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Planning for the storm: How confronting global warming changes urban planning

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INTRODUCTION

Much has been written about 'sustainability' and, as a result the discourse is replete with uncertainties, contradictions and confusion. In this paper I want to focus on a single sustainability problem and the change in planning that I believe is required to confront it. From our understanding of this problem many other changes cascade. There is not space here to deal with these further concatenations, and perhaps it is also premature, given that the propositions advanced below are not yet the subject of consensus either in the planning profession, the academy or the political community.

The first section below is devoted to the problem of climate change, or more correctly 'global warming'. Much will be familiar to planners, yet it seems necessary to reiterate it if only to drive home the familiar message of the environmental Cassandras that failure to change will result in a global holocaust of unimaginable horror[1]. Of course there are many interpretations of sustainability, and the planning academy must concern itself with these (Dobson, 1996). There are also other important dimensions of sustainability, for instance the biodiversity crisis, with which planning practice must also concern itself. But let us take one problem at a time: global warming, with the atmosphere viewed as 'critical natural capital' (Dobson, 1996, Daly, 1996: 76).

Clive Hamilton in his book *Running From The Storm* points out that the easiest gains in energy (hence carbon) efficiency are to be made in cities because daily life in cities is where the waste of energy mainly occurs (Hamiton, 2001: 18). The technology for avoiding that waste is simple and well understood. The difficult question is how to move not cities but the institutions that create them from a path that continuously reproduces waste to one in which both waste is averted and better living conditions are produced. This is a question that goes to the heart of planning. This question is addressed in the second section.

THE GLOBAL WARMING PROBLEM

The political world has, since the 1980s, been worrying about the impact on the Earth's climate of 'greenhouse gases' released into the atmosphere through human activity. With the support of all the world's governments, the United Nations has put

[1] A Trojan priestess (according to Homer) whose prophecy, one might recall, though unbelieved, turned out to be true.

an enormous scientific effort into understanding this impact. The UN Intergovernmental Panel on Climate Change was set up in 1988 to bring together the world's leading specialist climatologists to investigate and report authoritatively on what was happening. The IPCC's first report in 1990 suggested cautiously that global warming was probably occurring. Every IPCC report since, using new and better data, has confirmed those findings.

The evidence for warming has thus become steadily firmer. But scientists are cautious people. They deal in observed phenomena and the theories, built into models of the process, that tell us why the phenomena are happening. The core of the IPCC work is directed at finding out whether the records of temperature observations confirm whether global warming is occurring or not, and whether the observations of the Earth's atmosphere correspond with what the models predict.

Now any scientific endeavour is attended by uncertainty. It is well known that the Earth has warmed and cooled naturally at intervals over its lifespan of billions of years. What is new and dangerous about the current phenomenon is the extraordinary speed with which the new warming seems to be happening. Over a million years, or even perhaps ten thousand, the Earth's inhabitants — plants and animals including humans — stand a chance of adapting to the changing climatic conditions. Though we humans are very adaptable creatures and can live in very hot or very cold climates, we are still dependent for food on the adaptability of the plants and animals in the ecosystems that support human life. There is little chance of adaptation if the change takes place over a few hundred years or less. The Earth's biosphere will itself adapt simply by shrugging off the cause of global warming: humans. For us, however, global warming means much more than a change in the weather. Failure to adapt our economy to reduce global warming will bring death and misery on a scale never seen before in human history[2]. The scale of death will enormously exceed the plagues of the middle ages and the persecutions and wars of the twentieth century. Every single one of us on this planet needs to be frightened by this prospect.

[2] I do not subscribe to the view that it is best to play down the catastrophic possibilities of global warming, though discussion of the dangers must always be accompanied by presentation of the many ways in which the dangers may be mitigated.

There is still some uncertainty, but not enough to give us any real hope that rapid global warming is not under way. Reliable surface temperature records have only been kept since about 1860, satellite observations of the upper atmosphere for little more than a decade. The warming signal from the atmosphere has only become noticeable in the last century, with an upturn from about 1915 to 1940 and another larger upturn from 1970 to the present day. This is a very short timespan over which to assess what is normally a very slow moving event. Not surprisingly a few scientists dispute the findings. One of these is Professor Richard Lindzen, a meteorologist from Massachusetts Institute of Technology who has challenged the interpretation of the data. These challenges, including the arguments of Lindzen, have in fact been very carefully and cautiously assessed by the IPCC and — unfortunately — refuted[3]. While many people, some of them scientists, dispute global warming, there is near consensus among those scientists who specialise in the study of climate that global warming *is* being observed even over the short time so far available for observation.

Nevertheless there is still a normal and irreducible level of uncertainty and debate, just as there was over the ozone hole forming over the Antarctic. But a principle was applied at the time of the ozone debates called the 'precautionary principle'. This principle states simply that if the predicted event has serious enough consequences, lack of scientific certainty does not justify lack of action to deal with the problem. The depletion of the ozone layer which protects the Earth's upper latitudes from harmful ultraviolet radiation was considered to have such consequences. As a result, even before the processes of ozone destruction were fully understood, the world took action to ban the production and use of the family of chemicals, chlorofluorocarbons, believed to be causing the problem (through the Montreal Protocol and subsequent amendments). The consequences of rapid global warming are likely to be more terrible than the loss of the ozone layer. The cautionary principle must be applied again.

While much of the debate over global warming has been about observations, a different way of looking at the matter, which is perhaps not so well known, brings the

[3] One of the key arguments against climate change has been that the data from satellite readings does not confirm the evidence of surface temperature readings. However a recent re-examination of the satellite data suggests that the way the earlier studies adjusted the data between different satellites concealed the warming trend. A more accurate adjustment has the readings in greater agreement with the climate change models (report in *The Age* Nov 19th p. 14, and *The Journal of Climate Change*)

problem into sharper focus. The earth sustains what is called the ‘carbon cycle’ in which carbon in the form of gas is transferred between places where carbon is stored. Such places are the atmosphere which contains carbon dioxide gas, the land biosphere — the Earth’s cover of vegetation on land which contains solid carbon in plant and animal matter, and the oceans which contain both plant and animal matter and dissolved carbon dioxide. These are the main storages of carbon, ‘carbon pools’ or ‘carbon sinks’. An exchange of carbon is continually occurring among these carbon pools, and over the billions of years of the Earth’s existence a rather fine balance developed so that the flow of carbon into the atmosphere has been approximately equalled by its reabsorbtion by the other carbon pools: the ocean and land biosphere. In fact the balance is tilted slightly in favour of absorbtion of gas from the atmosphere by the other pools. Thus in a study of the period 1980-1989 the surface layer of the ocean each year absorbed about 92 gigatonnes of carbon (billion tonnes) and gave up about 90 gigatonnes into the atmosphere. The land biosphere absorbed about 61.4 gigatonnes from the atmosphere and gave up about 60 gigatonnes into the atmosphere. There was also an exchange of carbon between the deep ocean and the surface layer, but here the surface ocean absorbed 100 gigatonnes from the deep and sent back 91.6 (Houghton et al. 1996).

Into this system intrudes human activity. According to the International Energy Agency emissions of carbon dioxide from the burning of fossil fuels sent 6.14 gigatonnes of carbon dioxide into the atmosphere in 1999 (with zero in return to the source since power stations do not absorb any greenhouse gas!). Changing land use, including land clearing, sent another 1.1 extra gigatonnes net into the atmosphere. It is very clear that the major factor responsible for upsetting the existing balance is the emission of carbon dioxide, most of it coming from the growth of cities.

It is not just people that produce greenhouse gas but the production of commodities and services including travel: in short fossil-fuelled economic growth. But of course economic growth can occur with more or less greenhouse gas emissions. We need to know how much greenhouse gas is emitted per dollar of growth, and how that is changing over time. Is the world emitting less greenhouse gas in the drive for growth, or more? Is the rate of economic growth itself overwhelming any improvements in greenhouse emissions per dollar?

With the support of the General Assembly of all nations the UN has created a 'Framework Convention on Climate Change' to coordinate the actions of nations to reduce greenhouse emissions over the next hundred years to a level in which a catastrophic level of global warming may be averted. A 'protocol' was drawn up at the conference of the parties to the Climate Convention in Kyoto, Japan in December 1997. This protocol defines mandatory targets for each nation to reduce greenhouse emissions from an arbitrary base year of 1990. Australia, exceptionally, was allowed an 8 per cent increase. Adherence to the protocol will not save the world from global warming, but it will be a small first step on a path that will see the nations over the next fifty years strengthening their actions to reduce greenhouse emissions to the necessary low level by the end of the century. One hundred and eighty eight nations have signed the protocol. Australia and the United States are among those few that have not. These spoiler nations refuse to take even the first step. Only one more nation is needed to sign before the protocol becomes international law and trading of 'carbon credits' can begin. Russia could trade its reduced level of carbon emissions from 1990 (when the Soviet system collapsed) with the USA which has increased its emission level. But because the USA will not sign there is little immediate benefit to Russia from signing because the USA would be the main buyer of 'carbon credits'. So Russia is now not only hesitating on Kyoto but also threatening to turn 843 million hectares of natural woodland over to 'private enterprise' for logging[4]. Twenty two per cent of the world's forests are in Russia.

The IPCC has developed forty scenarios containing a variety of different assumptions about world economic growth. They are wildly diverging, but all of them indicate that, unless the world takes immediate action, emission levels are going to grow to dangerous levels in the next fifty years. Depending on the scenario, the level of global greenhouse emissions by 2050 is predicted to be between 9 gigatonnes per year and 27 gigatonnes per year. The former, the most optimistic, is dependent on full adoption of the Kyoto protocol and continuous progress beyond Kyoto to reduce greenhouse emissions. However, these scenarios, which are after all just informed guesses, could all turn out to be overoptimistic. China and India are two vast nations whose growth over the past ten years has been spectacular. Suppose that the economies of China and India continue to grow for the next fifty years at the same average rate as the last ten years. For the sake of world prosperity as well as their

[4] Nick Paton Walsh (2003) 'It's Europe's lungs and home to many rare species. But to Russia it's £100

own we must hope so. These nations have also been improving in terms of the amount of greenhouse gas emitted per dollar of growth but they are still a long way behind the United States. The USA is by far the world's largest greenhouse emitter but its vast economy emits much less greenhouse gas per dollar than China's. Let us further suppose then that the two rapidly developing nations improve their greenhouse performance (emissions per dollar) to the US level during the next fifty years. The result is that China and India alone, just two nations (albeit with 30 per cent of the world's people) will be emitting about 23 gigatonnes of greenhouse gas per year (Figures from the International Energy Agency website, 2001).

Turn back now to the carbon cycle. To stabilise the balance in the global climate system the atmosphere must retain the capacity each year to absorb some of the carbon already deposited there by industrial growth over the last hundred years. Fortunately in this respect we have Nature on our side. Climatologists of the IPCC tell us that the world has to get its greenhouse emissions down to about 2 gigatonnes per year within fifty years. This figure is now accepted by the Royal Commission on Environmental Pollution in the UK and by Dr Graeme Pearman, the chief atmospheric scientist of the CSIRO (Pearman, 2003). By contrast all credible scenarios suggest that in fifty years time the world will be emitting between 9 and 27 gigatonnes and maybe much more. Even the lower, optimistic figure, when compared with the total global exchange between the atmosphere and the surface of the planet of about 150 gigatonnes, represents an enormous disturbance of the carbon cycle. Therefore, given what we know today about the greenhouse effect and the climate system, it is highly improbable that a disturbance of such a scale would *not* cause a global climate catastrophe. If such a catastrophe is to be averted, action to meet the real target, a 60 to 70 per cent reduction in emissions (from the 2003 figure) over fifty years, must begin immediately.

There is complete agreement among climate scientists on the effect that carbon dioxide and other greenhouse gases have in trapping heat radiated from Earth. There is complete agreement that the amount of these gases accumulating in the atmosphere is steadily and regularly increasing every year. If global warming is not occurring it would be because the planet is somehow able to adjust its climate to the increased atmospheric carbon load without major long term fluctuation. There is no

billion of wood', *The Guardian,* London, Sept 19th p. 3

theory in physics, let alone evidence to support it, to explain how this might occur. Under these circumstances, the dispute, such as it is, over whether or not global warming has yet been observed is a little like a dispute over the behaviour of the speedometer amongst the occupants of a car speeding towards a brick wall.

REFOCUSING PLANNING'S SELF-UNDERSTANDING

Planning to mitigate climate change through the adaptation of cities is fundamentally about institutional change. To take on such a project will mean changing the planning profession's understanding of itself, changing planning's own institutionalised policy path.

The foundations of modern urban planning are to be found in a range of disciplines that have to do in one way or another with understanding and transforming spatial relationships: surveying, architecture, engineering and geography. Geographical understanding and spatial transformation, however, is not the kind of knowledge primarily required in order to address the problem of global warming effectively. In order to mitigate the effects of global warming by reducing carbon dependency, the institutional foundations of the economy have to be transformed. This observation is obscured in the debates about 'sustainability' in the discourses and practices of urban planning. Planning solutions to the mitigation of global warming the world over have centred on spatial patterns — as they have in relation to almost every social problem emerging during the twentieth century. The planner's tool kit is one of spatial manipulation: the spanners and pliers of density, land use, boundaries, belts and corridors. What are arguably the two most influential planning images of the twentieth century are spatial: Ebenezer Howard's garden city and Peter Newman's and Jeff Kenworthy's graph of fuel use against metropolitan density. To say this of course invites a long queue of candidates vying for position: Copenhagen's Finger Plan, Le Corbusier's 'ville radieuse', 'edge cities' (Garreau, 1991), 'compact cities' and 'splintering urbanism' (Marvin and Graham, 2001). It is true that spatial patterns did not drive Howard's vision of 'Tomorrow', but it was the spatially patterned solution that came to drive town planning.

Spatial manipulation certainly has a role to play in climate change mitigation, perhaps a significant one, but it is secondary to and entwined with, if not wholly dependent

upon, institutional transformation. This transformation is unlikely to occur through revolution followed by synoptic planning. In a post-Marxist world the efficacy of revolution is wisely regarded as ineffective, particularly from the point of view of environmental conservation. And, as Lindblom (1999: 60) points out, the Soviet Union tried for seventy years to approximate centralised synoptic planning of the economy 'only to decide that the negotiations and conflicts of power of the market system would be superior'. I would rather follow the green-left political scientist Alain Lipietz when he says that institutional transformation, in the vision of the green movement, is 'a series of "microruptures" … a sort of molecular revolution that never really ends' (Lipietz, 2000: 73).

Geographical theory, so influential in planning, has cloaked itself in political ideas in a succession of analytical fashions: liberalism, pluralism, Marxism, post-structuralism and back again to a more radical form of pluralism in the steps of Laclau (1990). Without real examples of the impact of these frameworks on planning practice, students of planning theory have been forced into a kind of rote learning of the 'isms. As Tony Darbas (2003) notes in a recent paper, all that the 'isms have achieved for planning practice is to shatter the planners' sense of identity. What prevails, where planning practice has had effect, is spatial patterning. Green belts, growth boundaries, district centres and corridors have achieved much more than planning scholars sometimes give them credit for. But they cannot be seen as the core of planning for mitigation of global warming.

Geography is alone among the spatial disciplines to make the connection with politics, and it has done so heroically. But the way to understand politics is not indirectly via geography but directly through political philosophy. I argued a decade ago (Low, 1991) that politics was the foundation discipline of planning and that the rules of the political game, political institutions, shape cities. Therefore it is to these rules and the institutionalised practices of city production that planners must attend if they wish to pursue social reform. My subsequent engagement with the politics of ecology has redoubled that conviction, bringing into focus what I regard as the defining problematic of twenty first century planning: environmental justice (Low and Gleeson, 1998). Piece by piece the institutional framework of society and the problem definitions and bureaucratic structures that form around solutions have to

change. In order to accomplish this through planning, politics has to displace geography as the foundation of planning theory.

There is much in the vast field of 'political science' that is not particularly useful for the practice of planning, especially of the transformative kind demanded by the climate change problem. Endless discussion of instances of the play of power, of the variety and complexity of rules and regulations, of highly mathematised interpretations of game theory — all of which are to be found in the political science literature, do not help build an understanding of medium term political change. But understanding planning theory through the lens of political philosophy requires at least a familiarity with the principal streams of political thought since the eighteenth century. Particularly lacking since the eclipse of communism and of Marx's theory of revolution is a helpful framework for understanding social transformation, and I have argued that the beginnings of such a framework might be found in the work of Karl Polanyi (Low, 2002; Low and Gleeson, 2001), whose work is being taken seriously in a number of recent political analyses (van der Pijl, 1998; Rieger and Leibfried, 2003).

Lindblom in the same essay as cited above notes that, while there is a descriptive and prescriptive theory of the market economy, we have no general theory of planning. We do not because there is no unified theory, either descriptive or prescriptive of politics. I would go even further and argue that the theory of the market economy actually depends upon one kind of theory of politics, in that the set of postulates it assumes about human values and behaviour is one among many such sets, and, closely examined, economic theory itself is not by any means as unified as it is portrayed by economists (Keen, 2001).

The reason that there is no general theory of politics and hence of planning is because we live in a society in which value plurality is itself highly valued (even if continually challenged), a value that is enshrined in a host of constitutional protections. What follows logically, then, is the virtue of mutual adjustment, as Lindblom consistently recommends and the recent preoccupation of planning theory with 'communication' supports (Sager, 1994). But here we encounter a political dilemma. Political values and interests are multiple, including those connected with

the production of greenhouse gas, and have to be engaged, but climate change is presenting the world with a categorical imperative.

I do not regard this dilemma as debilitating of political action for two reasons. First, democracy itself is beset with dilemmas, not least of which is the dilemma between the need for public action to be effective and the need to include the public in the process of decision. The state apparatus is the tool of democracy and unless that tool is employed to some effect on society democracy is a vacuous concept: talk without action. At the same time employment of the state apparatus without inclusion of the public is not in any sense democratic. So there is always a trade-off between the two opposing desiderata: decision and inclusion, and there is plenty of scope for debate about what sort of trade-off is best (March and Low). Second, the fact of dilemmas such as this does not preclude political action. On the contrary, the institutions of pluralist democracy maximise the scope for transformative political action without the use of force in a way that all forms of monism deny. But political action does not have to be seen as *party* political action. Institutional change plainly involves much more than competitive politics and the struggle to change the ruling party. In the last twenty years the developed world has witnessed a partial institutional shift (or return) to liberal market society that was planned fifty years ago, so institutional change can seem glacial to those whose understanding of politics is restricted to party competition. But long term institutional change is nonetheless political, and it is this form of political change that planners need both to understand and engage in.

The ‘new institutionalism’ in political science is now sufficiently developed to permit useful survey articles, and here I draw mainly on these secondary sources. Hall and Taylor (1996) identify three schools of thought: ‘historical’, ‘rational choice’ and ‘sociological institutionalism’. For the latter Torfing uses the term ‘social-constructivist institutionalism’: hence HI, RCI and SCI. Historical institutionalists, Hall and Taylor (p. 938) tell us, define institutions as ‘the formal or informal procedures, routines, norms and conventions embedded in the organizational structure of the polity or political economy’. This definition in fact serves well enough for all three schools. The new institutionalism, as opposed to the ‘old’, pays more attention to the informal aspects of institutional life, particularly networks of actors and their cultural norms subsisting within and between formal hierarchies (Torfing, 2001: 281). It is also fair to say that

the new institutionalism is paying more attention than the old to the dynamics of change.

Historical institutionalism situates the analysis of institutions within the structural development of the state as it — or more accurately its parts — respond to the conflict among powerful social actors, 'so as to privilege some interests while demobilizing others' (Hall and Taylor, 1996: 937). RCI attributes a somewhat larger role to the rational calculation of individuals and groups in the formation of institutions, attributing a game-like 'logic of consequentiality' to the thinking of such actors (Ostrom 1991: 238). If there is a difference between HI and RCI it is that the former school is most interested in the way rules and conventions come into being while the latter focuses more on the choices made within the rules. The overlap occurs where new rules are being created within the old which is arguably how institutions generally evolve. Thus Torfing finds a good deal of common ground between them. SCI on the other hand introduces the additional aspect of discourse and culture into the picture of how institutions are maintained and how support for them is mobilized. SCI introduces into the definition of an institution 'symbol systems, cognitive scripts, and moral templates that provide the "frame of meaning" of action' (Hall and Taylor, 1996: 947). Where RCI tends to view 'interests' in utilitarian terms of status, influence, money and security, SCI suggests that interests are constituted by a variety of more complex values structuring individual and organizational identity, many of which do not have to do with a narrowly inscribed 'self interest'.

The new institutionalism provides insights into what stabilizes institutionally entrenched policy paths and what changes them. The institutional perspective bridges between 'the voluntarist idea that the world can be changed at will and the structural determinist view that institutional legacies determine the future' (Torfing, 2001: 289). Thus there is an interplay between intentional politics and contextualising institutions. Institutions condition intentional action and make action possible by providing definitions of problems, solutions to those problems, the knowledge to implement those solutions and a corps of personnel bearing that knowledge. None of this complex of people and ideas is brought instantly into being, and once brought into being it is not lightly or rapidly discarded. It creates a 'policy path'.

In what follows I will use Torfing's conceptual scheme to interpret the evolution of Australian urban transport policy. There is something intuitively appealing about

applying the concept of path dependence to urban transport, since it is arguably the two revolutions in path technology that have shaped urban transport in the last century and continue to do so: the *chemin de fer* (the path of iron, or railway) and the path of tarmac. The vehicles riding on these paths have not changed much from the basic form of horse and buggy — the horses have been mechanized and some of the buggies have become more elaborate. The paths they run on, however, changed radically from rough and in constant need of grooming, to permanently smooth and therefore capable of supporting high speed.

The idea of 'path dependence', when it first occurred to Brian Arthur, was applied to the way a particular technology (of the mechanical typewriter) subsequently determined the form of interface between human and machine (the layout of the keyboard) which became universally accepted. In essence his argument was that a more or less chance event (such as the invention in 1873 by Christopher Scholes of a keyboard that slowed typists down) gathers a certain momentum because people derive increasing value to themselves from reproducing it[5]. Douglas North then applied the concept to the institutionalised persistence of certain policy paths (North, 1993). The policy path is 'a relatively entrenched way of unifying, organizing, and regulating a certain policy field' (Torfing, 2001: 286). It requires no stretch of the imagination to see that the inventions of the railway and of the hard surfaced road both involved a rapid accretion of bureaucratic organisation, programmatic funding and regulation to construct them, and that once created, the various personnel embedded in these institutional structures derived value from maintaining and further developing the technology. Thus railways gave way to the very fast train, and roads to freeways with grade separated interchanges.

North (1998) observed that 'value' was not simply to be understood in simple financial or even quantitative terms. Value is derived from doing things in the right way for the right reasons. Thus he modifies his RCI approach 'by pointing to the importance of institutionally imbedded mental models for shaping our perception of payoffs' (Torfing, 2001: 282). Torfing writes:

> [The policy path] forms a discursive terrain in which the objects of regulation, the regulatory agencies, and the institutional forms of regulation mutually constitute each other (Torfing, 1998: 137-8). The policy path is formed through

[5] Brian Arthur's ideas are discussed by Waldrop (1992) Chapter 1.

> a complex interaction between deliberate design, long-lasting traditions, learning processes, and chance discoveries (Torfing, 2001: 287)

With respect to urban transport, with only slight modification, we can say that the objects of regulation and construction (roads), the regulatory and construction agencies (the road construction authorities) and the institutional forms of regulation and funding mutually constitute each other. What is interesting, of course, is why one such policy path is able to gain dominance over another. In urban transport in Australia it is not a case of roads *supplanting* railways. But there can be little doubt that the road building path has become and remains dominant. Road building has continued whereas railway building, with a few exceptions, has ceased. The relative dominance of roads may have something to do with the prestige accorded in Australia to construction, and the opprobium, if that is not too strong a word, accorded to planning. Whereas construction is viewed as 'investment', effective planning and management of a public transport system of which railways form a part, is viewed as an expense (… of taxpayers' money).

We have elsewhere described in some detail the institutional and discursive terrain of Australian transport planning (Low, Gleeson and Rush, 2003). In summary, the dominance of road building strategies can be explained by the strength, coherence and foresight of road building agencies. Every road construction agency keeps a range of future road projects in the 'bottom drawer' to present to ministers of transport when funding opportunities occur. Road building agencies possess admired mathematised analytical methods and a highly visible 'solution' (motorways) to a well marked 'problem' (congestion). Their skills extend to the management of contextual variables: travel demand modelling, environmental impact analysis, mitigation through landscaping and noise barriers, and management of public consultation.

By contrast public transport agencies have traditionally been fragmented, with different agencies managing different parts of the public transport system. They lack a unifying transport planning presence comparable, for example, to the Zürich Transport Alliance (ZVV). Road agencies have been sustained by the constant flow of large scale funding for road construction — always described in terms of 'investment' — and by the absence of exogenous shocks. The road building agencies have also been supported by a discursive network of argument that

cements together a coalition of actors inside and outside government. Inside government planning agencies, for example, have interpreted the road building solutions in ways they can accept. Outside government roadside service agencies, such as the RACV in Victoria, staffed by former road agency personnel act as powerful voices articulating the road building storylines to the general public. This then is the transport policy path formed by design, tradition, learning and chance discovery.

Yet there are times when change forces itself on to the political agenda, as for example when a new problem such as climate change emerges which the old policy path cannot handle. This change is not necessarily intentionally initiated by politicians in the way the Westminster tradition would like us to believe, or necessarily by class actors as Marxists would have us believe. The agents of change like the agents of stability can be found inside and outside politics, and inside and outside the state. In a Polanyian perspective one would expect a very broad based social movement to develop spontaneously in reaction to the environmental and social damage done by the project of liberalization.

Institutional change can be conceived in terms of ‘path dislocation’ and ‘path shaping’. The institutional path becomes dislocated by the impact of exogenous events, or by the emergence of new interpretive schemes.

Nothing like Britain’s shock forecast from the roads agency that showed that no affordable road building program could ever reduce congestion, or the SACTRA Report demonstrating the existence of induced demand, has been published in Australia. And so far no-one has been unable to administer a forensic knockout blow to a road scheme that might serve as a comparable exogenous event. What, then, counts as an exogenous event? The oil shocks of 1974 and 1979 quickly became ‘events’ which set in motion numerous changes including Newman’s research program and the world’s best example of a low energy office building, the ING Bank headquarters in Amsterdam. The ‘ozone hole’ appears to have acquired event status quickly, perhaps because it linked a frightening immediate human effect, skin cancer, with a conceptualised phenomenon, ‘the hole’, which appeared in the press in multicoloured stratospheric maps, and a relatively simple cause: CFC gases that broke down to release chlorine once they reached the stratosphere. Climate change is much more difficult to link with effects such as drought, rising sea levels or extreme

weather events, the worst effects are projected to occur well into the future, and the causes are diffuse. One of the strategies planners could pursue is to make sure that climate change is portrayed as an event, just as the opposing strategy is already to portray it as an unproved theory.

All three 'exogenous events', however, have contributed to building a new interpretive scheme: sustainability, or 'sustainable development'. We should be neither surprised nor dismayed by the indefiniteness of the concept 'sustainability'. The agenda of sustainability is a symptom of dislocation, a symptom that the established path is not delivering the promised or desired outcome:

> Competing social and political forces will interpret the dislocation of the policy path in terms of failures, crises, or new opportunities understood from their own perspective. However, the common experience of frustration, negation, and loss will tend to construct a vaguely defined agenda to which the social and political forces must respond in order to speak in the name of society. The new political agenda will be structured around a series of empty, or at least floating, signifiers that aim to codify the absence of an adequate and legitimate way of unifying, organizing, and regulating social, economic, and political relations. (Torfing, 2001: 289, citing Laclau, 1994)

Laclau was writing over-optimistically about the possibility of the emergence of a radical pluralist New Left following the collapse of communism. However 'sustainability' fits the description of a floating signifier structuring a new political agenda, just like that other floating signifier over which there is just as much controversy, 'globalization'.

Following dislocation, path shaping always occurs in the 'sedimented institutional context that mediates the political struggles and conditions the formation of a new policy path' (Torfing, 2001: 290). The new path will never be able to break free from the old path 'and will always tend to recycle parts of the old policy path as part of the new one' (*ibid*.) Remnants of the old policy path will tend to affect path shaping strategies, allowing some strategies to advance while blocking others (Jessop, 1990: 260-262).

In the field of transport policy, the likelihood of road building agencies adopting the paradigm of sustainability in such a way as to render themselves obsolete is

extremely remote. What may happen, though, and shows some signs of appearing, is an interpretation of sustainability that allows the road construction agencies a powerful but changed role. In transport the key shift is from the construction of new roads to the management of the existing urban road system in such a way to facilitate the increased efficiency of the use of road space. What exactly this might mean in terms of the road infrastructure and the work of the authorities is certain to be the subject of internal struggle. It would not be surprising to find construction again vying to play a major role.

Urban road construction has peaked and must now decline. The road construction authorities need to reconstitute themselves as roads management agencies whose primary task is the efficient and sustainable functioning of the urban transport system as a whole. Roads planners will become much more like public transport planners, and as a result more equal to them in prestige — and of course essential elements of the public transport system run on roads. This seems much more important than linking land use and transport planning; in fact I am prepared to go out on a limb and say that land use/transport planning is a largely obsolete idea of the 1960s. The main issue for sustainability, viewed in terms of saving the climate, is simply effective urban transport planning.

From self-understanding to practice

The view of planning from the perspective of politics demands a different view of strategic planning practice: political strategy differs from geographic strategy. Geography can be very helpful to urban analysis, and I am not arguing for geography to be neglected. But institutional problems do not yield in the first instance to analysis from the perspective of spatial scale. An institutional focus might sound as though it is looking at the ‘grander’ side of politics. But, following Lipietz, it is often a series of ‘micro-ruptures’ that add up to larger scale change. It is also not necessarily a matter even of ruptures. For example finding ways to help a local government agency save water within its jurisdiction might involve a host of small initiatives, some involving partnerships, some regulation, some incentives and so on. But such initiatives, partnerships and negotiations — incremental steps and mutual adjustments in Lindblom’s terms — need to be taken within an awareness of overall direction and the required speed of movement in that direction. One hundred years may seem like

a long time but, in terms of the required 60-70 per cent reduction in greenhouse emissions, it is not.

The traditional focus of 'strategic planning' has been the macro-level, the metropolis. Sometimes the best political strategy is to proceed from the micro-level. In the case of housing, for example, an examination of what makes a dwelling 'sustainable' leads to questions like: why are energy intensive dwellings still being built? What is stopping and what would encourage the conversion of the existing housing stock to energy saving norms? Could energy be supplied to housing with greater carbon efficiency and less waste? We would then have to look at the institutional frameworks of the building industry and energy production, government regulation, fiscal structures impinging upon the production of housing, the skills capacity of the building industry and so forth. Thus the means of implementation come to be built in to the analysis of the problem. While acknowledging the difficulties of getting people to accept energy saving techniques, Troy et al. (2003: 42) argue that 'It is nonetheless important to explore policy options that speed up the conversion of the existing building stock to achieve greater efficiencies either by reducing energy consumption or by generating power from the buildings themselves'. I strongly agree but would postulate that the implementation problem lies less with community acceptance than with institutional change.

A spatial analysis framing the problem in terms of solutions like transit cities, growth corridors and urban growth boundaries, can easily fail to specify the means of implementation because the problem is viewed from the perspective of city form rather than from that of the production of sustainable dwellings and mobility. More useful from the point of view of greenhouse emissions is the research method developed by Troy et al. (2003) examining the energy consumption of different forms of development. This research goes directly to the problem rather than obliquely via spatial pre-conceptions. The policy implications are particularly important for transport: a high proportion of total annual embodied energy consumption is in motor vehicles, and a high proportion of the total annual energy is consumed in the transport task (pp. 40-41). Troy et al. state: 'Empirically based policies designed to reduce the transport task by pursuing changes to the structure of the city could lead to significant reductions in energy consumption by reducing congestion and peaking'

(p. 41). I would argue that the primary task is modal shift, but this should not preclude giving a helping hand to development that assists public transport.

Some transport problems require an immediate awareness of the larger spatial system rather than, say, the vehicle. One of the extraordinary features of Australian cities is their extensive infrastructure of heavy rail, and the under-use of this system in terms of annual *per capita* ridership compared with that of European systems of comparable extent. At first sight the most pressing institutional question appears to be how to change from a situation in which public transport agencies compete with one another to one in which they cooperate in order to compete effectively with private vehicles and roads. From this point of view there are very clear advantages in operating the public transport network as a single system with different modes complementing one another to provide a seamless service. However in seeking to shift a proportion of urban journeys from private cars to public transport we must not neglect to inquire about the precise effect of such a shift on greenhouse emissions. The advantage comes from the more efficient use of vehicles, or more precisely, of motors to move people and freight, but from the greenhouse point of view public transport is only a partial solution if energy is produced from fossil fuel. A shift to public transport, however, starts to look much better from the greenhouse viewpoint with energy from renewable or at least 'clean' sources.

Just as with the dwelling it will be necessary at some point to discuss questions like why are energy intensive vehicles being built? What is stopping and what would encourage the conversion of the existing vehicle fleet to energy saving norms? Could energy be supplied for mobility with greater carbon efficiency and less waste? Is it feasible to clean carbon emissions from exhaust gases? Alternatively, instead of beginning with the individual vehicle, it could be useful to begin with the individual journey. What would make journeys in cities more pleasant and healthy and less fossil fuel intensive? Looking at the journey can remind us that every journey has a walking component, and the walking component can become a cycling component for some people. The extra walking component involved in journeys by public transport can be seen not as a drawback but an advantage from the point of view of personal health. In this respect safety coupled with ease of movement for the pedestrian or cyclist becomes an important aspect of the transport system.

The problematic nature of planning from the macro-level is well illustrated by the issue of density and 'urban consolidation'. A simple statistical association between higher density of cities and fossil fuel use can be shown, but the *causal* relationship is *not* revealed by the statistics. For instance car dependence may just as easily be a cause of low density development as an effect. Car dependence may also be caused by a low fuel price or an impoverished public transport system. One cannot therefore assume that increasing density by itself will bring about a reduction in the use of fossil fuel. Although they are known for supporting higher densities, Newman and Kenworthy (1989: 67) actually advocate a range of interlocking policies of which higher densities around transport interchanges are just one, albeit perhaps the most important one. In this respect, for planners to be putting such effort into transit cities seems to misconstrue the problem. If there is a highly effective public transport system (including the walking component of the journey) the effect will be that property values will increase around public transport nodes, and planners will only need then to adjust the regulatory system to permit higher density development. To use urban density to support a mediocre public transport system is to put the effect before the cause. The result in Melbourne is, as reported by Buxton and Tieman (1999), scattered pockets of increased density throughout the urban area with no relationship to the public transport system, and possibly a negative effect on greenhouse emissions.

European cities are considered to be unlike Australian cities in that they have higher residential densities that therefore make public transport a viable option. This is true for the central parts of metropolitan regions, but just like Australian cities, European cities in the 1960s sprawled outwards as residents traded accessibility for space in and around the home, and cars and roads made such a trade-off possible. But because these cities already possessed effective public transport systems, and most importantly because the systems were highly valued by citizens and deeply institutionalised, they started to develop ways of providing public transport to 'the dispersed city' (Mees, 2000). The gross residential density of the area served by Zürich's S Bahn is in fact a little less than that of metropolitan Melbourne. Planning for public transport in the Randstad cities of The Netherlands is now looking at the whole urban network including the large areas of rural open space between cities, a metropolitan network whose gross density is largely irrelevant but is certainly much

less than that of any Australian metropolis — this in one of the world's most densely populated regions (Trip, 2003).

These kinds of questions lead not only to institutional analysis but also to political strategies for institutional change. The power of discourse should not be underestimated. The discourse of sustainability can of course be misused and become a 'greenwash' on the surface of business as usual. But greenwashing is at best a temporary strategy. It is usually rather transparent and, once seen for what it is — a kind of lie — it becomes ineffective and counterproductive for the greenwasher. Exposure of greenwash is itself an effective strategy. But there is a fine line between greenwash and the interpretation of sustainability in terms acceptable to a path-dependent institution. In the end what matters are the results and not the rhetoric. But it must be understood that the mode of action of politics is persuasion, and discourse that persuades functions both to stabilize and to dislocate institutions.

There is a huge literature of political strategy, some of it within the canon of planning theory. Terms like 'innovation', 'networking', 'coalition-building', 'trust formation' recur. Rothman's (1974) compendium of strategies of innovation and diffusion is still an important source for planners. Laclau's (1990) analysis of social change deserves further interpretation with an institutional focus. Planners need to be both conversant with the literature, capable of using its techniques, and aware of its ever contested ethical dimension. But political strategy is not sufficient. With its concern for pluralism, process and 'communication', with more than a touch of relativism added, planning theory has moved a little too far from substance. Planning to mitigate climate change requires some depth of substantive knowledge of the methods of achieving reduced energy consumption and greenhouse emissions in key aspects of the urban environment (housing, transport, workplaces, commercial and industrial sites). Some are pure technologies (building techniques) others are social and organisational methods (car pooling) and some combine the social and technological. Planners must feel confident enough in their understanding of this large domain of substantive knowledge to set quantitative targets and know how to measure outcomes quantitatively.

If the mitigation of and adaptation to global warming is, as I would guess, going to become the primary focus of urban planning in this century, planners will need to

know enough about the science of climate change to be able to understand the physical mechanisms underlying radiative forcing and the state of evidence of the phenomenon. Despite years of primary and secondary education engaging with climate change it is still not uncommon to encounter planning students who do not know the difference between the mechanisms of ozone depletion and global warming. Critically important too, especially for Australia, is the question of 'clean energy'. It matters greatly to the future of Australian cities if and when a cost effective way can be found either to produce hydrogen from coal, sequestering carbon before combustion, or to clean and sequester carbon from post-combustion exhaust emissions from power stations.

As opposition to change develops, as it is and will further, it is particularly important to know the counter-arguments of the 'climate sceptics' and how they in turn are being handled by climatologists. Political interests gravitate to those few scientists who still believe global warming is in doubt. They are rapidly incorporated into the ugly politics of climate change. But the possibility of the climate sceptics being right must always be entertained, for climatology is science and theory remains open to refutation by new evidence. It matters profoundly to planning and the future of Australian cities if in the end global warming does not turn out to be the frightening phenomenon one must reasonably fear on the present available evidence.

CONCLUDING REMARKS

To understand institutional change of the kind needed to react effectively to global warming, planning cannot look to geography or any of the spatial disciplines. These must remain important contributors but ancilliary to the philosophical core of planning.

Neoclassical economics has devoted itself more and more narrowly to the mathematisation of market behaviour and untrammelled ideological support for raw capitalism. Apart from its solipsistic obsession with mathematics — now objectionable even to alert students of the discipline — economics offers only a series of largely untested assumptions about society that would be laughable if they were not so ecologically and socially damaging.

Planning in the 21st century has a core problem: mitigation of, and adaptation of cities to global warming. To address this problem planning must centre itself on long term institutional change. The discipline forming the core of planning theory and the self-understanding of planners is politics read as a broad understanding political theory, practice and philosophy.

Finally, one should of course note that urban planning is itself institutionally path dependent, together with its academy. The points made above about transport policy apply in general terms just as much to planning. Change is going to be evolutionary and incremental.

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