

Equity, Social Justice, and Sustainable Urban Transportation in the Twenty-First Century

Jean Mercier
Université Laval

ABSTRACT

As an ever-increasing proportion of the world population lives in urban areas, one of the most important equity and social justice challenges governments and public administrations face is urban land-use and transportation issues. Within the context of this challenge, social justice, land use, transportation, health, and environmental dimensions are presented here as “a bundle of tangled elements sensitive to design.” The types of interdependence between these different dimensions are then described in more detail and further characterized as part of a sequential-type interdependence. Using notions coming from New Institutional Economics, different modes of governance are examined, and it is found that hierarchy, as opposed to market, is the mode of governance best suited to the task of achieving a more equitable and sustainable urban life. Within this context of the hierarchical mode of governance, professional public administration will be called upon to play a more active role than it has played until now.

In this symposium, *Administrative Theory & Praxis* wishes to identify and focus on the critical social justice issues that will confront societies and public administrations of our planet in the next 10 or 20 years, as suggested earlier by Oldfield, Candler, and Johnson (2006). In addition to discussing issues of equality, the goal of this paper is to go down some “roads less traveled” and look at related issues that have “fallen under the radar.”

Sustainable urban transport is a transport and, now, an environmental issue, but we believe it will also become, more and more, an important social justice and social equity issue. It will require proactive planning and action that go beyond what public administration has ventured to do up until now. Sustainable urban planning is a universal subject, confronting all urban areas of the world. The United Nations’ figures on demography estimate that half

the world's population now live in cities, and increasingly so in large cities. Because there are very wide differences in how much energy is used in transportation around the world, particularly between rich and poor countries, there is also an important international justice and equity component to the problem. For example, North America, with about 5% of the world population, uses about 40% of the world's transportation energy (excluding human energy, in walking or bicycling, for example). So, in addressing sustainable urban transportation, we are addressing both a national and an international equity and justice challenge.

THE CONTEXT OF SUSTAINABLE URBAN TRANSPORTATION

During the era of cheap and abundant oil, coming to an end within the next few decades, and when environmental matters fell under the radar, urban transportation was not seen as an important social justice and equity issue. Often, engineers were in charge of this area of public administration, and the engineering answer to urban transport was generally to build more and more roads, to satisfy the growing demand. The emphasis was on offering more supply, and not on trying to shape or affect demand. Public administration concentrated its efforts on trying to work on congestion, without putting into question the basic premises of our urban transportation system. In the past few years, partly because of a better understanding of our limited resources, and because we now see more clearly that a resource used by one group of persons is unavailable to another, transportation, and transportation in large cities in particular, is becoming a more contentious issue. As we move further and further away from peak production of oil and gas, and as these resources become rarer and, consequently, more expensive, urban mobility, that is to say the capacity to move from one point to another in large cities, will become an equity and a social justice challenge. Because cities have extended far into the suburbs, a substantial number of jobs are now situated in the suburbs, making it more and more challenging for the inner-city poor to reach the job market. But there is a relatively new angle to the problem, and that is that poverty may extend to the suburbs, as gas prices rise to the point that a new form of poverty becomes more and more familiar: the suburban poor.

At this point, it is important to address some other elements of the context. These new mobility challenges, increasingly different for the poor than for the wealthy, appear in the context of a growing gap between the wealthy and the less wealthy. In many developing countries, and also in the United States, income differentials between the wealthy and the less wealthy are reaching record highs, and executive compensation in large companies may only be the tip of the iceberg. This situation may become even more contentious if, as Hervé Kempf (2007) suggests, the lifestyle of the very rich, and the desire of all the rest of us to follow suit as best we can, are putting the survival of the

planet at high risk. Because of these different factors, there is the possibility that in the third millennium, we will see large differences in revenue and in access to natural resources, giving way to social tensions, and even the possible destruction of human and sustainable societies (Kunstler, 2005, p. 24).

URBAN TRANSPORTATION AS A POLICY AND ADMINISTRATIVE CHALLENGE

Over the past decade or so, there has been a better understanding of the complexity of urban travel, and “analysts today widely recognize that travel is more complicated—in part because people’s lives (and resulting travel) are more complex, and in part because analysts now explicitly recognize the complexity that was always there” (Levinson & Krizek, 2008, p. 52). There are now more careers per household, including education as a temporary career, and a greater proportion of trips not related to going to and from work or school, that is, more trips related to discretionary activities, such as going to sports activities, the movies, or shopping. Predicting travel time and itinerary has become more complicated, even for the experts, whether in public administration or in private consulting.

Our perception of the complexity of urban transport also comes from the fact that we know much more about how travel is intimately tied to other dimensions of the city, such as land use, environmental questions (including energy use), health, and equity and social justice issues. As academic disciplines and professional practices, human ecology and New Urbanism (also referred to as Transit-Oriented Development or Smart Growth) contributed much to our understanding of the city in the past few decades (Levinson & Krizek, 2008, p. 231). Because it uses systems theory to look at human societies and their natural and created environment, and because “(t)he central fact of modern human ecology is its urban character” (Hewitt & Hare, 1973, p. 34), human ecology has helped uncover the many relationships between different urban dimensions. Although its application has not always reached its wide-ranging goals in practice (Levinson & Krizek, 2008, p. 312), New Urbanism, for its part, has at least formulated the bases for “a preferred morphology of human settlements” (Levinson & Krizek, 2008, p. 231), with specific preferences for compact development, mixed land uses, and transportation alternatives to the private automobile.

Because of these developments in human ecology and New Urbanism, there is a better understanding of the dynamics of cities, and of large cities in particular, the focus of this paper. For example, it is now well established that “the way urban neighborhoods are designed is one of the factors responsible for physical inactivity, and the resulting epidemic of obesity and its health consequences in the American population” (Demers, 2006, p. 17). Of course, if there are spread out and exclusively residential suburbs, then operating public

transit to serve them is a losing proposition, as efficient public transit requires a certain degree of density. If land use is oriented toward the car, then there are consequences for greenhouse gas production and for the environment in general, as the massive use of the automobile causes much more pollution than any other transport mode. In such a context, the disadvantaged are obligated to use an underfinanced, discredited, and inefficient bus service, or alternatively, to spend a sizable proportion of their basic income on reaching relatively distant locations in automobiles (Brown, 2006, p. 37). Moreover, and as James Howard Kunstler predicts, there is the possibility that as we get past “peak oil” (Brown, 2006, p. 22; Grazi & van den Bergh, 2008, p. 633), this social justice and equity problem will become much more severe in the future, as a greater and greater proportion of the population might not be able to use the car at all, even for everyday, normal human activities (Kunstler, 2005, p. 146). The feeling of unfairness, in the face of comfortable transport modes being reserved for the wealthy, could lead to a crisis without precedent (Grazi & van den Bergh, 2008, p. 633), “a great scramble to get out of the suburbs” (Brown, 2006, p. 37), and even to vandalism, physical abuse, and violence (Kunstler, 2005, p. 320).

Hoping that the worst-case scenarios do not materialize, there is nevertheless a greater realization of the intricate relationships that exist between the different aspects of transportation in large cities (the situation is somewhat different in smaller cities, and we will not address that situation in this text), and more specifically between transportation, land use, health, the environment (including energy use), and social justice and equity. In actual fact, these five dimensions—land use, the environment, transport, health, and equity—were always tangled with one another; we have simply become more aware of their interaction, through progress in knowledge generally, and of environmental dynamics in particular. This helps us to better situate social equity and social justice within an urban system, which is made up of interacting elements. Drawing from Jaques (1991, p. 112), we could describe our five different dimensions of sustainable urban transport as “tangled” elements, strongly related to one another—in fact, a “bundle of tangled elements.”

Nowhere are these “tangled” elements better understood than when cities are built from scratch, as showcases for environmental concerns. As Shanghai is preparing to host a major international exposition in the near future, it is building a city from scratch called “Dongtan,” as a showcase to demonstrate to the world its newly found environmental concerns. The architects from its consulting firm, Arup, are adopting a holistic view of the emerging city, comparing it to an ecosystem:

Planning was an exercise in integrated thinking—“integrated urbanism,” as Arup’s literature calls it. Transportation was considered at the same time as health care, because in the big picture, one affects the other: the more walking and the less air pollution, the healthier the people and the

lower the health-care costs. Similarly, if internal-combustion engines are banned, Dongtan's office buildings will save on air conditioning: workers won't mind opening windows to cool down their offices if traffic noise is absent and the air is clean . . . (the) approach (is) more interdisciplinary. (Funk, 2007, p. 4)

In the next section, we would like to introduce the idea that much of what happens to an urban environment is determined by its basic choices and its choice of the dominant transport medium; we will also attempt to show how these choices, in a systemic way, strongly affect social equity and social justice.

SOCIAL EQUITY AND THE CHOICE OF TRANSPORTATION MODES

In urban studies, there are some schools of thought that insist more than others on the importance of the design of the urban space and its multiple and determining effects on urban life, including civic attitudes and equality. We already mentioned two such schools of thought by referring earlier to human ecology and New Urbanism. When viewed in their widest scope, these traditions can be tied to a Canadian tradition interested in the interaction between media and society, represented by Harold Innis and Marshall McLuhan, the latter of "the medium is the message" fame (Hewitt & Hare, 1973, p. 35). It is useful to call upon this intellectual tradition to better understand social equity in urban settings.

As suggested earlier, sustainable and equitable urban life can now be understood as a "bundle of tangled elements" once it is understood that land use, the environment, transport, health, and equity are interrelated parts of a system. Let us add at this point that this "bundle of tangled elements" is "design sensitive"; in other words, the way we build our urban areas, how we design them in terms of land use and transportation especially, has important consequences on other factors, particularly health, the environment, and social equity. This is not an entirely new idea, as we have seen, but it needs to be "unpacked" to better understand its important implications for equality and justice in urban settings.

Comparing land use that is more favorable to public transit, walking, or cycling to land use that is more favorable to the personal automobile, it is easy to see that the first group of transportation media is inclusive and the second is exclusive. Almost by definition, the personal car separates and isolates individuals, and it also reduces public space in favor of private space. Let us now look at some of the other characteristics of the massive use of the automobile, in terms of social relations.

First, the construction of the private automobile requires a tremendous amount of resources, resources that are used up for the one individual that usually uses it—resources that, as we are increasingly aware, are finite and

consequently unavailable for other uses. For example, the construction of an automobile requires tremendous amounts of water, at different phases of its construction, from the mining of the metals, to the painting of its body, and to different cooling devices. All in all, the total amount of water used in these different processes is huge and has been estimated at as much as 500,000 liters (Barlow & Clarke, 2002, p. 8). Admittedly, there can be large discrepancies in the estimates, but even the smaller estimates leave us with a substantial quantity of water that is devoted to the urban mobility of, most often, a single person.

And then, of course, there are the consequences of the use (as distinct from its construction) of the private automobile. If, as Marshall McLuhan suggested, “the medium is the message,” then we can ask ourselves what is the message sent by the use of the car. The automobile is a very private medium, probably the most private mode of transportation imaginable. The message is that we do not want to share, and that we build a moving wall around us in order to assure our privacy. The word *privé* in French, more or less equivalent to the word *private* in English, may convey the meaning more clearly: *privé* means that I can exclude another person from enjoying what I enjoy myself. With my car, I have built a space that is *privé*, which others cannot invade. Moreover, the logic of the car, its private appropriation of vast quantities of resources, in its construction and in its use, compels it to become a “positional good”: a good the enjoyment of which is derived from the fact that it confers status and from the feeling that “what I have, others don’t have.” It becomes an essential element of the race for status and differentiation. In this race for status, there are amenities of the automobile which, in themselves, we do not really appreciate, or need, but we know we have them, and others do not, and that is an important source of satisfaction. We do not really need all that is offered by the sport utility vehicle, but, sitting above other vehicles, its driver sees the road more clearly, even though the driver blocks the view for others; the driver is better protected from accidents, even if he or she can cause more injuries to the passengers of other, smaller vehicles; and the driver may marginally see more clearly at night with sophisticated new lighting systems, even though he or she may diminish the view of the dozens of oncoming cars that will be faced during a single trip.

As an ego-enhancing medium, the automobile disrupts the balance between the public sphere and the private sphere, in favor of the latter. Let us say that modern, wealthy societies are built on an equilibrium between the private sphere and the public one, and that breaking that equilibrium, in one sense or the other, is detrimental to society. Of course, a society where the public sphere is unreasonably large gives way to totalitarian societies, and of course this is to be avoided. But there is another case of imbalance, and that is where the individual sphere crowds out the public sphere. In her book on the health implications of the overuse of the automobile, Marie Demers observed that “the private car makes us competitors; it simultaneously isolates and marks the

social status of its owner” (2006, p. 92), and she went one step further when she noted that “the public space is narrowing while the private one is inflating, leading to greater segregation and atomization of society and decreasing the sense of belonging to a community” (p. 86).

Why is the shrinking of public spaces in our cities pertinent to our subject of equity and social justice? It is important because it is in the public sphere that we find social equity and social justice, and its shrinking reduces the chances that we meet on “equal footing,” in this case, literally.

Among the worldwide success stories of public transit and of alternative transportation, Bogotá, Colombia, is particularly outstanding. Its mayor, Enrique Penalosa, considered as a hero by a great number of urban planners and public administrators, started his reforms with a simple idea: he would concentrate resources on building a transportation system for the 70% of people of his city who do not own a car, and not only for the 30% who do (Montgomery, 2007, pp. F4ff.). Because the public sphere is enhanced by public transit, walking, and cycling, he was led, naturally, to substantially increase the amount of land used for parks and other public spaces. There were several benefits to his reform, among which was a substantial reduction in the rate of crime, in a country known for having a very high crime rate. In fact, Colombia, along with Mexico and Brazil, has several cities that are plagued with carjacking and kidnapping, in the context of cities where extreme inequality exists between rich and poor, an inequality that is obvious, too obvious perhaps, particularly when the general population waits for a rundown bus, as luxurious private automobiles pass them by. Obviously, the situation in Bogotá is very different from other Colombian cities, and it is also very different from the situations in North American cities, already built to accommodate the automobile. But the example of Bogotá serves to demonstrate the intimate links between the form of the city, the dominant medium of transportation, and questions of equity and social justice.

There are three other points we would like to make in this section, which we have not yet touched upon. The first point is that a land use strongly oriented toward the car and suburban living naturally leads to strong segregation patterns, so much so that “the powerful concept of segregation [may] perhaps [be] the strongest push factor in land use-transportation” (Levinson & Krizek, 2008, p. 56). The rich will generally prefer to be with other wealthy people, and blacks and whites will usually be reluctant to be the only family of their race in a given neighborhood (Levinson & Krizek, 2008, p. 57)—a land-use and transportation reform would not substantially change these preferences. However, the present land use in most North American cities, leaving the poorer inner cities exclusively to the disadvantaged, has the effect of worsening social inequality, simply because the wealthy, living far away from the city center, do not have a strong stake in its condition, which would not be the case if they lived closer by.

The second point, often overlooked, is the fact that, depending on the countries and the cities, as many as one-third of adult citizens do not own or drive a car in industrialized cities, which leaves them disadvantaged and dependent in the standard land-use paradigm where the private automobile dominates. Of course, this question of equity is even more pressing in developing countries, especially if, at some point in the not too distant future, we come to realize that the North American lifestyle and its land and transportation patterns cannot be fully sustained in the developing world, not through political or environmental preferences, but because resources, oil and gas in particular, will prove to be insufficient. The sooner we all come to this realization, the better.

The third point, related to our previous one, is that the question of equity and justice can also be addressed in its international dimension. The world energy spent in transportation, as suggested at the outset, is spent in an inequitable fashion, with as much as 40% of worldwide transportation energy used up by the North American population, while Asia, in comparison, uses about 10%, with a much larger population. Here again, our new consideration of environmental concerns makes us more conscious of this equity and justice problem, as we now know that in a finite world, what is used by one is not available to another, especially in the case of nonrenewable resources. Of course, the same remarks could be extended to unborn generations who also depend on the resources that are currently used.

Having characterized and outlined some of the important elements of our sector of interest, in our case, sustainable urban transport and land use, we will now address the administrative and governance questions of the modes of governance most appropriate to it. There needs to be a “fit” between the type of challenge at hand and the governance methods used to address that challenge.

NEW INSTITUTIONAL ECONOMICS AND GOVERNANCE STRUCTURES FOR CITIES

We already described the essential characteristics of the challenge at hand, developing sustainable urban transportation, including improving its equity and social justice aspects, and we thus described them by stating that sustainable urban transportation is made up of a “bundle of tangled elements that are sensitive to design.” We now turn to the question of governance and to some theoretical elements of the concept of governance. This part of the paper might appear more like an essay, because, to some extent, we will be in uncharted territory.

Let us first say that the theme of “governance” is addressed in several social sciences, albeit from different perspectives. It is not our intention to review these different perspectives here. We chose the New Institutional Economics (NIE) as a perspective and as a discipline because it offers some

explicit guidelines as to why certain structures of governance are better adapted than others to answer certain specific challenges. In other words, once it is established that the challenge at hand presents itself as a “bundle of tangled elements that are sensitive to design,” what can be said about the governance and administrative structure that better answers this challenge?

The original question that NIE addresses is why firms choose to produce certain goods or services, and why, in other cases, they choose to buy goods or services from outside firms, or then again, why they would tie themselves by contract to other firms or economic actors (for the provision of goods and services) in other cases. In NIE language, this becomes a choice between, respectively, “hierarchy,” “market,” and “contract.” It is the question posed to all large commercial or industrial firms, from deciding whether they will operate their own cafeteria or purchase these services from an outside firm, or whether or not they will transport the goods coming off their assembly line by themselves. Even though these basic choices were first analyzed for firms, they have since been applied to other organizations, from family to government, and in this latter case, the questions often become the conditions under which a government contracts out its services or chooses to provide them “in house.” It is the basic question, in other words, of the choice between “make or buy,” and that basic choice confronts any organization, even families (Furubotn & Richter, 2000, pp. 413, 432).

Of course, there are certain elements that no organization can buy or contract out, such as its very basic reason for existence, or the final choice of its strategic plan. In our case, a city cannot really buy or contract out the decision to become responsible for the choice of a sustainable urban transportation and land use, although it can certainly get help for thinking about it. The distinction reminds us of Karl Mannheim’s fundamental distinction between “substantial rationality,” on the one hand, and “functional rationality,” on the other, the first addressing itself to some fundamental, existential question, and the second addressing itself to the manner in which these fundamental choices will be implemented. Having said that, it may very well be that in the past, even in the recent past, cities left some substantial rationality elements to the market to the extent that it only reacted, *ex post*, to private initiatives that, added together, designed the basic form of the city.

In any large concern, be it private or public, there is a mix of hierarchy, market and contract, in the sense that there is a wide variety of circumstances where organizations will produce themselves, buy in the market, or contract out what they need. It is no different for urban government administration. So the question thus becomes the balance between hierarchy, market, and contract, and not the exclusive use of one or the other. In the challenge of sustainable urban transportation, what is the proper balance between these three modes of governance?

There are specific criteria spelled out by NIE, which can help us understand

why organizations will choose a certain mode of governance for a specific task, and not another. These are asset specificity, frequency of interaction, and uncertainty. Remembering that these considerations were thought of, at the outset, for commercial and industrial firms, NIE posits that an organization will move from buying in the market, to contracting, and then to internal provision (hierarchy), as there is an increasing necessity to buy specific assets to interact with other organizations (or individuals), as it has frequent interactions with them or with (outside) individuals, and as there is substantial uncertainty in the course of these interactions. For example, if a manufacturer is buying energy from a utility company, and if the price of energy is paramount to its operations, it will want to enter into a long-term contract with the utility, a contract that will specify future prices, before investing or reinvesting substantially in specific assets for its plant. In the case of “frequency of interaction,” it is obvious that a top executive will not go “to the market” everyday to see what the current hourly wages for secretaries are or to see if a better-performing secretary can be found, possibly for a cheaper price. This executive does not do this because doing so would increase his or her “transaction costs,” an important concept in NIE that states that whenever one deals with an outside organization, transaction costs increase—that is, the costs of finding, bargaining, verifying, and training a person from outside the organization. In several cases, transaction costs are compared with production costs, and the former usually encourages us to do things in house, and the latter usually encourages us to entrust the task to an outside but often more specialized firm or organization.

Now, how does all this apply to the challenge of sustainable urban transportation? In other words, to find the proper balance between what a city should do itself, through its public administration, what it will buy in the market, and what it will purchase by contract, what are the criteria that will be appropriate? Can we use the three classical criteria of NIE mentioned earlier, specificity of assets, frequency of interactions, and, finally, the degree of uncertainty, or should we suggest different criteria, more adapted to our case and to the public sector and to public administration? We will attempt to do both and let us start by using the standard NIE criteria as best we can, even though, as we said earlier, these criteria were first developed for organizations within the private sector.

Concerning the first classical criteria of NIE (asset specificity), we can draw parallels between the characteristics of our case and the NIE concept of asset specificity. When we describe our challenge of sustainable urban transportation by stating that it is “sensitive to design,” we are referring to a concept quite close to the notion of asset specificity. The idea of asset specificity implies that certain assets will have to be specifically purchased in order to fulfill the transaction with the other party, and these assets will have to be purchased before other actions can be undertaken. In other words, there is a *sequential interdependence* here, in that certain actions must be performed before others can be realized and because there is a financial risk in putting in place

these specific assets, due to the fact that in a market situation, the partner can choose to interact with another partner or change its prices over time. Then, the party acquiring the specific assets wants to move to a safer mode of interaction with the supplier organization, in this case contract, so as to protect his or her investment in the assets put in place. This situation of “sequential interdependence,” where certain actions have to be taken before others can be performed, is similar to the challenge of sustainable urban transport, when it is described as “sensitive to design,” in the sense that the health, environmental, and social equity goals can only be realized after planning for transportation and land use. This situation would naturally lead to “hierarchy,” to use the NIE expression, or, in our case, to public, governmental initiative.

In the case of the second NIE criteria, frequency of interaction, we believe it is satisfied by our own characterization of “bundle of tangle elements,” in the sense that there is an intensity of reactions and counterreactions between the different components of sustainable urban transportation, land use affecting transport, and transport patterns affecting health and the environment, for example, in an intensive way. The only difference with the original NIE frequency idea is that the interaction in the original NIE idea is frequency between different organizations, whereas in our case, the interaction is between different elements or dimensions of a problem or policy. Here, too, the application of the criteria would lead us away from market provision and toward hierarchy; in other words, toward government and public administration.

It is more difficult to apply the third NIE criteria—uncertainty—but we can draw a parallel between uncertainty and our own characterization of “tangled” elements, by stating that the elements are so tangled, intimately tied to one another, that working on each one separately would lead to unintended consequences for the others, in other words, to uncertainty. Here, too, the application of the criteria would lead us to governmental responsibility, or hierarchy, in the same way a firm would choose to do in house a task characterized by a high level of uncertainty. And, in the words of Furubotn and Richter, “NIE includes hierarchical transactions as an answer to the problem of rapid adaptation to change” (2000, p. 278). As in the case of the criteria of frequency, we can draw a parallel with NIE, but our parallel is directed between different elements of a policy or problem, not between different organizations.

We can thus conclude that the heuristic application of the three NIE criteria to the case of sustainable urban transportation leads us to choose hierarchy (in our case, government) as a governance mode to deal with the provision of sustainable urban transportation.

COMPLEXITY AND URBAN GOVERNANCE

After drawing parallels between the classical NIE criteria and urban governance, to better understand the choice of a governance structure, we will

try to draw from the specifics of our own case to formulate some additional patterns that help us understand governance modes, in addition to the classical NIE ones covered above. In other words, can we draw lessons from our own case in order to better grasp the patterns that help us understand the choice of modes of governance, and especially the choice between government (hierarchy) and market? Can conclusions be drawn for cases outside the challenges of urban life?

There has been a decades-long debate between, on the one hand, economists and more specifically, neoclassical economists, and, on the other, organization theorists, public administrationists, and political scientists, focusing on the implications of complexity for governance. For the first group, complexity leads to the choice of the market as a governance mode, in part because the “center” (government or hierarchy) does not know more than other participants, and so the spontaneous creativity of the market forces—the invisible hand—should be left to address the question. The second group, more often than not, gives the opposite answer, proposing hierarchy or government, the visible hand, to deal with the same problem of complexity.

Both opinions may be correct in their own way. The real question is: What kind of complexity are we dealing with? If we are dealing with what we will call “unknown complexity,” such as research on carbon sequestration—a complex subject where hierarchy knows less than creative and imaginative scientists do—then we deal with this complexity by decentralizing, in other words, by letting the spontaneous forces of creativity discover these improvements, where the competition and the price signals of the market will play an important coordination role. This is the same answer that Herbert Simon gave in the face of complexity by proposing “factorization.” But that is a quite different situation than our own situation of “a bundle of tangled elements sensitive to design,” because in the latter case, there is complexity, but it is a complexity that is known. In other words, there are complex patterns, but we know how these elements are related to one another, and we know, for example, that a certain land-use pattern will orient us toward the automobile, and another to public transit. We know with certainty the direction of the patterns, even though they are complex. This type of complexity leads more to hierarchy than to market. Most economists who have taken the time to look at this type of complexity agree, although they used slightly different expressions or concepts to deal with essentially the same pattern. There are different ways to describe this type of complexity, which we temporarily called “known complexity.”

Some called this type of complexity “large-scale coordination issues,” which naturally leads to government intervention, as Joseph Stiglitz described (2000, p. 83). Others referred to “joint and strongly interdependent production,” justifying a highly hierarchical mode of coordination (Johanson & Mattsson, 1991, p. 261). Earlier, Hewitt and Hare defended the idea of strong

management, “sophisticated enough to cope with the accelerated paced technical innovation in the urban-industrial world” (1973, pp. 35–36). Alfred D. Chandler, looking at the passage of many competitive railways toward only a few integrated ones, when rail travel became less local and more integrated, called the corresponding and emerging business form of the first half of the last century a “unified” form of administration (the unitary form, strongly hierarchical) (Williamson, 1985, pp. 274–276). New Institutional Economists looked at the same question and dealt with it using their essential concept of “transaction cost,” by observing that transmission of information is costly and that in large and interdependent undertakings, transaction costs are economized by transmitting the bulk of information to one central authority, in one single transmission (Arrow, 1976, p. 85). Kenneth Arrow dealt with “known complexity” when he gave the example of the control of traffic, where coordination by a center is more efficient (Arrow, 1976, p. 86; see also Johanson & Mattsson, 1991, p. 261). Referring to essentially the same concept, but in more general terms, Canadian veteran public administrator Maurice Strong explained the very existence of government, including the search for elements such as social justice, as a response to the particular goal of “translating complex social needs,” which cannot be met by the market (Strong, 1984, p. 11). Here again, we are dealing with complexity, but complexity that is known.

The necessity of a center of decision, or hierarchy, is also related to the fact that the different dimensions of a complex problem, in strong interaction, are also competitors of sorts, but because they are always complementary, an *arbitrage* is sometimes necessary between them, if only because these different dimensions are mirrored by different suborganizations, represented by different people, all wanting more resources for the dimension under their responsibility (Arrow, 1976, pp. 84–85). These arbitrage situations often require a synthetic and holistic view, one that is better performed by the right-hand side of the brain, if we are to believe Henry Mintzberg, or in an integrative, rather than in an additive process (March & Olsen, 1989, pp. 118–126). The market is very apt at comparing alternatives and choosing winners when similar or quite similar processes are involved, when choice is limited to highly “scaffolded” cases (Clark, 1997, pp. 271–272). But when an arbitrage between different but interdependent dimensions is needed, it is ill-equipped to do so. Even within business firms, such decisions are highly centralized. A center of arbitrage is even more necessary when the choice will have significant implications, involving long-term goals, or when an arbitrage between values is involved, as in the case of how different urban forms will affect social justice and equity.

The market is not well equipped to deal, spontaneously, with future goods (Furubotn & Richter, 2000, p. 276) or with externalities for basically the same reason, and that is that the inclusion of these types of concerns goes beyond “one-on-one comparison” of similar elements. In this regard, it is interesting

to note that Friedrich von Hayek's defense of the private market as a source of decision making and allocation of resources was partly based on the fact that in a market situation, there is no need to agree on ultimate ends (1991, p. 300); this is a situation for which no arbitrage is needed. But this is not the case when we are choosing between the needs of different generations; or between present economic comfort and future survival; or, to come back to our own topic, between a sustainable city that has some positive effects on social equality, and an unsustainable city that satisfies mobility in a short-term and narrow view.

All these remarks seem to point to the need for hierarchy—probably more hierarchy than in our contemporary situation—to reach the goal of sustainable and equitable urban transportation. In the case at hand, this means more government and more initiatives for public administration. That does not mean, however, the absence, upstream, of mechanisms of participation that allow citizens and groups to express their views and hopes (Thwaites et al., 2007, p. 21).

But there are also other ways to lay the foundation of better-coordinated government action to meet the challenge of more sustainable and socially equitable cities. These arguments are more direct and less theoretical: quite simply, a large project, such as a more sustainable and equitable city, involving so many different but interdependent dimensions, requires a large and multidimensional organization, and the only ones we have that correspond to this description are city and metropolitan governments. In the following section, we look at the policy and the public administration implications of more sustainable and socially equitable urban transportation.

PUBLIC POLICY AND ADMINISTRATION IMPLICATIONS

In one of the founding articles of public administration, Woodrow Wilson (1887) compared European cities to North American ones and pointed out how much European ones seemed to have been built on the basis of a general plan. In North America, too often we have looked upon the different dimensions of city life as separate sectors, and, consequently, land use, transportation, environmental matters, health, and social equity were too rarely addressed together. The decisions, instead of being integrated and coordinated, were too often guided by market forces, with the isolated consumer in charge, so to speak. The result has been inefficient cities in terms of land use, energy consumption, and externalities—cities that contributed to obesity and social segregation and inequality. In reality, a sustainable city goes well beyond individual choice, even though in the end, individuals will be better off with it than without it. The situation is not unlike the solution of the great health challenges of cities of the beginnings of the twentieth century, when it was realized that protection from unhealthy substances required more than indi-

vidual cleanliness and needed to address the question of the public provision of clean and drinkable water (North, 2005, p. 96). That is not to say that private organizations cannot eventually be called upon to deliver the service once it has been integrated in a general plan, or when the choices become “scaffolded,” to use an NIE technical term.

As Levinson and Krizek noted in their book on metropolitan land use and transport, “it is time to abandon an incrementalist paradigm,” because “with small cuts, our progress has been minuscule to date” (2008, p. 8). The situation “requires holistic thinking . . . beyond our disciplinary upbringings” (p. 9). Of course, a comprehensive approach takes time, decades, if not half-centuries (p. 9).

An integrated approach is more complex, but at the same time, simpler. Simpler, in the sense that once the direction of the interdependence is well understood among land use, transportation, the environment, health, and social equity, public authorities can attack several dimensions in one stroke—in one policy. For example, it is clear that creating dense, transit-oriented corridors, with a mix of residential, commercial, and leisure activities, as New Urbanism recommends, will go a long way toward building a less-polluting, healthier, and more socially equal urban environment. Such is the case when one is confronting a “bundle of tangled elements sensitive to design”: one can work on some aspects to have an effect on another. It is even possible to argue that such “indirect policies” would have more of an effect on reducing obesity than all the “private policies” exclusively devoted to weight loss, which have been spectacularly unsuccessful in recent decades.

One final remark on policy and administration, an observation directly related to public administration: If, as we have tried to show, the building of a more sustainable and just city is made up of different, yet interacting elements, then such a task, in its conception and implementation, requires specialized knowledge. This specialized knowledge—of land-use planning and transportation, for example—is the stuff of specialists, and more specifically, the stuff of unelected specialists in most cases, considering that these integrated policies will take decades to be implemented. This does not mean that civil servants will disobey their political masters; it only means that they might have to defend the continuity of a well-thought-out plan in the face of short-term considerations, and they will have to take on this responsibility over several decades. In the language of the NIE, this role is justifiable on grounds of rationality, in the sense that it is rational to want to achieve the benefits of specialization, including the specialization of vertical coordination (McGuiness, 1991, pp. 74, 78), and it would be inefficient to let this particular specialization go unused and wasted. In response to those who recommend private provision for almost any good or service, and who base their recommendation on the idea that government does not “know all,” we would simply answer that what is necessary is only “better knowledge,” not

“perfect knowledge.” It is reasonable and rational to entrust an organization or a group of persons who has better knowledge on a given subject, and it is unreasonable to set complete or perfect knowledge as a precondition. The advantages of specialization exist in public administration, just as they do in private administration.

CONCLUDING COMMENTS

We tried to show how, in an urban setting, the quest for more equity and justice between fellow humans is part of a “bundle of tangled elements sensitive to design”—so much so that it is often more effective to develop more equality and justice by working on one of the other elements of the bundle. For example, if cities invest in quality transit, and if they do so by also planning for land use, creating multipurpose corridors of commercial, residential, and leisure activities, well served by modern, public transit, it will make the use of the automobile optional but not compulsory for more urban citizens. The fact that under the expert guidance of specialized civil servants this project will take time—decades and possibly up to a half a century—to be completed should not deter us from doing what is necessary. After all, the North American city as it now stands, dominated by suburbia and the automobile, also took decades, in fact at least a half century, to be completed. In the financial crisis of 2008–9, which is in fact a suburban mortgage crisis, at least at the outset, we are now witnessing some of its far-reaching effects. If we are to believe most energy experts, and if we accord any credence at all to James Howard Kunstler’s dire predictions about our common future energy crunch, predictions also supported by other experts (Brown, 2006, pp. 22, 37), then we should spend a substantial amount of the remaining petroleum reserves constructing energy-efficient modes of transportation infrastructures for the future. The alternate answer—the one that says that we only need to find new forms of energy to propel our cars—will in all probability prove to be insufficient, will not address the energy problem of constructing the car in the first place and of disposing of it afterward (which also requires a substantial amount of energy, by the way, even if it is “recycled”), and will not address the question of social justice and equality between citizens or between nations. Over the following decades, the energy spent on transportation in different countries, now extremely unequal, will have to move toward some kind of international average, and that will not be achieved by an international race toward the suburbs and cars, simply because there will not be enough resources for everyone to do so. The sooner we realize this, the better.

We can look upon urban transportation infrastructure as a kind of institution—a “physical institution,” as it were—and institutions lay out several kinds of rules, rules about what is proper and how we relate to one another within it. Transportation infrastructures, as physical institutions, reveal some kind

of worldview. The automobile culture, especially pushed to extremes, as it is in North America, sends a message of separateness and segregation, and the gated “community” is its logical, ultimate step—its *grande finale*, as it were. This logic of segregation and separateness is an international phenomenon, because the car is an international phenomenon. In the 1990s, as Russia saw its public sector starved for funds, and as its population was first hit by the negative aspects of the market economy (hopefully, they will soon see more of its benefits), the sale of private automobiles increased dramatically, interestingly enough, most often in the most impoverished areas. In São Paulo, Brazil, wealthy businessmen now use the helicopter to commute to work, in good part because the strongly unequal income distribution makes commuting to work a dangerous enterprise. Hopefully, that is not the direction we are moving toward, but it is a possibility.

We are not proposing here an urban setting where individuals will be totally equal. There will always be some form of inequality. But societies that survive find a balance between the individual and the community. The current trend of separateness and segregation in land use and transportation is toward an unbalanced social environment. We will begin the long journey to restore balance in our urban environments when we understand more clearly that an urban environment is a bundle of tangled elements, sensitive to design. Social equity and justice are a crucial part of this bundle of tangled elements.

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Jean Mercier, Ph.D. in public administration (Syracuse, Maxwell School), is a professor of public administration and environmental policy in the Département de Science Politique, Université Laval, Québec City. At Laval, he is a member of several research groups on environment policy and planning. One of his four books, on environmentalist organizations, was published in English in 1998. He has published in Canada, France, and the United States, among others, in *Public Administration Review*, *Administration and Society*, *Social Science Research*, and the *International Review of Administrative Science*. He is a regular recipient of federal and provincial research grants in Canada.