderly, the handicapped). This can necessitate the "adding on" of compensatory human services, or an increase in the capacity of public transit to provide access for this population to other more normative forms of support and social contact [20].

Practitioners of both disciplines are beginning to overlap. Land use planners are discovering (or rediscovering) the importance of the neighbourhood, a sense of place, an emphasis on participation, and of the neighbourhood as a locus of social experience. Concurrently, social planners are recognizing the importance of "setting" in the delivery of services, especially in the move towards affinity-based services, deinstitutionalization, and networking as a service mechanism.

The concept of "environmental fit" or "congruence" as against a direct cause and effect relationship is one which has been explored by William Michelson in Canada, and David Popenoe in the United States. This concept suggests that the physical environment alone cannot achieve that elusive quality of life or even encourage certain specific activities. For example, the availability of park space does not

mean that it automatically will be used for picnics, sports, etc.; all that is certain is that without that park space, such recreational activities cannot take place.

Although the issue of financing and cost/benefits has not appeared in any formal response by the Province, in an era still strongly influenced by the Henderson Report on Government Productivity the government is not willing to place itself in a position where it is vulnerable to increased financial demands from municipalities for services for which a direct cost/benefit advantage is difficult to prove.

### Critique of Current Planning

The above definitions and quick summary of the current status illustrate, in our minds, the shortsightedness of attempts to broaden the content of official plans to encompass objectives, planning, or services whose origin, mandate, and jurisdictional basis is convoluted, diverse, and rooted in traditions, data bases, and procedures which are hardly conducive to the legal and economic criteria such as are used in the practice of land use planning.

Given the complexity and uncoordinated nature of the process and practice of social planning, any attempt to graft it onto the traditional legal framework of an official plan would be impossible. Further, the data base, language and even the principles on which social planning is based would not fare well in the adversarial forums in which land use planning takes place. The constituency of lawyers, market analysts, planners, and developers which has been built up around this process would steamroller effectively and quickly the diffuse and qualitative data base and practices of social planning and its constituency of social workers, academics, community and voluntary agencies, and citizens groups. However, somewhere in this morass of complexity and dysfunctionality, planning of a scale and an efficacy to cope with both the emerging pressures discussed in the earlier part of this paper and with the looming inevitability of technologically induced restructuring of society must be found.

While the definition of planning is still acceptable, the ways in which this definition is operationalized - both the theoretical base and the jurisdictional framework - must be reconstituted. Also, and perhaps more important, a new involvement, consensus and consent between people, planners and policy makers, must be established.

### Conclusion

For planners then, this dawning revolution implies an even greater

need for policy planning at the macro societal (economic and social) level, within a framework of clearly articulated principles and social objectives. A sweeping and massive income distribution program, to support the unemployed and to enable the dollars earned by increases in productivity to be shared across society and to circulate through the economy, is needed. Such a policy would subsume regional disparities and would need to be within a federal framework. It is hard to contemplate such a policy at the present time; in the present political climate current income transfer programs have only grudging public acceptance. However, in the long run, if technological advance is to be used to benefit society as a whole, a paradigm shift in our values and expectations regarding work and individual responsibility, as against cooperative and collective enterprise, will have to take place.

As the foregoing has suggested, the scale and pervasiveness of the coming technological revolution and societal change requires public policy making on a scale unprecedented and (in our current political context) probably unacceptable. However, the free market (the invisible hand) and the aggregate sum of private and corporate decision making can no longer be allowed to make choices which form, de facto, public policy.

The relationship between structural change in the workforce and the workplace made probable by technological change, the income disruption and widening disparity of lifestyle and economic position, and the patterns of settlement (both macro and micro) are clear.

The scale and complexity of the policy making required is clearly beyond the capability of the current mechanisms for economic, social, and land use planning. Debate regarding the place of social objectives in official plans becomes akin to rearranging the deck-chairs on the Titanic in view of the massive and dramatic demands about to be made upon our apparatus of planning.

The promise and the advantages of the change facing us could well be dissipated into confusion and disaster for all but a few if we do not start to see further than a status quo which is unsuited even to the problems of today.

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