TELECOMMISSION

Study 6(d)

Report on the Seminar on the Wired City

The Department of Communications

STUDY 6(d)

SEMINAR ON THE WIRED CITY

University of Ottawa - June 26,27,28, 1970

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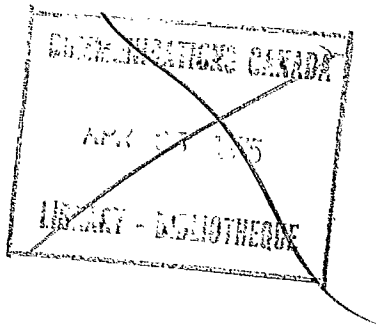

This is a Report on the Seminar and does not necessarily represent the views of the Department or of the federal Government. No commitment for future action should be inferred from the recommendations of the participants.

This Report is to be considered as a background working paper and no effort has been made to edit it for uniformity of terminology with other studies.

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Introduction: The How and the Why

"IN GENERAL, TO DETERMINE HOW ADVANCED TELECOMMUNICATIONS TECHNOLOGY CAN BE USED TO MEET THE NEEDS OF CITIES AND HOW SUCH TECHNOLOGY WILL SHAPE THE NEEDS OF CITIES; AND IN PARTICULAR TO CONSIDER THE DESIRABILITY, FEASIBILITY AND POSSIBLE SCOPE OF PROPOSALS FOR A WIRED CITY PILOT PROJECT INVOLVING GOVERNMENT, INDUSTRY, AND UNIVERSITY PARTICIPATION": From the objectives of the Seminar on the "Wired City".

There is some argument whether or not the term "Wired City" is a useful one and more argument about what it means. The origin of the term is unknown (certainly, no poet coined it) and its principal value seems to be that it has passed into common usage.

Obviously, all cities now are wired. Indeed, looking at the tangle of overhead spaghetti that disfigures urban landscapes, most seem to be overwired. "Wired City" clearly means much more than this. It means a quantum jump in communications technology - and a corresponding change in the social environment. It means, in practical terms, communications systems so complex and sophisticated that children can be educated at home, housewives can shop at home and businessmen, even if they do not work at home, can conduct their business via videophone, closed-circuit television or high-speed data links. For computerized information utilities are an integral part of the city of the post-industrial society.

As for the technology which will bring this about, some aspects will involve actual wires (as in the case of cable systems designed to provide upwards of 60 TV channels and two-way audio-visual communications).

Other - like lasers and satellites - will not. And some forms of communication like home video machines will not use telecommunicatons links at all.

This was the kind of "Wired City" considered by the 120 delegates who attended a three-day Seminar held in mid-June at the University of Ottawa, sponsored jointly by the Department of Communications, the Ministry of Transport and the Central Mortgage and Housing Corporation as part of the Telecommission. Participants examined not an existing city - or an existing system - but rather a series of probable models for future communities and their systems of communications. "Future", it is important to note, was defined as being 10 to 15 years from now. Equally important was the question of feasibility: Could the

various models be built? And for what purpose? And if built, either as part of a rational plan or as a blind response to commercial and technological forces, what would be their social and environmental impact?

The Architecture - Cable and Telephone

The basic components of the Wired City have been with us for some time. In fact, Canada has one of the best-developed communications systems in the world. There are two principal elements: 1) a switched telecommunications network connecting some 9 million telephone subscribers from Newfoundland to Vancouver Island, and used for many purposes besides voice traffic: TWX, Telex, telegraphs, data-transmission and a limited amount of facsimile reproduction; and 2) a broadband cable system (CATV) reaching over one-quarter of all urban Canadian households[1] and ultimately capable of bringing 25 and more channels of color TV into the average home. The rapidly-spreading CATV systems are also "broadcasters" in the sense that everything -- information or 'noise' -- in the system flows one way: from the operators' antennas or studios to the subscribers' TV sets.

Postulate now that the flexibility of the two-way switched telephone network could be integrated with the massive broadband capacity of the coaxial cable network. The effect would be to give each household a 'total communications' capacity. And this, it was argued at the Seminar, is technically possible.

In fact several elements of the "Wired City" already exist. Tele-shopping is now a reality -- in San Diego, California. In the next few years videophones will come on the market in Canada and home video recorder/playback machines were due to go on sale before the end of 1970. National data banks are already being planned. In fact, one of the most advanced banking information systems in the world - the interactive system of the Bank of Montreal which will link central computer processing facilities and automated storage files to terminals in all 1,000 branches - is due to be completed within the next five years.

It is true, of course, that, as yet, neither existing cable systems nor the Bank of Montreal project meet all the requirements of a true wired city. Though the Bank's system will be multiple access design it will be privately owned and used only for the Bank's purposes. And the CATV service available to the general public is heavily restricted: it does not, for example, encompass two-way communication, and CATV operators have not opened up their one-way capacity for use by individuals or the community as a whole. Equally restrictive is the fact that the various CATV systems do not interconnect.

1 Canadian Radio-Television Commission, Cable Television in Canada, Jan. 1971.

Perhaps it would be realistic to say that we have arrived at the outskirts of the wired city. But simply to point out that the technology like Everest, is there, that it is already being used to some degree, and therefore total communications is inevitable, is to miss the whole point of the Seminar.

But the Wired City -- with its total communications capacity -- is not simply a technological concept, or even an economic concept - although every new service, from tele-mail to video-phone, will have to prove its worth in the market place. Above all, the Wired City has a critical social dimension. If knowledge is power, then making information available in massive quantities to all citizens by way of individualized two-way information systems - demand television; information retrieval; computer-aided instruction - could effect a major change in the power structure. And then again, what would be the social effects if - as more than one delegate posited - the concept of separating hardware owners from software - or program - producers become accepted? Certainly, programmers would have much greater editorial freedom and private individuals would have the opportunity to originate their own programs instead of only receiving those of others. The difference, in a nutshell, is between active participatory democracy and passive participatory democracy.

The Consequences

A major concern of the Seminar was the impact of "total communications" on social, cultural, economic and political structures. Delegates discovered however, that it is not easy to decide how to measure the impact, nor to predict the good and bad consequences, of something which has not yet happened.

While much can be learned from studying the partial systems that already exist, they can provide no more than partial answers. Hence the idea of a pilot "wired city" study which was introduced at the outset. As the Seminar Chairman explained, the project need not involve an actual wired city "set in concrete" with white-collar residents working on their basement terminals and housewives ordering up their week's groceries by a wideband communications system. Instead, some of these studies could be undertaken by computer simulation, and many others could be conducted at different times and places.

Is the Wired City important enough socially, politically and economically, to justify systematic study, before it happens of its own accord? Will such a study enable society to ward off its worst consequences and capitalize on its best features? Should the Government be concerned only with the commercial and

technical efficiency of the system and not with its possible sociological and ecological by-products?

The overwhelming feeling of participants - the majority of whom were sociologists, educators, architects, urban planners and social workers - was that it is essential to develop technology to meet society's social, political, cultural and economic goals, and above all to make certain that the machine liberates man, instead of dominating him. No participant expressed this view more strongly than the keynote speaker, Professor K. Izumi, head of the Human Information and Ecology Program of the University of Saskatchewan at Regina.

The Meaning of Life

"As the inhumanities of man, particularly towards man himself continue unabated, the assorted violence, murder, suicide, riots, war and even genocide and lesser but just as inhumane psychological murders", said Izumi, "some are raising questions which shift our thoughts from our preoccupation with the survival of the species to the survival of individual man himself, to the meaning of life from the means to life."

The line between man's outer and inner environnement "is often indistinguishable, as our scientific colleagues learn more about the psycho-biochemistry of man." But while we can measure man's basic environmental needs, like the amount of food, air and water necessary to sustain life, there are dimensions of man's inner environment which do not appear to be measurable, at least by existing techniques. But some people say these qualities should not be measured, even if it were possible. "These inner environmental qualities of man are his sense of kindness, politeness, tolerance, compassion, reverence for life, in short, that sense of humanity that distinguishes man from the other animals."

"The essential human information on which this enlightenment is based has been acquired through a variety of human experiences in which other human beings were involved in some meaningful way, be it the market place, the theatre, temple or church, school or arena, but where the human experience is a confrontation which permits the infinite varieties of social relationships and behaviour and which is perceived as directly as possible without the adulterating influence of any media...the essential understanding of man stems from that kind of direct communication that requires no media."

Yet the economic, administrative and legal structures which determine man's physical environment are also stratifying and separating man from man and not just inhibiting but

prohibiting many desirable and increasingly essential face-to-face social relationships and human experiences.

The scientific and military principles which say "isolate and examine, divide and conquer, manifest and permeate all our social techniques including those that build our physical environment. And these abstracted concepts of order are more often than not at odds with the more important psychic order of man."

Izumi discussed the ways in which telecommunications can help build an urban environment which facilitates and enhances "essential human experiences". First they can "release us the ever-increasing time-binding routines of our daily lives... banking, making appointments and reservations, staple shopping...that interrupt and disrupt more creative activities in which we are and want to be engaged."

Izumi looked forward to the day when our moods and needs dictate the time to "tune in" to information or entertainment resources which "reinforce the face-to-face dialogue. This is particularly important in the learning situation, though what life experience is not? I must emphasize, that this resource is not to be substituted for the face-to-face dialogue as the industry tends to suggest. It is to enhance that essential human experience by extending, expanding and focussing our perception."

"As we free ourselves from the binding parameters of time and space through the appropriate use of this technology," Izumi concluded, we will be justified in "replacing the commercial and related facilities in the core cities with a more important setting that reflects the necessary shift from our preoccupation with the means of life to the meaning of life."

The How and the Why

The same concern was felt by the Minister of Communications, the Honourable Eric Kierans, when he opened the Seminar. "The concept of a Wired City", he said, "arouses two general and fundamental questions. The first is "How", how can it be done, with what equipment, at what price, available over what time frames. The second question is "Why", and it is the only question that really matters. In part it is redundant: Many of the components of a Wired City are already upon us and the task is that of drawing them together into an integrated whole and of making the new range of services more widely available. And so in a sense the "why" question becomes a "how" question also, but of a different order -- how can we shape this awesome technology to our social needs and objectives instead of allowing it to determine our objectives for us, and how can we make sure that we really are increasing the sum total of human

communication instead of simply increasing the speed, volume and efficiency of mechanical information exchange?"

For three and a half days participants examined the "How" and the "Why" of the Wired City. The "How" proved the easier question, yet even there the experts were divided about whether the answer lay in a single, switched coaxial cable system, or a hhybrid system combining an improved telephone network and an improved, but non-switched cable system.

Among the crucial "Why" questions raised were: the social and psychological effects of the shift from personal communication to telecommunication; the effect on home life of electronic education and automated shopping; the impact of two-way, individualized communication on social and political processes; the matter of whether communications can or should replace transportation, to some degree; the possibilite of using communications to create new communities within cities, or to revive dying neighbourhoods.

These issues were raised during a series of panels and succeeding discussion periods on Technology; The Urban Social Environnement; Urban Commerce; Urban Transportation, and The Urban Physical Environnement[2]. At the close of the Seminar, participants met in plenary session to hear the reports of the workshop groups and to try to agree on the steps which should be taken, by government, industry and universities.

Most participants felt that, before any pilot Wired City project was initiated, a series of preliminary studies were needed to identify both the principal opportunities and the potential disruptions telecommunications would be responsible for. Among the areas suggested for early and intensive study were communications - transportation, and two-way - one-way communications. On these matters, as on most others, panelists and participants came up with more questions than answers.

2 A list of panelists and terms of reference for the Seminar is contained in Appendix 'A'.

PANEL I

BUILDING THE WIRED CITY

The purpose of the first panel was to suggest "how" the "Wired City" might be built. But before discussion began, the chairman, Professor M. Krieger of the Electrical Engineering Department, University of Ottawa, warned that it is difficult -- and perhaps impossible -- to discuss how a system might be built unless one knows what purpose it is to serve. The papers presented by the four panelists showed that all had recognized this problem.

Dr. John de Mercado, of the Department of Communications, proposed a definition of the wired city that many speakers were to adopt during the Seminar: "It is customary to think of a future city with a total communication system as a "Wired City". Where total is used to imply that the number of services that the system could provide is limited only by the imagination and pocketbook of the subscriber." But while de Mercado thought such a system might be possible within 10 to 15 years, he said that, individually, neither the telephone nor CATV has the capacity for "total communications."

"The telephone system, although highly developed and employing sophisticated and complex swithching techniques, suffers from the limitation that it utilizes pairs of copper wires as its local distribution facilities ("loops") ... only suitable for handling signals of the telephone or low speed data type."

Existing CATV systems employ coaxial cable which "can potentially provide more than 300 times the space (spectrum) of a copper pair. However, most existing CATV systems are usually laid out in grid fashion, and are specialized to the one-way distribution of broadcast type signals; therefore, these systems cannot be readily adapted to provide other telecommunication services requiring two-way transmission and switching (for example, telephony, computer aided instruction, etc.)".

Dr. de Mercado said it is possible, "at least conceptually", to significantly increase the telephone system's capacity by replacing its copper pairs with coaxial cable, thereby forming a switched coaxial cable system. "The British Post Office is convinced that this is a viable concept", and have an experimental system operating in their laboratories at Wembley. It is seen as the forerunner of multi-service coaxial cable systems to be installed throughout Britain during the next 20 years. However, the Dutch Post Office have come to the

conclusion that it is impossible to intergrate their television and have abondoned the idea.

"A switched coaxial cable system would have the same philosophy of operation as the existing telephone system," and it could accommodate such services as:

1) Advertising
2) Alarm (burglar, power failure, fire, etc.)
3) Banking
4) Facsimile
5) Emergency Communication
6) Communication between Subscribers and Computers
7) Meter reading (utilities)
8) Distribution of Radio Programmes
9) Shopping from the home
10) TV (origination and distribution)
11) TV (stored movies, available on demand)
12) Educational Television
13) Telephone
14) Computer Aided Instruction
15) Picturephone
16) Voting

"To determine the demand for, and use of multi-service intra-city cable communication systems," a pilot project should be built, within five or six years. "From a purely technological point of view, there are no insurmountable limitations to the degree of sophistication of the experimental system. The real problem is the high cost, which tends to increase exponentially as a function of the number of services". And in reply to a later question, Dr. de Mercado estimated the cost of a fully wired Canada at $70 billion.

Alex Curran of Northern Electric Company Laboratories accepted the feasibility and desirability of building a pilot "Wired City". His paper considered the technological development necessary for a system providing telephony, broadcasting capacity, two-way point-to-point video communications (videophone), information retrieval and data services. The system he proposed was a hybrid of paired-wire technology and coaxial cables.

In the Canadian telephone system today, the average loop length is about 2-1/2 miles. The material only cost of this loop facility is just over $100 and the inplace cost is not more than $150. Apparently then, the telephone modulation equipment for the wired city subscriber should cost no more than $150 and should preferably be closer to $100."

However, "the most inexpensive subscriber channel available today uses analogue frequency division techniques. The cost is about $450 per channel. Time division (digital) terminals today would cost more than $1,000 per channel, primarily because no significant effort has been made to apply them to the subscriber service.

"To make it attractive to incorporate the telephone network into the wired city communications system, it is highly desirable to offer a four-wire network, digital if possible. The cost of this new facility, however, must not exceed the cost of today's network for the service is satisfactory to the great majority of subscribers." Therefore, additional costs would have to be borne by the new services which an improved telephone system could offer.

"In creating the wired city we must also ensure that the telecommunications network will satisfy the user's needs for privacy." Considerable ingenuity will be required to design a subscriber's terminal which is sufficiently "tamper-proof" that the privacy of information is essentially equivalent to that of today's telephone network.

Similarly service availability has not been a serious problem in existing telecommunications networks, and widespread service disruption has been very rare. But "in a wired city service, disruptions will be much more critical." A fault on the distribution cable will interrupt all telecommunications services to a group of perhaps 150 subscribers who will not even be able to report the service failure.

"Obviously equipment must be designed to monitor the performance of the disbribution network to give warning of actual or imminent failure, and to localize accurately the position of the fault".

Claude Frémont, Deputy Director of the Department of Physics at Laval University and head of the University's Audio-Visual Centre, believed that the wired city is imminent, and "we need to start planning it now."

In particular, planning is essential in the field of electronic education: "A two-way communications system equipped with several channels would not only permit an individual school to choose appropriate courses for its pupils but it would also allow students to receive supplementary explanations from human, or even from electronic 'tutors'". At the University of Illinois, for example, the Plato System has put students and computers in an essentially tutorial relationship.[3]

3 D.L. Bitzer, B.L. Hicks, E.R. Lyman. "The Plato System: Current Research and Developments. IEEE transactions on Human Factors in Electronics, Vol. HFE-8 No. 2, June 1967, pp 66-74.

Professor Frêmont suggested that the educational network will eventually be linked to industry, to the benefit of both management and workers. "The university-industry relationship will become more and more important in response to the needs of updating information and retraining".

"Tele-teaching" by computers may make it unnecessary for students to be on campus for the first two years of their degree courses, with the possible exception of laboratory of seminar sessions. In the later years however, where there is more specialization and classes are smaller, it would probably be more economical to bring students to classes.

Improved communications could benefit other fields. In medicine, there is the possibility of remote diagnosis over telecommunications lines and computer-assisted diagnosis. Better communications facilities could also make contact easier between academics from different disciplines and different campuses, and help bridge the gaps created by ever-increasing specialization.

As for some of the technical considerations of the wired city, Professor Frêmont suggested that, whatever the system used, "in the first stages of development most of the information will probably flow one way from the centre to the users and only one voice channel will be needed for the return link. But in the second generation of terminals visual information will no doubt move in both directions." The system could be suppelmented by a second cable of smaller capacity which would be switched and two-way in the same way as the telephone system is today, and able to carry audio as well as visual material.

Frêmont's notion of a hybrid system was shared by other speakers at the Seminar. But as Israel Swytzer of MacLean-Hunter Cablevision Ltd. suggested, competition between corporate entities with vested interests in different systems might be a greater obstacle to building the wired city than the difficulties outlined by the technologists.

W.G. Pither of the Welsh CATV Group in Vancouver, said that "if CATV was left alone it would continue to prcvide a basic entertainment service with some embellishments and technical refinements in the future." But this comfortable world could not last long, even though "many people within the industry want it to do just that." Already CATV is changing "from a passive receiver to a hybrid service." The CRTC's licensing regulations

are forcing CATV operators into programming and technological advances will transform their services into a multi-faceted industry.

As de Mercado had done, Pither pointed out the limitations of the existing CATV and telephone systems. He went on to suggest a judicious allocation of services to each of them - presumably by some independent authority - over the next 15 years. If such a division could be agreed upon, he foresaw an era of "peaceful coexistence" between CATV and the telephone companies.

To the CATV broadband cable he assigned such services as television and radio, shopping from the home, traffic and crime surveillance. To the switched telephone system he offered the telephone service, including picturephones, meter reading, burglar and fire alarms, plus banking and voting from the home. Services which both systems could provide - like facsimile transmission - he said should be offered by both on a competitive basis.

Within the next five years, Pither suggested, like de Mercado that a pilot project could be tried in a new community. Cost studies of a prototype system had been done by others, and it appeared that costs would be about three times those of the two separate systems. But the cost per user is "probably not a factor when weighed against the technological and sociological results... Much valuable information and experience would be gained. Not the least important would be the sociological effects of what amounts to a technological invasion of the individual's privacy." The number of homes connected to the pilot system need not be more than 1,000 and could be as few as 100.

In the first phase, a CATV system would be built, using "buried plant, two-way amplifiers, extended bandwidth devices." A variety of one-way services, not requiring swithching, would be offered. Subscribers would be connected by cable to a central office where, eventually, switching equipment would be housed.

The second phase would bring two-way services which do not require switching, and the third phase "the more difficult provision of two-way subscriber-to-subscriber switched services."

Because of past differences between cable television and telephone companies, it seems that the federal government would have to sponsor this project." Otherwise, "it is doubtful whether we will see either industry develop a switched coaxial cable system, or if they did, put it into use in Canada during the next 15 years."

Canada is currently in the vanguard of coaxial cable development. "Let us not lose our leadership by complacency, lack of capital, foolish jealousies, stifling regulations, and overcalculation.

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The discussion period which followed turned almost immediately to questions of policy. J. Alphonse Ouimet, Chairman of the Board of Directors of Telesat Canada Corporation, said Canada cannot afford a multitude of cable installations, and in fact needed a unified system. At the same time, steps would have to be taken to ensure that ownership of cable hardware would not mean monopoly control over programming or usage. Would it not be better, asked Ouimet, if CATV companies were owners of a hardware system which others used to distribute programs and various services?

PANEL II

A City is for People

If the technologists and policymakers of telecommunications faced the question of "How" on the first panel, on the second the social scientists grappled with the issue of "Why?" The tone was much less optimistic. Indeed, one panelist titled his paper "Beware! Wired City Ahead". A sort of Luddite angst hovered over part of the discussion - an image of total communications as totally inhuman.

Dr. David S. Abbey, of the Ontario Institute for Studies in Education, whose paper carried the pessimistic title quoted above, set the mood for the discussion:

"I am excited by the possibilitées of designing an urban environment which provides the potential for interaction through a distance; but I am fearful that more telecommunications gear may lead to more action at a distance. I am excited by the possibilitées of extending (or creating) educational environments beyond the traditional physical structures of schools: but I shudder to think of the exponential rise in costs as each new service is added. The possibility of taking the town Council meeting into the living room foy amall group discussions is encouraging: but the inability of very mary groups to react in real-time and simultaneously discourages me. I want adults to be able to enjoy leisure as a productive (or escapist) commodity: yet I see the effects of large ingestions of TV pap on all sides."

Abbey described four possible facets of life in the Wired City:

(1) "A wired city which had no direct feeds from or to other parts of the province, or one in which line charges to these were excessive but which had easy communication within itself could foster a real sense of "We" as opposed to "Them." The community would turn in upon itself.

(2) "A similar "logic" can be followed to create a neighborhood. If local shopping, banking, discussion groups, educational facilities CAI), library research and access, production of drama, sports coverage, etc., are fed around on a small grid with one or two foci (head ends) and only a few lines to go out to the city centre then a real sense of the neighborhood might be fostered.

(3) "Conversely, a sense of nationalism rather than provincialism might be fostered by providing for various

communities at a distance to pick up or feed into some long haul transmission facilities. What CBC Radio and Television do for their portions of the spectrum might also be attempted for some of the services noted in (2) above.

(4) "The wired city can strangle us all, too... If the wired city becomes more of a reality and we add all the peripheral equipment now possible, we had better do something about teaching John Q. Public how to use it. How many non-college types know what a "See Also" card is? How are they going to interrogate a system?

"I'm afriad the answer is that many people will back off from the potential of the wired city, and will retreat into the safety of the personal world that they can smell and feel and see. Thay may not pay the mill rate; they may refuse to subscribe if services are offered to them; they may even buy in initially and them become disillutioned. If we design our cities on the assuption that wiring will bring about community and productivity then we better work hard at helping people to understand how to plug in."

Dr. Daniel Cappon, Professor of Environmental Studies at York University, said the crux of the matter was "both the basic conflict and the intimate relationship between mass telecommunication and mass transportation, public and private."

"If the world increases its already intolerable overcrowding and pollutions, and if we can't do any better than using motors like cars and ultrasonic jumbo jets, and if the city continues to spread and sprawl then we shall prefer mass telecommunication and staying at home (even while working). This will mean escalated alienation, dropping out, opting out, indifference in the street, family break-up, interpersonal neurosis, socio-political fragmentation from regionalism to the block, the apartment, the house; the gamut of city malaise. Ultimately, in the circuit of "wired cities", there'll be no massive need for schools, places for assembly for education, no need for offices (e.g. filing cabinets) no need for the actual market place (it will be contained in the network) no need for parliament. And no need for extensions of our legs - transportation.

"If, on the other hand the Earth, the countryside, the city became once more a pleasant place to live in, to visit, to circulate in, the need for mass telecommunication would be reduced; people and the family of man might become re-united."

Gail Stewart, an Ottawa economist, was more optimistic than the previous speakers.

"It is currently fashionable to fret a bit about the social implications of the wired city, as though there were some real danger that we might be worse off with two-way communications capability than we have been with predominantly one-way channels. The wired city will not solve all social problems and admittedly may even create a few of its own. To focus upon minimizing these, however, rather than upon developing to the full potential net benefits of the new technology, is to invite a mediocre response to a magnificent opportunity."

Clear policy and sound planning could create a system where social objectives, rather than technical and commercial requirements, were dominant.

"Let me say right away that I am not making a simple argument for public ownership -- I am making an argument for a planned mix of various methods of social control over the communications industry in pursuit of certain defined objectives. Social control policies in my definition include competition policies, various kinds of regulation, and certain forms of government encouragement or discouragement of private industry."

"The environment in which we live is increasingly the product of human decisions and under human control. Forethought and care in its development are increasingly necessary letting events take their course increasingly risky. In more and more fields we shall have to proceed by defining our social objectives -- by specifying the kinds of environment we want -- and then moving to achieve it."

Mrs. Stewart defined six social goals for wired city planners:

1. "The needs of the ordinary private citizen would have first priority in building the wired city, and it would be responsive to his needs in a continuing way.

2. "The wired city would have two-way communications capabilities, with an electronic retrieval capacity which would reduce the potential market for devices which attach to television sets but rely upon physical pick-up and return of videotapes for home viewing." Incidentally, the system would contribute to "the erosion of broadcasting and of advertising. Both become second-best forms of communication in a two-way environment, and it seems likely that both can dwindle to a vestige of their importance today without great social loss."

3. "Among the organizations collecting and distributing information to the public there would be at least one which did not have a vested commercial interest in the use made of that

information, so that public access to factual and unbiased information would be protected.

4. Control of communications facilities and of information stored and carried by them would be in separate hands.

5. Government officials responsible for social control of the communications industry would not also be responsible for promoting the health of the industry.

6. The wired city should also:

- Show special concern for the problems of low-income families in acquiring and disseminating information;

- have a clearly bicultural or multi-cultural character;

- "provide special opportunities for those who operate it to acquire knowledge, develop skills and use their initiative for its imporvement."

A major obstacle in the way of achieving these goals was the division of constitutional responsibilitêes which "does not reflect any reasonable classification of the needs of the individual citizen, the general public, of industry in the communications field." The citizen has no protection "unless there is either perfect coordination between governments or, failing that, one government, the Federal Government in this case, undertakes to think and plan for the whole body politic." But the Federal Government is not responsible for all the communications policies affecting the public.

In the circumstances, it is important to have strong and effective agencies "which do have sufficiently broad terms of reference to represent the public adequately in the formulation of public policy. The government policy mix must embrace the support and encouragement of such organizations."

"It would appear that competition has an important role to play in the communications field. Revision and up-dating of the Combines Investigation Act should have high priority." Special encouragement may have to be given to "particular activities which are highly productive for Canadian society as a whole, but because of the peculiar characteristics of information as a commodity, cannot attract adequate private investment." In such cases, government support should be considered.

"I have argued for encouraging greater public awareness of and involvement in the policy-making process which will lead

to the wired city. As the Telecommission draws to a close and the process of policy formulation proceeds, I hope that special steps will be taken to inform and involve the public.

"In particular, I think that the early and deliberate creation of a non-profit community information clearinghouse and network would be desirable... it seems to me to be the core system of the wired city. It might indeed form the basis for a wired city pilot project involving government, industry, university and public participation."

In the following discussion period, Prof. Thomas McPhail, a sociologist from Loyola College, expressed disappointment at the "wholesale buck-passing" by his colleagues who did not believe in the merits of a two-way communications system.

Both Dr. Abbey and Dr. Cappon responded that not enough long range research existed on which conclusions about the environmental impact of communications could be based. Dr. Cappon believed there should be much more social research conducted, and added that there might even be some economic justification since software was becoming an increasingly important element in the cost of new information systems.

PANEL III

Commerce in a Wired City

The wired city may be coming, but how soon and in what form depends largely on cost -- and on what the customer is prepared to pay.

M.F. Anderson, General-Manager of Simpson-Sears Ltd., began by warning his audience: "Consumers have a most disconcerting habit of confounding the most elegant technology by acting like people." He recalled the uproar some years ago when the telephone companies abolished exchange names and introduced the seven-numeral telephone number. Hopefully "the next generation of consumers will be more rational in their assessments of the need for those technological changes which disturb the familiar."

In the wired city, "the data set in the home will be a more powerful instrument for transacting business than it is today," Anderson predicted. It will have a convenient automatic transmitter "to expedite the handling of fixed data pertaining to both the household and the supplier." It would be similar to the present card dialer, although much cheaper. For routine merchandise purchases, the kind where 'shopping' is neither easy nor fun, I would expect an extension of the present catalogue selling techniques, using this data set." It will be relatively simple for the householder to connect with the store and transmit a charge account number, or bank account number, his address code and his telephone number. Then he would key the quantities and catalogue numbers of the acticles desired.

When shopping for items bought repetitively, like groceries, the householder might well retain a file of plastic 'cards' capable of activating the transmitter. A catalogue and the keys would be used for other purchases. "The householder will have accessible cards to call the doctor (presumably for advice and instructions -- not for a visit), the police, the fire department and so forth."

Anderson questioned whether cable systems could be economically converted to two-way communications and said: "It would seem more probable that cable channels will be used to supplement catalogues and cards files. For example: daily specials from the food distributors might be shown and described in a certain time slot each day.

The data set could also give the householder access to data banks - perhaps for consumer information. "It has been predicted that public libraries will extend their function by refining and organizing data instead of merely storing documents

for others to search... Use of the data terminal to reach such a public data bank would be relatively straight-forward, and key information would be sent back by audio response.

"Private data banks could be accessed in the same way, and banking and other account information could be made available, although provision would have to be made to secure private information from electronic prying."

Are these domestic communications systems gimmicks or truly useful developments? "It is my position that the inherent conveniences and economics are very useful indeed."

"The policies of all levels of government should be those that will hasten such inevitable developments -- not retard them."

telephone system a common cable system and they

Michael Hind-Smith, Vice-President of Media and Broadcasting, Foster Advertising Ltd., cast himself in the role of defender of the private enterprise ethic, and provoked considerable ccntroversy.

Advertising, Hind-Smith declared, would find its outlets in the wired city just as it had in the print and electronic media of the past. But communications systems which allowed much greater freedom of choice for most households could have an important impact on the way entrepreneurs allocated funds for advertising.

Present television advertising is geared to mass audiences, and is so expensive that it is beyond the reach of many businessmen who, in any case, are aiming at a socially or georgaphicallly restricted audience. Cable systems in many Canadian cities could be used to reach restricted groups of consumers if the CRTC would permit local advertising on CATV systems.

A fragmentation of advertising would, he predicted, lead to a fragmentation of programming and a decline in the importance of the mass media. "While there will still be conventional broadcast stations, their programs and national advertising will be distributed by, but in direct competition with, cable casters and local advertising."

At least two other-contradictory-developments are possible:

(a) "Major retailers with comprehensive services such as Department Stores may ultimately find it economical to rent whole channels or major portions of cable channels tied in with return computer impulses for shopping at home.

(b) Specialized programs like professional sports, which the national advertiser has hitherto supported, may become so expensive that they are inefficient as advertising vehicles. "The opportunity for the cable operator (nationally networked by this time) is the re-introduction of pay-television, a premium service for which the consumer will pay directly rather than indirectly as part of the cast of advertised goods."

Robert A. McDougall, Vice-President of the Bank of Montreal, began by declaring he suspected that the Seminar's real purpose was to marshall support for a wired city pilot project. Such a project was "premature and probably irrelevant". What was needed was "the establishment of a methodology" which can help us find meaningful answers to relevant problems.

A study "identifying the probable environmental situation and problems in 1985 should be undertaken without delay, "by people drawn mainly from commerce and industry. "This is not to say that university representatives, including social scientists, should not belong to such a project team, or that government people should be excluded, but it is essential that the 1985 picture be drawn up by those who are intimately aware of the environment and the realities of practical situations, and not just (with apologies) by those who merely wish the world were a more ideal place."

The second step would be a study of the probable overall technological position in 1985, covering many areas besides communications.

The next move would be "to explore the possibility of using the anticipated 1985 technologies to solve the potential 1985 problems." Communications would undoubtedly show up as a major element, but not necessarily as the whole story.

Step four would be a programme -- involving industry and commerce, government, and the universities -- to ensure that the appropriate moves are made between now and 1985, and that the objectives are achievable by that date.

Unless senior people from commerce and industry are deeply involved, "it is most unlikely that step four would be accepted or that it would function as a practical reality. Dictatorial control cannot be exercised by government agencies, any more that it can be done within large industries."

On a more specific note, McDougall described the integrated computer and telecommunications system being installed in his own company.

"Plans at the Bank of Montreal call for the largest terminal-orientated banking system in the world, and, according to the Chairman of our Bank, represent the most revolutionary development in the history of Canadian banking. All of our 100 branches will be equipped with terminals -- one terminal for every two tellers, and at least one administrative terminal in each branch."

The terminals will be linked directly to a central computer complex, where all transactions from every branch will be processed. It will maintain all records, including customer accounts, for the entire Bank. Management information will be handled on the central facility, and it will be assessed by the administrative terminals. Virtually all the existing manual bookkeeping and routine chores will be eliminated.

"Obviously, the transfer of funds will be vastly improved if retail establishments employ our terminals on their premises." Instead of having a credit card or being billed directly by the retailer, the customer could arrange for a transfer of money from his account to cover the amount of the purchase. "It is entirely possible that touchtone telephones or similar devices will enable our customers to tie directly into our system," but the need has not yet been firmly established.

The discussion that followed showed the conflict between the "laissez-faire" attitude and the "dirigiste" approach favored by the social scientists of the previous panel. When Dr. Cappon declared morality dictated that the effects of a new system be known before it was introducted -- implying that policy-makers and their advisors should decide what was good for the people -- he drew this reply from Professor Donald Armstrong of McGill: "I distrust the command society because I don't think anybody is that wise". Yet some action has to be taken on society's behalf. When Professor Izumi said that as long ago as 1957 predictions were made about the dangers of a widespread use of drugs, McDougall's reaction was that the public should have been acquainted with the problem, by those who knew about it.

And finally, Toronto Lawyer Gerry Grafstein pointed out that someone had to pass judgement on technological systems, since some were obviously more beneficial that others, for society.

PANEL IV

Communications and Transportation

Communications systems can improve the efficiency of existing transportation systems, as computer-controlled traffic flows have shown. Communications can also substitute for transportation - for a business deal concluded over the telephone removes the need for either party to actually meet the other. In fact the relationship between the two activities is so close that they are, ultimately, different aspects of the same process: transportation means the movement of goods, or people, from one place to another; communication means the movement of information, between places or people.

Two speakers, both urbanists, Professor A.J. Dakin of the University of Toronto and Professor Iskandar Gabbour of the University of Montreal, considered the potential use of communications as a substitute for transportation. Two other panelists, R.M. Knox of the TRW Systems Group and Lee S. Sims of the Federal Ministry of Transport, dealt with ways in which urban transportation systems could be improved by telecommunications.

Both Dakin and Gabbour questioned the notion that telecommunications could be regarded as a simple substitute for transportation.

Professor Dakin said that while we do indeed substitute information movement for bodily movement, it is nct on any simple basis. "The technical equipment making possible substitution allows new things to be done that were not possible before. The telephone begins by substituting for the letter or the errand boy. It goes on to become a medium for selling things and a means for machine to talk to machine, and automatic passing and storing of information that did not previously exist."

"Many substitutions are substitutions of substitutions...The telegraph does the job faster than the letter. Then the telephone substitutes for the telegraph. The typewriter substitutes for the clerk with a scratchy pen. The dictaphone plus typewriter substitutes for the shorthand typist."

And substitutes increase transactions: "they have an innate capacity of their own...and must be expected to generate their own potentials." A new mode of communications may not merely substitute for a slower mode, but may also allow new activities which require transportation.

Professor Gabbour reminded the Seminar that the history of cities shows that improved communications have not often been coverted into "reduction in the duration of movements".

"Generally", said Gabbour, "only about 50 per cent of these gains result in time-saving. The remainder is translated into a residential dispersal which increases the average duration of movements over what they would have been if the original configuration had been maintained."

Even if one accepts some substitution of communications for transportation, changes are taking place in the configuration of cities that will result in increased demand for transportation. Cities, he noted, began as concentrations of population which allowed a more efficient transfer of goods and information. With improved transportation, cities have tended to disperse into suburbs and exurbs, where modern communications have made it possible for people to maintain contact with those at the centre. So in the final analysis, the relationship between communications and transportation is complementary.

Professor Dakin amplified this theme: "The wired city is not the city of substituted physical movement. and informational availability. It is the city of expanded transactions over an exploded region in which the tempo of life is increased and human consciousness is made more vivid."

First, the 'city' will give way to the greater urban region, at a greater rate than is already happening. This expansion will be accompanied by a rising demand for telecommunications facilities in non-urban areas, and also by improved transportation, for "when the urban dweller becomes exurbanite," he demands more goods and services. And as the 'region' becomes more urban, telecommunications improve once again, and in their turn attract more traffic. Therefore, said Dakin, "physical communications and telecommunications mutually stimulate each other's growth . This is a characteristic of the so-called post industrial society."

The extent of the region could be enormously increased, Dakin said, by"

1) Expanding the areas and times of low telephone rates.
2) Using the view phone, even if only at specialized telecommunicatcns centres.
3) Establishing centres equipped with facilities for data processing and transmssion, conference link-ups, secretarial service, etc.
4) Linking the domestic telephone to specialized equipment owned by the subscriber. "The recently developed possibility of plugging in a computer manual to a callbox phone is perhaps the beginning of some expansion in this field."

Although the growth of telecommunications may initially increase the density of central urban areas, "the predominant tendency is toward a very low density development over the region as a whole." People like to escape from the city and its routines. "If large numbers of individuals have these feelings strongly and if they can afford to leave the city they may so force the pace of the use of 'substitute' telecommunications that a whole new culture may emerge."

For his part, Professor Gabbour observed that:

a) the ever-growing use of communications affects the process of planning transportation and land use; thus a systems analysis covering both areas becomes increasingly necessary;

b) the role of the city core will be to offer specialized services in a concentration of business buildings, art galleries and other centres of activity involving a high degree of public participation; "the city core supported by a significant number of identifiable and properly inter-related sub-centres will constitute a powerful network of exchanges and communications."

Using communications to improve the efficiency of transportation systems was the concern of Robert M. Knox of TRW Systems:

"It seems quite obvious that the way to achieve good traffic control is to let the computer collect the data; let the computer analyze the data; and finally, let the computer change the signals. Traffic engineers around the world are trying to do just that." Several North American cities have been using computers to control the traffic flow, among them Toronto, New York City, San Jose, and Wichita Falls. Toronto was one of the first cities to install an extensive computerized traffic control system, and its initial test project started 11 years ago.

"The last link in the communications system, and perhaps the most important from a system performance/cost pcint of view, is the Data Controller and Computer/Communications Interface Unit. This device, coupled to a communications-oriented third generaticn computer, enables the efficient transfer of large blocks of data to the computer core memory. This data transfer takes place with minimal supervision...The interface unit can process data received over a large number cf communication channels. It can accommodate the largest system expansion, even for a city such as New York or a widespread area such as Los Angeles County."

With this kind of communications capability the city traffic engineer "can economically incorporate variable message signs into his control system. Route guidance for the motorist moves one step closer to reality. Vehicle locator systems can be incorporated for use by police and fire departments, or it is possible to lease such a service to taxi-cab companies or local concerns using extensive fleets of delivery trucks. And all this can lead us closer to the dawning of the automated highway, the motorist's age of Aquarius."

Lee Sims of the Ministry of Transport described the accelerating use of communications to increase the efficiency of transportation systems:

"Pioneered on Expo '67's Expo Express, automatic train operation is being installed on newer systems such as London's Victoria Line and San Francisco's BART System. The trains are driven at the proper speed from one station to the next, the train is stopped at the proper place on the platform, and the doors are opened and closed, all by the means of an automatic central control. Switches are set, destination signs on the platform are changed, and schedule adherence is enforced, all automatically."

The Westinghouse Skybus, a new urban rapid transit system whose prototype is operating in Pittsburgh, will also be automatic.

Extending these systems to surface transportation is difficult because buses and trolley coaches operate in a much less controlled environment. Nonetheless, London Transport is experimenting with a system of automatic bus identification. After a bus is "recognized" by an optical scanner, the bus number, route, time and so forth are communicated to a control centre where this information is displayed and remedial action can be taken if large deviations from the schedule are detected.

The Chicago Transit Authority is testing a more sophisticated bus surveillance system that uses radio communications. "A central computer interrogates each bus several times a minute. Equipment on board the bus automatically responds and gives the bus number, its route, its direction and the time it passed the last radio "signpost" by the side of the road. Since the computer knows the time the bus should pass each signpost, it can automatically calculate and display information about the bus' schedule adherence. The system also includes a voice channel and an alarm system. With all this data before him, the controller can monitor the operations, and at the first sign of trouble, using his radio control he can take the appropriate action."

The automobile has cut into public transportation to such an extent that it now accounts for only about about 15 per cent to 20 per cent of all urban trips, and the proportion is decreasing. "The resulting increase in pollution and congestion is obvious to all. Cars have encouraged a dispersed urban settlement pattern so that for the only, the young, the poor, and others without access to a car, it is becoming more difficult to get around." Drastic improvements in public transport are necessary.

One of the more promising innovations is the telebus, which instead of following fixed routes on fixed schedules, is dynamically controlled by a central computer according to demand. "A subscriber might telephone the computer's number; the computer would automatically look up the address, compute a new optimum route for all vehicles under its control, and send a vehicle within minutes to the subscriber's home."

Other urban transportation possibilities include those where vehicles carrying either a single passenger or a small number of people "move along electronic guideways non-stop from origin station to destination station. On some of these systems the vehicles may leave the guideway and be operated manually on ordinary roads while on others the system and the vehicles are restricted to the guideways. In some cases it is thought that private vehicles may use the guideways but in all the proposed systems vehicles are available for hire." Prototypes of several systems have been built and the guideway concepts shown to be mechanically sound and efficient.

"While the control system for such a network must be extremely complex, comparisons with the size of the telephone network at any large city and with the sophistication of transportation planning models and signal light control systems make the concept seem much more feasible."

PANEL V

The Form of the City

Perhaps the commonest, and least founded, concern about the wired city is that it would add to the tangle of wires above urban streets. Of major significance however, is the impact of total communications upon the physical structure and form of cities.

Professor Patrick Horsbrugh of Notre Dame University reminded his audience that telecommunication requires large, visible and often ugly equipment. He proposed that "the statutory definition of telecommunication systems should be enlarged to recognize also those visible structures upon which any communication system depends, and which, by reason of their design, their numbers or their position relative to other features of the city, justify identification."

In view of the rising public impatience with aesthetic pollution, Horsbrugh said "if this prognosis of emotional impatience with communications impedimenta (from wirescape entanglements to billboard clutter) is accurate, then the minister's legal advisors might see the advantage in expanding the present Telecommission Studies into a nationwide Consensus on the social values of positive aesthetic qualities to be backed by legal testings upon the ethics of imposing upon an unwilling individual the sight and reminder of something against which he has no defence, and cannot avoid."

The United Nations, he reminded the group, was organizing the world's first conference on 'The Problems of the Human Environment' in 1972. In the meantime, the Telecommission could establish Canadian leadership in what he termed "the realm of environic awareness."

Professor Alex L. Murray, of the Department of Environmental Studies, York University, agreed with Professor Dakin that communications and transportation are really complementary, and therefore he was "somewhat sceptical about the dramatic impact telecommunications will have on the form of our cities."

In particular, he questioned the view that telecommunications would reduce the need for high density living, by making it unnecessary for people to live close to stores, theatres, churches, friends and relatives. According to Murray, "the real determinants of urban form are the basic services of water, sewage, roads and mass transit. Only as these are expanded by being plugged into existing systems can new

residential locations become available. The lower the density, the higher the cost of the servicing.

"If some inexpensive re-cycling device can be invented, perhaps out of space technology" low-density living would be more possible. Yet even that possibility is limited by the need for access to jobs, and "few people like to commute regularly more than 30-45 minutes. I don't see telecommunications changing that for very many people." Only if almost all employment activities could be handled by computer terminal, videophone, etc. would freedom to work at home become operational.

The physical form of schools and universities could be altered by the wiring of cities, and, like the new TV university in Bavaria, they might almost cease to be institutions with campuses, classrooms and large centralized libraries. But their course offerings will be limited, compared to what a large university can now offer. Even with 25 channels available on co-axial cable not many programmes can be broadcast at any one time. Home use of VTR and EVR could, of course, increase the range of possible courses. "But all this is very costly, more costly than using live professors."

The past 30 years have seen the movement of manufacturing plants into the suburbs and the exurbs, largely because of improved road transport and the increased use of aircraft for shipping. Telecommunications had little to do with it. But cable systems linked with computerized data banks make it possible to separate production plants from company headquaters, which can remain in the more prestigious central area. This trend is likely to increase.

Remote shopping via touch-tone telephone might soon be widely used for routine purchases, but "specialized shopping would probably become more significant." As Murray observed, "shopping is very much a recreational and social activity."

It was Murray's conclusion that "Canadian urban regions in 1990-2000 will not look much different from what they do today. They will just be bigger."

The final speaker, Professor M. Barcelo of the University of Montreal, suggested that telecommunications might very well make things worse for a whole class of urban dwellers: Those who live in what he called the "grey zones" at the city core.

These zones are residential parts of the city, built before the advent of the automobile, and now its chief victims. Telecommunications, Barcelo contended, could still further increase the gap between the "grey zones" and the suburbs which were created by the automobile.

In those central city areas, "the installation of the ordinary telephone has created serious problems. Invented for private conversation, this apparatus is ill-adapted to a small overpopulated house where there is, in general, only a tiny common living room." Even television, which is a one-way form of communication suitable for collective viewing, creates "serious problems of channel conflicts between members of the family."

For remote communication to be successful, there must be a "conviction that the means used effectively brings the interlocutors closer." But Barcelo said he had seldom noticed this conviction among members of the urban poor. "For a certain group that I know well, the City Hall, and the authority it represents, seems much more remote physically to them than to me. And, on the other hand, it seems to them absolutely inaccessible through the ordinary telephone that you and I use constantly.

"While our conception of the city, at least my conception, has moved away considerably from the idea of a precise physical territory, theirs remains strong spatial and territorial, and the poorer they are the more limited it is. I know it is difficult to imagine that there are persons who live one mile from Place Ville-Marie and do not even know of its existence or where it is located, but our enquiries have revealed, more than once, facts as alarming as this one: the "town", the urban territory of several Montrealers, very often has a radius of not more than a quarter mile. Can we imagine that, through telecommunications, this radius could be extended to several tens or hundreds of miles without inventing some sort of participation which, for the time being, is totally unknown to us?

In the following discussion, Barcelo suggested that instead of studying the effect of communications on the urban housewife, funds should be available for research into the use of communication in the 'grey zones' of cities.

If "the ideal of a wired city is socially desirable...Are we ready to accept that a "socially" desirable objective for the Canadian society as a whole cannot really be desirable unless the economical and cultural minorities consider it as useful as the economical and cultural majorities? Are we ready to modify our national objectives so that Canadian society has a strict minimum of non-participants? Or else, are we so proud of our suburbs, our colour television, our direct distance dialing, that we should consider the third solitude as being the necessary price for these amenities?"

CONCLUSIONS

"The defining of objectives was agreed to be essential, and yet virtually impossible."

Workshop Report

Seminar participants found it difficult to visualize the technological shape of a wired city, and even harder to see it in its social and political context. The fact that they were asked to consider what should be rather than what might be did not make their task any easier.

The multidisciplinary workshops discussed at length the issues raised elsewhere during the course of the Seminar. The majority of workshop observations and recommendations are grouped under subject headings. But two workshops prepared a long list of proposals which were often complementary and are combined in summary form below.

The strategic placement of computer terminals concerned both groups, and they suggested putting them in booths, public buildings and banks in a community. Minimal charges should be made for home terminals, to encourage maximum access to information. And, on an experimental basis, terminals should be placed in some inner city homes to find out if they can help equalize opportunities.

Concern for low income people recurred in the recommendation that educational television programs, concerning job retraining for instance, should be prepared specifically for the inhabitants of big-city ghettos.

Several proposals by these two workshops concerned the telephone. They suggested free long distance calls and free information from the telephone system about such things as time, weather, theatre and scheduled services. It was also recommended that a rotating selection of decision-makers should be accessible by phone for one hour each day. A conference telephone system installed within a discrete housing project was another idea.

Television should be non-commercial, and at least one CATV channel should be devoted to Parliamentary proceedings. CATV systems should be compelled to open one or more channels to community organizations and two-way video production should be introduced between some schools and ethnic groups across Canada.

In the field of education, Computer-Assisted Learning devices should be installed in a representative sample of homes.

It was pointed out that "there is a danger of creating a hardware system we cannot afford." More effort, it was felt, should be put into producing better software for existing media. And a greater awareness of changes over time was needed, so that people may consider the future consequences of planning.

The Majority View

1. The Wired City as a descriptive phrase was accepted by most groups as a convenient label for total communications systems within urban areas. One group felt the title misleading, and proposed instead the "planned city" or "electronic city". Another group stated: "The phrase 'wired city' should be re-worded to refer to the services provided by the telecommunications facilities."

2. Switched coaxial cable systems are a technical possibility, but are by no means economically certain. One group said specifically: "Talk of replacing or supplementing the present telecommunications infra-structure with multi-service coaxial cable system is too speculative and utopian." The reason given was the high cost. One workshop believed that such a development was more likely to emerge from increasingly sophisticated CATV systems than from the telephone network. But most others wondered whether CATV systems could ever supply more than they do at present: one-way entertainment and information programs. Several workshops agreed on the need for research into possible advanced communications systems which could serve as building blocks for a wired city.

3. Whatever its technological foundation, the Wired City will happen. This was not a unanimous, but a general view, and it was put into words by two workshops. One said: "there was a general consensus from the outset that the wired city in some form was coming, whether we planned for it or not"; and the other concluded that "it was taken for granted that such a system would ultimately exist, whether or not it happened later than the 15-year perspective laid down at the Seminar". Restraining factors on the progress of the Wired City were social ("will people really want to use all these new services?") and economic ("Concern was expressed over the tremendous investment that will be required.")

Assuming that it will happen, in part or in full, the Wired City will create probems as well as opportunities.

4. Telecommunications may increase social alienation. One workshop asked: "Would social isolation and alienation result if people could obtain most services in the home? Shopping could be seen as a social experience. Would people lose their inquisitiveness and miss the surprises in life? Perhaps the

written culture is dying as the telephone becomes more important that the letter." Another workshop posed similar questions: "Will the reduced necessity to conduct business in a common office tend to diminish social gregariousness and harm the social psyche? What are mass telecommunications doing to the levels of social confrontation?" One group raised the possibility of a 'Luddite' reaction against too much technology. Another stated that "These systems must allow for the spontaneous exchange that occurs in face-to-face interaction..Children would have access to education material on demand and could therefore schedule their own activities. The human contact provided by the school, however, was seen as a continuing need."

5. More information may be too much information. Two groups raised the issue of information overload. "Concern was expressed over the pollution aspect of providing too many information services" one reported, while the other asked "Can there be too much communication in too quick a time?"

6. The Wired City could produce major changes in the political order. If information is power, then the more people who have access to it the more will political power be dispersed. One workshop felt that, through the wired city's capacity for two-way communication, "people might be encouraged to participate in decisions, and by participating, accept the outcome of decisions. Telecommunications should then be used to create a sense of community participation in, and responsibility for, decision-making." Another group said: "Greater exposure is needed for problems requiring corrective or regulatory legislation" and more comprehensive information is required by the public so that proposed policies can be assessed. "The telecommunications systems should be used to greater advantage by governments, interest groups, citizen and professional associations and acedemia in order to provide this 'political' service. Audio-visual linkages between an MP or MLA and the legislatures might increase the member's mobility and permit better allocation of his time."

7. Citizens will have to be taught to make the most effective use of Wired City systems, for political or other purposes. As one group put it: "A 'Yes-No' button in every home presupposes well-informed decision-makers. The humane use of technology therefor demands educational up-grading of people so that they won't simply push buttons but understand the implications of their actions."

8. No matter how sophisticated, communications systems are unlikely to substitute for transportation. All workshops which considered the question reached this conclusion. One said that "over the next 50 years the proliferation of telecommunications will not replace transportation, but instead, direct or face-to-

face communications will incite the population in general to travel more and thus multiply the opportunities for transportation." This same group added that "total communications will not substitute for personal, face-to-face communications, but on the contrary will add to the needs of the population for physical exchange among themselves."

9. Control and regulation of the communications system is essential. One workshop report said: "We must look ahead and plan for the time when the cable industry will be a large public utility", and "it was felt that under those circumstances, the producation and distribution functions should be separate." Several groups agreed, and said that this division should apply to all communications facilities.

"The creation of a single system of transmission for all the country," was one group's recommendation, but opinion was divided over who should own and operate an integrated communications system, and how it should be regulated. The conflict of ideas was reflected in one workshop report: "One faction felt that 'the government shouldn't be mucking around running these things'; another faction that they'd rather have the government run a utility than the cable companies." A similar division was expressed in another report: "Fear of all communicaton systems being contained in one large tube under the control of one authority was expressed. Public ownership of hardware was felt desirable, but there was concern over the software of the system and the necessary control of content." And one group concluded: "There was some scepticism as to the likelihood of government performing a good coordinating job in this field...There was a strong fear that the complexity of the technological and social issues involved in telecommunications militated against reasonable policy proposals by the Department of Communications and ultimately, effective legislative enactments by Parliament."

10. Whatever its structure, the Wired City implies social and political change of a magnitude that requires study and planning. Proposals ranged all the way from a formal task force and a pilot project to a generalized recommendation for research into critical areas. Participants were warned about the high costs of a wired city, and another important cautionary note was sounded by the workshop which reported that: "The group was implored to be concerned with 'what is', rather than always seeking refuge in studying 'what should be'. Using existing and anticipated technology to answer present needs was seen as preferable to trying always to predict and answer future needs."

"Discussion began with a recognition of the importance of looking ahead," was the report of one group and it reflected the genral feeling.

11. The formation of some type of multidisciplinary task force was recommended by most workshops, to predict the social, cultural, political and economic effects of impending communications and computer technology. One specific suggestion was for: "A task force to design research proposals to explore the impact of electronic technology on society. This task force would be composed of about 10 experts from various disciplines, and including industry and other telecommunications users."

"The government could permit the development, under ordinary market pressures, of new telecommunications services in specific areas. With the aid of mathematical models it would be possible to simulate the appearance of new services in an area so as to be able to predict some of the environmental consequences and thus avoid the advent of phenomea such as those of water and air pollution." Any task force should make use of systems analysis and of "a market survey and cost analysis".

12. No pilot project should be undertaken until its validity has been tested and proven by preliminary studies, it was generally agreed. In one workshop, some members voiced their suspicion "that the government had already decided to do a wired city pilot project, and wanted the participants to agree to the recommendation." Mention was made of the need to take advantage of advanced urban communications projects, actual or planned. Erin Mills, Ontario, was one example, and there were more in other ccuntries. Several groups emphasized that any pilot project should draw upon the widest possible range of disciplines--urban planners, social workers, doctors and businessmen were specifically mentioned.

The most explicit recommendation for a pilot project came from one group which declared:

> "A mandate for the definition of a pilot project should be given to a sufficiently broad and representative group consisting of government? industry? universities? and interest groups. The guidelines should be wider than considering the merely technical (engineering) side of the wired city. These should be wide enough to cover the social and economic considerations necessarily implied when talking in terms of a pilot project on the wired city."

Suggested sites for the project -- should it happen -- included St. Scholastique Airport and Kanata, Ontario.

13. Any studies which may be undertaken should take account of the needs of all citizens, "and not just the kind of elite that would be able to afford all these new services." That was the feeling of several workshops. According to one group, "many

felt that new technology is benefitting only a small percentage of the population." And another asked: "If the urban areas are to be provided with city services, what will happen to the rural areas?" Specific concern was expressed for the needs of the young, poor and cultural minorities.

Studies involving the future run into difficulty because, as one workshop observed: "People can't predict what effects technology will have on them so they cannct specify what they want the systems to do...The social scientist cannot determine what is wanted, because people cannot see their needs. Nor can they understand the implications of the technology. Therefore cooperative effort between the technologist and the social scientist must occur so that collective objectives can be set, and systems designed to meet them."

A Final Note

After all the proposals for giving people access not only to information but to each other, there was a certain irony in one workshop's observation "privacy is now a luxury. It must be made a social value so that everyone can be alone if he so desires." Perhaps it will be necessary to create special environments, one group said, while another recommended that "public retreat centres be created for refuge from the compulsion of utterance and exchange."

Some people, it seemed, feared that the Wired City would be another Tower of Babel.

Seminar Objectives

The purpose of the seminar was, in general, to determine how advanced telecommunications technology can be used to meet the needs of cities and how such technology will shape the needs of cities and in particular, to consider the desirability, feasibility and possible scope of proposals for a wired city pilot project involving government, industry, and university participation.

Technology Panel

The objective of the panel was to explore and chart from the technical point of view the problems that might arise in implementation of future intra-city multiservice communication systems; and specifically tc survey the technical and economic parameters of intra-city telecommunicatien systems that may be anticipated in the time frame of 1970-1985.

Urban Transportation Panel

The objective of this panel was to explore the impact of communications technology on urban transportation; facilitation and/or substitution.

a) What role can it play in developing better urban transportation systems? Computerized urban traffic control can expedite the movement of traffic on our congested existing road networks. Telecommunications devices are being introduced into conventional vehicles and transit systems; they represent essential parts of most new modes of urban transport. What are the costs and what are the benefits to users and to the community?

b) Is substitution probable, desirable and feasible from economic, cultural and physical standpoints? What are the implications to transportation planning and traffic engineering?

Urban Environment (Physical) Panel

The traditional concept of the urban area as a physical place is being challenged by one whose ccncerns are with flows of money, goods, services, information and human satisfaction. The potential of communication technology for extending social inter-action and for making information readily available can be expected to further stimulate new approaches to the city and to city planning, to influence the form of the city and the rigional pattern of urbanization, and to have effect on recreation and its physical aspect.

Urban Commerce Panel

The objective of this panel was to explore the impact of advanced communications systems upon urban commerce, with particular emphasis upon how such systems may affect the relationship between business firms and their clients.

Urban Environment (Social) Panel

The objective of this panel was to explore the impact of advanced communications systems upon social environment of the city, with particular reference to the impact upon personal, family and group identity and upon patterns of education and leisure.

APPENDIX "A"

Seminar Chairman: R. Gwyn, Department of Communications

Panelists:

1. Inventing the Wired City

   M. Krieger, Ottawa University (Chairman)
   A. Curren, Northern Electric Ltd.*
   John de Mercado, Department of Communications
   Claude Frémont, Laval University*
   W. G. Pither, The Welsh CATV Group*

2. Urban Environment (Social)

   Claude Asselin, City of Montreal (Chairman)
   David Abbey, Ontario Institute for Studies In Education *
   Daniel Cappon, York University *
   Gail Stewart, Ottawa *

3. Urban Commerce

   D. E. Armstrong, McGill University (Chairman)
   M. F. Anderson, Simpson Sears Ltd. *
   Michael Hind-Smith, Foster Advertising Ltd.*
   Robert McDougall, Bank of Montreal *

4. Urban Transportation

   D. Scrafton, Ministry of Transport (Chairman)
   A. J. Dakin, University of Toronto *
   I. A. Gabbour, University of Montreal *
   Robert M. Knox, TRW Systems Ltd. *
   Lee S. Sims, Ministry of Transport *

5. Urban Environment

   M. Chevalier, University of Montreal (Chairman)
   M. Barcelo, University of Montreal
   P. Horsbrugh, University of Notre Dame
   Alex Murray, York University *

Workshop Chairmen:

G. Bergeron, Department of Communications
C. Lemyre, University of Ottawa
De Montigny Marchand, Department of Communications
A. Nantel, Central Mortgage and Housing Corporation
D. Scrafton, Ministry of Transport

* Position Papers available on request.

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