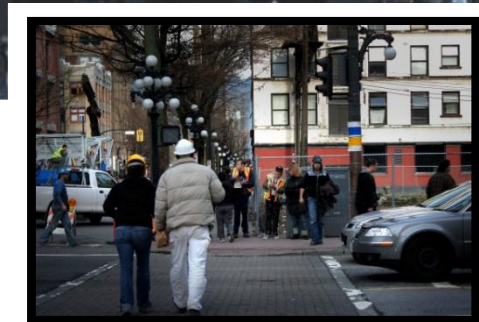
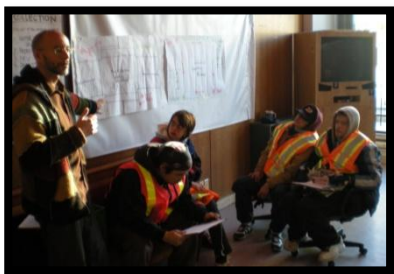
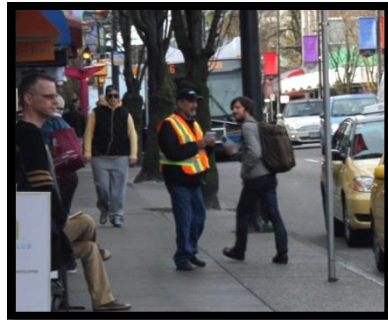


“We’re All Pedestrians”

FINAL REPORT OF THE DOWNTOWN EASTSIDE PEDESTRIAN SAFETY PROJECT



Vancouver Area Network
of Drug Users



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The Downtown Eastside Pedestrian Safety Project would like to acknowledge the many contributions that made this project a success. It was a collaborative partnership of diverse groups working together for the first time, all for a common goal – pedestrian safety.

First, our thanks go to the City of Vancouver who funded the project through its Great Beginnings Program, which made it possible to begin addressing the longstanding and serious issue of pedestrian safety in the Downtown Eastside. In particular, the enthusiasm and dedication of Social Planners Christine Tapp and Dana Walker shone throughout the project and Assistant City Manager Wendy Au ensured the project kept moving forward.

Second, the members of the Steering Committee, including Marion Allaart, VANDU's Program Director, Katie Hume from Vancouver Coastal Health, Ann Livingston, VANDU co-founder and volunteer, Hugh Lampkin, VANDU's Vice President, and Christine and Dana from the City consistently provided valuable input and direction to the coordinators.

Thirdly, the Advisory Committee, for your commitment, passion, and guidance, including:

- Wendy Au, Assistant City Manager, City of Vancouver
- Doug Bain, Sergeant, Vancouver Police Department
- Bev Ballantyne, Putting Pedestrians First
- Joanne Bergman, Road Safety Delivery, Insurance Corporation of British Columbia
- Colleen Carroll, Carnegie Community Centre Board Member
- Dr. John Carsley, Vancouver Medical Health Officer, Vancouver Coastal Health
- Winston Chou, Traffic Management Engineer, City of Vancouver
- Jon Cinnamon, Injury researcher from Simon Fraser University
- Paul Gagnon, Engineering Project Coordinator, City of Vancouver
- Paul Goodman, Regional Coordinator, Road Safety & Loss Prevention Services, Insurance Corporation of British Columbia
- Hugh Lampkin, VANDU Board Member
- Toby Lewis, Engineering Assistant, City of Vancouver
- Matthew Matthew, Carnegie Community Centre Board Member
- Patrick Simpson, member, City of Vancouver Seniors and Persons with Disabilities Advisory Committees
- Meghan Winters, Injury researcher from University of British Columbia
- Rob Wynan, Vice-Chair, City of Vancouver Bicycle Advisory Committee

- Jemay Zheng, Road and Infrastructure Engineer, TransLink

Next, the Board, staff, and members of VANDU for your insight, involvement, sense of humour, and unwavering support in taking the organization in a new direction of harm reduction for Downtown Eastside residents – the safety of all pedestrians in the community. A special thank you to the “core” volunteers – Richard, Dianne, Lynden, Lorna, Laura, Irene, and Hugh – for helping direct the project and guiding us through the unique organizational culture at VANDU.

Finally, the project would like to acknowledge the residents of the Downtown Eastside, without whom this project would not have been possible. We were able to engage over 1,500 local residents and would like to dedicate this report to them.

Lani Russwurm
Don Buchanan
June 2010



Executive Summary

Introduction

Traumatic pedestrian injury leads to about 4,000 hospitalizations in Canada each year. These injuries often result from the interplay of modifiable or preventable environmental factors. Addressing the environmental factors related to pedestrian injury represents an important public health opportunity.

The City of Vancouver places pedestrians as the top priority in transportation planning. For example, one of the recommendations in the Greenest City Action Team’s 2009 Quick Start Report, under the section “Greener Communities – Mobility,” is to “make streets safer for pedestrians and cyclists.”

A background study conducted by researchers at SFU and UBC entitled “Pedestrian Injury and the Built Environment: An Environmental Scan of Hotspots” provides the foundation for the Downtown Eastside Pedestrian Safety Project. The study found there were 2,358 recorded pedestrian injuries citywide in the six year period, an average of 393 per year, or just over one per day and just over 10% of recorded pedestrian injuries occur in a small area of the Downtown Eastside (DTES). It identified 32 injury “hotspots” (five or more pedestrian injuries during the study period) in Vancouver, of which nine (28%) are on East Hastings in the Downtown Eastside.

Hastings Street is home to a disproportionately large number of vulnerable road users including seniors, families with children, and people with disabilities, mental illness, and addictions – some of Vancouver’s most marginalized residents. For example, out of a total DTES

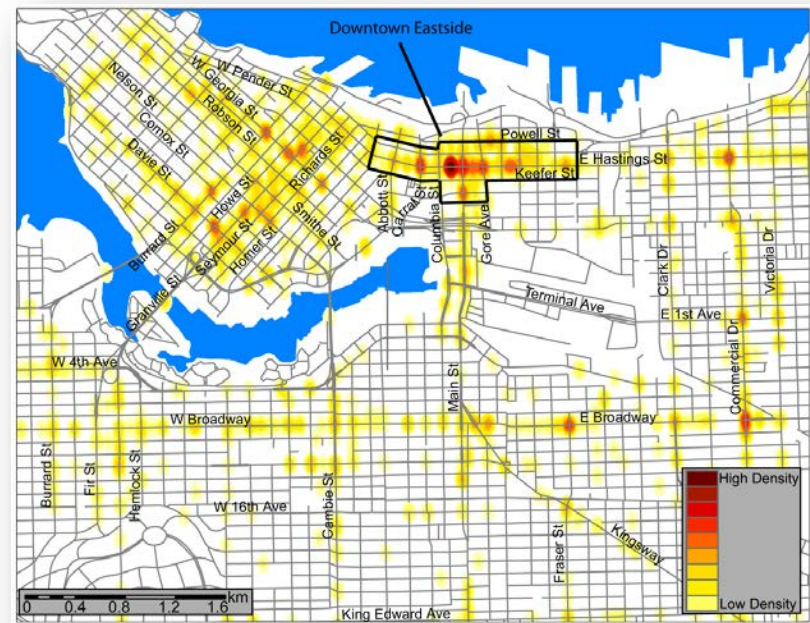


Figure 1: Kernel density map of select pedestrian injury hotspots in Vancouver.

population of just over 16,000, an estimated 4,700 (29%) are injection drug users. As for motorists, a study by the Canadian Centre on Substance Abuse found that 10.4% of BC drivers tested positive for drug use and 8.1% had been drinking.

Project Description

A high level Advisory Committee was convened to identify broadly what the whole project would look like and what deliverables could be achieved within the resources available. It included participation from the City's Engineering, Planning, and Police departments, the City Manager's Office, and Seniors, People with Disabilities and Bicycle Advisory committees, Vancouver Coastal Health, Carnegie Community Centre, ICBC, TransLink, injury researchers from SFU and UBC, VANDU, and Putting Pedestrians First.

The objectives of the Downtown Eastside Pedestrian Safety Project were to:

1. Engage with Downtown Eastside residents in creating awareness about pedestrian safety in their community;
2. Increase knowledge about factors contributing to DTES pedestrian injury; and
3. Recommend concrete and realistic solutions that will make the Downtown Eastside safer for pedestrians.

The project work plan had three components:

1. Best practices research and baseline data gathering, with volunteers conducting observation reports on road user behaviour;
2. An education campaign focused on road user safety using a community health-based strategy; and
3. Community engagement to elicit the experiences, ideas, and suggestions of DTES residents to inform short, medium and long term changes to improve pedestrian safety in the area.

The project was funded by the City of Vancouver through the Great Beginnings Program and Vancouver Agreement with in kind support from Vancouver Coastal Health and safety clothing from Acklands Grainger. It is estimated that the total cost would have been approximately \$130,000 if the project were carried out completely by City staff, and approximately \$210,000 if carried out by a consultant, the difference being mainly in salary rates and the project's use of volunteer labour. The total project budget was \$65,000 for two part-time staff members over a period of eight months, volunteer stipends for 2,000 hours of volunteering, training, materials, and supplies, resulting in a substantial cost savings.

Education and Community Outreach

From early December 2009 to mid-April 2010, a total of 167 volunteers went out on daily shifts engaging with other Downtown Eastside residents to both educate and learn from them regarding pedestrian safety in the neighbourhood. Specifically, volunteers led workshops, hung posters along Hastings Street, distributed brochures, held placards with messages aimed at motorists, and surveyed pedestrians.

Seventeen workshops with a total of 347 participants were conducted in social housing buildings, single room occupancy hotels, and in public gathering places throughout the Downtown Eastside. Over 7,500 brochures were distributed containing information about pedestrian safety in the neighbourhood and the DTES Pedestrian Safety Project. Over 1,400 pedestrian intercept surveys were conducted in the Downtown Eastside between January and April 2010, reaching almost 10% of the total population.

Of the 1,400+ DTES respondents to the pedestrian intercept survey, 63% were aware that their neighbourhood has the highest injury rate in the City. A full 32% had been hit by a motor vehicle in the Downtown Eastside. Half of respondents identified Main and Hastings as the most dangerous location in their neighbourhood, followed by 21% who responded “Anywhere on Hastings”. The top four ideas for making the neighbourhood safer for pedestrians were longer walk signal times (30%), more drug treatment programs (17%), install crosswalks (15%), and slow/reduce traffic on Hastings (13%).

The workshops uncovered several recurring themes including the underreporting of injuries, frequent pedestrian conflicts with buses, the aggressive attitude and behaviour of motorists towards Downtown Eastside residents, and the impact of the street drug trade on pedestrians. According to workshop testimonials, the most common reasons pedestrian injuries in the Downtown Eastside are not reported are as follows:

- Drivers paid them money to consider the matter resolved.
- Injured pedestrians who were in possession of illicit drugs or had a warrant wished to avoid the police.
- Because of negative past experiences, some injured pedestrians do not want to deal with the police or hospital staff.
- In the case of hit and runs, injured pedestrians did not feel there would be any benefit to them for reporting the incident when the identity of the motorist was unknown.
- Pedestrians did not realize the extent of their injuries until well after the incident or did not feel their injuries were severe enough to merit medical attention.

Ironically, people disabled in collisions with motor vehicles sometimes find themselves living in the worst pedestrian injury area in the city. Victims are often forced to stop working, at least for a period of time, and the various assistance options leave them with less money. They no longer have the means to afford to live in a safer neighbourhood, especially if left with permanent disabilities, and are attracted by the cheaper/social housing and services available in the Downtown Eastside.

Data Collection

A total of 81 volunteers – both VANDU members and members of the community – were trained to collect traffic data that would be used to evaluate appropriate recommendations. Data collection within the study area included all nine intersection and midblock pedestrian injury hotspot locations along Hastings Street, as well as a couple of other sites that came up in the pedestrian survey and other midblock locations throughout the city for comparison purposes.

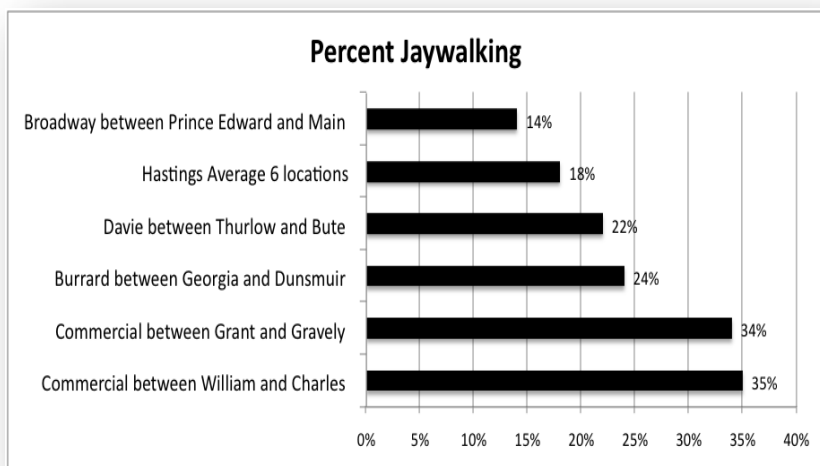


Table 1: Percentage of total observed crossing that were jaywalking crossings, at select locations.

The first question tackled was whether or not Downtown Eastside pedestrian behaviour was quantifiably different from pedestrian behaviour in other neighbourhoods. Jaywalking accounted for an average of 18% of all crossings of Hastings Street in the 10-block study zone. This is less than all the other jaywalking “comparison” neighbourhoods studied except Broadway between Prince Edward and Main Streets. These results suggest that the act of jaywalking itself does not explain the high rate of pedestrian injuries in the Downtown Eastside, but rather injuries occur as a result of the interplay between vehicle speed and a very high ratio of vulnerable pedestrians, many with compromised judgment.

Burrard Street between Georgia and Dunsmuir for comparison with Hastings Street.

The project examined whether or not the overall infraction volumes and infraction rates were higher in the DTES than other non-hotspot locations. In this regard the project collected further midblock data on

Pedestrian infractions – both in total number and rate – were much higher at this Burrard Street location than at any of the injury hotspots in the Downtown Eastside. Overall, approximately 60-70% of pedestrians on Burrard Street committed an infraction when crossing the street, varying by the time of day and day of week. Infractions included not staying within the painted lines of the crosswalk, stepping off the curb against the flashing or solid hand signal, and jaywalking. In comparison, approximately 30-60% of pedestrians on Hastings Street committed an infraction when crossing the street, varying by location, the time of day, and day of week.

Vehicle Speed	Pedestrian Death Rate
64 km/h	85%
48 km/h	45%
32 km/h	5%

Table 2: Vehicle speeds and pedestrian deaths

On Hastings Street, the tally of vehicle drivers entering the intersection on a yellow or red light is between 3% and 17.8%. The red+yellow light infraction rate is highest in the evening and the average across sites is just under 9%. The highest red light infraction rate was observed on a Friday evening after 9:00 PM at 5.2% of vehicles.

Speed data was collected at select locations within the study zone as well as neighbourhood gateways leading into the study zone. In general, traffic is traveling close to the current 50 km/h speed limit on Hastings Street with the exception of afternoon peak period eastbound traffic between Jackson and Dunlevy.

Best Practices Research

According to Helsinki’s Traffic Planning Division, from the point of view of capacity, the “optimal speed in downtown traffic is somewhere between 30 and 39 km/h.” According to Singapore’s Land Transport Authority, Electronic Road Pricing (ERP) was implemented to reduce congestion and the rates are

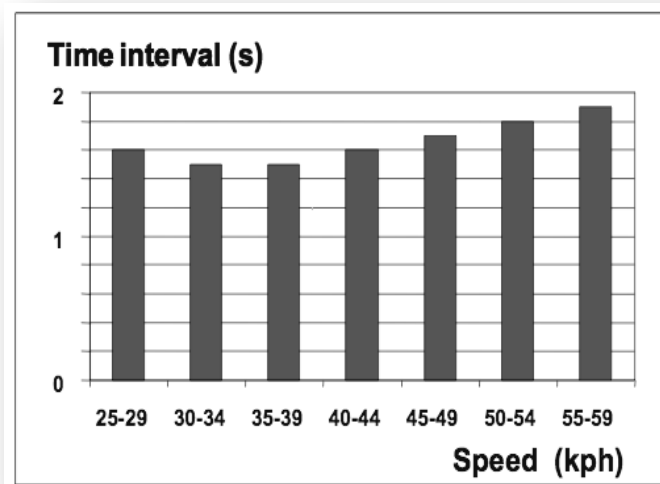


Table 3: The effect of the driving speed on the leading car on the time interval to the following vehicle on signalized downtown streets. Source: Helsinki City Planning Department.

reviewed on a quarterly basis and during the June and December school holidays: “After the review, the ERP rates would then be adjusted where necessary to minimise congestion on the roads. ERP has been effective in maintaining an optimal speed range of 45 to 65 km/h for expressways and 20 to 30 km/h for arterial roads.”

London has seen over four hundred neighbourhood wide 20 mph (30 km/h) zones created since 2001. A study published in the *British Medical Journal* found that serious traffic injuries and fatalities have fallen by 46 percent within the zones. With the success of the neighbourhood scale zones, eight of London's 32 boroughs are moving towards a blanket 20 mph (30 km/h) speed limit. Other cities with 30 km/h injury reduction zones on major arterials include Portsmouth and London, England, Perth, Australia, and Dublin, Ireland and Amsterdam, The Netherlands as noted in Figure 2.

Pedestrian injuries have been experienced by about one third of Downtown Eastside residents. In BC, the average hospitalization cost of a pedestrian injury in 2008, not including ambulance or rehabilitation, was \$15,747.06. This is only the direct cost to the taxpayer. According to a 2004 Ontario study, the average total *social* cost of a pedestrian injury is over \$400,000, which includes the cost of healthcare, first responders, property damage, rehabilitation, out of pocket expenses, lifetime loss of income, and so forth.



Figure 2: 30 km/h zones in Dublin and Amsterdam superimposed on Vancouver, showing proposed 30 km/h zone on Hastings.

Recommendations

The recommendations of the Downtown Eastside Pedestrian Safety Project are targeted to have the most positive public health outcomes possible. They have the support of all project stakeholders with the exception of the 30 km/h zone, which is not supported by TransLink.

Short-term recommendations could be announced at end of project, require limited funding, and could be substantially implemented by the end of 2010. Medium term recommendations are targeted at the study area and need more time to implement but are within the City's jurisdiction and the funding envelope of the 2009 – 2011 Capital Plan. Longer term recommendations target the study area but require

additional Capital Plan allocations and inter-agency partnerships. The longer term planning could be undertaken as part of the forthcoming update of the City's Transportation Plan, expected to begin in late 2010.

Short Term Recommendations (ST)

- ST1:** 30 km/h Pedestrian Safety Zone
- ST2:** Pedestrian Injury Monitoring, Reporting, Targets, and Capital Spending Alignment
- ST3:** Signals
 - ST3.1:** Extended clearance time
 - ST3.2:** Countdown Signal
 - ST3.3:** Reduced wait times at existing semi-actuated pedestrian operated signals

- ST3.4:** Speed Reader Board
- ST4:** Education
 - ST4.1:** Education Campaign Network
 - ST4.2:** Pedestrian Safety Media Campaign
 - ST4.3:** Buses
 - ST4.4:** Community Outreach/Safety Patrols
- ST5:** High Visibility Crosswalk Markings
- ST6:** Improvements outside the Hotspot Zone

Options Needing Further Review: Pedestrian Scramble, Enhanced Pedestrian Operated Signals, Convert Full Signals to Pedestrian Signals, Leading Pedestrian Indicators, Civic Pedestrian Advisory Committee

Medium Term Recommendations (MT)

- MT1:** Signalized Midblock Crossings
- MT2:** Street Trees, Furniture, and other Public Realm Greening
- MT3:** Pedestrian Bulges

- MT4:** Pedestrian Only Areas
- MT5:** Review Location of Target Land Uses
- MT6:** Develop a DTES Neighbourhood Centered Bike Network
- MT7:** Intersection Safety Cameras (Red Light Running)

Options Needing Further Review: Barrier to Separate Pedestrians from Vehicle Traffic

Long Term Recommendations (LT)

LT1: Redesign of Hastings Street

LT2: Speed Reducing Crossing Treatments

LT3: Pedestrian Corridor Plans

LT4: Better Pedestrian Weather Protection

LT5: A Ban on All Devices While Operating a Vehicle

LT6: Photo Radar

Conclusion

The Downtown Eastside Pedestrian Safety Project is the first step in transforming one community from the epicentre of pedestrian injury in Vancouver to among the safest. It focused primarily on Hastings Street and did not engage with non-English speaking residents or specific demographic subgroups. It is proposed that a subsequent phase would address these shortcomings.

Introduction

In Canada, injury is the leading cause of death for those under 45 years of age and the fourth most common cause of death for all ages. Collisions between motor vehicles and pedestrians claim hundreds of lives and injure tens of thousands annually. Traumatic pedestrian injury, in particular, results in around 4000 hospitalizations in Canada each year. These injuries often result from the interplay of modifiable or preventable environmental factors. Addressing the environmental factors related to pedestrian injury thus represents an important public health opportunity.¹

As the above quote notes, pedestrian injury is a public health concern of national significance. Here in Vancouver, Hastings Street has high volumes of pedestrian and motor vehicle traffic. It has a dual role, as a regional commuter route, a key city arterial and an east-west connector in the regional Major Road Network, as well as a residential street. East Hastings Street also lacks the pedestrian safety features common in other areas of the city such as high visibility markings, corner bulges, and so on. According to ICBC data, a pedestrian is injured in the Downtown Eastside (DTES) every eight days on average and the study cited above found that nine (28%) of the city's 32 "pedestrian injury hotspots" are on Hastings.

Hastings is also the main street of the Downtown Eastside neighbourhood, the historic "heart of the city" and home to a disproportionately large number of vulnerable road users including seniors, families with children, and people with disabilities, mental illness, and addictions – some of Vancouver's most marginalized residents. For example, out of a total DTES population of just over 16,000, an estimated 4,700 (29%) are injection drug users.² As for motorists, a study by the Canadian Centre on Substance Abuse found that 10.4% of BC drivers tested positive for drug use and 8.1% had been drinking in a sample of 1,533 motorists.³

Since 1998, the Vancouver Area Network of Drug Users (VANDU) has advocated for the interests of its membership, which consists of drug users and former drug users. It is a grassroots organization that promotes harm reduction strategies to offset the ill-effects of the war on drugs. VANDU members are not solely drug users, however. They are DTES residents and some of the most active leaders in the community

¹ Nadine Schuurman, Jonathan Cinnamon, Valorie A. Crooks, and S. Morad Hameed, "Pedestrian Injury and the Built Environment: An Environmental Scan of Hotspots," *BMC Public Health*, Vol. 9, no. 233 (14 July 2009), <http://www.biomedcentral.com/1471-2458/9/2333>

² Jane Buxton, "Vancouver Drug Use Epidemiology," (June 2005), Canadian Community Epidemiology Network on Drug Use (CCENDU), http://vancouver.ca/fourpillars/pdf/report_vancouver_2005.pdf

³ Beirness, D.J., & Beasley, E.E., "Alcohol and Drug Use Among Drivers: British Columbia Roadside Survey 200," Canadian Centre on Substance Abuse (2009), http://www.ccsa.ca/2009%20CCSA%20Documents/ccsa0115382009_e.pdf

who understand that reducing harm to themselves and their neighbours need not be limited to drug issues. In this case, VANDU seeks to mitigate harm stemming from a city designed for motor vehicles.

The engineering measures proposed for the Downtown Eastside in this report are much needed changes to update a street that was designed decades ago and modified many times since to facilitate ever-increasing volumes of motor vehicle traffic. From a strictly cost-effectiveness standpoint, leaving the area unsafe for pedestrians is not an option. According to the BC Injury Research and Prevention Unit, the average hospitalization cost of a pedestrian injury in 2008, not including ambulance or rehabilitation, was \$15,747.06.⁴ This is only the direct cost to the taxpayer. According to an Ontario study in 2004, the average total *social* cost of a pedestrian injury is over \$400,000, which includes the cost of healthcare, first responders, property damage, out of pocket expenses, lifetime loss of income, etc.⁵

This report highlights the best practices in other cities, illustrating the paradigm shift underway in transportation planning. From New York's bold move to make Times Square a pedestrian mall,⁶ the "complete streets" movement,⁷ large reduced speed zones in many central cities,⁸ to Vancouver's own passionate discussions regarding the city's bicycle network, our cities are changing at an impressive rate to address injury reduction, rapid population growth, pressing environmental concerns, and the overall livability in urban settings.

The recommendations contained in this report are an opportunity to demonstrate a commitment to improving the lives of Vancouver's most vulnerable citizens, move the city towards a more sustainable future, and embrace innovations that have proven successful elsewhere.

⁴ BC Injury Research and Prevention Unit, Online Data Tool, <http://www.injuryresearch.bc.ca/categorypages.aspx?catid=10&catname=Online%20Data%20Tool>

⁵ Vodden, Keith, Dr. Douglas Smith, Frank Eaton, and Dan Mayhew, "Analysis and Estimation of the Social Cost of Motor Vehicle Collisions in Ontario – Final Report," Transport Canada, (August 2007), <http://www.tc.gc.ca/media/documents/roadsafety/tp14800e.pdf>

⁶ Times Square Alliance, "Mayor Bloomberg, New Yorkers, and Times Square businesses and constituents declare 'green light for midtown' a success," 11 February 2010, <http://www.timessquarenyc.org/GreenLightforMidtown.html>

⁷ National Complete Streets Coalition, <http://www.completestreets.org>; Toronto Coalition for Active Transportation, "Complete Streets Forum 2010," <http://www.torontocat.ca/main/completestreetsforum2010>

⁸ Pedal Power Canberra Region Cycling, "Extended 40 km/h speed zones. Attachment C: Speed Zoning in other Jurisdictions," [http://www.pedalpower.org.au/advocacy/docs/speed%20limits%20brief%20incl%20%20atts%20a%20b%20%20c%20\(text\).pdf](http://www.pedalpower.org.au/advocacy/docs/speed%20limits%20brief%20incl%20%20atts%20a%20b%20%20c%20(text).pdf)

Background

There are a number of drivers that highlighted the epidemic of pedestrian injury in the Downtown Eastside (DTES) and led to the City approving funding for the Downtown Eastside Pedestrian Safety Project. These include:

- An academic study identifying pedestrian injury hotspots citywide and highlighting the DTES as the injury epicentre,
- The policy platform of Vision Vancouver, the governing civic party,
- City of Vancouver policy, and specifically the Transportation Plan and Greenest City Action Team recommendations, and
- A public safety initiative of the Vancouver Police Department that included a jaywalking ticketing campaign.

Academic Study on Pedestrian Injury Hotspots

A groundbreaking study⁹ conducted by researchers at SFU and UBC entitled “Pedestrian Injury and the Built Environment: An Environmental Scan of Hotspots” provides the foundation for the Downtown Eastside Pedestrian Safety Project. Data for the study was obtained for the period from 2000 to 2005 inclusive from ICBC and the British Columbia Trauma Registry. Throughout this report, the study “Pedestrian Injury and the Built Environment: An Environmental Scan of Hotspots” will be referred to as the academic study or the hotspots study.

The study found there were 2,358 recorded pedestrian injuries citywide in the six year period, an average of 393 per year, or just over one per day and that just over 10% of recorded pedestrian injuries occur in a small area of the Downtown Eastside. It identified 32 injury “hotspots” (five or more pedestrian injuries during the study period) in Vancouver, of which nine (28%) are on East Hastings in the Downtown Eastside.

⁹ Nadine Schuurman, Jonathan Cinnamon, Valorie A. Crooks, and S. Morad Hameed, “Pedestrian Injury and the Built Environment: An Environmental Scan of Hotspots,” *BMC Public Health*, Vol. 9, no. 233 (14 July 2009), <http://www.biomedcentral.com/1471-2458/9/233>

The two worst hotspots citywide are East Hastings Street midblock between Main and Columbia (49 recorded incidents in six years) and the intersection of Main Street and Hastings (18 incidents). The study flagged that important physical pedestrian safety countermeasures are missing from the Downtown Eastside (special crosswalks, signals, bulges, etc) and that traumatic pedestrian injuries were the result of “the interplay of modifiable or preventable environmental factors.”

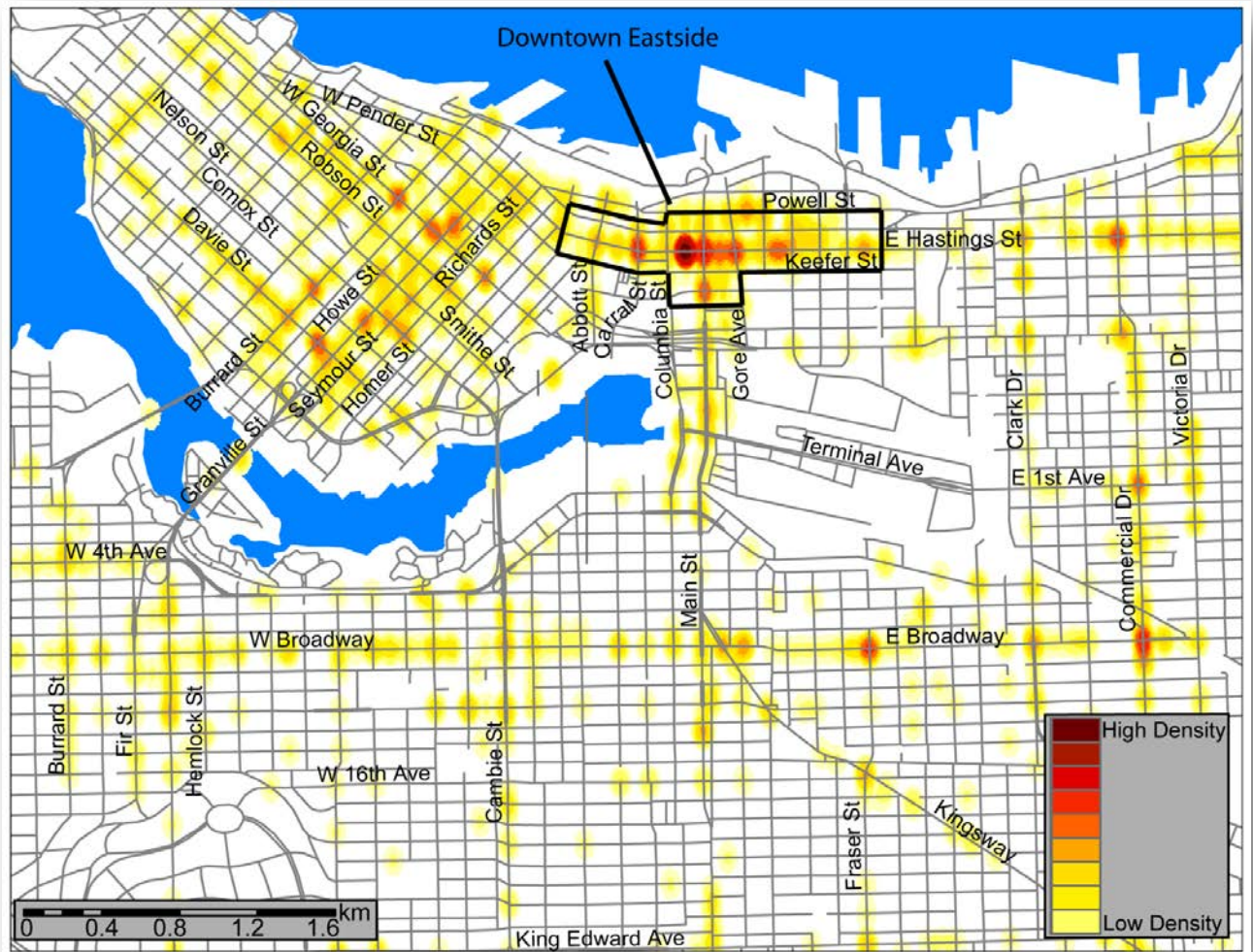


Figure 3: Kernel density map of select pedestrian injury hotspots in Vancouver.

Vision Vancouver Platform

The current mayor and majority on council in the City of Vancouver are from the Vision Vancouver party and were elected 15 November 2008. Vision proposed a policy platform with a mandate for change, with Vision's "Action Plan" promising to make Vancouver the "greenest city in the world—the international leader among environmentally sustainable cities." Specifically with respect to pedestrian safety, their policy platform (2008) proposed to "make cycling and walking a priority. If we want people to get out of their cars, we have to make it safe, easy, and enjoyable to bike and walk in our city."¹⁰

City of Vancouver Policy and Greenest City Action Team

The City of Vancouver places pedestrians as its first priority in transportation planning.¹¹ Its 1997 Transportation Plan sets out the following policies for neighbourhoods and pedestrians:

1. For the greater comfort and convenience of pedestrians in the city, pedestrian facilities will be improved by such means as reducing unnecessary pedestrian barriers, increasing opportunities for crossing busy roads in safety, providing direct routes where practicable, and providing incentives for walking throughout the city and especially within residential neighbourhoods. (Actions NP1, NP2, NP4 and NP5)
2. Pedestrian priority areas will be identified in neighbourhood centres where pedestrian environments are to be especially encouraged. (Action NP6)
3. The City's traffic calming program will give priority to streets and neighbourhoods where traffic impacts are the most serious. (Action NP3)
4. The City's traffic calming program will be expanded to include busier neighbourhood streets such as collectors and streets with less than 10,000 vehicles per day proposed for collector status. (Action NP 7)
5. The City's traffic calming program will be expanded to include a greater range of measures.
6. Pedestrian space will be given a high priority when analysing the impacts of roadway changes. (NP8)

The Greenest City Action Team was a blue ribbon advisory body to the City co-chaired by the Mayor in 2009.¹² As outlined on the City's website:

¹⁰ Vision Vancouver, "Vision in Action," <http://www.visionvancouver.ca/vision-in-action>

¹¹ City of Vancouver, Engineering Services – Transportation, "Principles, Policies and Priorities," <http://vancouver.ca/engsvcs/transport/plan/1997report/3-6.htm>

¹² City of Vancouver, "Greenest City 2020," <http://vancouver.ca/greenestcity/index.htm>

The objective of the Greenest City Team is to provide a comprehensive 10-year action plan for addressing Vancouver's environmental challenges that recommends targets, timelines, and actions that should be taken in the next three-year period. The action plan will identify best practices from leading cities around the world, highlight benchmarks that can be used to evaluate Vancouver's performance, identify creative ways to finance environmental actions, and offer a suite of innovative recommendations for accelerating progress toward a prosperous and sustainable future. An important component of the plan will be a set of 'Quick Starts.' These are environmental initiatives where expedited decisions and actions will have a significant immediate impact.

One of the recommendations in the Greenest City Action Team's 2009 Quick Start Report, under the section "Greener Communities – Mobility," is to "make streets safer for pedestrians and cyclists."¹³

Downtown Eastside Jaywalking Tickets

Hundreds of jaywalking tickets were given to DTES residents in the fall of 2008 as part of a public safety campaign by the Vancouver Police Department (VPD). Most of the recipients of these tickets were low income residents who could not afford to pay the tickets. After substantial negative community reaction, the City agreed to reexamine the tickets on an individual basis and explore other options for promoting pedestrian safety in the Downtown Eastside. The Downtown Eastside Pedestrian Safety Project was in part a result of meetings between VANDU and other community members and representatives of the City to resolve the ticketing issue.

With the above developments as a foundation, the City provided funding to VANDU for the Downtown Eastside Pedestrian Safety Project from its Great Beginnings Program.

Original Conception of Downtown Eastside Pedestrian Safety Project

The Downtown Eastside Pedestrian Safety Project was originally conceived as an eight week crossing guard program, with pedestrian and driver education and the exploration of minor passive interventions such as signal timing changes. The original terms of reference included:

Countermeasures aimed at reducing the potential for pedestrian incidents include both active interventions, those focused on education and behaviour changes, and passive interventions, modifications in the built-environment. This project aims

¹³ City of Vancouver, "Greenest City: Quick Start Recommendations," (27 April 2009), <http://vancouver.ca/greenestcity/PDF/greenestcity-quickstart.pdf>

to address both active and passive interventions to improve pedestrian safety, though the primary focus will be on active interventions.

Key interventions that will be explored and/or included as part of this project are:

1. Locating pedestrian crossing guards at key incident areas
2. Developing a pedestrian safety education campaign
3. Developing a driver education campaign/signage
4. Increasing the pedestrian crossing time at light controlled intersections*
5. Reducing response time for pedestrian controlled light intersections*

Objectives

The objective of the Pedestrian Safety Campaign is to improve pedestrian safety in the Downtown Eastside (DTES) area through a community-based strategy. The strategy will primarily target behaviour changes, with some limited environmental interventions.

Deliverables

Key project deliverables include:

- Minimum of 8 DTES residents trained and employed as 'Pedestrian Safety Guards'
- Minimum of 10 DTES residents trained and employed as 'Pedestrian Safety Outreach Workers'
- Targeted community education materials developed for vulnerable road user populations in the DTES, specifically people with mental health and/or addictions challenges, people with mobility restrictions, and Chinese speaking seniors
- Targeted education materials distributed to vulnerable road user populations
- Development of a driver education campaign

Subsequent to the hiring of the project team, a number of new opportunities were identified. The major opportunity not originally anticipated was to utilize the methodology from the peer reviewed academic pedestrian injury hotspot study to collect more robust data on road user behaviour. There was also the opportunity to involve many more neighbourhood residents in Participatory Action Research, and the recognition that the proposed crossing guard component posed complex liability issues. By engaging and training local residents to do the data collection, the project was not only an opportunity to build confidence and employment skills, but also gave those residents greater education and awareness about pedestrian safety, which in turn influenced their own behaviour. Finally, further funding was made available to ensure a robust methodology was used that was suitable as the basis for further Engineering Department decisions.

Component 1: Project Development, Research, and Data Collection

Component 1 ran from October 2009 until mid February 2010 and involved refinement of the workplan, the formation and first three meetings of the Advisory Committee, research on world-wide best practices in pedestrian safety, and data collection. Some activities at the end of Component 1, notably data collection, overlapped with the beginning of Component 2. Findings are presented in “Component 3: Findings.”

After staff was hired, a small steering committee with representatives from the City of Vancouver, Vancouver Coastal Health, and VANDU met to adapt the project to achieve the best possible outcomes and produce a realistic workplan within the limited resources. As reconceived, the project had the following objectives:

1. To engage with Downtown Eastside residents in creating awareness about the issue of pedestrian safety in their community
2. To increase knowledge about factors contributing to making the DTES the epicentre of pedestrian injury in Vancouver
3. To propose concrete and realistic solutions that will make the Downtown Eastside safer for pedestrians

In order to meet the objectives, the project work plan had three components:

1. Best practices research and baseline data gathering to inform proposed solutions, with volunteers conducting observation reports on road user behaviour;
2. An education campaign focused on road user safety using a community health-based strategy; and
3. Community engagement to elicit the experiences, ideas, and suggestions of DTES residents to inform short, medium, and long term changes to improve pedestrian safety in the area.

The project was funded by the City of Vancouver through the Great Beginnings Program and Vancouver Agreement with in kind support from Vancouver Coastal Health and safety clothing from Acklands Grainger. It is estimated that the total cost would have been approximately \$130,000 if the project were carried out completely by City staff, and approximately \$210,000 if carried out by a consultant, the difference being mainly in salary rates and the project’s use of volunteer labour. The total project budget was \$65,000 for two part-time staff members over a period of seven and a half months, volunteer stipends for 2,000 hours of volunteering, training, materials, and supplies, resulting in a substantial cost savings. In addition, had the project been undertaken solely by the City or consultants, the neighbourhood would not have benefited from the training 167 volunteers received in various methods of public engagement, pedestrian safety, and data collection.

One of the major questions the project encountered was how the pedestrian safety problem could be solved in such a short time. The DTES Pedestrian Safety Project was a pilot project focusing on measuring the existing conditions, education, community engagement, and

reporting the outcomes. It was not expected to solve the pedestrian injury crisis; rather it was an initial response to guide further action. Long- term continuation of the program depends on the outcome of Phase One and the availability of funds.

Advisory Committee

A high level Advisory Committee was convened as part of VANDU's commitment to the City in the funding agreement. The committee's mandate was to identify broadly what the whole project could look like and what deliverables could be achieved within the resources available. Committee members were selected based on their knowledge and expertise, as well as the role they could play in championing and implementing proposed changes to improve pedestrian safety. The Committee met four times over the course of the project and also provided valuable advice via email and phone calls on various issues. Meetings were held at the Carnegie Community Centre and VANDU offices on the following dates:

1. 3 November 2009,
2. 15 December 2009,
3. 19 January 2010, and
4. 20 April 2010.

The Committee included participation from the City's City Manager's Office, Engineering, Planning, and Police departments and Seniors, People with Disabilities and Bicycle Advisory Committees, Vancouver Coastal Health, Carnegie Community Centre, ICBC, TransLink, injury researchers from SFU and UBC, VANDU and Putting Pedestrians First. Not all members were able to attend all meetings and some were replaced by other people in their organization. The full list of Advisory Committee members who participated in the project is contained above in the "Acknowledgements" section.

Research on Pedestrian Safety Best Practices

Within its limited resources, the project undertook a scan of best practices in pedestrian safety. While not meant to be exhaustive, the examples below illustrate the importance of vehicle speed and the range of innovative measures that are being implemented both in North America and around the world. Readers can follow the links provided to find more detailed information about each example.

VEHICLE SPEED

In addition to the high injury rate in the DTES, the rationale for the DTES Pedestrian Safety Project is that speed is the key determining variable when assessing the potential injury to a pedestrian struck by a motor vehicle.

PEDESTRIAN DEATH RATE

Table 4 below illustrates the correlation between vehicle speed and pedestrian death rate, according to a British study.¹⁴

Vehicle Speed	Pedestrian Death Rate
64 km/h	85%
48 km/h	45%
32 km/h	5%

Table 4: Vehicle speeds and pedestrian deaths

According to the City of Vancouver’s website, a pedestrian struck by a vehicle traveling at 60km/h is 70% more likely to die from their injuries than a pedestrian struck at 50km/h.¹⁵ As noted in the table, a pedestrian struck at 48 km/h is seven times more likely to die than a pedestrian struck at 32 km/h. The vast majority of the road space in Vancouver is devoted to facilitating fast moving (50 km/h +) motor vehicle traffic, with the exception of 30 km/h zones around schools and playgrounds, Granville Island, and the Carrall Street Greenway. In addition to the cities discussed below, vehicle speeds have been reduced in substantial sections of a number of urban centres, including Montreal, Quebec;¹⁶ Perth, Australia;¹⁷ Singapore;¹⁸ Barcelona, Spain;¹⁹ and Graz, Austria;²⁰ often with dramatic increases to pedestrian safety.

¹⁴ United Kingdom Department Transportation, “Killing Speed and Saving Lives,” London, England, 1997, cited in Ryan McGreal, “The Speed Factor,” *Raise the Hammer*,” 9 February 2007, http://www.raisethehammer.org/article/506/the_speed_factor

¹⁵ City of Vancouver, Engineering Services, “Traffic Management – Pedestrian Safety Programs,” <http://vancouver.ca/engsvcs/transport/traffic/peds.htm>

¹⁶ Ville de Montreal, Transportation Plan, “Road Safety – Maximum 40 km/h,” http://ville.montreal.qc.ca/portal/page?_dad=portal&_pageid=5957.54865598&_schema=PORTAL

IMPACT OF SPEED ON ARTERIAL CAPACITY

Concern has been expressed that the reduction of the speed limit for the proposed 30 km/h Pedestrian Safety Zone on Hastings Street would increase congestion. However, this is not supported by the best practices research, as at lower speeds, the distance between successive vehicles decreases. For example, measurements undertaken by the Helsinki Traffic Planning Division have shown that the reduction of speed limits did not increase congestion or fuel consumption.

According to Helsinki's Traffic Planning Division, from the point of view of capacity, the "optimal speed in downtown traffic is somewhere between 30 and 39 km/h." Table 5 illustrates the time between vehicles at various speeds. The smaller the time interval, the higher the capacity. As noted below, speeds of 25-29 km/h and 40-44 km/h have the same capacity, slightly lower than the 30-39 km/h range. Any speeds above 45 km/h result in a decrease in capacity, as illustrated by the time interval between vehicles increasing.²¹

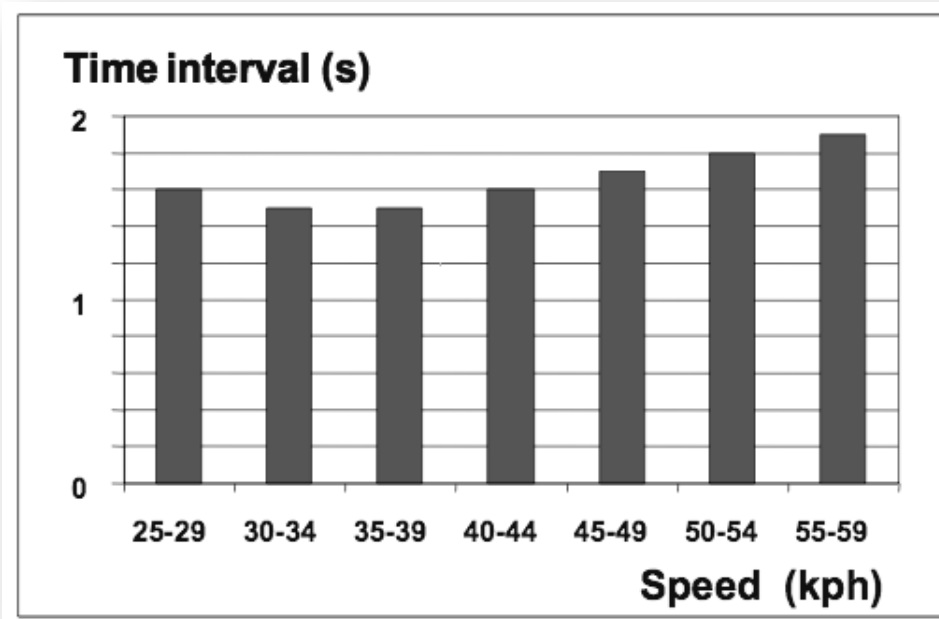


Table 5: The effect of the driving speed on the leading car on the time interval to the following vehicle on signalized downtown streets. Source: Helsinki City Planning Department – Traffic Planning Division, "Speed Limits in the City of Helsinki," 20 October 2005.

¹⁷ Glenn Cordingley and Liam Croy, "City speed limit cut to 30km/h," *PerthNow*, 8 August 2009, <http://www.perthnow.com.au/news/western-australia/city-speed-limit-cut-to-30kmh/story-e6frg14l-1225759353765>

¹⁸ Environmental Defense Fund, "Singapore: A Pioneer in Taming Traffic," 9 April 2007, <http://www.edf.org/article.cfm?contentID=6166>

¹⁹ Ajuntament de Barcelona, Safety and Prevention, "Barcelona will have 215 kilometres of 'Zones 30' by the end of the year," 28 May 2009, http://w3.bcn.es/V57/Serveis/Noticies/V57NoticiesLlistatNoticiesCt/0.2138.215502824_238698740_3_856551665.00.html?accio=detall&home=

²⁰ "The Speed management situation in Austria," *Shlow!*, <http://www.shlow.eu/the-shlow-forum/austria/>

²¹ Helsinki City Planning Department – Traffic Planning Division, "Speed Limits in the City of Helsinki," 20 October 2005, http://www.hel.fi/static/ksv/www/Liikenne/speedlimits_in_helsinki.pdf

For another example of jurisdictions targeting the ideal speed to maximize capacity, Singapore has one of the most advanced electronic road pricing (ERP) schemes worldwide. ERP was implemented to reduce congestion and the rates are reviewed on a quarterly basis and during the June and December school holidays. According to Singapore's Land Transport Authority:

After the review, the ERP rates would then be adjusted where necessary to minimise congestion on the roads. ERP has been effective in maintaining an optimal speed range of 45 to 65 km/h for expressways and 20 to 30 km/h for arterial roads.²²

MAJOR ARTERIAL 30 KM/H ZONES

There are numerous jurisdictions worldwide that are implementing 30 km/h zones along major arterial streets as a traffic safety measure. As the European Transport Safety Council notes:

The speed of motor vehicles is at the core of the road safety problem. Higher speed increases both the risk of crash and the consequences of a crash.

Speed limits need to protect vulnerable road users. Speed of motor vehicles in urban areas is critical to the safety of vulnerable road users. At low speeds, drivers have more time to react to an unexpected situation and avoid collisions. If the collision is unavoidable more than 90% of those struck survive at a speed of 30 km/h or less.²³

As one example, Amsterdam is beginning with a 30 km/h zone on an inner ring road around the Centrum (central city), and then expanding that to the entire zone within the ring road, including the main highway feeding a tunnel to North Amsterdam.

²² Singapore Government – Land Transport Authority, “Electronic Road Pricing,” http://www.lta.gov.sg/motoring_matters/motoring_erp.htm

²³ European Traffic Safety Council, “Motor Vehicle Speed in the EU,” September 2005, http://www.etsc.eu/documents/FS_speed.pdf



Figure 4: Major arterial ring road and highway tunnel all within Amsterdam's 30 km/h zone.

In the City of Perth, Australia, the state road authority, Main Roads, identified potential problem areas with a number of local councils where pedestrian safety was considered high-risk.²⁴ Since then it has reduced the speed limit on three arterials from 50 km/h to 30 km/h.

According to a European Transport Safety Council Speed Limit circular, the UK Department of Transport references the success in Portsmouth where a townwide 20 mp/h (30 km/h) limit is in place.²⁵

²⁴ Main Roads – Western Australia, “Variable Speed Zone Trial for Beaufort Street Mount Lawley,” Winter 2009, http://www.mainroads.wa.gov.au/Documents/Beaufort%20Street%20Speed%20Zone%20Trial%20Project%20information%20sheet.u_2387777r_1n_D09^23166873.PDF

²⁵ European Transport Safety Council, “Editorial,” *Speed Monitor*, March 2007, <http://www.etsc.eu/documents/Speed%20Monitor%207.pdf>

OTHER BEST PRACTICES

LONDON, ENGLAND

London has seen over four hundred neighbourhood wide 20 mph (30 km/h) zones created since 2001. A study published in the *British Medical Journal* found that serious traffic injuries and fatalities have fallen by 46 percent within the zones.²⁶ Measures implemented to ensure motor vehicle driver compliance include speed humps, raised intersections, raised crosswalks, and speed cameras. With the success of the neighbourhood scale zones, eight of London's 32 boroughs are moving towards a blanket 20 mph (30 km/h) speed limit.

NEW YORK CITY, USA

New York City is a North American leader in rebalancing the transportation system in favour of increased safety for non-motorized users. For example, their "Safe Streets for Seniors" program used a GIS analysis to create density maps of severe injuries and fatalities to senior citizens and identify areas with a high concentration of crashes similar to the SFU/UBC pedestrian injury study. Twenty-five areas were identified for improved safety measures, including enhanced high visibility sidewalks and pavement markings, curb bulges, pedestrian refuge islands, narrowed roadways with traffic calming techniques, and leading pedestrian indicators.²⁷

New York City has also implemented protected pedestrian and cycling zones on a trial basis that were targeted to "drive down injuries"²⁸ and increase modal share. Two hundred miles of bike lanes were created in a three year period. Bicycle commuting mode share increased 35% in 2008 and a further 26% in 2009 for a total 66% increase from 2007 to 2009, and doubling since 2003.

The NYC Department of Transportation's strategic plan set a goal of reducing all traffic fatalities by 50% in 2030 compared to 2007. In 2009, NYC traffic fatalities fell to an all time low since record keeping began in 1910, with a 35% reduction since 2001 alone.²⁹

²⁶ Chris Grundy, Rebecca Steinbach, Phil Edwards, Judith Green, Ben Armstrong, and Paul Wilkinson, "Effect of 20 mph traffic speed zones on road injuries in London, 1986-2006: controlled interrupted time series analysis," *BMJ* (10 December 2009), http://www.bmj.com/cgi/content/full/339/dec10_3/b4469

²⁷ New York City Department of Transportation, "Safe Streets for Seniors: City Launches Safe Streets for Seniors to Reduce Traffic Fatalities Among Seniors," <http://www.nyc.gov/html/dot/html/sidewalks/safeseniors.shtml>

²⁸ Janet Sadik Kahn, "Learning From New York," [speech], Vancouver Trade and Convention Centre, Vancouver, Canada (19 October 2009), http://www.sfu.ca/city/city_pgm_video030.htm

DUBLIN, IRELAND

At the national level, the Irish government published *Smarter Travel - a Sustainable Transport Future: a New Transport Policy for Ireland 2009-2020* which states “Unless inappropriate, ensuring that 30 km/h zones are designated in central urban areas which will continue to accommodate motorised traffic.”

At the local level, the City of Dublin has a rolling 3-year road safety plan, with the extension of 30 km/h speed limits included as an action in the current Dublin City Road Safety Plan 2009 to 2012. The reduced speed limit is not expected to reduce traffic capacity but rather reduce speeding between intersections and facilitate smoother traffic flow. Transport for Dublin (Dublin’s equivalent of TransLink) states

The implementation of 30 kmph will reduce the huge imbalance in the relative safety of motorists and non-motorists. It will particularly reduce the risks for vulnerable people - children, pedestrians, elderly and disabled people - who are at greatest disadvantage with current speeds. A 30 kmph limit would allow fairer access to the road network, which currently penalises non-motorists and those who are less able and fit.³⁰

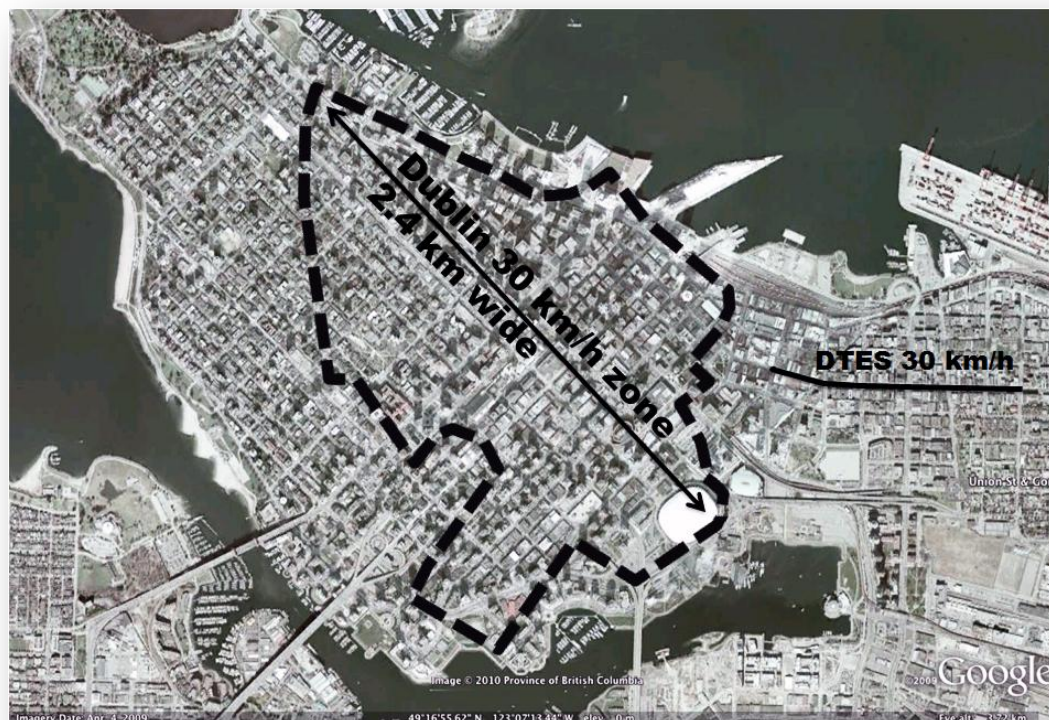


Figure 5: Dublin central city 30 km/h zone, effective 1 January 2010 vs. proposed Downtown Eastside pedestrian safety zone. Drawing to scale.

²⁹ New York City Department of Transportation, “About DOT: Sustainable Streets,” <http://www.nyc.gov/html/dot/html/about/stratplan.shtml>

³⁰ Transport 21 Project Office, “New 30 Kph zones for Dublin City Centre,” <http://www.transportfordublin.ie/news/new-30-kph-zones-for-dublin-city-centre/>

On 1 January 2010, Dublin expanded their 30 km/h pedestrian safety zone to cover an area over half the size of Vancouver’s downtown peninsula and 2.4 kilometres across at its widest point. Their 30 km/h zone includes major arterials and national highways that carry significant volumes of traffic. Figure 5 is an image of Downtown Vancouver superimposed with the Dublin 30 km/h zone.

AMSTERDAM, THE NETHERLANDS

As mentioned earlier, the City of Amsterdam has also approved a large 30 km/h zone in the central city. It will begin with a major ring road and then expand to the entire zone within that road, including the central train station and a highway that feeds a tunnel to North Amsterdam. It is 3.5 km wide at its widest point and covers an area larger than Vancouver’s Downtown peninsula, as noted in Figure 6.

BOGOTA, COLOMBIA

The City of Bogota, Colombia has a weekly “Ciclovía” every Sunday and holiday which closes 120 km of streets to motor vehicles for use by the citizens of the city.³¹ It is estimated that approximately two million people (30% of the population) come out each week. Runners, skaters and bicyclists take over the streets. At the same time, stages are set up in city parks. Aerobics instructors, yoga teachers, and musicians lead people through various performances and participatory activities.



Figure 6: Amsterdam’s proposed central city 30 km/h zone vs. proposed Downtown Eastside pedestrian safety zone. Drawing to scale.

³¹ StreetsWiki, “Ciclovía,” <http://streetswiki.wikispaces.com/Ciclovía>

TORONTO, CANADA

The City of Toronto has an advisory Pedestrian Committee and a Walking Strategy that includes a number of engineering and public safety initiatives and policy changes to decrease the pedestrian injury rate. As well, Toronto produces an annual Pedestrian Collision Summary,³² one of the recommendations from this Project. Further information on actions that Toronto is taking and which could be implemented in Vancouver can be found for each of the following bullets, which link to the City of Toronto's website.³³

- Zebra Striped Pedestrian Crossings
- Pedestrian Countdown Signals
- Pedestrian Scramble Pilot Project
- Leading Pedestrian Intervals
- Accessible Pedestrian Signals
- Pedestrian Crossover Enhancement Program
- Pedestrian Safety Media Campaigns
- Pedestrian Safety and Injury Prevention for Children
- Toronto Police Traffic Services
- Crossing Streets Safely – Pedestrian Signals
- Pedestrian Collision Summary
- Pedestrian Collision Study

SUMMARY

In summary, the best practices research showed that Vancouver is behind other cities in promoting pedestrian safety, not just at the international level but also at the continental and even national level. There are a number of relatively simple changes that could be made to the road network that would have a large impact on injury rates. For example, many jurisdictions in Europe and Australia are implementing very large blanket 30km/h zones in their downtowns, including major arterials and highways. Closer to home, some Canadian cities are modifying their signals to favour non-motorized modes and promote injury reduction. Still others worldwide and in Canada have

³² City of Toronto, "Traffic Safety Unit 2007," http://www.toronto.ca/transportation/publications/brochures/2007_ped.pdf

³³ City of Toronto, "Pedestrian Safety," http://www.toronto.ca/transportation/walking/ped_safety.htm

robust monitoring, reporting, and capital planning programs aimed solely at reducing injuries. With the exception of TransLink (see Appendices 11 and 12), there is strong support on the Advisory Committee for implementing these initiatives in Vancouver.

Data Collection

A total of 81 volunteers – both VANDU members and members of the community – were trained to collect traffic data that would be used to evaluate appropriate recommendations.

Numerous volunteers remarked on how participating in the data collection made them more aware of and think differently about pedestrian safety issues. They noted that every time they committed an infraction, they were now more aware of it and were more inclined to choose the safer option. Some volunteers also said they were now much more aware of the behaviour of their friends and neighbours on the street, and watched out for them if they were making a dangerous crossing, sometimes leading them across or encouraging them to cross at the intersection.

STUDY ZONE HOTSPOT LOCATIONS

Data collection within the study area included all intersection and midblock pedestrian injury hotspot locations along Hastings Street, as well as two other sites that came up in the pedestrian survey in Component 2 of the project. Data was also collected at other midblock locations throughout the City for comparison purposes.

HASTINGS MIDBLOCK HOTSPOTS

- Abbott/Carrall (9th highest injury location)
- Columbia/Main (1st)
- Main/Gore (4th)



Figure 7: Volunteers collecting traffic data at the intersection of Hastings and Gore.

- Dunlevy/Jackson (5th)
- Heatley/Hawks (7th)
- Carrall/Columbia (non hotspot added by project)

HASTINGS INTERSECTION HOTSPOTS

- Abbott/Hastings (8th)
- Carrall/Hastings (3rd)
- Main/Hastings (2nd)
- Gore/Hastings (4th)

COMPARISON MIDBLOCK LOCATIONS

- Burrard Street between Georgia and Dunsmuir Streets
- Davie Street between Thurlow and Bute Streets
- Commercial Drive between William and Charles Streets
- Commercial Drive between Grant and Gravelly Streets
- West 4th Avenue between Yew and Vine Streets (data lost)

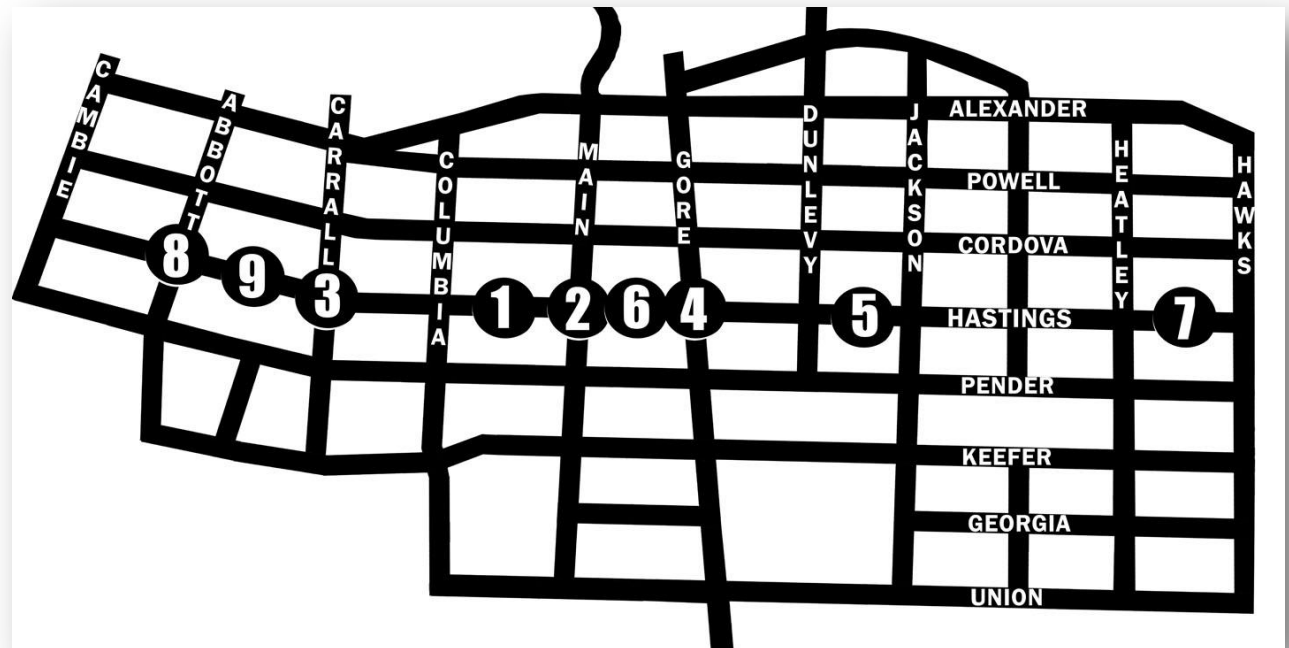


Figure 8: Pedestrian injury hotspot locations along Hastings Street.

METHODOLOGY

As noted earlier, the methodology was designed with input from the Advisory Committee and specifically the academic injury researchers and City of Vancouver Engineering, and approved by all members except TransLink. A full description of the methodology is in Appendix 1.

Twenty minute counts of pedestrian and vehicle volumes and infractions at both midblock locations and intersections were collected. Infractions counted:

- Pedestrians: Jaywalking, crossing while hand is flashing or solid, not staying within crosswalk lines
- Motor vehicles: Going through red or yellow lights, entering intersection while pedestrians were crossing, talking on cell phones while driving

Data Collection Times:

- Weekdays 12:00 PM, 4:30 PM, 9:00 PM
- Saturday 4:00 PM, 9:00 PM
- Sunday 12:00 PM, 4:00 PM

Each location had data collected for all of the above times. The project originally planned to also collect data during the AM peak period. However, it was difficult to recruit volunteers for 7:00 AM and was noted that few injuries happened in this time period, as summarized in the Downtown Eastside Summary Statistics breakdown in Appendix 2. After consultation with the Advisory Committee, the AM peak time period was dropped.

Vehicle speeds were measured at select locations within the study zone as well as neighbourhood gateways leading into the study zone. A radar gun was used by the project and speed data collection was one of the most popular volunteer activities.

GAMES TIME

It was also initially planned with the Advisory Committee that there would be a separate “Games Time” phase during the Vancouver 2010 Winter Olympics, including a high profile DTES Pedestrian Safety Project media campaign with support from the Police Department and Vancouver Coastal Health. Although significant effort went into planning and developing this phase, the media coverage of Games related issues was increasingly negative leading up to the Opening Ceremonies. In that context it was decided not to link the project to the Games as the outcomes were to be longer term than a one-month event and everyone involved saw the project as a good news story, so most of the Games specific activities did not transpire.

However, the project was successful in having a DTES pedestrian safety memo circulated to all VANOC drivers (see Appendix 10). As well, Vancouver Coastal Health, one of the active Advisory and Steering Committee members, produced a health promotion message about traffic safety for their “2010 Health Watch” e-newsletter.

Component 2: Education and Community Outreach

Component 2 of the project ran from January through mid-April 2010 and primarily consisted of volunteers engaging with other Downtown Eastside residents to both educate and learn from them regarding pedestrian safety in the neighbourhood. Specifically, volunteers led workshops, hung posters along Hastings Street, distributed brochures, held placards with messages aimed at motorists, and surveyed pedestrians. The overlap with Component 1 meant that some traffic data was also collected during this period, for example, counting jaywalkers and pedestrian volumes in other neighbourhoods for comparison purposes.

Volunteers

Using VANDU's model of peer support and education, the DTES Pedestrian Safety Project relied on a large pool of volunteers made up of both VANDU members and DTES residents.

A core volunteer committee of seven VANDU members was struck early in the project to facilitate volunteer recruitment and coordination as well as to assist project coordinators with planning and in dealing with issues that arose. Orientation sessions were held weekly for new volunteers and were open to all residents of the Downtown Eastside regardless of whether or not they were VANDU members. In order to participate, all volunteers were required to sign a Pedestrian Safety Pledge (see Appendix 9).

From early December 2009 to mid-April 2010, a total of 167 volunteers went out on daily shifts performing a variety of tasks for the project. Most tasks were low-threshold, i.e., simple and not requiring any special skill or ability to perform, such as handing out leaflets and poster. Other tasks, such as leading workshops, were more challenging and gave volunteers an opportunity for new experiences and skills development while enhancing their knowledge about the issue of pedestrian safety in the neighbourhood.

Volunteers for the safety project were members of the pedestrian population found on Hastings Street and were therefore able to engage their friends and neighbours more effectively than a non-resident or non-street-involved person. Volunteers also frequently remarked that being part of the project made them more aware about pedestrian safety and that they changed their behaviours as a direct result of their involvement. Some reported that they never jaywalk anymore, while others have said that they have become more attentive to the behaviour of pedestrians generally and now watch out for others when crossing the street.

Workshops

Seventeen workshops were conducted in social housing buildings, SRO hotels, and in public gathering places throughout the Downtown Eastside. The first half hour of each 90 minute workshop consisted of VANDU volunteers outlining the issue of pedestrian safety in the neighbourhood and the DTES Pedestrian Safety Project. The final hour of the workshops gave participants the opportunity to convey their experiences as pedestrians in the Downtown Eastside, discuss their own and other pedestrians' behaviour, identify safety hazards, and voice their opinions on how the neighbourhood could be made safer. In total, 347 people participated in the workshops (see Appendix 15 for dates, locations, and number of participants).

Workshop discussions were recorded, selections of which can be found in Appendix 16. Not all sessions were captured due to technical problems and not all recordings are intelligible owing to acoustics and noise issues in some of the venues.

Pedestrian Surveys

Volunteers conducted 1,409 pedestrian intercept surveys in the Downtown Eastside between January and April 2010, reaching almost 10% of the total population. Informants were asked six forced-response questions to gauge their level of awareness about pedestrian injuries in the neighbourhood, what they felt could be done to make the community safer, and to convey their personal experiences. In its role on the Advisory Committee, TransLink proposed a more elaborate, five-page survey in order to collect much more detailed information about pedestrian behaviours and patterns. Instead, a short, one-page survey was chosen because field testing by volunteers found pedestrians were more receptive when only a few minutes of their time was required. Moreover, the workshops were an opportunity for DTES residents to provide the project with more in depth qualitative data. A copy of the survey is in Appendix 13 and the results are reported below under "Component 3: Findings."

"I was standing right on Main and Hastings and a big truck came around the corner and somebody just pushed her, or something happened to make her fall down and the truck just ran over her head. Not the rest of her body, just her head; the back wheels went over her head. This happened about seven, ten years ago. I still dream about it. I still think about it. She was one of my best friends."

-workshop participant

Poster Campaign

A series of five posters were put up on Hastings Street encouraging people to be careful crossing the street. The posters contained humorous and attention-grabbing images and text reminding pedestrians to be careful, especially when crossing Hastings Street. The full set of posters can be found in Appendix 8.

Leafleting

Volunteers distributed over 7,500 brochures (see Appendix 7) containing information about pedestrian safety in the neighbourhood and the DTES Pedestrian Safety Project. The brochure was a key outreach and educational tool in workshops and on the street. In many cases, it served as a conversation-starter for volunteers to engage people on the street about the issue and project. In addition to text, a map and photographs were used to ensure the leaflet was accessible to a range of people. Vancouver Coastal Health paid for 3,000 of the brochures to be printed in colour to make them more inviting. Volunteers handed them out individually on the street and at SkyTrain stations, and distributed them to community centres, shelters, cafés, and other public spaces throughout the Downtown Eastside.

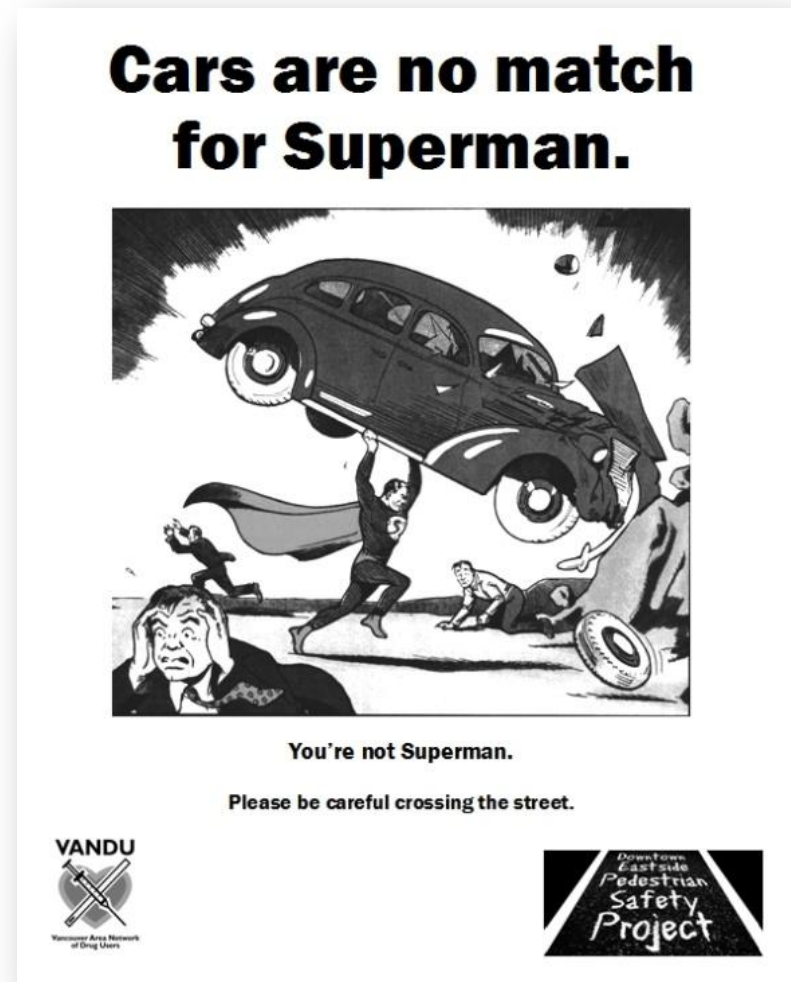


Figure 9: Sample poster.

Driver Education: “Burma Shaves”

The term “Burma Shave” originates from an advertising gimmick in which a single marketing message was conveyed across a series of roadside billboards. Adapting the concept to pedestrian safety in the Downtown Eastside, volunteers made placards with messages targeting motorists and stood at the side of Hastings Street holding the signs and wearing bright orange safety vests. Participants remarked that they frequently received positive responses in the form of honking horns and “thumbs up” from passing motorists. It was also an opportunity to engage with passersby, who frequently approached the volunteers out of curiosity and were given a brochure.



Figure 10: Volunteers conducting a "Burma Shave" on East Hastings Street.

Component 3: Project Findings

Component 3 focused on compiling and sharing the findings and developing appropriate recommendations. It was undertaken in the months of April and May 2010 and consisted of summarizing the findings, drafting recommendations, further meetings with the Steering and Advisory Committees, and refining the recommendations and report using feedback from Advisory Committee members.

Project findings are contained in this report, which includes a 4-page summary aimed at the general public and an updated web presence on the VANDU website. The sheer volume of data collected by volunteers and supervised by project staff was not anticipated when the project was first conceived. The vast majority is considered reliable with a few exceptions that are specifically noted.

Jaywalking Findings

Jaywalking results are summarized in Table 6. As noted earlier, jaywalking infractions were counted at all the DTES hotspots as well as at comparison locations throughout the city. Jaywalking accounted for an average of 18% of all crossings on Hastings Street in the 10-block study zone. This is less than all the other jaywalking “comparison” neighbourhoods studied except Broadway between Prince Edward and Main Streets. In terms of volumes, there were between 119 and 241 jaywalkers per 20-minute period on Burrard Street, depending on time of day. In comparison, there were between 5 and 114 jaywalkers per 20-minute period on Hastings Street, depending on the location and time of day. Note that none of the comparison sites were high injury locations. These results suggest that the act of jaywalking itself does not explain the high rate of pedestrian injuries in the Downtown Eastside, but rather injuries occur as a result of the interplay between vehicle speed and a very high ratio of vulnerable pedestrians, many with compromised judgment.

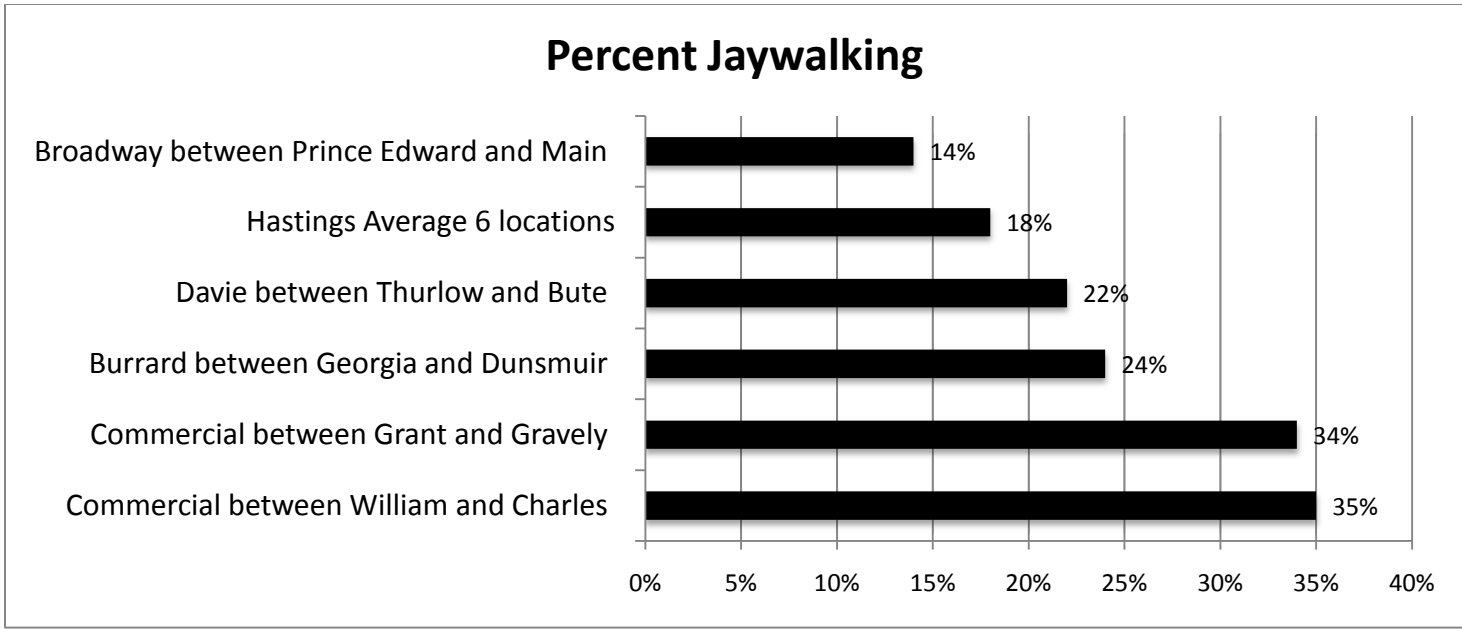


Table 6: Percentage of total observed crossing that were jaywalking crossings, at select locations.

Comparing Pedestrian and Driver Behaviour on Burrard Street with Hastings Street

The project collected further midblock data on Burrard Street between Georgia and Dunsmuir for comparison with Hastings Street in order to see whether the overall infraction volumes and rates were higher in the DTES than other non-hotspot locations. Full data tables are in Appendices 4 and 5.

Pedestrian infractions – both in total number and rate – are much higher on this Burrard Street location than at any of the injury hotspots in the Downtown Eastside. Overall, approximately 60-70% of pedestrians on Burrard Street committed an infraction when crossing the street, varying by the time of day and day of week. Infractions included not staying within the painted lines of the crosswalk, stepping off the curb against the flashing or solid hand signal, and jaywalking. In comparison, approximately 30-60% of pedestrians on Hastings Street committed an infraction when crossing the street, varying by location, the time of day, and day of week.

Data collection on Burrard Street was conducted prior to the ban on handheld cell phones that was introduced in January 2010. Between 36 and 48 motorists were observed to be using handheld cell phones (an impairment similar to being drunk) in any of the 20-minute periods measured. The average was just over 40 handheld cell phone impaired motorists per 20 minute period. In the Downtown Eastside, between 5 and 57 motorists were observed to be handheld cell phone impaired in any of the 20 minute periods measured. The average was 26 handheld cell phone impaired motorists per 20 minute period.

The afternoon rush hour period was the highest for handheld cell phone use at all locations. Preliminary data shows that handheld cell phone use has declined approximately 60% since the law banning their use has come into effect. Further hand-held cell phone data will be collected if Phase Two of the project is funded.

Other Hastings Street Intersection Data

On Hastings Street, the tallying of vehicle drivers entering the intersection on a yellow or red light is between 3% and 17.8%. The red+yellow light infraction rate is highest in the evening and the average across sites is just under 9%. The highest red light infraction rate was observed on a Friday evening after 9:00 PM at 5.2% of vehicles. Compared to vehicle infractions, a higher percentage of pedestrians exhibit last minute behaviour and step off the sidewalk during the flashing and solid hand phases – between 4.8% and 40.3%.

This data shows that there is significant last minute behaviour on the part of both pedestrians and motorists in all parts of the city. In particular, the rate of last minute behaviour by both motorists and pedestrians was not anticipated by the project. For this reason, the recommendations for signal changes do not include a Leading Pedestrian Indicator (LPI), where pedestrians are able to begin their crossing three to five seconds before the green light changes for vehicles, as it was deemed to be inadvisable without a substantial change in driver behaviour. Having pedestrians stepping out alone while over 5% of vehicles are running red lights at peak infraction times was seen to be an unacceptable safety risk. If the vehicle infraction rate could be lowered then LPIs could be an excellent addition to the pedestrian safety recommendations.

Speed Data

Speed data was collected at select locations within the study zone as well as neighbourhood gateways leading into the study zone. In general traffic is traveling close to the speed limit on Hastings Street as noted in Table 7, with the exception of afternoon peak period eastbound traffic between Jackson and Dunlevy. One reason for the higher speeds at this location could be the marginal retail business and resulting lack of pedestrian crossings and motor vehicle turning activity along this section of Hastings.

Hastings Street

Location	Date	Time	Flow direction	Average speed (km/h)	85 th percentile	% 50-59 km/h	% 60 km/h and over
Hastings btn Hawks/Heatley	Tues., Jan. 5 th , 2010	4:30 PM	Eastbound	46	53	10	2
Hastings btn Jackson/Princess	Thurs., Mar. 4 th , 2010	5:00 PM	Eastbound	48	52	46	1
Hastings btn Jackson/Dunlevy	Thurs., Mar. 4 th , 2010	5:00 PM	Eastbound	48	57	30	10
Hastings btn Jackson/Dunlevy	Fri., Dec. 18 th , 2009	12:00 PM	Westbound	35	46	5	0
Hastings btn Jackson/Dunlevy	Thurs., Mar. 4 th , 2010	4:00 PM	Eastbound	49	54	48	6
Hastings btn Carrall/Columbia	Wed., Mar. 10 th , 2010	4:00 PM	Westbound	45	51	19	2
Hastings btn Carrall/Columbia	Thurs., Mar. 4 th , 2010	4:30 PM	Eastbound	44	51	19	0

Table 7: Speed data from Hastings Street locations

Neighbourhood Gateway Locations

Traffic speeds are significantly higher at gateway locations to the neighbourhood, as noted in Table 8. The project was interested in these gateways even though none of the locations are injury hotspots. The viaducts were closed during the month of February for a period longer than the Olympics and there was a concern that the drivers diverted to Hastings Street would have the expectation of maintaining their high-speed commute on a new route through the DTES. This driver behaviour was not confirmed when the targeted “Games Time” phase was dropped. However, according to statistics from the Vancouver Police Department, traffic accidents were up 36.5% in February 2010 from February 2009.³⁴

Location	Date	Time	Flow direction	Average speed (km/h)	85 th percentile	% 50-59 km/h	% 60 km/h and over
Dunsmuir Viaduct	Mon., Nov. 30 th , 2009	4:30 PM	West	66	72	17	82
Georgia Viaduct	Fri., Dec. 11 th , 2009	5:00 PM	East	64	72	70	20
Powell/Cordova diversion	Tues., Jan. 5 th , 2010	4:30 PM	East	52	60	52	16
Prior/Dunlevy	Wed., Jan. 21 st , 2010	3:00 PM	East	51	57	56	8
Prior/Dunlevy	Wed., Jan. 21 st , 2010	3:00 PM	West	54	61	59	18

Table 8: Speed data from Downtown Eastside gateway locations

³⁴ Vancouver Police Department, “Crime Incident Statistics,” <http://vancouver.ca/police/Planning/StatsDistrict/2010/201002.pdf>

Burma Shave

The Burma Shave monitoring was conducted in the 00 Block of East Hastings for vehicles traveling eastbound during a weekday PM peak period. Speed data was collected in the three blocks past the Burma Shave signs and is summarized in Table 9. While the signage had a significant immediate impact, speeds increased as vehicles got further away from the Burma Shave. In the first block past where the signs were located, the average speed was 39 km/h and only 6% of vehicles were speeding, with none of them 10 km/h+ over the speed limit. By the third block past the Burma Shave, average vehicle speeds had increased to 47 km/h, a 20% increase, and 27% of vehicles were speeding, with 8% of them 10 km/h+ over the 50 km/h speed limit.

Location	Date	Time	Flow direction	Average speed (km/h)	85 th percentile	% 50-59 km/h	% 60 km/h and over
100 Block E Hastings	Thurs., Apr. 8, 2010	5:00PM	East	39	44	6	0
200 Block E Hastings	Thurs., Apr. 8, 2010	5:30PM	East	43	52	16	1
300 Block E Hastings	Thurs., Apr. 8, 2010	5:45PM	East	47	55	27	8

Table 9: Speed data in the three blocks after a Burma Shave.

Survey Findings – Downtown Eastside Locations

Below are the results of the 1,409 pedestrian intercept surveys conducted in the Downtown Eastside. Almost two thirds of respondents recognized their neighbourhood is not as safe as other areas of the City.

1. How safe do you think the Downtown Eastside is for pedestrians compared with other neighbourhoods in Vancouver?

Not as safe	63%
The Same	29%
More Safe	8%

At the same time, only 41% had a clear guess on how often a pedestrian is injured.

2. How often do you think a pedestrian gets injured in the Downtown Eastside?

More than once every 2 weeks	41%
Once every 2 weeks	29%
Once a month	22%
Once every 3 months	8%

Probably the most unforeseen finding was that almost one third (32%) of respondents had been hit by a vehicle in the DTES. This would indicate that the ICBC data that the academic hotspot analysis is based on underestimates the severity of the problem to a much greater extent than initially thought. The reasons for undercounting injuries are explored further in the Workshop Findings below.

3. Have you ever been hit by a motor vehicle in the Downtown Eastside?

No	68%
Yes	32%

Half of all respondents selected the intersection of Main and Hastings as where they feel the least safe crossing the street. This is the second highest pedestrian injury location in the City. Just over one in five respondents feel unsafe crossing anywhere on Hastings, mirroring the findings of the academic hotspot analysis.

4. Where do you feel the least safe crossing the street in the Downtown Eastside?

Main & Hastings	51%
Anywhere on Hastings	21%
Hastings between Carrall & Columbia	6%
Hastings between Main and Columbia	6%

Hastings between Abbott & Carrall	5%
Main & Pender	4%
Abbott & Hastings	3%
Gore & Hastings	3%
Carrall & Hastings	1%

The top suggestion to improve pedestrian safety in the Downtown Eastside was longer walk signal times, with three in ten respondents selecting this solution. From conversations in the workshops and on the street, what most people were referring to was the clearance time, a technical concept that is not widely known outside the transportation planning profession. The recommendations on signals further explain and address this. It is interesting to note that the second most popular suggestion is more drug treatment programs, recognizing the importance of harm reduction and supporting the Four Pillar approach to drugs. The third and fourth most popular choices related to providing additional opportunities to cross the street, and reducing the number and severity of injuries for pedestrians.

5. What's one thing the City should do to make this neighbourhood safer?

Longer walk signal times	30%
More drug treatment programs	17%
Install crosswalks	15%
Slow/reduce traffic on Hastings	13%

Enforce speed laws	9%
Redesign Hastings Street	6%
Enforce jaywalking laws	5%
More beat cops	5%

Almost one third of DTES respondents had heard of the project, which was also higher than initially anticipated. It could be expected that with the release of the final report this number will go much higher. If a second phase is approved, a fuller distribution of the findings with a robust education component is proposed and this assumption about knowledge of the project will be explored in a follow up survey.

6. Have you heard about the Downtown Eastside Pedestrian Safety Project before today?

No	68%
Yes	32%

The seventh and final survey question asked “Is there anything else you would like us to know?” The responses are consistent with remarks made during the workshops and are in Appendix 14.

Survey Findings – Comparison Neighbourhoods

A modified pedestrian intercept survey was conducted at the jaywalking comparison sites, with much smaller sample sizes ranging from 28 - 56. Note that some of the original data was lost for these sites, either for jaywalking or the pedestrian survey. The pedestrian survey was not conducted at the Burrard Street comparison site. The following questions were asked:

- What is your number one public safety concern?
 - Pedestrian Safety
 - Other
- How often do you think a pedestrian is injured in the City of Vancouver?
 - Less than once per month
 - Once per month
 - Once per week
 - Once per day
 - More than once per day
- Have you heard of the Downtown Eastside Pedestrian Safety Project?

- Yes
- No

Not all respondents answered all questions, so the percentages given will not always equal 100%. It is significant to note that of the 159 respondents citywide, a full 64% gave either pedestrian safety (43%) or some other transportation related issue (21%) as their top public safety concern. Reporting of responses to the “Other” category will use the original wording of the respondent.

Davie Street

A total of 56 surveys were conducted on Davie Street, with 48% choosing pedestrian safety as their number one public safety concern, and an additional 9% giving some other transportation related response in the other category, including poor drivers, drivers on cell phones, etc. Other public safety concerns included homeless people (three responses), police assaults, needing more police, break and enters, racism, terrorism, and drug dealing. Just over 30% of respondents thought the frequency of pedestrian injury citywide was once a week or less, while 68% thought it was once a day or more, the correct response. Only 7% of respondents had heard of the project.

Hastings Sunrise

A total of 36 surveys were conducted on East Hastings Street near London Drugs and Nanaimo Street, with 53% choosing pedestrian safety as their number one public safety concern, and an additional 22% giving some other transportation related response in the other category, including traffic speed (three responses), buses, etc. Other public safety concerns included stealing, robbery and assault, women’s safety and senior’s safety. Just over 52% of respondents thought the frequency of pedestrian injury citywide was once a week or less, while only 28% thought it was once a day or more, the correct response. None of the respondents had heard of the project.

Commercial Drive

A total of 28 surveys were conducted on Commercial Drive near Grandview Park, with 18% choosing pedestrian safety as their number one public safety concern, and an additional 9% giving some other transportation related response in the other category, including bike riders, safe roads for cyclists, and jaywalkers. This is the lowest for any of the survey areas. Other public safety concerns included police harassment/brutality (five responses), abusive/drunken panhandlers (two responses) and drunk people, nighttime personal safety, safer neighbourhoods for families, street violence, physical assaults, and drugs. Just over 14% of respondents thought the frequency of pedestrian injury Citywide was once a week or less, while 82% thought it was once a day or more, the highest level of correct responses. Only 25% of respondents had heard of the project.

West 4th Avenue

A total of 39 surveys were conducted on West 4th Avenue between Yew and Vine Streets, with 46% choosing pedestrian safety as their number one public safety concern, and an additional 43% giving some other transportation related response in the other category, including traffic (nine responses), traffic speed (two responses), riding the bus/violent lunatics on public transit, road safety, people running red lights, pedestrians stepping in front of cars, jaywalking and cyclists. Other public safety concerns included dirty needles, police, police brutality, vandalism, and public confrontations. Just over 46% of respondents thought the frequency of pedestrian injury citywide was once a week or less, while 51% thought it was once a day or more, the correct response. Only 10% of respondents had heard of the project.

It is proposed that a follow up survey be conducted in Phase Two of the project, if approved, measuring the results of the Education and Outreach initiatives as well as the impact of the media coverage of Phase One.

Workshop Findings

Several recurring themes relating to pedestrian safety arose during workshop discussions. In particular, the underreporting of injuries, pedestrian conflicts with buses, the attitude of motorists towards Downtown Eastside residents, and the impact of the street drug trade on pedestrians were frequently discussed. Workshop participants were asked to share their stories about any collisions they were involved in or witness to (transcribed testimonials can be found in Appendix 16). The project also documented pedestrian injuries that residents suffered in areas other than the Downtown Eastside.

Underreporting

Workshops and survey results indicate that a large proportion of pedestrian injuries are not reported and are therefore not reflected in the available injury statistics. Roughly one-third (32%) of the 1,400 Downtown Eastside pedestrians surveyed reported having been hit by a motor vehicle in their neighbourhood. Many people said that they did not go to the hospital, seek legal recourse, or make a statement to police after getting hit, even in cases in which they sustained relatively serious injuries. According to workshop testimonials, the most common reasons pedestrian injuries in the Downtown Eastside are not reported are as follows:

- **Drivers paid them money to consider the matter resolved.** One man reported receiving \$1200 after being hit by a limousine, but the amounts were more typically in the \$20-\$60 range. In one example, a woman said she was bumped in her wheelchair “a little bit” while waiting for the light at Powell and Dunlevy by a van that drove onto the sidewalk. “I asked him for bus fare and he gave me a

twenty,” she said. For people living in poverty and/or who use illicit drugs, a small amount of money on the spot is incentive enough to forego a potentially much higher settlement that they might be eligible for months or years into the future.

- **Injured pedestrians who were in possession of illicit drugs or had a warrant wished to avoid the police.** In August 2006, one pedestrian was hit so hard while crossing Cordova Street that she “died for two seconds or something like that... I didn’t feel it hit me, but I remember flying through the air.” She refused to go to the hospital because she “was worried about my drugs...It was in my hand.” A police officer at the scene tried to compel her to go to the hospital by threatening to charge her. “I said ‘I don’t care, charge me,’ and they gave me a ticket for not going to the hospital.” The officer saw her drugs, she said, but “he didn’t care, he was worried about me going to the hospital.”
- **Because of negative past experiences, some injured pedestrians do not want to deal with the police or hospital staff.** One man whose arm was broken by a bus at Main and Hastings explained that “I don’t like hospitals ... I like healing myself... There’s a lot of people out there that won’t report anything, especially if a bus ain’t gonna stop, right, they’re not gonna take a report, it would take too long for them.” Another said “I gotta be unconscious before I go down there [St. Paul’s Hospital] because the last time I went there the guy ... told me he didn’t think I was hurt. He thought I was there for a free high so I didn’t bother going to the hospital when I got hit. I could walk, I could crawl home, which was half a block up the street. If I want to get treated like I’m a useless piece of crap I’ll stay home.”
- **In the case of hit and runs, injured pedestrians did not feel there would be any benefit to them for reporting the incident when the identity of the motorist was unknown.** A woman described witnessing her husband getting knocked unconscious in a hit and run. “I was freaked out because I could see it from my apartment,” she said. “He was drunk but still, he got knocked right out.” There were witnesses, but “because they were all dealing in drugs and stuff like that they didn’t want to get involved.” With no willing witnesses and because the motorist did not stop, “we still never did anything about it,” she said.

“Pender and Carrall, I was in the bike lane and this lady she cut me off and I ended up t-boning her and I flew over the hood ... I thought I had a warrant on me. I had dope on me, so I was hurt and stuff like that. I just wanted to get the f*** out of there, but I was injured...She wanted to call, she was really upset. She knew she f***ed up and stuff, right. I didn’t want to deal with the cops. I found out later I didn’t have a warrant, eh, so I screwed up there because of whether or not I had a warrant. But I had dope on me. I had no fault in it at all, actually ... I was wearing bright clothing, it was dusk...I ended up somersaulting over the vehicle. [Were there any long term injuries?] Oh, probably. I’ve had a couple concussions. I hurt my head then too, eh, really poor health, really bad memory now.”

-workshop participant

- **Pedestrians did not realize the extent of their injuries until well after the incident or did not feel their injuries were severe enough to merit medical attention.** One person described seeing a man in a wheelchair get knocked over at Carrall and Hastings. “He was crossing properly ... I went to see if he was alright and me and another guy helped him back up, and he kept mumbling ‘I’m fine, I’m fine.’ ... I seen him a few weeks later at a thrift store. He was hurting then. The pain came after, like after a few days.”

Buses

Workshop participants frequently complained about bus drivers driving too fast, having an “attitude” towards DTES residents, driving so close to the sidewalk that their sideview mirrors posed a danger to pedestrians, and blocking the crosswalk so that pedestrians are forced to walk into traffic to complete a crossing.

Many participants described collisions involving buses that they experienced or witnessed. One person described two incidents involving buses: “I witnessed a person get hit by a bus but it was actually one guy cut in half... For a month I couldn’t get that image out of my brain ... we’re extremely traumatized by such a thing.” Another time she saw someone fall from the back door of a bus “and the bus ran over his legs and broke his legs.”

One man described how a friend with mental health issues had been drinking at the Empress Hotel. After leaving, he was hit by a bus “hard enough that he lost both his shoes.” An ambulance came, but the man refused to go to the hospital. “You should’ve seen the guy the next morning. Behind his neck all the way down to his knee ... all his back was black, and he couldn’t walk for a couple weeks, and after that no doctors would help him.”

Several people felt that some bus drivers in particular “have this attitude towards us down here.” One person described how bus drivers “scream past through the intersection and just narrowly miss people. I’ve seen people literally this close to getting hit by a bus ... I think they have to have some kind of sensitivity training or something.”

Motorists’ Attitudes towards DTES Residents

Many workshop participants expressed their belief that motorists have a prejudicial attitude towards Downtown Eastside residents that affects their behaviour behind the wheel. In one incident, a woman that nearly hit a couple crossing at a crosswalk by Oppenheimer Park got out of her car and shouted “‘Ah, you guys are just in too much of a hurry to go get your crack’... That’s all that came out of her f***ing mouth,” a workshop participant explained, even though they were crossing in a crosswalk and one of them was an elderly man with a cane.

Some people felt that motorists intentionally targeted them. “I got hit at Carrall and Hastings there,” one person told us. “It was my light but it was like three o’clock in the morning and the guy, I don’t know whether he accidentally stepped on the gas, but the guy slammed right into me, and I swear the guy did it on purpose.” Someone else was hit while crossing Quebec Street by a motorist that changed lanes “as I was crossing the street ... like he tried to hit me on purpose ... His rear wheel ran over my foot ... [and] broke my ankle. I ended up having to get taken to the hospital.”

Drug Trade

The illicit drug market centred on Hastings Street is a significant reason for the concentration and flows of people on the street in the DTES pedestrian injury hotspot zone. Destination shopping locations similarly determine pedestrian flows on other commercial streets, but in the Downtown Eastside, the difference is that the marketplace is largely out on the sidewalk on a busy arterial road.

Workshop participants who use drugs described how participating in the drug market affected their behaviour as pedestrians. Several people explained that they were likely to jaywalk on their way to purchase drugs, but not when they were high. One man said that “I’ve been a crackhead for 33 years. After my first hoot [smoking crack], when I see my dealer across the street, I don’t care if there’s traffic coming or not.” Another person explained that “for me, when I’m high, I don’t like to jaywalk because I don’t want to get caught by the cops.” Someone pointed out the difference between being high and being drunk: “even myself, I get paranoid [when I’m high], but yet if I was drunk I’d jaywalk.” Others believe that people under the influence of drugs were more likely to get hit. One participant said that he has “heard horror stories about people tweaking at the side of the road and then getting clipped by a bus.”

Pedestrians Injured in Other Areas

Numerous people told of getting hit in areas outside the Downtown Eastside. One man described getting hit crossing the Fraser Highway in Langley. “They had to take me to the hospital,” he said. “It wasn’t that bad, could’ve been worse... I settled for 500 bucks, because I was on welfare at the time. He kind of knew that so he kind of low-balled me.” Another workshop participant was injured in a collision on Davie Street in the West End that cost him his leg. Two vehicles collided. One of them “just went sideways, jumped up onto the sidewalk, hit my right side. I fell backwards. I didn’t feel any pain but I felt the tire going over my leg.”

Ironically, people disabled in collisions with motor vehicles sometimes find themselves living in the worst pedestrian injury area in the city. Victims are often forced to stop working, at least for a period of time, and the various assistance options leave them with less money. They no longer have the means to afford to live in a safer neighbourhood, especially if left with permanent disabilities, and are attracted by the cheaper/social housing and services available in the Downtown Eastside.

Component 4: Project Recommendations

The recommendations of the Downtown Eastside Pedestrian Safety Project are targeted to have the most positive public health outcomes possible. As noted earlier, pedestrian injuries have been experienced by about one third of Downtown Eastside residents. In BC, the average hospitalization cost of a pedestrian injury in 2008, not including ambulance or rehabilitation, was \$15,747.06.³⁵ This is only the direct cost to the taxpayer. According to an Ontario study in 2004, the average total *social* cost of a pedestrian injury is over \$400,000, which includes the cost of healthcare, first responders, property damage, rehabilitation, out of pocket expenses, lifetime loss of income, etc.

The recommendations fall into several categories. The first set is applicable corridor wide or in the instance of data monitoring citywide, and are grouped into short, medium, and long term recommendations. They focus on the three “E’s” of traffic safety – Engineering, Education, and Enforcement – and on building the lasting partnerships needed to implement change. Following those is a set of location specific recommendations.

Short Term Recommendations (ST)

Short-term recommendations could be announced at end of project, require limited funding and could be substantially implemented by the end of 2010.

ST1: 30 km/h Pedestrian Safety Zone

The Vancouver Police Department, an active member of the project’s Advisory Committee, has proposed a lower speed limit to match the unique conditions in this zone. As noted, over 10% of all pedestrian injuries citywide take place along a small stretch of Hastings Street. On average, a pedestrian injury is reported every eight days in the Downtown Eastside.

³⁵ BC Injury Research and Prevention Unit, Online Data Tool, <http://www.injuryresearch.bc.ca/categorypages.aspx?catid=10&catname=Online%20Data%20Tool>

A new 30 km/h Pedestrian Safety Zone along six blocks of Hastings Street from Abbott to Jackson would result in a significant decrease in the incidence and severity of injuries over the epicenter of pedestrian injury in the City. Driver education, signage and sporadic enforcement would support the initiative. At slower speeds drivers would have more time to react to erratic pedestrian behaviour or jaywalking and with slower speeds many collisions and therefore injuries would be prevented. For collisions that did take place, the severity of pedestrian injuries would be greatly reduced.

Previous studies have quantified the impact of vehicle speed on pedestrian fatalities. At 64 km/h, 85% of pedestrians will be killed, at 48 km/h, 45% of pedestrians will be killed and at 32 km/h, 5% of pedestrians will be killed.³⁶ The current speed limit along Hastings Street and within the City of Vancouver in general is 50 km/h unless posted as an alternative speed zone such as around playgrounds and schools, which have speed limits of 30 km/h. However, a large percentage of motorists citywide are traveling over these speeds, as the City notes on its website, and a pedestrian struck by a vehicle traveling at 60km/h is 70% more likely to die from their injuries than a pedestrian struck at 50km/h.³⁷

The project has found that traffic is generally not speeding excessively above the current 50 km/h speed limit within the ten block high injury zone along Hastings. There are also not an inordinate number of jaywalkers compared to other neighbourhoods, as noted above. At the same time, due to the vulnerability and impaired judgment of the pedestrians jaywalking on Hastings, a much larger percentage of them are being struck and injured. This points directly to the need for a lower speed limit to address the unique conditions in this zone. A lower speed limit is also supported by the best practices research and is one of the top four suggestions from the pedestrian survey. All project stakeholders including the Advisory Committee members, with the exception of TransLink, support the VPD proposal for a 30 km/h pedestrian safety zone on six blocks of Hastings Street, as this one change would have the largest single impact for improving pedestrian safety in the Downtown Eastside.

³⁶ See, United Kingdom Department Transportation, "Killing Speed and Saving Lives," London, England, 1997, cited in Ryan McGreal, "The Speed Factor," *Raise the Hammer*, 9 February 2007, http://www.raisethehammer.org/article/506/the_speed_factor

³⁷ City of Vancouver Engineering Services – Transportation, "Traffic Management: Pedestrian Safety Programs," <http://vancouver.ca/engsvcs/transport/traffic/peds.htm>

TRANSLINK'S POSITION

TransLink's key role in planning and funding transportation includes the designation of Hastings Street as part of the regional Major Road Network (MRN). TransLink and the City have a contractual agreement that changes to MRN designated roads will not impact the road's people carrying capacity.

As noted above, there were four meetings of the Advisory Committee. TransLink was only able to attend part of the first meeting on 3 November 2009. TransLink's response to the draft report and recommendations was that they could not support a 30 km/h Pedestrian Safety Zone on Hastings Street. The Project sought clarification and TransLink responded (see Appendices 11 and 12) that:

For a 30 kilometre per hour speed zone to be effective on Hastings Street, it would need to be accompanied with the downgrading of Hastings Street to a non-arterial class of road ... the removal of Hastings Street from the Major Road Network ... (and) a detailed analysis and understating of the full implications of such significant changes on Vancouver's downtown road network, in terms of traffic, bus, and truck re-routing, and the ability of alternative corridors to safely accommodate the diverted traffic without a net increase in the number of pedestrian crashes. ...TransLink cannot support the recommendation to introduce the 30 kilometre per hour speed limit without a thorough review and resolution of all the issues discussed above.

ST2: Pedestrian Injury Monitoring, Reporting, Targets, and Capital Spending Alignment

Pedestrian injury and other road user collision and injury statistics are currently collected by ICBC, VPD, and TransLink (for their fleet). However, there is currently no mechanism for collating and reporting these statistics together. As well, ICBC has provided their injury statistics to the City on an annual basis for about the last ten years, though targets for injury reduction and alignment of capital spending with injury prevention are lacking. The monitoring, reporting, development of targets, and alignment of capital spending are common in other jurisdictions such as New York and take place at a national level in some countries like Sweden.

This is a key recommendation that would have a lasting impact by establishing a mechanism for the City to be systematically proactive in identifying and addressing pedestrian hazards citywide, rather than reacting to a one-off academic study. This recommendation is supported by Vancouver Coastal Health and the City's Transportation Plan, which under "Section 3: Principles, Policies and Priorities" sets out seven initiatives for monitoring and implementation.³⁸ The project recommends that:

³⁸ City of Vancouver, "Transportation Plan: 1997 Report," <http://vancouver.ca/engsvcs/transport/plan/1997report/3-10.htm>

- **ST2.1:** The City, in partnership with VPD and the Public Health Surveillance Unit of VCH Public Health, creates an annual list of pedestrian injury hotspots from the information they are currently provided annually by ICBC. This hotspot analysis was the first step in the academic study and was performed by a graduate student.

It is estimated that annual mapping of pedestrian injuries in GIS would take about two weeks, with an additional two weeks to write a report describing the nature of the hotspots and any changes from previous years. This would cost the City approximately \$4,000 per year based on four weeks of work for a graduate student. In New York City, the number of annual traffic fatalities was lower in 2009 than it has been in a century, which is largely attributable to the City's ability "to focus its resources on high crash locations and corridors and on particular groups of at-risk pedestrians."³⁹

- **ST2.2:** The City reports annually on pedestrian injury hotspots and the results of mitigation efforts by all agencies involved.
- **ST2.3:** The City, in consultation with Vancouver Coastal Health Public Health, develops targets for the reduction of injuries using best practices from other jurisdictions.
- **ST2.4:** The City aligns capital spending and future capital planning to give first priority to pedestrian injury prevention, utilizing the ICBC data they are currently provided.
- **ST2.5:** The VPD aligns enforcement of motor vehicle violations to high pedestrian injury locations.
- **ST2.6:** The City implement a parallel program for cyclist injury monitoring, reporting, targets, and alignment of capital spending.

³⁹ New York City Department of Transportation, "High Pedestrian Crash Locations: Pedestrian Safety Improvements at the Top 20 Intersections," (March 2010): 2, http://www.nyc.gov/html/dot/downloads/pdf/top20pedcrashsites_2007.pdf

OPTIONS NEEDING FURTHER REVIEW

- The City encourage the implementation of an inter-agency system for regular monitoring and reporting of pedestrian and other road user injuries Metro Vancouver-wide, including TransLink and other agencies.

ST3: Signals

There are a number of options for new signal configurations that could be implemented in the short term. Individual options should be tailored to specific intersections as noted in the site specific recommendations below. The project recommends the following new signal configurations:

- **ST3.1: Extended clearance time** for slower moving pedestrians. Many pedestrians in the DTES are not able to travel at 1.2 metres per second as the current signals assume. Extending the clearance time available – the time between when they step off the curb and when the light changes – would allow these users to cross within the time allotted and not be left in the middle of the intersection when the light changes. This would address the number one suggestion from the pedestrian survey (mentioned by over 30% of respondents) for making the neighbourhood safer for pedestrians.⁴⁰ A trial of both microwave and infrared pedestrian detection, which holds the lights while pedestrians clear the intersection, could be implemented at selected locations.
- **ST3.2: Countdown Signals:** This option would provide pedestrians with additional information in judging whether it is safe to begin their trip across the intersection. In addition, our workshop discussions revealed that many DTES pedestrians believe the flashing red hand signifies that they are not supposed to be in the intersection. Rather, this is the time they have to “clear” the intersection once they start across the street. Countdown signals could therefore help clarify road safety rules and make them seem more reasonable in the minds of Downtown Eastside pedestrians. These signals were received enthusiastically when discussed in the workshops and are common in Burnaby and North Vancouver.

⁴⁰ US Department of Transportation – Federal Highway Administration, “Pedestrian and Bicycle Safety, Lesson 10: Pedestrian Facility Signing and Pavement Markings,” <http://www.fhrc.gov/safety/pedbike/pubs/05085/chapt10.htm>

- ST3.3: Reduced Wait Times at Existing Semi-actuated Pedestrian Operated Signals:** There is the opportunity to increase the differentiation between weekday and weekends, and peak and off peak times when traffic volumes are lower. For example, in most cases in the evening it takes less than ten or fifteen seconds for all traffic to clear the intersection after being stopped at a signal. Having the signal change within a shorter period in the late evening and early morning could encourage pedestrians to choose the safety of the signalized crossing rather than jaywalking. Wait times could also be reduced at other times of day and days of the week depending on traffic volumes. This recommendation is supported by the City’s Transportation Plan, which under “Section 3: Principles, Policies and Priorities” sets out an initiative for reducing the wait time for pedestrians.⁴¹
- ST3.4: Speed Reader Board:** The City and ICBC have been in discussions regarding installing permanent speed reader boards in high impact locations. The project recommends that one reader board be installed at each end of the proposed six block 30 km/h Hastings Pedestrian Safety Zone. The boards would be installed initially with only the built-in radar collecting traffic speeds but without the external display turned on. Once a “before” sample is collected, the display would be turned on and the impact on traffic speeds would be measured. Experience in other jurisdictions shows that the speed reduction is long term when combined with enforcement.

OPTIONS NEEDING FURTHER REVIEW

Pedestrian Scramble/ Barnes Dance: A three phase signal could be explored that would allow a separate pedestrian phase for crossing in any direction. This pedestrian priority measure is a local innovation that was used in Vancouver until the 1960s. It could appeal to DTES residents by making it more practical and convenient to choose the safety of crossing diagonally at the intersection rather than risk jaywalking by



Figure 11: Pedestrian Scramble at Hastings and Granville, 1948. City of Vancouver Archives #1184-2772

⁴¹ City of Vancouver Transportation Plan, <http://vancouver.ca/engsvcs/transport/plan/1997report/3-6.htm>

eliminating the need to cross the intersection twice. Pedestrian scrambles implemented in cities such as Montreal⁴² and Calgary⁴³ in recent years have proven successful. The City of Toronto has implemented these signals at major intersections in the downtown core such as Yonge and Bloor and Yonge and Dundas.⁴⁴

Civic Pedestrian Advisory Committee: The City currently has 24 Advisory Bodies made up of volunteers who provide important input on a number of issues from their perspective as a resident or member of a specific profession. Members from three of these bodies - the Persons with Disabilities, Seniors, and Bicycle Advisory Committees - were on the Downtown Eastside Pedestrian Safety Project Advisory Committee. There is the opportunity for a dedicated Civic Pedestrian Advisory Committee to elevate the consideration given to pedestrians in decision making and provide expert advice. A new Pedestrian Advisory Committee would help to maintain the momentum of this project and implement the City's stated transportation policy of putting pedestrians first.

Enhanced Pedestrian Operated Signals: Legally, vehicles that approach a pedestrian operated signal from the side street must stop before the stop bar at the stop sign and yield to pedestrians at all times. In practice, vehicles almost universally failed to stop before the stop bar at the stop sign, usually stopping in the pedestrian space or simply slowing down and yielding to vehicle traffic on the arterial.

Vehicles generally also failed to recognize pedestrian right of way in crossing the side street when the pedestrian signal was red for vehicles on the main street. They simply drove through the intersection as if they had a green light, often speeding up to make the light, and ignored the stop sign. The study observed numerous verbal pedestrian-vehicle conflicts including raised voices, profanity, and even physical conflict like banging on vehicles etc.

There is the opportunity to make a number of small changes that would clarify right of way and encourage safer driver and pedestrian behaviour. Pedestrian space is not clearly marked on the side streets. Painting a zebra striped crosswalk on side streets and locating the stop bar behind the crosswalk would clearly indicate where vehicles are expected to stop. Providing a second pedestrian walk signal directed at pedestrians crossing the side street that is always lit would help to clarify pedestrian right of way. Finally, installing signage under the stop sign indicating right of way could help to change driver behaviour to respect pedestrian right of way and improve safety. For example, signage could read: "Vehicles must stop and yield to pedestrians at all times" or something similar.

⁴² Andy Riga, "Doing it diagonally, or how to fix the pedestrian scramble at peel and ste. Catherine," *Montreal Gazette* (21 September 2009), <http://communities.canada.com/montrealgazette/blogs/metropolitannews/archive/2009/09/21/doing-it-diagonally-or-how-to-fix-the-pedestrian-scramble-at-peel-and-ste-catherine.aspx>

⁴³ Christopher Dewolf, "Notes from Calgary: Scramble!" *Spacing Montreal*, 31 July 2008, <http://spacingmontreal.ca/2008/07/31/notes-from-calgary-scramble/>

⁴⁴ Sam Javanrouh, "Scramble," time lapse video of Yonge and Dundas in Toronto, <http://vimeo.com/1626058>

Convert Full Signals to Pedestrian Signals: There is the opportunity to switch some of the full signals on minor side streets to pedestrian controlled signals, to provide a higher level of service to pedestrians traveling along Hastings, and discourage motor vehicle traffic from using side streets that run next to parks, etc. This should only be considered if the pedestrian signals incorporate the enhancements suggested above to clarify right of way and reduce the observed vehicle/pedestrian conflict, and will be explored in Phase Two if funded.

Leading Pedestrian Indicators (LPI): The high rate of last minute behaviour by both motorists and pedestrians was not anticipated by the project. As noted earlier, for this reason the recommendations do not include implementing leading pedestrian indicators, where pedestrians are able to begin their crossing three to five seconds before the green light changes for vehicles, as it was deemed to be unadvisable at this time without a substantial change in driver behaviour. Having pedestrians stepping out alone while over 5% of vehicles are running red lights at peak infraction times was seen to be an unacceptable safety risk. If the red light infraction rates could be lowered, for example by increasing education, enforcement and implementing intersection safety cameras corridor wide, then LPIs, which are currently used in Toronto, could be added to the pedestrian safety recommendations.

ST4: Education

ST4.1: EDUCATION CAMPAIGN NETWORK

An ongoing education campaign could target both drivers and pedestrians using innovative marketing techniques. A network of groups with an interest in improving motorist behaviours could share resources and costs in working towards a common goal. Such a network might include:

- Mothers Against Drunk Driving (MADD)
- Insurance Corporation of British Columbia
- TransLink
- Vancouver Police Department and specifically community police centers
- BarWatch
- Vancouver Area Cycling Coalition (VACC)
- VANDU

ST4.2: PEDESTRIAN SAFETY MEDIA CAMPAIGN

Periodic advertising campaigns using billboards, social media, ads on public transit shelters and vehicles, television commercials, and other media could be an effective means of reaching motorists citywide. Since motorists driving through the Downtown Eastside generally live elsewhere, the DTES Pedestrian Safety Project was limited in its ability to target this group. In this respect, advertising media with a citywide reach is more suited to the task. Other cities and institutions have launched similar campaigns, including Toronto's "We're All Pedestrians"⁴⁵ and WorkSafe BC's "Slow Down"⁴⁶ campaigns.

ST4.3: BUSES

There were frequent complaints about tour and transit buses in the Downtown Eastside in our workshops and on-the-street conversations. Buses have become more conspicuous in the neighbourhood with the expansion of tourism and TransLink's fleet and the introduction of articulated buses and a dedicated bus lane on Hastings during peak hours. Consequently, the opportunity for conflicts with pedestrians has increased.

The most common complaints were buses blocking the crosswalk at Main and Hastings and forcing pedestrians to walk around and into vehicle traffic to complete the crossing; driving too fast; and driving too close to the curb so that their sideview mirrors pose a hazard to pedestrians on the sidewalk. As noted in the workshop comments in Appendix 16, several horrific and fatal bus/pedestrian collision anecdotes were reported by DTES residents who witnessed or heard about them.

Internal education at Coast Mountain Bus Company and coordinated through TransLink could target bus drivers to encourage extra vigilance while driving through the Downtown Eastside and be tied in with the launch of a 30 km/h Pedestrian Safety Zone on Hastings Street. Similar campaigns targeting specific groups or involving neighbourhood-specific initiatives could come out of partnerships between the City and local non-profits, business, resident, and benevolent associations, and Community Policing Centres.

⁴⁵ City of Toronto, "We're All Pedestrians," http://www.toronto.ca/transportation/publications/pedestrian_safety/index.htm

⁴⁶ WorkSafeBC, "'Slow Down' Campaign," http://www.worksafebc.com/news_room/campaigns/slow_down_signs/default.asp

ST4.4: COMMUNITY OUTREACH/SAFETY PATROLS

An ongoing safety program made up of resident volunteers to:

- Patrol Hastings Street intersections at peak hours to facilitate safe pedestrian street crossing and be a highly visible pedestrian presence to motorists by wearing safety vests and using flags. Safety patrols would reinforce the categorization of Hastings Street as a pedestrian safety zone, similar to a school zone.
- Report any safety-related maintenance issues to the City through the 311 system.
- Liaise with appropriate City departments regarding pedestrian safety issues in the neighbourhood.
- Carry out community engagement strategies to generate and sustain awareness about pedestrian safety in the neighbourhood. This could include art projects, workshops, poster campaigns, etc., independently or in conjunction with neighbourhood events or existing community programs. Local artists could also be engaged through the Great Beginnings Program to create unique pedestrian safety measures such as high visibility crosswalks that would contribute to beautifying the public realm and demarcate historic areas in the DTES. It is proposed that the details be refined by the Advisory Committee in Phase Two.
- Engage residents on the street to ensure any issues or concerns arising are addressed without delay and to facilitate incident reporting.

ST5: High Visibility Crosswalk Markings

Most of the crosswalks in the hotspot zone are simply marked with parallel white lines except for two locations that



Figure 12: High visibility zebra crosswalks at pedestrian scramble intersection Toronto.
Photo: Sam Javanrouh

have no markings.⁴⁷ More visible zebra markings are used in mid-block non-signalized crosswalks in the area, but there are none of these in the hotspot zone. Current City policy is to limit the use of zebra markings to crosswalks “involving school children, the elderly or disabled, mid-block crosswalks and crossings of right-turn channels.”⁴⁸

Research shows that high visibility crosswalks can lead to significant reductions in pedestrian/vehicle conflicts. For example, New York found a 42% decrease in pedestrian involved collisions at crosswalk locations where parallel line markings were replaced with zebra stripes.⁴⁹ Similarly, studies conducted in Kitchener-Waterloo found that “a poorly defined crosswalk can result in 4 to 10 times more vehicle/pedestrian conflicts. When drivers can see the crosswalks better, they seem more likely to respect the crosswalks as pedestrian space. The literature is consistent in recommending white horizontal stripes as a means to make a crosswalk more visible.”⁵⁰ As such, cities are increasingly using zebra crosswalk markings to improve pedestrian safety, either at select locations such as particularly dangerous intersections (Ottawa and NYC) or in all marked crosswalks, which has been the City of Toronto’s policy since 2006.⁵¹

Given the high incidence of pedestrian injuries and large number of seniors and people with disabilities in the neighbourhood, the project recommends marking all crosswalks in the pedestrian injury hotspot zone with zebra stripes. This intervention would make pedestrians using the crosswalk more visible to motorists and clearly define crosswalks as pedestrian space, which could positively affect both motorist and pedestrian behaviours and reduce conflict between the two. Although it would represent a departure from current norms at signalized crossings, creating high visibility crosswalks are a cost effective measure that would help reduce the number of pedestrian injuries in the community and support the City’s stated objective of making pedestrians a top priority in Vancouver.

⁴⁷ The unmarked crossings are the north crosswalk at Hastings and Carrall streets and the midblock crosswalk on the 00 block of East Hastings.

⁴⁸ City of Vancouver, “Transportation Plan Progress Report,” May 2006, <http://vancouver.ca/ctyclerk/cclerk/20060530/documents/rr1a.pdf>

⁴⁹ Michael King, “Zebra Crosswalk Markings,” Case Study No. 37, http://www.walkinginfo.org/pedsafe/casestudy.cfm?CS_NUM=37

⁵⁰ Region of Waterloo, “Report: Crosswalk Visibility and Pedestrian Safety,” 14 June 2005, [https://www.region.waterloo.on.ca/web/region.nsf/8ef02c0fded0c82a85256e590071a3ce/862E1BE360F05AD68525701C00495A4A/\\$file/E-05-069.pdf?openelement](https://www.region.waterloo.on.ca/web/region.nsf/8ef02c0fded0c82a85256e590071a3ce/862E1BE360F05AD68525701C00495A4A/$file/E-05-069.pdf?openelement)

⁵¹ City of Toronto, “Pedestrian Safety: Zebra Striped Pedestrian Crossings,” http://www.toronto.ca/transportation/walking/ped_safety.htm#zebra-striped

ST6: Locations outside the Hotspot Zone

The project focused on the hotspot zone on Hastings Street because of the high incidence of pedestrian injuries there. However, two other problem locations came to our attention during the course of the project. The first one is Oppenheimer Park, particularly the 200 block of Jackson. A new playground is being installed as part of the renovation to the park. Approximately 20 children live across Jackson who will likely be the most frequent users of the playground.

The other location is the intersection of Union and Gore Streets. Residential density has been rapidly increasing in the vicinity of this intersection, and Union Street is a major east-west corridor on the bike route network. Despite considerable volumes of pedestrians, cyclists and motorists, the intersection is controlled only by stop signs on Union.

The project recommends that the City assess these locations to determine the need for interventions such as traffic signals, bulges, and high visibility markings. Further study of locations outside the hotspot zone will be within the scope of the proposed Phase Two of the project.

Medium Term Recommendations (MT)

Medium term recommendations are targeted at the study area and need more time to implement but are within the City's jurisdiction and the funding envelope of the 2009 – 2011 Capital Plan. The first recommendation was first championed by the Advisory Committee, is one of the top four suggestions from the pedestrian survey, and also had strong support at the workshops. The other recommendations are solutions for pedestrian safety from the best practices research on other cities, feedback from the workshops and pedestrian survey, and observations during data collection. The project recommends:

MT1: Signalized Midblock Crossings

The project recommends a signalized midblock crossing be introduced in the 100 block of East Hastings where the block is long, injuries are the highest in the city, and pedestrian generators encourage midblock jaywalking. It also supports the City's intention to reinstate the signalized midblock crossing in the 100 block of West Hastings.

MT2: Street Trees, Furniture, and other Public Realm Greening

Many sections of Hastings Street in the study area are without trees. Studies have shown that street trees and furniture serve to slow traffic,⁵² and the project recommends they are infilled on Hastings Street.

MT3: Pedestrian Bulges

Pedestrian curb bulges on side streets would shorten crossing distances and slow turning vehicles, thus calming traffic off the major streets.

MT4: Pedestrian Only Areas

Car free areas could be created, for example, along side streets or the CPR right-of-way to establish market zones where vending and other activities that generate high pedestrian volumes could take place away from arterial routes.

MT5: Review Location of Target Land Uses

The City, through its zoning and related granting of business licenses, and the police, through enforcement, have a large indirect impact on pedestrian safety by determining where pedestrian generators are situated. Formal and informal land uses such as bottle depots, health services, bars, vending, etc. are important destinations for vulnerable road users. Exploring opportunities for locating some of these activities on side streets with lower traffic volumes, in laneways, or in pedestrian only spaces (see MT4) could improve pedestrian safety through creating a greater separation between vehicle and foot traffic. Phase Two can examine this in more detail.

MT6: Develop a DTES Neighbourhood Centered Bike Network

The DTES has the lowest rate of car ownership in the city (15%, compared with 67% citywide⁵³). Currently many cyclists use the sidewalk for local trips, creating a safety hazard for pedestrians as reported at the workshops, in the surveys, and as observed by project stakeholders. A network of safe, segregated bike routes serving local trips (rather than the commute to downtown) would encourage more people to cycle and create a safer pedestrian environment.

MT7: Intersection Safety Cameras (Red Light Running)

The project found that over 5% of vehicles are running red lights at peak infraction times. The recommendation is for the introduction of full time intersection safety cameras at all hotspot intersections. These intersection safety cameras do not record general road user

⁵² Massachusetts Department of Transportation, "Traffic Calming and Traffic Management, http://www.mhd.state.ma.us/downloads/designGuide/CH_16.pdf

⁵³ Statistics Canada, 2006 Census, cited in "Downtown Eastside: How It Compares," *Globe and Mail*, http://v1.theglobeandmail.com/v5/content/features/eastside/dtes_comparison_chart.swf

behaviour and only target red-light running vehicles, in contrast to the closed circuit (CCTV) cameras used for monitoring both road users and crowd control.

Previously, BC's 30 intersection safety cameras rotated among 120 intersections. Since deployment began in the summer of 2009, an upgraded program put digital cameras at 140 sites and enables police to target these sites individually, at times of the day and week when crash data and other analysis show the risk is greatest.⁵⁴

OPTIONS NEEDING FURTHER REVIEW

BARRIER TO SEPARATE PEDESTRIANS FROM VEHICLE TRAFFIC:

A suggestion was made at the Advisory Committee to install a pedestrian barrier down the centre line of the street that is low enough for law enforcement to penetrate. This suggestion had a generally negative reception at the workshops. Alternatively, and in line with MT2 above, planters, street furniture, etc. could be configured along the edge of the sidewalk to form a permeable barrier separating pedestrian and vehicular traffic. Both options could potentially discourage jaywalking.

Long Term Recommendations (LT)

Longer term recommendations target the study area but require additional Capital Plan allocations and inter-agency partnerships. The planning could be undertaken as part of the forthcoming update of the City's Transportation Plan, expected to begin in late 2010. Options needing further review include:

LT1: Redesign of Hastings Street

A similar level of intervention as the recent Carrall Street Greenway and Granville Mall redesigns, with a focus on pedestrian safety but also to incorporate other elements such as bus rapid transit (Hastings B-Line). The Hastings B-Line was originally approved by the TransLink

⁵⁴ ICBC, "Better cameras to monitor more high-crash sites," 6 March 2009, http://www.icbc.com/about%20ICBC/news_room/2009news_releases/mar_09

Board for delivery in 2002. It was subsequently approved and funded by the TransLink Board in December 2004 for implementation in 2007, but has yet to be delivered.⁵⁵

LT2: Speed Reducing Crossing Treatments

In support of the proposed 30 km/h Pedestrian Safety Zone, a number of treatments could be explored including raised crosswalks and raised intersections that would provide the physical means to slow vehicle traffic.

LT3: Pedestrian Corridor Plans

Redesign plans for select corridors that prioritize pedestrian safety over vehicle flow.

LT4: Better Pedestrian Weather Protection

Some form of weather protection shelter at intersections that would encourage pedestrians to cross at legal crossings.

LT5: A Ban on All Devices While Operating a Vehicle

Research shows that there is no statistical difference in driver impairment between hands free and handheld devices.⁵⁶ Currently, only the use of hand held devices is prohibited in BC. The project recommends that the ban be extended to the use of hands free cell phones and other devices that similarly distract drivers behind the wheel. This would require a change in Provincial legislation.

LT6: Photo Radar

To facilitate traffic enforcement, the project recommends the installation of permanent photo radar at all intersections in the study area. This would require a change in provincial legislation, which currently bans photo radar.

⁵⁵ TransLink, "Three Year (2005 – 2007) Implementation & Financial Strategy," (December 2004); 6-9, <http://www.translink.ca/~media/Documents/Plans%20and%20Projects/10%20Year%20Plan/2005%20to%202007%20Implementation%20and%20Financial%20Strategy.ashx>

⁵⁶ Jeffrey K. Caird, Charles T. Scialfa, and Geoffrey Ho, "Effects of Cellular Telephones on Driving Behaviour and Crash Risk: Results of Meta-Analysis," Canadian Automobile Association (25 October 2004), http://www.ama.ab.ca/images/images_pdf/FinalReport_CellPhones4.pdf

Site Specific Recommendations (SS)

The following recommendations are tied to the specific pedestrian injury hotspots studied. A short description of the location and motor vehicle driver and pedestrian behaviour is provided to give context to the site-specific issues.

SS1: Intersection of Hastings and Abbott



Figure 13: Hastings and Abbott looking northeast.

DISCUSSION

This intersection injury hotspot marks the west end of the study zone. Vehicle speeds were not measured here but were observed to be generally lower than hotspots to the east due to the congestion caused by the reduction of lanes from three to two for westbound travel, and construction around Woodward's. Given the ongoing construction during the project, data for this location is likely not representative of normal post construction conditions. If approved, Phase Two would repeat the data collection at this location.

SPECIFIC RECOMMENDATIONS

- Western extent of 30 km/h zone.
- Location of speed reader board for eastbound vehicles.
- Signals – pedestrian phase with longer walk times, longer clearance times, and countdown signal.
- Improve crosswalks in all directions with high visibility zebra markings.
- The City's Engineering Department has indicated that the former midblock signalized crosswalk will be re-instated in the 100 block West Hastings, to the west of the study area, which the project supports as it would increase the number of safe pedestrian crossing options and discourage jaywalking.

SS2: 00 Block West Hastings between Abbott and Carrall



Figure 14: Hastings between Abbott and Carrall looking east.

DISCUSSION

This midblock hotspot covers the 00 block of West Hastings Street from Abbott in the west to Carrall and Pigeon Park in the east. It includes the Army and Navy Department Store, a bar, residential buildings, and two vacant lots – a large one midblock on the south side and a smaller one at the west end of the block on the north side. Both intersections on either end have full signals and there is a signalized crosswalk midblock. Crosswalk markings are no longer visible.

The block is 200 metres long, longer than most blocks in the city. Vehicle speeds were not measured but were observed to be generally lower than hotspots to the east due to the congestion caused by the reduction in lanes for westbound travel. Jaywalking rates were highest at midday.

SPECIFIC RECOMMENDATIONS

- Enhance midblock crosswalk visibility with zebra stripes and cut back overhanging branches near the midblock signal.
- Reduce pedestrian wait times at the midblock signal.
- Explore opportunities for pedestrian only spaces and market areas in the vacant lots.

SS3: Intersection of Hastings and Carrall



Figure 15: Hastings and Carrall looking north.

DISCUSSION

This hotspot location is the intersection of Hastings Street and the Carrall Street Greenway. The Greenway was inaugurated in January 2010, but construction has since resumed. Road markings have not been added to the north side of the intersection. Infraction rates are average for both pedestrians and vehicles.

SPECIFIC RECOMMENDATIONS

- Signals – pedestrian phase with longer walk times, longer clearance times, countdown signal, and audible signals
- Improve crosswalks in all directions with high visibility zebra markings.
- That the City work with United We Can to explore or create opportunities for relocating the bottle depot to a location that is less conducive to jaywalking, for example, on a corner, side street, a pedestrian only zone, or one that has laneway access.

SS4: 100 Block East Hastings between Columbia and Main



Figure 16: Hastings between Columbia and Main looking east.

DISCUSSION

The 100 block East Hastings between Columbia and Main is the highest pedestrian injury location in the City. The roadway is flat in the block to the east but then slopes from east to west so that westbound vehicles cannot see the whole block until they are entering it. This location has an average jaywalking rate but the highest number of jaywalkers of the five midblock locations studied.

The block is home to North America's only supervised injection facility (InSite), Carnegie Community Centre, three bars, over 700 residents, and significant sidewalk vending, including the alley alongside Carnegie where alley-to-alley jaywalking across Hastings is common. The vast majority of residents of this block inhabit tiny single room occupancy hotel rooms, which means they must leave their homes to participate in any socializing or entertaining activities that would normally be conducted at home.

SPECIFIC RECOMMENDATIONS

- Signalized midblock crosswalk marked with high visibility zebra stripes.
- Explore opportunities for pedestrian only spaces and market areas that would reduce the likelihood of jaywalking.

SS5: Intersection of Hastings and Main



Figure 17: Hastings and Main looking northeast.

DISCUSSION

Hastings and Main is the highest volume pedestrian intersection in the study area. Unique to this location, there are significant volumes of pedestrians stepping off the curb during the advanced left-turn phase. This is also the source of observable verbal and physical conflict (hood banging etc.) between pedestrians and motorists. Bus volumes are high, and there are ongoing issues with transit vehicles compromising pedestrian safety, as reported in the survey and at the workshops. As the city's busiest community centre, the Carnegie on the southwest corner is the major pedestrian generator at this intersection.

SPECIFIC RECOMMENDATIONS

- Signals – pedestrian phase with longer clearance times, countdown signal, and audible signals.
- Improve crosswalks in all directions with high visibility zebra stripe markings.
- Change curb ramp alignment on the northeast and southeast corners to match those on the northwest and southwest corners so that wheelchairs, strollers, and scooters can cross without going outside the crosswalk lines.

OPTIONS NEEDING FURTHER REVIEW

- Pedestrian Scramble. An exclusive pedestrian signal phase would reduce opportunities for vehicle/pedestrian conflict and reduce the number of pedestrian crossings by allowing diagonal crossings (one crossing instead of two).
- Eliminate advanced left-turn signal for vehicle movements from westbound Hastings to southbound Main. Left turns are permitted at both the preceding and following intersections. This measure would eliminate a major source of pedestrian/vehicle conflict at this intersection.

SS6: 200 Block East Hastings between Main and Gore



Figure 18: Hastings between Main and Gore looking north.

DISCUSSION

This block has the lowest jaywalking rates of the midblock locations studied, yet still has a high number of injuries. In the evening, the major pedestrian destination points were observed to be the Savoy Pub and the Rickshaw Theatre during live performances. As noted in the academic study, the presence of alcohol serving establishments tends to correlate with pedestrian injury hotspots.

SPECIFIC RECOMMENDATIONS

Due to the low jaywalking volumes and shortness of the block, a signalized midblock pedestrian crossing is not recommended. Follow-up injury monitoring will be key to determining whether improvements to the intersections at Main and Hastings and Gore and Hastings contribute to a reduction in the number of pedestrian injuries at this midblock location.

SS7: Intersection of Hastings and Gore



Figure 19: Hastings and Gore looking northeast.

SPECIFIC DISCUSSION

The homeless shelter at First United Church at the southeast corner of the intersection is a major pedestrian generator. Food lines at the church often overflow onto the street or block the sidewalk so that passersby step off the curb in order to get through. This intersection has average infraction rates and vehicle speeds.

RECOMMENDATIONS

The general signal and crosswalk intersection improvements as noted corridor wide are recommended, specifically, zebra stripes at the crosswalk and shorter signal times for pedestrians.

The First United Church is planning a \$31 million redevelopment of their site.⁵⁷ The project recommends that the City work with the church in the design process to ensure that clients using the new development are not blocking the sidewalk on Hastings Street. The accessibility review proposed in Phase Two of the project will look at opportunities such as this in more detail.

The project also supports maintaining the elimination of the advanced left turn phase at the intersection, which is being considered by the City's Engineering Department. There has been no additional congestion observed with the elimination of the advanced left turn as part of the Olympic Transportation Plan.

⁵⁷ First United Church Mission, "Press Statement April 28th, 2010," <http://firstunited.ca/2010/04/press-statement-april-28th-2010/>

SS8: 400 Block East Hastings between Dunlevy and Jackson



Figure 20: Hastings between Dunlevy and Jackson looking north/northeast.

DISCUSSION

Jaywalking rates were average for the midday and afternoon peak period, but exceptionally high in the evening. Some of this is related to the sidewalk vending taking place midblock on the north side of Hastings. Speeds were generally average, with slower speeds measured during the midday compared to the afternoon peak period. Due to the shortness of the block, a signalized midblock pedestrian crossing is not recommended.

SPECIFIC RECOMMENDATIONS

- Eastern extent of proposed 30 km/h zone.
- Jackson intersection the location of speed reader board for westbound vehicles.

SS9: 700 Block East Hastings between Heatley and Hawks



Figure 21: Hastings between Heatley and Hawks looking north.

DISCUSSION

This midblock hotspot marks the east end of the study zone and is characteristic of a transitional commercial district. Heatley to the west has a full signal and Hawks to the east has a pedestrian controlled signal. Vehicle speeds were similar or slightly higher than other hotspots, reflecting the limited commercial activity, low pedestrian volumes, and faster moving traffic to the east. Jaywalking rates were average for the midday and afternoon peak period, but exceptionally high in the evening. The major jaywalking pedestrian generator in the afternoon and evening was the bar at the Astoria Hotel.

Direct pedestrian/vehicle conflict was observed at the pedestrian controlled intersection of Hastings and Hawks, including shouting and banging on hoods, etc. This illustrates the need to clarify road user right of way at pedestrian signals using innovative measures as offered for consideration under the section “ST3 Signals – Options Needing Further Review – Enhanced Pedestrian Operated Signals” above. The fully signalized intersection at Heatley did not have the same level of conflict.

The hotspot data was from 2000-2005, covering a period in which there was significant drug related pedestrian activity in this block. This activity is no longer present, and it is expected that injury rates have fallen since the ICBC pedestrian injury data (2000-2005) was analyzed for the academic study. Further monitoring as per recommendation “ST2: Monitoring, Reporting, Targets, and Capital Spending Alignment” would confirm this assumption. At this time the 30 km/h zone is not proposed to extend this far east.

SPECIFIC RECOMMENDATIONS

Given the low pedestrian volumes, expected decrease in injuries (to be confirmed as noted above), and single jaywalking generator, a midblock crossing is not recommended.

- At the intersection of Hastings and Hawks, currently a pedestrian signal, the project recommends: countdown signals, reduced wait times, increased pedestrian clearance time, enhanced signals, markings, and signage to clarify right-of-way.
- At Hastings and Heatley (full signal), the project recommends: countdown signal, reduced wait times, increased pedestrian clearance time, enhanced markings.

Conclusion

The Downtown Eastside Pedestrian Safety Project is the first step in transforming one community from the epicentre of pedestrian injury in Vancouver to among the safest. It focused primarily on Hastings Street and did not engage with non-English speaking residents or specific demographic subgroups. It is proposed that a subsequent phase would address these shortcomings.

Since the project began in October 2009, over 30 more Downtown Eastside pedestrians have been injured based on the academic research showing an average of one pedestrian injury reported every eight days. If approved, Phase Two of the project will focus on facilitating and expediting the work required to implement the pedestrian safety recommendations.