CYCLISTS, BIKE LANES AND ON-STREET PARKING: ECONOMIC IMPACTS

TORONTO CYCLING THINK & DO TANK

The 3rd report in a series examining cycling behaviour, social and civic infrastructure and cycling economies.

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OUR PARTNERS:

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The Project

The Toronto Cycling Think & Do Tank is a multi-disciplinary, multi-sector research project focused on increasing cycling for transportation. Funded by a Social Sciences and Humanities Research Council of Canada (SSHRC) Partnership Development Grant, this diverse research group is studying, applying and evaluating three elements critical to reinforcing urban cycling as a significant transportation choice: sustainable cycling economies; social and civic infrastructure; and knowledge mobilization. With this initiative, principal investigator Beth Savan, a veteran University of Toronto School of the Environment researcher, has built a coalition of expert practitioners and academics to address an important gap in knowledge about creating more sustainable cities: how experience from the behavioural change field (applied extensively to building occupants) can be successfully adapted and used in the field of active transportation.

Executive Summary

This report focuses on the economic impacts of cycling infrastructure and participation on local retailers and businesses in urban areas in North America, while accounting for the fact that bicycle lanes and other forms of infrastructure sometimes compete with on-street parking for space.

Bicycle infrastructure can bring very positive economic impacts to business communities in North American urban shopping strips. Today, North American urban cyclists are a desirable demographic for local businesses. They are skilled, selective, loyal, and spend more money where they shop than their driving counterparts. Cycling infrastructure is important to them, and therefore important for businesses who want to attract them (both as customers and as employees). Bicycle lanes and bicycle parking can increase the capacity of roads and the ability of people to shop simultaneously, all while improving various social and environmental aspects of a neighbourhood.

In walkable urban cores, bicycle infrastructure is likely to provide a bigger boost to local businesses than on-street parking, especially where off-street parking exists within the vicinity. North American retailers have a tendency to over-estimate car mode-share and under-estimate cycling mode-share among their customers. Further study of the impacts of combining on street parking and bicycle lanes would clarify best practices.

Introduction

Transportation is a key environmental issue and in 2011, the sector accounted for 24% of Canada's greenhouse gas emissions. Transportation stands out for its significant increase (5.8%) in emissions between 2005 and 2011, more than double the increase of

the two other increasing sectors while five of the eight reporting sectors actually decreased emissions in this period (Environment Canada, 2013). In urban areas, increased cycling is a practical solution and an important mitigation strategy to help Canada reach its emissions goals. In 2008, traffic congestion in the Greater Toronto & Hamilton Area cost commuters $3.3 billion and reduced gross domestic product by $2.7 billion. It is estimated this cost will rise to $15 billion by 2031 (Greater Toronto Transportation Authority, 2008; Toronto Region Board of Trade, 2013). Active transportation has been identified as a significant part of the solution to traffic congestion. It has multiple economic, health and environmental benefits helping to reduce the cost of unnecessary physical infrastructure, as well as the negative impacts and the considerable financial costs arising from environmental damage, poor health and long commute times associated with personal automobile transportation.

In North America, the economic and practical implications of facilitating or encouraging cycling are frequently misunderstood or altogether ignored by many important stakeholders. While the social and environmental benefits of active transportation and cycling specifically are now widely accepted and understood, until recently information regarding the economic impacts of safely accommodating cyclists through the reconfiguration of our public spaces has been scarce. As dense mixed-use communities continue to flourish in North American urban centres and space on our streets becomes highly contested by various users, it is necessary to understand how to most efficiently administer these spaces to best serve the local community, economically as well as socially and environmentally.

In the past, adding bicycle lanes to main streets, especially when on-street parking may be reduced in the process, has proven a contentious issue for North American business communities (Andre-Gee, 2013; CBC News, 2012; Florida, 2010; Rowe, 2013). Frequently, main street business improvement groups have opposed cycling infrastructure. As more research is done to better understand the economic impacts of such decisions, however, it has become increasingly apparent that concerns about detrimental impacts to business communities as a result of allocating a greater share of public space to cyclists in urban areas are unwarranted. Cycling infrastructure does in fact appear to be very beneficial for North American urban shopping strips.

As cycling participation increases rapidly throughout North American cities (Pucher et al, 2011), it is important for stakeholders to make informed decisions about the allocation of our public space. The role of urban transportation infrastructure for both communities and businesses needs to be carefully evaluated especially in environments where drivers frequently do not represent the majority of users. This report aims to contribute to the informed decision-making process that needs to happen with regards to cycling infrastructure in urban shopping streets across the continent.

1 Research Questions

1.1 How can transportation infrastructure best serve urban businesses?

Is urban transportation infrastructure in tune with modern mode share realities? How accurate are current mode-share perceptions among business owners? Is the current allocation of resources optimal?

1.2 Are cyclists good for business?

Who are cyclists as a demographic, and what does this mean for businesses? What is the economic potential of catering to cyclists in North America today?

1.3 How does bicycle infrastructure affect businesses? How does removal of on-street parking affect businesses?

How do bicycle lanes and other forms of cycling infrastructure affect the business environment? What if bike lanes are competing for space with on-street parking?

1.4 Can bike lanes and on-street parking coexist?

Are configurations that accommodate both bicycle lanes and on-street parking more desirable where viable? Are they ever viable?

2 Methods:

A search for online literature and journal articles was conducted during the period between October 2012 and September 2013. Although news articles and manuals were considered acceptable literature, the backbone of this report is built on quantitative peer-reviewed or otherwise official research articles and reports. Scholarly sites and search engines were used to find relevant scientific literature using key words bicycling, cycling, infrastructure, modal share, economic impact, business, on-street parking. Mainstream media outlets were regularly scanned looking for references of public opinion regarding the subjects discussed in this paper, and internet-wide search engines were used with the same purpose. Fellow researchers at the Toronto Cycling Think and Do Tank regularly participated in this process. Each article was read in full and its relevance and implications to and for the questions above and other sources carefully evaluated. I attended several community consultations where local Toronto businesses were asked about the possibility of replacing on-street parking with bike lanes in order to familiarise myself with the priorities and concerns of planners, advocates, and especially business owners. For the purposes of this paper, the term ‘bicycle lane’ or ‘bike lane’ refers to

space on or directly adjacent to a road allocated exclusively to cyclists. Bicycle lane designs where cars may traverse the lane to reach parking were considered bicycle lanes, but shared-lane markings or 'sharrows' were not.

3 Findings

3.1 How can transportation infrastructure best serve urban businesses?

While cars remain the main mode of transportation in North America, other forms of transportation now dominate within dense urban areas. Although 86.1% of people in the United States and 72.3% in Canada still commute by car today, the modal share in dense urban areas is remarkably different (Statistics Canada, 2008; U.S. Department of Transportation, 2010). Less than 15% of people choose to drive to work within downtown Toronto, for example, and less than 5% within Manhattan (City of Toronto, 2012a; New York City Department of City Planning, 2010). Though the importance of drivers to the economic well-being of businesses remains unquestionable in much of North America, dense urban neighbourhoods work under a different dynamic, and will continue to do so in the future according to observable trends. In Chicago, New York, Boston, Portland, Seattle, San Francisco, and Washington DC, the relative number of people who commute by car decreased by anywhere from 6.0 to 12.7% in the period from 2000-2009. Over the same period of time, the number of people who cycle increased between 50.2 to 230.0% (Freemark, 2010).

It is noteworthy that the central areas of many North American cities predate the invention of the car, and may remain ill-suited for a car-centric approach to transportation, especially where it concerns businesses hoping to attract large numbers of customers or employees all at once. The considerable space required for high customer turnover, assuming most customers drive, is simply not available in pre-war main streets, even with on-street parking on both sides of the road. Malls, strip malls, and big box developments have a significant competitive advantage in terms of the capacity of cars they can accommodate at any given time. However, pedestrians and cyclists – much more efficient in their use of space – can visit neighbourhoods with limited car parking in much greater numbers without saturating their infrastructure and without preventing fellow customers from visiting the same places. This is consistent with the fact that 19th and early 20th century shopping strips were designed and built with trolleys, pedestrians and cyclists in mind, but not cars. Today, although most of our public space has been allocated to drivers, it is cyclists, pedestrians, and transit users who remain the main customers of many of North America's urban businesses. Six independent studies show that non-automobile modes of transportation are in fact the norm among many of North America's urban shopping destinations (**Figure 1**). There is now evidence that making these destinations friendlier and more attractive to visit for cyclists and pedestrians substantially improves the business environment, reduces commercial vacancies and increases sales.

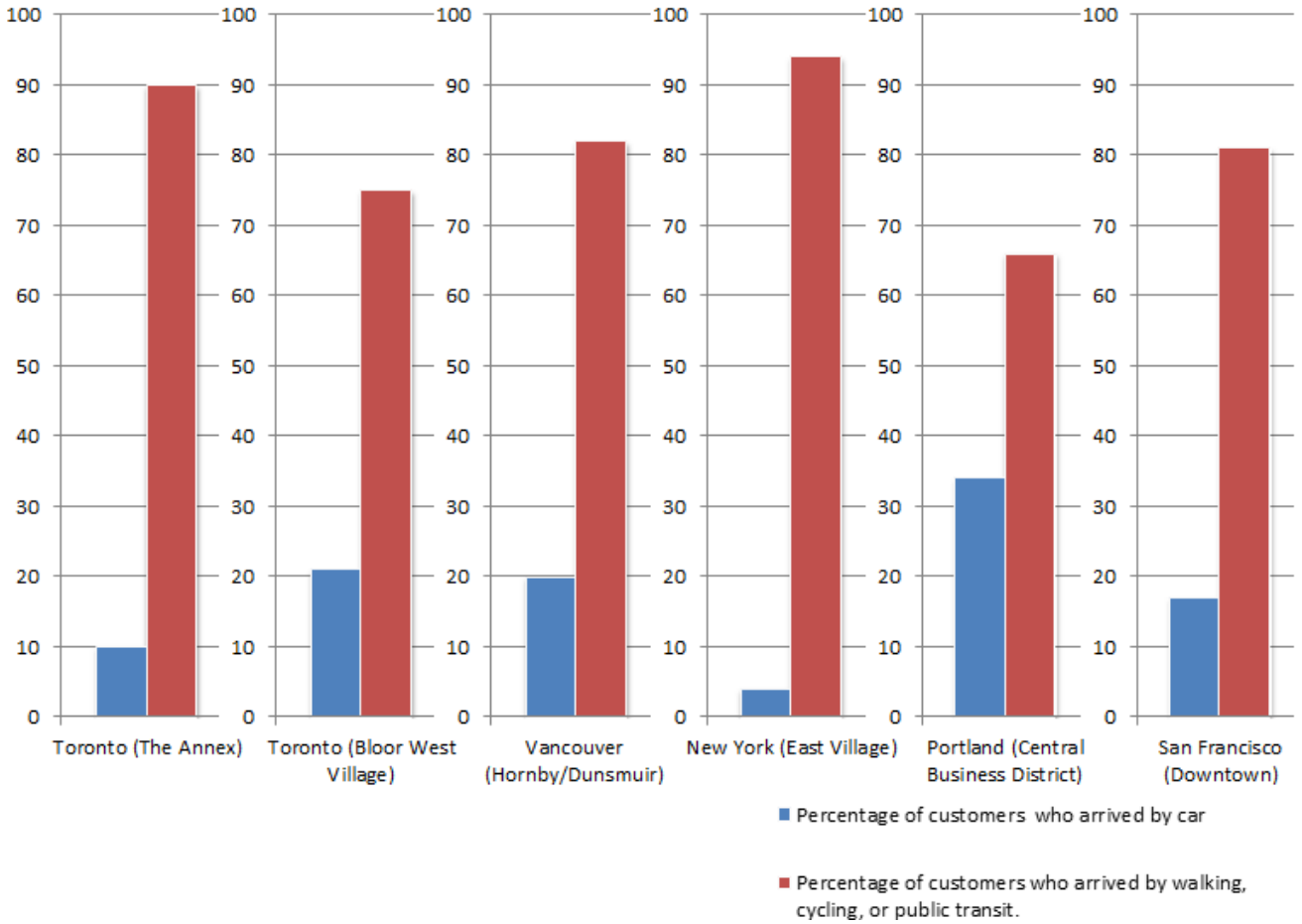

Figure 1: Urban Neighbourhood Shopper Mode Share Six independent studies show that shoppers are more likely to use modes of transportation other than cars in urban North American neighbourhoods. Data from Stabinsky (2009) and Forkes et al. (2010) was used for the Toronto (Annex) and Toronto (Bloor West Village) graphs respectively. Data for Vancouver is from Stantec (2011). The Portland study numbers here are for all of Portland's downtown (Clifton et al., 2013). The New York survey was carried out by Transportation Alternatives (2012). Note that the San Francisco study by Bent et al. (2009) was done after congestion pricing measures were in place.

3.1.1 Perceptions and optimisation:

The perception that customers are likely to arrive by car in dense urban areas continues to be held by many retailers – even if other travel modes have firmly established themselves as the most popular. Studies conducted in downtown neighbourhoods of Toronto and Vancouver have shown that business operators tend to overestimate the number of customers arriving by car, and that the volume of customers who arrive by car is small in comparison to that of those who don't (**Figure 2**). In The Annex, a landmark Toronto neighbourhood where customers are more likely to arrive by cycling than by driving (12% cycling mode share vs. 10% car mode share), retailers overestimated the car mode share on average by 100% (Sztabinski, 2009). Merchants from a different Toronto neighbourhood, Bloor West Village, where car use is more prevalent, also over-estimated the number of drivers visiting their stores by 100% (Forkes et al., 2010). In Vancouver, merchants along Hornby and Dunsmuir streets estimated a 40% car mode share and 4% bicycle mode share, but a customer survey demonstrated that only 20% of people arrived by car, and 8% of people arrived by bicycle – with the remaining 72% arriving through transit or by walking (Stantec, 2011).

The Annex study, published by Toronto's Clean Air Partnership, also demonstrated that on-street parking in the neighbourhood is very rarely at capacity, and is typically between one-third and two-thirds full (Sztabinski, 2009). The removal of some on-street parking space in that context would be unlikely to trigger any profound negative economic impacts (Shoup, 2011). On the other hand, opening the streets to other users of the road, through infrastructure such as bike lanes would likely produce tangible economic benefits as people within cycling distance of this retail strip would be encouraged to shop there.

New York, a city which has made substantial efforts over the past several years to accommodate cyclists and pedestrians in areas previously allocated to automobiles, has set an excellent precedent for the potential of such reconfigurations to attract more cyclists. On New York's Second Avenue, where buffered bike lanes were put in place, 61% of people reported they were more inclined to bike into the neighbourhood (Transportation Alternatives, 2012). This was confirmed by The New York Department of Transportation (2012), which recorded "up to a 177% increase", in bicycle volumes along First and Second Avenues shortly after the bike lanes were installed.

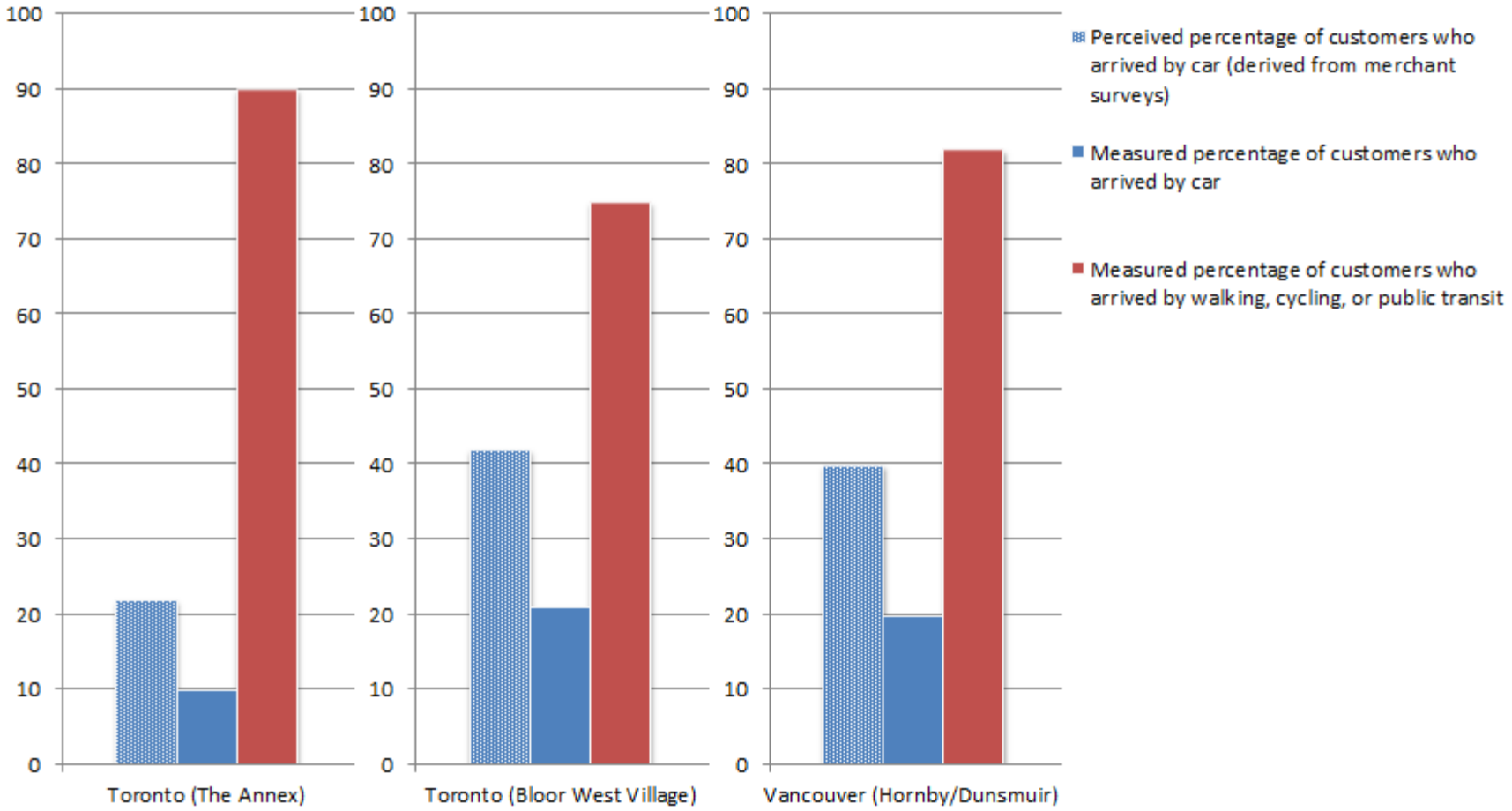

Figure 2: Merchant Perception versus Actual Mode Share of Shoppers. Three independent studies show that merchants in urban neighbourhoods over-estimated by 100% on average the percentage of customers who drove to their stores. In all three studies, surveys show that drivers made up a relatively small percentage of all customers. Data from Stabinsky (2009) and Forkes et al. (2010) was used for the Toronto (Annex) and Toronto (Bloor West Village) graphs respectively. Data for Vancouver is from Stantec (2011).

3.2 Are cyclists good for business?

Bike lanes and on-street parking appeal to both a different demographic and a different customer base in North American cities. While drivers spend more money per visit at a particular location, cyclists tend to make more trips over the course of a month. Evidence suggests that in North American urban centres cyclists are responsible for greater monthly per capita spending than drivers and transit users (Clifton et al., 2013; 2012; Forkes et al., 2010; Sztabinski, 2009; Transportation Alternatives, 2012). This may be due to several factors. One hypothesis is that since cyclists need to spend less money on auto repairs, gas, insurance, and car payments, they have more disposable income (Clifton et al., 2013). While this phenomenon appears to be particularly palpable in dense urban areas, Clifton et al. (2013) suggest that cyclists spend more on a per capita monthly basis even in suburban environments. Although cycling is a very cost-effective form of transportation, other demographic traits likely factor into these findings; cyclists in Toronto tend to earn a higher income than the city's average, for example (Cycle Toronto, 2011; Ipsos, 2009).

When members of Cycle Toronto, that city's largest cycling advocacy group, were asked in an anonymous survey about their main considerations when buying a product, 'quality' and 'supporting local businesses' ranked among their top priorities (Cycle Toronto, 2011). This willingness to support local products and stores, coupled with above average incomes and the fact their preferred mode of transportation is most suitable for medium and short distances, makes contemporary urban cyclists an ideal target demographic for their local 'main street' merchants.

3.2.1 Are cyclists attractive for employers/institutions?

Many cities are revamping their cycling infrastructure in an attempt to attract "creative class" workers (Walljasper, 2012). Rahm Emmanuel, Mayor of Chicago, justified the location of a set of separated bicycle lanes by stating: "It is not an accident that, where we put our first protected bike lane is also where we have the most concentration of digital companies and digital employees. Every time you speak to entrepreneurs and people in the start-up economy and high-tech industry, one of the key things they talk about in recruiting workers is, can they have more bike lanes" (Spielman, 2012). In Toronto, five prestigious law-firms recently wrote to the city supporting cycle tracks for the use of their employees (Kuitenbrouwer, 2013). Richard Florida, director of the University of Toronto's Martin Prosperity Institute, insists that successful cities need to accommodate creative class cyclists by building cycle tracks, and showed that there was a significant positive correlation in American cities between bicycle mode share and both human capital and average wages (Florida, 2010; 2011). The value of cyclists as a demographic is also evident when considering that bicycle infrastructure is often used as a selling point by realtors, and is known to correlate positively with residential property values (Racca et al. 2006).

3.3 How does bicycle infrastructure affect businesses? How does removal of on-street parking affect businesses?

While on-street parking and bike lanes are both believed to foster economic activity, the potential benefits of bike lanes are particularly important in urban neighbourhoods and should be especially appealing to businesses looking to capitalise on a strong local customer base. According to numerous studies, utilitarian cyclists are high per-capita spenders likely to live in or visit dense urban areas, more likely to be repeat customers, and more likely to reach a particular store or shopping district if bike lanes are in place.

The incidence of cycling and the number of cyclists in any given geographical area are expected to increase as infrastructure to facilitate this mode of transportation is provided, and the quality of infrastructure is a strong determinant of whether or not cyclists are attracted to a particular route (Broach et al., 2012; Buehler et al., 2012; Strauss, 2013).

Available evidence suggests bike lanes effectively act as a catalyst for economic activity. For example, the implementation of physically separated bike lanes in New York City led to widespread economic benefits along the streets where these lanes were located. These bike lanes contributed to a 49% increase in retail sales in businesses located on 9th Avenue compared to a 3% increase borough wide, 49% fewer commercial vacancies on Union Square, compared to a 5% increase borough wide, and a large increase in bicycle volumes on First and Second Avenues accompanied by 47% fewer commercial vacancies which compared to 2% more vacancies borough wide (New York City Department of Transportation, 2012). Similar measurements taken in Seattle by Kyle Rowe (2013) showed that recent bicycle lane/sharrow additions (which reduced on-street parking by a few spots) did not produce any negative economic impacts on surrounding businesses (Rowe, 2013). A survey of retailers in Valencia Street, San Francisco, CA, found that bike lanes had a positive impact on business 4 years after their addition according to 65% of merchants, with only 4% reporting an overall negative impact (Drennen, 2003).

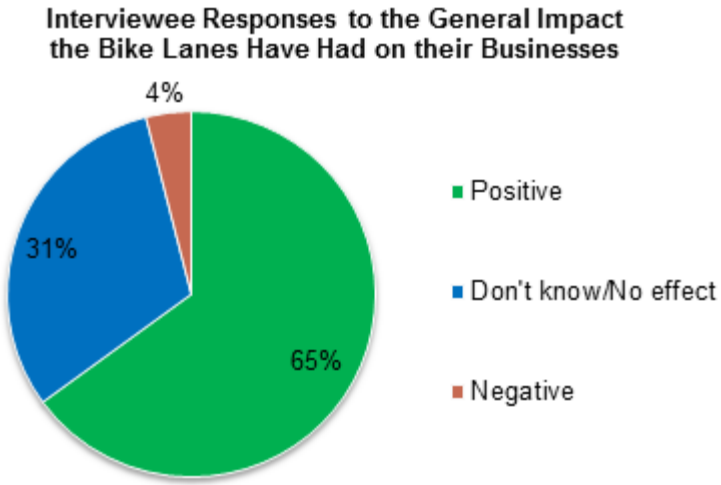

Figure 3. Merchants' responses when asked to review the general impact that bicycle lanes have had on their businesses in San Francisco's Valencia Street, 4 years after implementation. Source: Drennen, 2003

Other forms of cycling infrastructure, such as bike parking 'corrals' that take over space previously dedicated to on-street car parking, have been very positively reviewed by adjacent businesses. Corrals offer an advantage to businesses in urban environments: a way for customers to shop at their stores without competing with one another for scarce on-street parking. Since many bicycles can be stored in the space of a single parking spot (usually 8-10), it is possible for businesses using such corrals to expand their customer base much more efficiently than if they relied on customers finding an available on-street parking spot nearby – bicycle parking greatly diminishes the amount of parking space required to generate profit (Lee et al., 2010). Studies have shown that by converting one parking spot to a bike corral, it is possible to make the land 150% more effective at bringing revenue to retailers (Lee et al., 2010). Merchants in close proximity to bicycle corrals that replaced on-street parking in Portland, OR, overwhelmingly support the idea that these increased transportation options for employees and patrons enhance neighbourhood identity and improve the sidewalk environment (Meisel, 2010). Many of these benefits would also be made possible by replacing on-street parking with bicycle lanes and providing corral-like bicycle parking at intersections or over the sidewalk. While parking facilities are important to cyclists, the role that bicycle lanes play in bringing cyclists to a neighbourhood and in supporting cycling for transportation should not be underestimated.

The only North American study linking cycling infrastructure with a decrease in economic activity was done by Stantec (2011) in Vancouver, Canada, where an existing painted bike lane was turned into a more sophisticated type of bike lane: a bidirectional cycletrack. The survey methods used in that study, however, were inappropriate to conclusively assess the economic impacts of that transformation. A more detailed critique of that study can be found in the background section of this report.

Setting a precedent

Figure 4. New York's bicycle lanes have contributed to increases in sales, decreases in commercial vacancies, and rising bicycle volumes (New York City Department of Transportation, 2012).

In New York's East Village neighbourhood, 73% of shoppers surveyed considered the new bike lanes positive or very positive for the neighbourhood and the community, and only 14% objected (Transportation Alternatives, 2012).

Photo: Clarence Eckerson Jr. STREETFILMS. Press HERE or on the photo to see a video of business owners talking about the impact of bicycle lanes and parking.

3.4 Can bike lanes and on-street parking coexist?

It is not necessary to remove all on-street parking to accommodate bike lanes. If the street is wide enough it is possible to include both in a number of configurations. New York City and Chicago have built bike lanes with buffers which still allow for on-street parking, usually at the expense of traffic lanes. Replacing a left-turn lane or equivalent with bicycle infrastructure will likely benefit the immediate business community judging by the experience described by E. Drennen (2003) in Valencia St.

Toronto has several bike lanes located in between parked cars and regular traffic, though these are not considered optimal by those who advocate for safer and more inviting cycling infrastructure. The main advantage of having bicycle lanes on the street side of parked cars is that bicycles can merge with traffic freely and overtake other cyclists more easily. Some cycling advocates do not consider these lanes safe for people of all ages and different levels of experience; cyclists are unprotected from car traffic, must be constantly on the watch for sudden car movements with little space for reaction, and run the risk of getting hit by opening doors (Ontario Ministry of Transportation, 2013; Duthie, 2010; Furth, 2010). Official bicycle infrastructure design guidelines from the American Association of State Highway and Transportation Officials (AASHTO) and the latest bicycle infrastructure guidelines from Ontario Traffic Council (OTM) also recommend removing on-street parking to ensure the safety of cyclists where space is limited (AASHTO, 1999; OTM, 2013). Moreover, there is mounting evidence that protected bicycle lanes/paths are more efficient at attracting cyclists than painted lanes (Broach et al., 2012; Pucher et al., 2008; Strauss et al., 2013; Tilahun, et al., 2007).

Toronto officials are now looking at the possibility of bidirectional cycle tracks that would keep on-street parking on one side of the street – an approach successfully implemented in Montreal. Jacobson et al. (2012), however, do not recommend placing two-way cycle tracks on two-way streets, since some cyclists must face car traffic coming in the opposite direction. It is possible that permanent on-street parking between the cycle track and moving traffic would improve on that scenario, creating a buffer.

There are cases where streets are too small to comfortably accommodate cyclists, on-street parking, and through traffic. In those circumstances it is important to consider the safety of all road users, but also that bicycle lanes bring important social and economic benefits to urban communities (where such narrow streets tend to be found). Since suburban arterial roads in North America tend to be very wide, the competition between bicycle lanes and on-street parking remains mostly an urban challenge.

4 Background

Shopping strips in pre-WWII North America were originally designed to serve a local demographic consisting mostly of pedestrians, cyclists, and transit users. Following the widespread use of the automobile, main street retail suffered as it failed to offer the convenience of shopping centres, strip malls, and big box stores, which had ample parking and were more easily accessible for wealthier suburbanites. We are currently witnessing a shift towards urban living and non-automotive modes of transportation. 'Main street' retailers stand to gain from that shift.

Today, a very large percentage (often the majority) of people in denser North American cities rely on modes of transportation other than the car to get to work (City of Toronto, 2012b; Freemark, 2010; New York City Department of City Planning, 2010). This urban modal-share reality comes with a number of challenges and opportunities. People's preference for non-automotive transportation in urban environments means that changes to our infrastructure – so often tailored to satisfy drivers' needs after extensive projects and refurbishment efforts in the 20th century - are required to facilitate walking, cycling, and public transit. This is a challenge after so many years of prioritising motorists, but it also means that businesses and institutions in urban areas can free themselves from some of the constraints of car-oriented configurations.

Cycling is an increasingly popular form of transportation in the continent. Over the past decade, the number of people who use a bicycle for transportation has been steadily growing in major North American cities (Freemark, 2010; Pucher et al., 2011). While cycling for transportation is normal in a number of European cities (where bicycles can account for up to 50% of all trips, and where a 20% mode-share is common, widespread urban cycling is still a relatively new phenomenon in modern North America (EPOMM, 2013). Cycling for transportation is a socially inclusive and environmentally friendly alternative to motorised travel, and a growing

number of municipalities are embracing it and dedicating infrastructure specifically for cyclists – mostly in the forms of bike lanes for safety and bicycle parking for convenience (and to prevent bicycle theft).

Bicycle lanes and on-street parking are both independently perceived as positive features by modern planners. The availability of paid on-street parking has been linked to increased economic activity and pedestrian traffic, and is thought to act as a buffer between the sidewalk and traffic (Edwards, 2002; Marshall et al., 2008). Bicycle lanes or physically separated bicycle tracks allow people to safely use bicycles as means of transportation, and have been associated with reductions in gridlock and pollution. The construction of bicycle infrastructure is one of the ways in which traffic resulting from high residential densities may be alleviated, and is therefore especially relevant to dense urban areas (Melia et al., 2011). Because the city centres of most large North American cities predate the invention of the automobile, their infrastructure may not be able to handle a car-centric approach to transportation while supporting local businesses and institutions. To illustrate the reduction of capacity and change in transportation patterns that we have had on city streets as cars have become more prominent and travel routes more widespread, it is worth looking at the historic capacity and usage of the Brooklyn Bridge in Manhattan, NY. In 1907 the Brooklyn Bridge, which then accommodated mostly transit riders and pedestrians, experienced 426,000 daily crossings, compared to only 178,000 in 1989 when it served mostly cars (Dubin et al., 2001). Cycling offers merchants in shopping strips the possibility to extend their local reach while increasing the total number of customers who can simultaneously visit their shops.

In Portland, Clifton et al. (2013) found by surveying customers throughout Portland's metropolitan area that cyclists there are bigger spenders on a per-capita per-month basis than drivers. Two Toronto studies also showed that cyclists in pre-war urban neighbourhoods contribute significantly to businesses' sales and are in fact higher per-capita monthly spenders than drivers (Forkes et al., 2010; Sztabinsky, 2009). Both Toronto studies were carried out in residential neighbourhood 'main streets' where bicycle parking is available but bicycle lanes are not. Since a City of Toronto (2009) study reports that only 3 out of 10 Torontonians feel safe riding on a major street without bike lanes, and all businesses in the two Toronto studies were located on one such street, it is fair to hypothesise that the cycling potential of these neighbourhoods is not yet realised without bike lanes.

Higher monthly per capita spending by cyclists compared to their driving counterparts was a recurrent theme in the literature reviewed. It was interesting to see that, in Toronto at least, cycling advocates are wealthier than the population average, and studies in New York and Portland support the higher monthly expenditure trend by cyclists (Clifton et al., 2013; Ipsos Reid, 2009; Transportation Alternatives, 2012). On the other hand, the Alliance for Biking and Walking reports that cyclists' incomes tend to match the incomes of those who use other modes of transportation, although those who earn more than $100k per annum show a disproportionate tendency to cycle, although most frequently for recreation (2012). Income and spending may be differently aligned among cyclists, especially those cyclists who do not also own an automobile which would result in higher disposable income. More

information on the average income of cyclists and the related spending patterns, especially as cycling gains popularity throughout the continent, would be needed to develop a better understanding of the factors behind the current spending patterns of urban cyclists as discussed in this report.

Although no evidence was found that bicycle lanes in urban environments lead to a loss of business (please see 4.1 for an analysis of the Vancouver case), and several examples of the contrary have been well-documented, fears persist among some business communities when the implementation of bicycle lanes requires the removal of traffic lanes or on-street parking (Florida, 2010; Kramer, 2011). These fears may be compounded by the fact that many North American retailers have a tendency to greatly overestimate the percentage of their customers who drive and park nearby. Two Toronto and one Vancouver study showed a tendency of urban retailers to overestimate the share of customers who drive by 100% (Forkes et al., 2010; Stantec, 2011; Sztabinsky, 2009). In all three studies, drivers turned out to be a relatively small minority of all customers – ranging from 10-21% of the total surveyed customers.

Studies conducted where bicycle lanes have been constructed conclude cyclists often become valuable customers, and infrastructure serving them is an asset to local businesses. In New York, the installation of new bike lanes was linked to significant increases in retail sales, a reduction of commercial vacancies, and large increases in bicycle volumes (New York City Department of Transportation, 2012). While it is worth pointing out that widened sidewalks were also added to Union Square, one of the areas where the business environment improved following the intervention, there is no evidence that cycling infrastructure there was anything but an asset to local businesses. Another New York study post-bike lane implementation offers concrete evidence that as a result of the new cycling infrastructure, cyclists specifically are very significant contributors to the well-being of local businesses: a large percentage of patrons turned out to be cyclists (25%, compared to under 5% for drivers), and respondents reported they were more likely to cycle to the neighbourhood than before (Transportation Alternatives, 2012). Rowe's (2013) Seattle study found increases of up to 400% of previously recorded values in retail sales following the installation of a bicycle lane and sharrows in the Latona and 65th Neighbourhood Business District, compared to steady sales in the rest of the neighbourhood and in a comparison site. While he could not directly prove that the new infrastructure caused the improvement in sales, his measurements show that comments warning about the severe detrimental impacts that the lanes would have on local businesses were not justified (Rowe, 2013). Rowe's (2013) research also shows that although sales remained constant in Greenwood, another neighbourhood where bicycle infrastructure was put in, no negative impacts were recorded.

Bicycle infrastructure alone will only get neighbourhoods so far. It is likely that in New York, for example, there was pent up demand for bicycle lanes and so the results were immediately very positive when these were installed. It would be unfair to expect a similar

degree of success if physical cycling infrastructure is not backed by social infrastructure that helps encourage and sustain active transportation behaviour.

4.1 The Vancouver Case

Only one study was found that identified the addition of bicycle infrastructure as a potential cause for loss of revenue. A Stantec (2011) study commissioned by the City of Vancouver to assess the consequences of the implementation of protected bicycle lanes in Hornby and Dunsmuir streets attracted media attention after announcing that there were moderate negative economic impacts as a result of the reconfiguration (Jackson, 2013). A closer look at the study results and methodology reveals that the data are not conclusive for several reasons. Metropolitan area phone surveys were made to determine whether people were more or less likely to shop on these streets, which is entirely inappropriate given that any business boost would be expected primarily from locals more willing to cycle to these shops. The wider survey dilutes this effect by including more distant residents. Sidewalk surveys were carried out but did not enquire about the spending patterns or frequency of visits of customers polled - thus missing out on important data. Information about changes in revenue was gathered directly from business owners, but only from those who volunteered to share it (about a third), and was not corroborated using any other means. These same business owners greatly overestimated the number of people who drove to their stores. Still, by far the most important reason why the Stantec (2011) study cannot be used as an argument against bicycle lanes is because the streets it examined and where the new protected lanes had been recently added, already had painted bicycle lanes before, albeit unidirectional (**Figure 5**). The results therefore reflect the effects of a particular type of bicycle lane over another – an entirely different scenario from the transformation of a street without any cycling facilities. The study does include comparator streets without bike lanes, but interestingly enough, the streets with separated bike lanes as a whole performed equivalently or even better in some of these objective measurements. Vacancy rates dropped on Hornby St., for instance, and rose on its comparator (Howe) street over the course of the study (Stantec, 2011). Unlike the surveys, that piece of data is entirely unbiased. It is also worth noting that Hornby and Dunsmuir, one-way streets with sporadic and relatively wide storefronts underneath modern commercial and residential towers – with a strong presence of franchises - do not fit the scale and model of the classic urban core North American shopping strip.

Figure 5. Snapshot from Google Maps' Streetsview showing Hornby St. in 2009 – before protected bicycle lanes were added. Although this was by no means an optimal arrangement, this street already possessed more cycling infrastructure back then than most equivalent streets do now. This is not a typical North American urban shopping strip.

The Stantec team recommends a series of mitigation measures to improve the business environment, but recognise that it is difficult to assess the lasting impacts of bike lanes within the study area based on the research conducted thus far. Future studies, once surrounding neighbourhoods have had time to adapt to the new protected bicycle lanes, should tell a more complete story about the economic impact of this piece of infrastructure.

4.2 Conclusions

Bicycle infrastructure has the power to bring very positive economic impacts to business communities in North American urban shopping strips. While the extent of those benefits will vary depending on factors such as the quality of the infrastructure available, the types of businesses in question, the pent up demand for cycling infrastructure and the space constraints that may prevent some features from being implemented, the potential for improvements is significant. North American urban cyclists today are a desirable demographic for local businesses, known to spend more money where they shop than their driving counterparts. Cycling

infrastructure is important to them, and therefore important for businesses who want to attract them. Bicycle lanes and bicycle parking can increase the capacity of roads and the ability of people to shop simultaneously, all while improving various social and environmental aspects of a neighbourhood.

On-street parking and bicycle lanes (and parking) should both be included so as to maximise the economic potential of a typical North American shopping strip. Where this is impossible due to space constraints, there is evidence that, although parking removal may represent a small loss of revenue from driving customers, the implementation of bicycle lanes can lead to a substantial amount of new revenue instead. While it depends on the specific context, it is safe to conclude that many North American retail streets would benefit rather than suffer as a result of replacing on-street parking with some form of bicycle lanes. Even in neighbourhoods where a cycling culture is not yet mature enough for bicycle lanes to make economic sense, this doesn't necessarily mean that this dynamic will persist into the future; cycling rates in North American cities are rapidly and consistently increasing, and the addition of better cycling infrastructure can further catalyse the uptake of cycling for transportation. It is important to remember that, although the health of urban businesses is critically important to the well-being of our communities, our streets remain public spaces that are paid for collectively and where we must ensure the safety of all users above any other considerations. As tempting as it may be to squeeze in as many of the features discussed in this report as possible, the integrity of the infrastructure as it pertains to the safety of all users should always be prioritised.

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