

Impeaching the Car: An Assessment of the Potential for Sustainable Urban Transportation

**by Robin Macdonald
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The Institute of Urban Studies





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INTRODUCTION*

The political arena of the wealthier industrialised economies is currently being inundated with commitments to and pleas for sustainable development. While these discussions are broadly based and relatively inclusive, considerable focus has been directed towards improving the sustainability of urban centres. The potential to create sustainable cities, however, is severely weakened by widespread and increasing private automobile usage. Not only are motorized vehicles responsible for extensive environmental degradation, but the physical infrastructure which they demand is equally unsustainable.

Those governments sincerely dedicated to the achievement of sustainable communities must therefore confront and challenge the current and longstanding subserviency to automotive interests, and work towards shifting the emphasis in their societies away from the automobile and towards less destructive means of mobility and access.

This paper briefly describes the extent of automobile dependency in the developed world, and particularly that of North American cities; summarises the various problems associated with such a reliance; assesses a number of alternative modes of transport, as well as strategies to reduce automobile usage; and discusses the elements required for more sustainable urban transport practices to occur.

THE DIMENSIONS OF AUTOMOBILE DEPENDENCY

The global vehicle fleet is currently concentrated in the high-income nations. In 1988, the Organization for Economic Cooperation and Development (OECD) countries alone accounted for 80 percent of the world's cars, and 70 percent of the world's trucks and buses. Both of these proportions sit within a global automobile population of 630 million vehicles.¹ These statistics reflect both the form and function of North American cities, which are characterized by universal car ownership, extensive scenarios of urban sprawl, and transport policies geared almost exclusively towards accommodating the automotive industry. While the benefits that once accrued from car ownership might have supported this enormous amount of automobile-related investment, such deference to the car is no longer valid.

The principal benefits traditionally associated with vehicle ownership consisted of high social status, and of improving people's access and speed to their destinations. Since that time, cars have

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evolved from a luxury to a necessity, and have reached a point of diminishing returns in terms of both speed and access.

Most North American cities are currently plagued with frequent traffic congestion. Drivers in the largest American cities, for example, waste 1-2 billion hours stuck in traffic jams each year. During the morning rush hour to Paris, traffic crawls in at less than 10 kilometres per hour.² These data seem to suggest that mobility by car saves less time than is generally assumed.

In terms of access, evidence reveals that drivers are having to travel further and further to perform vital daily tasks. American households, for example, drove, on average, 16 percent more kilometres to get to work in 1990, than in 1969, 88 percent more kilometres to do shopping, and 137 percent more kilometres for other personal matters.³ These statistics reflect an increase in traffic at twice the rate of population growth during the past 15 years.⁴

In addition to covering greater distances to perform daily tasks, Americans are also making more trips to accomplish these activities: the annual number of car trips each household took rose from less than 1400 in 1969 to over 1700 in 1990.⁵ While some of this increase is due to higher female work force participation and changes in their occupations, children of baby boomers reaching driving age, healthier seniors driving longer, and a rise in concern over personal safety,⁶ much of the surge can be attributed to the vicious automobile-related cycle. This cycle consists of car dependency leading to inefficient land use such as, single-purpose, low-density zones which, in turn, increase driving requirements.⁷

Thus, over the past few decades, North Americans, have expanded their network of activities over a wider and wider geographical area, producing an increase in the number of trips made, the distance travelled, and an excessive dependency on the motor vehicle to access common destination points. Urban citizens now expect to live in one community and work in another, shop in neighbourhoods other than their own, and are generally ignorant of the efficiencies and practicalities of the traditional compact and diverse community structure which characterized the earlier part of the century.

In short, the high status once associated with car ownership has been reduced to only those who travel in cars situated at the upper end of the market, and the greater mobility conferred by the automobile has failed to give people more rapid and improved access to their destinations.

PRIVATE AUTOMOBILE LIABILITIES

Despite the aforementioned depletion of automobile-related benefits, the majority of North Americans continue to perceive cars as providing them with a sense of freedom, convenience,

flexibility and power. Consequently, most North American citizens currently choose the private vehicle in favour of other travel options. From a broader perspective, however, the automobile is proving unsustainable due a wide range of substantive and pervasive environmental, social and economic costs.

Environmentally, the automobile is now recognized as a principal origin of local and global ecological damage. Perhaps the most cogent indication of this is its standing as the main source of air pollutants in the majority of cities in industrialised countries.⁸ This is particularly true of carbon monoxide, the nitrogen oxides and, to a lesser extent, suspended particulate matter and lead. The repercussions of these emissions are significant contributions to global warming, acid deposition, and photochemical smog.

Beyond the air quality ramifications of widespread urban automobile use are additional environmental impacts. Most notable of these is the fostering of urban sprawl and the simultaneous destruction of irreplaceable natural assets such as wildlife habitat and vegetation, while the considerable noise and water pollution caused by road traffic should not be overlooked.⁹

The pernicious effects of widespread automobile use can also be viewed from an economic perspective. Again, many of the liabilities can be attributed to automobile induced urban sprawl. This phenomenon constitutes a huge burden on taxpayers, since a low density area requires more miles of roads, transit lines, sewer, water and gas mains and other services *per capita* than a compact community.¹⁰ Such sprawl is also responsible for the loss of huge tracts of valuable agricultural land.

In addition to the costs imposed on individual taxpayers, car dependency reduces the profits of private businesses. Not only do the infrastructure costs of businesses rise due to the necessity of providing large amounts of parking space for their patrons, but highway congestion has been estimated to cost countries billions of dollars annually in lost employee time and delayed delivery of goods.¹¹

The enormous quantity of deaths and injuries from traffic accidents generates astronomical medical costs, as do respiratory diseases and other health problems which result from air pollution. Traffic accidents also add to the load of court activities and police services. Clearly, the economic costs generated by private-automobiles are far from insignificant.

While the social impacts of motor vehicles are less quantifiable than both their environmental and economic counterparts, they are no less meaningful, and should be identified. A number of these impacts are health related. In automobile-oriented cities, traffic gridlock and long commuting times result in psychological stress for individuals and families.¹² Moreover, automobile accidents are a leading cause of deaths and injuries, while urban smog and other air pollution problems are important source of bronchial and cardiovascular diseases, lung damage, throat and eye irritation, and headaches.¹³

The sprawling, homogeneous, low-density urban form which characterizes most North American cities is also a contributor to social isolation, the loss of neighbourliness, and a general disintegration of community life. Studies reveal that people feel cut off from each other as a consequence of the streets' often incessant traffic flows. As such, much of the value of streets as a locus for social interaction has been lost.¹⁴

Finally, cars have been cited as sources of social inequality. In North America, streets often cater so exclusively to cars that it has become prohibitively dangerous for alternative travel practices such as pedestrian travel, cycling, or even waiting for public transit.¹⁵ Furthermore, those citizens who do not own a car may lack access to employment opportunities, services and community life, especially in the absence of decent transit service.

In summary, the perceived right to and unrestricted use of the private car has resulted in an abundance of detrimental social, economic and environmental legacies, and the price of the car, as it stands today, fails to reflect the extent and severity of these consequences. This would suggest that North American societies have greatly overvalued the automobile, and made the perilous mistake of underestimating its true costs.

OPTING OUT OF AUTOMOBILE DEPENDENCY

As the previous section indicated, the longstanding preoccupation with automobiles has degraded communities both socially and environmentally, and has imposed significant economic costs. Based on these premises, a transformation in transport modals is required which would continue to provide people with access to the destinations they seek, albeit in the least destructive manner possible. This would entail both a reduction in the use of private automobiles, as well as an increase and improvement in alternative modes of transportation such as pedestrian travel, bicycling and public transit.

Before introducing alternative means of mobility, however, an ostensibly practical option, which would require the least drastic change in current travel behaviour, would be to rely on technology to mitigate some of the negative consequences associated with automobile transport. Some auto makers, in fact, have already produced cars which run on electric motors instead of an internal combustion engine and which eliminate polluting tailpipe emissions. Other entrepreneurs have devised vehicles made of exceptionally light weight materials and improved aerodynamics to achieve the much needed gains in fuel-efficiency. While alternative fuels and light-weight materials do offer improvements, they are by no means a panacea. Left unaddressed are other previously identified shortcomings of automobile-centred transport, including traffic congestion and urban sprawl.¹⁶ Moreover, for all the

advancements in automobile technology, the fundamental problem would remain unsolved, that being humanity's momentous and expanding dependency on the car. Thus, it would seem, non-car options remain the only solution.

Walking and bicycling surface as the most energy-efficient and environmentally positive alternatives to private automobile transportation. For the individual, walking carries with it a number of benefits. It costs nothing, provides exercise, and over time can create an intimate acquaintance with the neighbourhood and community, thus mitigating some of the negative social impacts of car dominated societies. Unfortunately, however, most cities are no longer designed for pedestrians. Pedestrian guidelines could therefore need to be integrated into future planning processes for walking to be a viable alternative for city residents. These would include standards for sidewalks, walkways, walking distances, accessibility, spacing and design of street crossings and safety features.¹⁷

Bicycles are another energy-efficient and non-polluting form of transport. In addition to being relatively inexpensive, they provide the same fitness and social benefits as walking. In addition, they are more efficient in terms of the speed of travel, and yield a considerable range and flexibility in trips (i.e., errands, work trips, recreation, *etc.*). Their use is restricted, however, by the individual's physical condition, and to some extent, by weather.¹⁸

Given the extent of urban sprawl, the zonation of cities, and the distances such networks require people to travel on a daily basis, both pedestrian travel and cycling are often severely limited as practical modes of transport. As a result, public transit is frequently promoted as an important alternative.

Public transit options are numerous and diverse. The possibilities include: employee bus pools, street cars, light rail transit, subways and buses. The potential for implementing these systems, however, varies according to numerous factors, such as feasibility, climate and topography, current land use, and population size and density. Thus, not all public transit systems constitute universally feasible options.

Like the private automobile, public transit as a whole entails a variety of strengths and weaknesses. Public transport is route-specific, requires some waiting, and is generally fraught with limited goods carrying capabilities.¹⁹ It also necessitates capital investment whether it be for the purchase of buses, the laying of rails, the digging of tunnels, or the building of a station. At the opposite extreme, public transit is space and energy efficient, serves high volumes of people well, is safe and pedestrian friendly. Finally, public transit can be relatively inexpensive, and encourages and supports high-density urban form.²⁰

CONCLUSIONS

In conclusion, the variety and severity of automobile-related ailments are extensive and pervasive, but can be remedied. Similarly, government rhetoric pertaining to the creation of sustainable cities can be realised.

However, the political and physical transformation of cities from the inefficient, expensive, and destructive state in which they currently exist to more sustainable settlements requires a vision of communities which are not dominated by cars. The structural and political challenges therefore include: re-orienting transport infrastructure away from the automobile; exposing the true costs of driving through the removal of subsidies; implementing measures to facilitate bicycle and pedestrian use of residential areas and major roads; and the integration of transport policies with land-use planning. The fundamental point is that the reduction of car dependency is an essential step towards sustainable communities.

NOTES

1. The United Nations Environment Programme and the World Health Organization, "Air Pollution in the World's Megacities," *Environment*, 36,2 (March 1994): 7.
2. Marcia D. Lowe, "Reinventing Transport," in *State of the World Report* (Washington, DC: World Watch Institute, 1994), p. 84.
3. *Ibid.*, pp. 82-83.
4. Wayne McEachern, "Transit Supportive Land Use Planning," *Plan Canada* (January 1993): 28.
5. Lowe, *op. cit.*, p. 83.
6. McEachern, *op. cit.*, p. 28.
7. Lowe, *op. cit.*, p. 84.
8. UNEP and WHO, *op. cit.*, 7.
9. For a more thorough examination of the environmental effects of motor transport, see for example: Chris Ferrary, "Environmental Assessment and Transport," *The Planner* (November 1990): 9-12; Joell Vanderwagen, *Transit in Canada: A Handbook for Environmentalists* (Greenpeace Canada, 1992) and Lowe, *op. cit.*
10. Vanderwagen, *op. cit.*, p. 10.
11. Lowe, *op. cit.*, p. 84.
12. Vanderwagen, *op. cit.*, p. 10.
13. Danny Blair, class hand-out: "Major Primary Air Pollutants," November 1992.
14. Herbert Girardet, *The Gaia Atlas of Cities* (New York: Doubleday, 1992), pp. 148-49.
15. Lowe, *op. cit.*, p. 84.
16. *Ibid.*, pp. 84-85.
17. Vanderwagen, *op. cit.*, p. 18.
18. *Ibid.*
19. McEachern, *op. cit.*, p. 28.
20. For a more thorough exploration of the alternative forms of public transit, consult, e.g.: Vanderwagen, *op. cit.*, pp. 14-19; Lowe, *op. cit.*, Girardet, *op. cit.*, pp. 147-51.

21. Girardet, op. cit., 148-49, and Mark Roseland, *Toward Sustainable Communities* (Ottawa: National Round Table on the Environment and the Economy, 1992), pp. 97-98.
22. Marcia D. Lowe, "Calming Motorized Traffic," *Alternatives*, 18,1 (1991): 16; Roseland, 1992, op. cit., p. 98.
23. Girardet, op. cit., pp. 150-51; Roseland, op. cit., pp. 91-92.
24. These measures are described in detail in Roseland, op. cit., pp. 1-100 and Lowe, op. cit., pp. 93-97.
25. Roseland, op. cit., pp. 92-95.
26. Some Canadian provinces, such as Saskatchewan and Alberta, have recently begun to require the consideration of public transit in the land-use planning process. For details, see Vanderwagen, op. cit., p. 24 and David G.H. Watson *et al.*, "GoPlan—A Work in Progress," *Plan Canada* (May 1994): 17-20.
27. Wayne L. McEachern, "Transit-Friendly Land-Use Planning: A Key Ingredient Supporting Urban Environmental Quality and Economic Development," *Plan Canada* (September 1991): 15.
28. Vanderwagen, op. cit., pp. 9, 21-24.
29. Girardet, op. cit., p. 146.
30. Ibid.

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