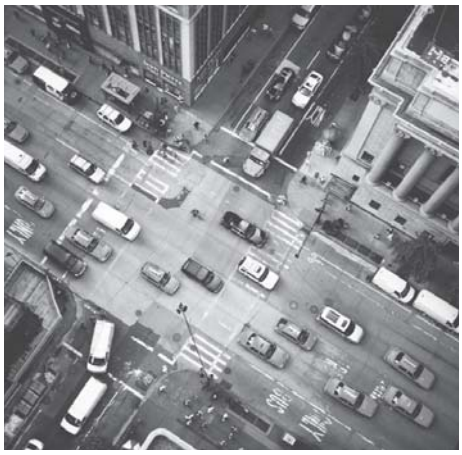
How can technology enable us to reimagine urban streetscapes?

Tanner Hyland

The Problem

Cities across the world are undergoing a transformation in the ways in which they think about their streetscapes. Originally conceived as shared spaces capable of fulfilling a multitude of transit and community-oriented functions, our understanding of streets has changed radically in the decades following WWII to support the development of a predominantly car-oriented society. This reliance on automobiles as our primary means of travel has permeated every aspect of our communities, resulting in a prescriptive formula for streetscapes that emphasizes the automobile above all else, regardless of setting or context.



While this rigid framework for streets remains successful in areas that have minimal density to contend with, it poses a major problem for urban streets that must accommodate a broad range of occupants and uses. With the heightened usage of alternative forms of transportation contributing to new infrastructure needs and safety concerns, cities are beginning to reconsider the framework of streets altogether.

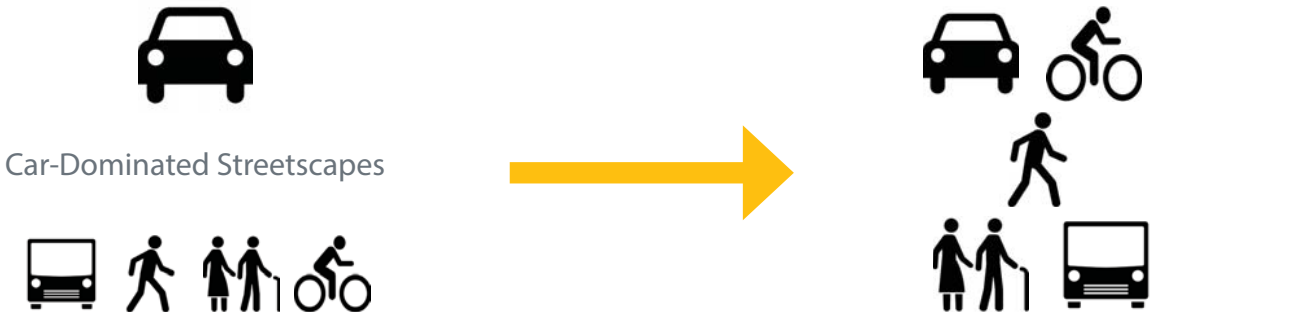
As citizens become increasingly educated on sustainable lifestyle practices and the threats associated with automobiles, cities are experiencing a resurgence in bicycle and foot traffic as well as a demand for the integration of public transportation in downtown areas.[1] While this trend represents an undeniable step in the right direction, it also creates an added strain to streetscapes that were, in most cases, designed with a narrow focus on accommodating automobiles.

[1] Jake Lucas, "Cities like Boston are redesigning their streets for the people who use them," 24 Aug. 2015.

Current Solutions

Complete Streets

The need for more diverse and flexible streetscapes has prompted cities such as Boston to pursue the implementation of "complete streets," a concept that seeks to accommodate a multitude of uses by shifting the focus of streets from being car-oriented to people-oriented.[2] By placing cars and people on equal footing, streets evolve to accommodate pedestrians, bicycles, and public transit vehicles at the same level as cars. Recognizing the level of integration necessary to achieve such a streetscape, the Boston Complete Streets initiative illustrates the need for smart technology as a means of coordinating and enabling multimodal transportation. Examples of such technology include the integration of bike and car sharing services, intelligent street signals, and charging stations for electric vehicles.[3] While the reach of the complete streets concept is broad in the sense that it seeks to accommodate many different uses and functions, it is critical to understand that the criteria must be tailored to each individual street to achieve an optimal outcome.



[2] Ibid.
[3] Boston Complete Streets, Boston Department of Transportation.

Current Solutions

Living and Naked Streets

The notion of "living" versus "naked" streets is based largely on the premise of the woonerf, a street typology introduced in the Netherlands in the late 1960's that is predicated on restricting automobile traffic to reposition streets as social spaces.[4] Whereas complete streets seek to place all modes of transportation on equal footing, living and naked streets place cars below pedestrians and bicycles in the streetscape hierarchy. With a vested interest in promoting safety and an overall sense of community, living streets employ a number of traffic calming devices such as narrow and meandering drive lanes, street furniture, reduced speed limits, and an absence of curbs to mitigate the flow of cars.[5]

Naked streets push the idea of mitigating traffic a step further, creating safer streets under the premise that a higher perceived level of risk naturally triggers risk-mitigating behavior.[6] Through the removal of all street signage and markings, naked streets seek to establish a self-governing streetscape that allows pedestrians, cyclists, and automobiles to coexist harmoniously. Perhaps the best example of this concept is London's Exhibition Road, which includes elements such as bicycle parking, outdoor seating, and free moving pedestrians among two rather ambiguous vehicular drive lanes.[7] By deemphasizing the role of the car in the urban street, Exhibition Road functions as both an effective thoroughfare and a vibrant social hub within the city.

[4] Nicole Thomas, "Living and Naked Streets," 27 Aug. 2014.
[5] Ibid.
[6] Ibid.
[7] Gordon Fyfe Webster, "Exhibition Road," Urban Design London.

A Proposal for the Future

While the solutions discussed above solve the current problem of better accommodating people within complex streetscapes, they too run the risk of becoming outdated as new technologies develop. Thus, it is critical to consider how the inclusion of smart technology can not only facilitate the accommodation of multimodal transit and pedestrian access, but provide flexibility for the future in terms of street layout.

While technologies such as street light sensors presently offer value in the form of detecting activity and adjusting to make intersections safer for pedestrians and cyclists, the capabilities of smart city technology such as that of Panasonic extends far beyond the realm of directing traffic. Developed in partnership with Panasonic, the city of Fujisawa, Japan is already utilizing street lights that have the built-in functionality of brightening or dimming according to activity levels, flashing in the event of an emergency, and monitoring street activity via security cameras.[8] Although the purpose of the camera feature is purely for town safety, Panasonic is in the process of deploying street lights in Denver that will have the added capability of detecting noise, weather conditions such as cloud cover, temperature and humidity, and the exact number of people or cars in a given place.[9]

When analyzed against the backdrop of a complete or living street format, the potential uses for such technologies are endless. It is essential to consider how the ability to detect activity and atmospheric conditions can be leveraged to create more adaptive streetscapes, and how we can position our urban districts to better accommodate new technologies as they develop. For example, in the context of a complete street, cities may soon face the added challenge of integrating autonomous vehicles into their streetscapes as opposed to the typical combination of cars, bicycles, and pedestrians. As we look to the future, it is imperative to consider how the ability to gather and analyze real time user data can lead to a sustainable and flexible street typology capable of adapting to future conditions.

[8] Tamara Chuang, "Denver smart city Peña Station Next a technological testing ground for Panasonic," Denver Post, 11 Dec. 2016.
[9] Ibid.