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THOUGHT PIECE**Achieving Sustainable Transportation****by Jonathan Mason**

Sustainability is a serious concern for future transportation planning, but it should not be regarded as a straightforward problem with a simple but difficult solution. Achieving sustainability is a contextual and multi-dimensional process. Just as transportation pollutes the environment in a variety of ways and over a long period of time, addressing these pollutants requires a long-term, incremental, and multi-dimensional strategy to achieve sustainability. Genuine sustainability will likely take generations to achieve, but such a goal is most likely to be achieved through steady, incremental understanding and improvements in environmental impact. Given that sustainability is a long-term agenda, history is a useful and essential guide.

Sustainability by nature suggests a longitudinal process, measured by historical change and trends. After all, environmental disruption is not a new problem. Indeed, the climate changes we are now experiencing are likely caused by decades-old pollution. The historical legacy of environmental regulation and planning — of what has worked, what has not, and what were unexpected side-effects — is essential in guiding the best way forward. The proper questions have to be addressed in order to build a framework of change and to properly define measures of improvement. Understanding the historical context will enable better planning for the future.

Transportation should be at the top of the agenda for sustainability, yet transportation planning has to satisfy many competing agendas, such as managing economic growth, safety, equity, and social networks. Globalization is the central challenge to sustainability, and transportation is the backbone sustaining the global economy. Without travel and trade, the global economy simply would not exist, yet all this movement has a significant environmental impact. Furthermore, despite the increasing pollution burden from transportation, more travel is expected, not less. Stemming from the strong complementary nature between transportation and global communications, we can expect the global demand for travel to rise significantly. Dealing with more travel in a sustainable manner is the great challenge ahead.

A sustainable transportation agenda requires a flexible, holistic approach, as its agenda has to be integrated with other competing

objectives, such as equity, economy, and safety. The historical trend of globalization is profound, and increased travel should be accommodated as opposed to restricted. In addition to the deleterious economic effects, restricting mobility raises serious equity concerns, as it is likely that only elites will retain their right to mobility. Sustainable transport is thus just that: a sustained system, not a constrained, limited system. Energy consumption is a popular concern due to the atmospheric pollutants produced, but many other types of pollutants should also be of concern: the global impacts of transportation also involve land degradation, water pollution, and the transfer of invasive species. A great deal of waste exists in the transport sector, particularly when moving people, and sustainability should involve an agenda of eliminating such waste and improving efficiency.

How to instrumentally deal with a sustainable globalism requires a subtle, flexible approach on case-by-case bases, but general outlines can be determined. Problems should be understood scientifically, and innovation should be based on iterative learning of what works and what does not: a process of trial and error. Technology certainly has a central role in achieving sustainable transportation, but political reform is just as important. In understanding how to encourage effective and responsible technological development, political structures are crucial to such development. Too often transport is considered a field only for technical enquiry, an exclusively engineering subdiscipline, yet politics are central to the development of transportation infrastructure.

Within the political spectrum, methods of implementing solutions are diverse and should not be driven by such political ideologies as statism or privatization. A growing consensus is settling on the need for well-regulated markets to achieve policy goals. Market mechanisms have proved to be useful in improving efficiencies, but they are weaker in addressing strategic social goals, such as pursuing equitable outcomes. Proper regulation is necessary to guide the market mechanism. For instance, congestion pricing and parking pricing have great promise in better managing existing automobile use and its infrastructure, yet equity concerns could also be addressed in a regulation that transferred the pricing revenue for achieving equity in the system. Much progress is to be achieved with creative congestion pricing and parking charges utilizing a properly regulated market structure to achieve social and environmental ends. The techniques for implementation are essentially well established, but the political obstacles are the main hurdle. Approaches to solutions should not be assumed or ideologically driven, as trial-and-error is an effective instrument of improvement and progress.

What will a better model of sustainable transportation look like? Again, the future will develop upon existing historical trends. Strategically, a single solution such as fuel cells or a bicycle revolution may have promise, but it lacks the diversity of innovation required. Promoting bicycling and walking is a promising trend, but such narrow, individual measures clearly have their limits, especially in dealing with longer travel distances. Radical shifts are hard to achieve and thus less likely to be implemented.

Incremental shifts hold far more promise. Multiple fronts for innovation and change offer hope for comprehensive reform, while a proper understanding of why certain modes are dominant at the moment is instructive of achievable change. If only due to the vast capital infrastructure already developed for it, the automobile will be with us for some time, but planners would be wise to appreciate the popular appeal of automobiles in providing their users with control and convenience.

Transportation choices are not solely defined by the mobility they provide, but by a myriad of social and economic factors. For instance, the consumerism attached to the automobile is also crucial in understanding the popularity of the automobile. Transit has a great deal to learn from the flexibility, adaptability, and consumer popularity of cars. Great improvement in fuel efficiency and emissions can be achieved simply through off-the-shelf technology and better regulations, yet other social factors resist such change. Simply making vehicle weights lighter reduces fuel consumption and emissions considerably, yet consumers often consider heavier cars safer. Meaningful reform requires an appreciation of the complex nature of transportation choices.

A distinction between short-term versus long-term strategies provides a realistic framework for achieving sustainability. Over the long term, entirely new power plants may be developed for automobiles, but over the short term, improvements in the internal combustion engine hold the most promise. Land use changes can produce measurable results towards sustainable transportation, but it must be recognized that widespread land use changes take decades to be implemented and, thus, to have a measurable impact. The challenges of sustainable transportation are great, but they are not insurmountable with wise and concerted effort.

Jonathan Mason is completing his PhD in the Department of City and Regional Planning at the University of California, Berkeley. His interests cover the interactions between transportation policy, land use planning, and urban design and how they relate to the globalizing economy.