



# Lower Lonsdale East Traffic Calming Plan



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## 1.0 INTRODUCTION

In 2001, the City of North Vancouver adopted a Community Traffic Calming Program in response to concerns expressed by residents regarding speeding, pedestrian safety, short-cutting traffic and other safety issues on neighbourhood streets. The Community Traffic Calming Program, which was updated in 2004, identified twelve neighbourhoods throughout the City for the purposes of preparing Traffic Calming Plans. To date, Traffic Calming Plans have been prepared for seven of these neighbourhoods. Lower Lonsdale East is the eighth neighbourhood in the City for which a Traffic Calming Plan has been developed.

This report describes the Traffic Calming Plan developed for the Lower Lonsdale East neighbourhood. The primary objectives of the Traffic Calming Plan are:

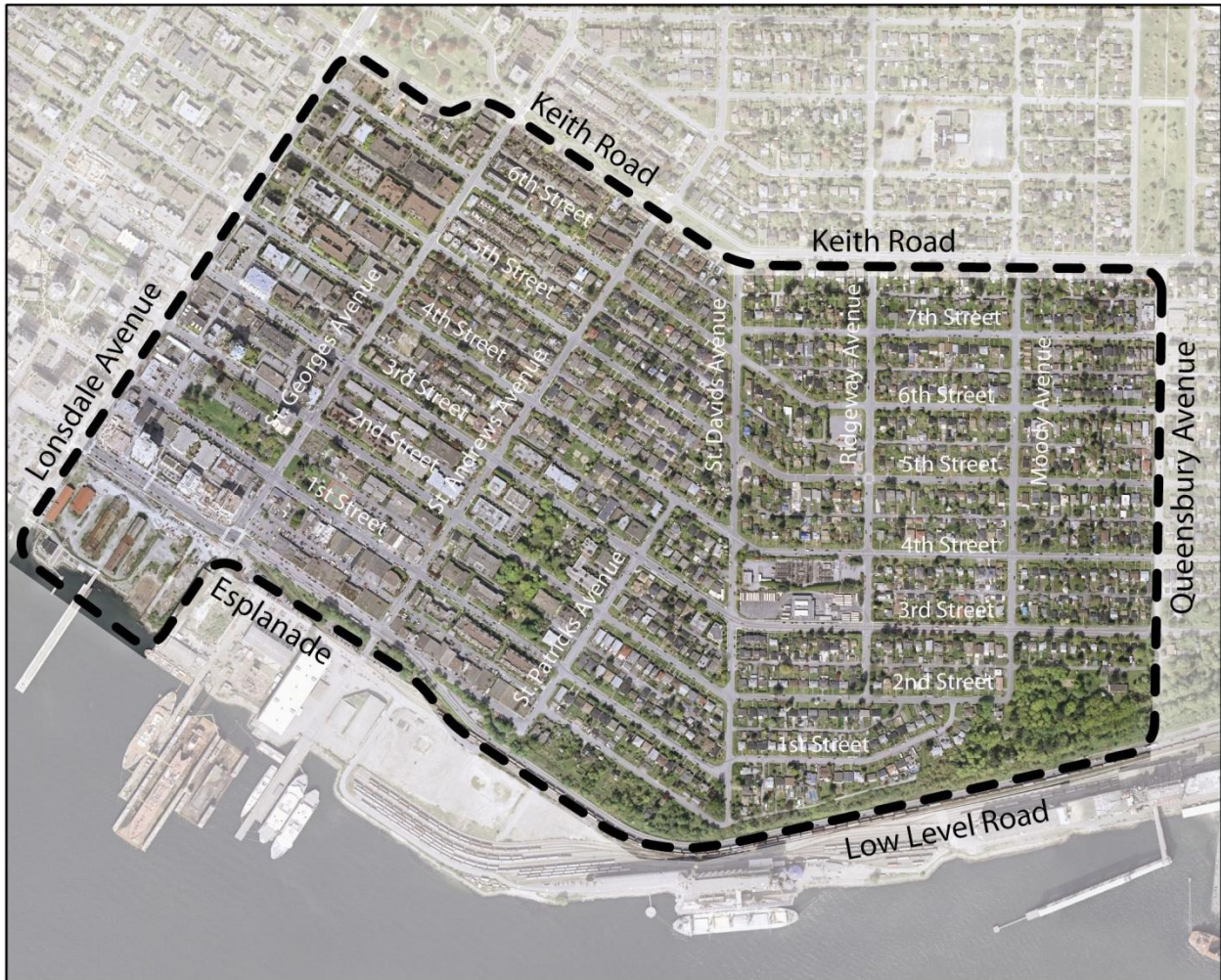
- **Safety** — make neighbourhood streets safer for everyone, including pedestrians, cyclists, children and motorists.
- **Livability** — restore and enhance the livability of the neighbourhood.

The Traffic Calming Plan was developed by Urban Systems Ltd., with the involvement of neighbourhood residents and with the assistance of City staff. Development of the plan was initiated in September, 2009

The boundaries of the Lower Lonsdale East neighbourhood are illustrated in **Figure 1**. The neighbourhood is bounded by Lonsdale Avenue to the west, Keith Road to the north, Queensbury Avenue to the east, and Esplanade Street and Low Level Road to the south.



Figure 1 – Study Area

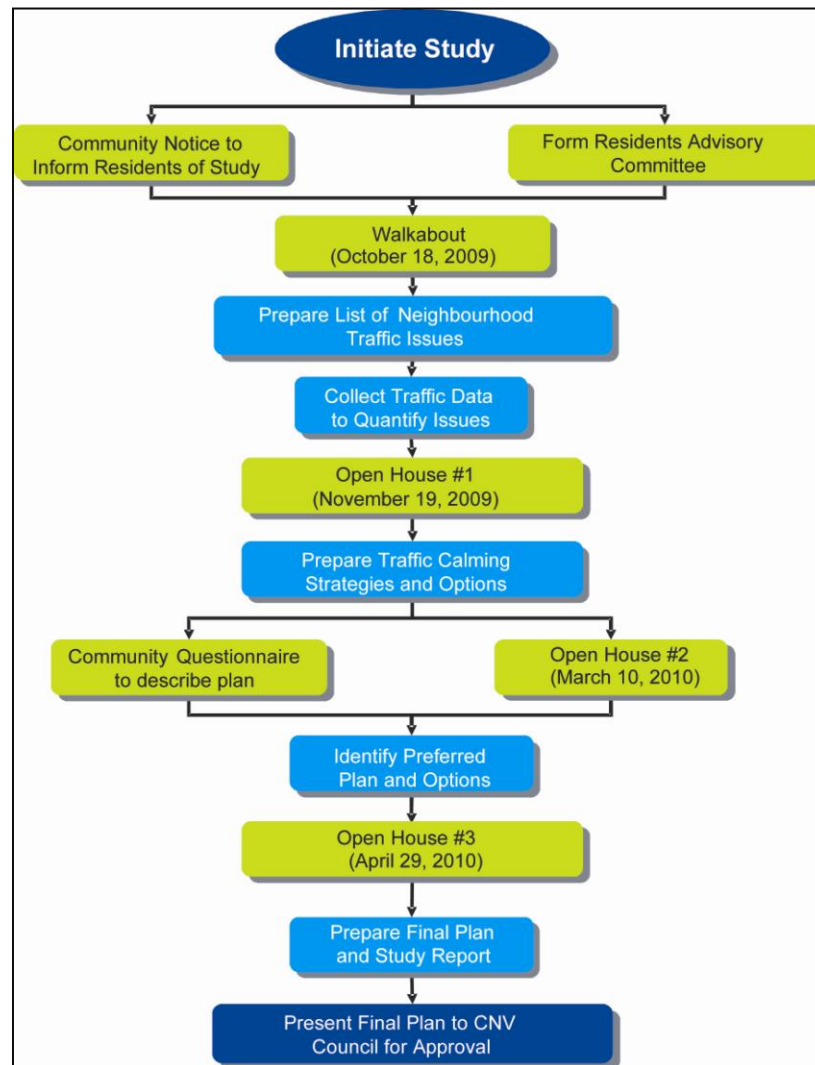


## 2.0 STUDY PROCESS

The most important aspect of developing a neighbourhood Traffic Calming Plan is involving the entire community in the process — residents, business owners and stakeholders. The people who live and work in the area know better than anyone what the traffic and safety issues are, and provide an essential perspective on the practicality of potential traffic calming solutions in their neighbourhood.

As shown in **Figure 2** and described below, residents and other members of the community had several opportunities to provide input and suggestions for the development of the Traffic Calming Plan.

**Figure 2 – Study Process**



The following community events and activities were undertaken in the Lower Lonsdale East neighbourhood:

- **A Neighbourhood Traffic Residents' Association (NTRA)** was established to assist the consulting team and City staff in identifying traffic and safety issues, involving the community, and developing the Traffic Calming Plan. In August, 2009 a notice was sent to all households and businesses in the Lower Lonsdale East neighbourhood to inform them of the study and to invite them to apply to be a member of the NTRA (see **Appendix A**). Eight applications were received from all areas of the neighbourhood, and all eight applicants were selected to form the NTRA. The NTRA participated in community events and assisted consultants in identifying neighbourhood issues, soliciting input from other residents, and identifying and reviewing various solutions to include in the Traffic Calming Plan.
- **Stakeholder input.** In order to develop a Traffic Calming Plan that addresses the concerns of all members of the community, several stakeholders were contacted for their input regarding the plan, including the North Vancouver RCMP, Ambulance Services, North Vancouver Fire Department, the North Vancouver School Board, Ridgeway Annex Elementary School, TransLink, the Lower Lonsdale Business Association, and the Joint Bicycle Advisory Committee (JBAC). No objections to the Traffic Calming Plan were raised by stakeholders, and a number of implementation suggestions were provided.
- **A neighbourhood walkabout** was held on Sunday, October 18, 2009. The walkabout consisted of a four-hour tour of the neighbourhood, where residents were invited to walk with consultants and City staff and identify traffic and safety issues in the neighbourhood. The walkabout was advertised by distributing a flyer to all residents and businesses within the neighbourhood. The flyer included a map of the neighbourhood, the walkabout route and meeting times along the route. In addition, an advertisement was placed in the local newspaper (see **Appendix A** for a copy of the flyer and newspaper advertisement). Approximately 20 residents, NTRA members, City staff and the consultants participated in the walkabout. Compared with other neighbourhoods where walkabouts have been conducted, this number of participants reflects a good level of interest from the community.



- **Dedicated Webpage.** The City established a dedicated web page for the Lower Lonsdale East Neighbourhood Traffic Calming Plan ([www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast)). The dedicated webpage included all information and materials that were provided throughout the development of the plan, including the walkabout notice, the questionnaire from the first open house, the community questionnaire, the results of the community questionnaire, display boards from all three open houses, traffic data, and the City's *Traffic Calming Program*.
- **An email address and dedicated telephone information line** was provided for residents who wished to communicate via the internet or telephone. The telephone information line was connected directly to the consulting team during business hours, and a voice mail was provided outside business hours. The voice mail was regularly updated throughout the course of the study to provide general information about the current status of the plan and upcoming events. All phone calls and e-mails were followed up with a telephone or e-mail response.
- **An open house** was held on November 19, 2009 at the North Shore Neighbourhood House. The open house was advertised by sending a notice to all residents and businesses in the neighbourhood, and by placing an advertisement in the local newspaper (see **Appendix A** for a copy of the flyer and newspaper advertisement). Approximately 20 residents attended the open house to learn about the traffic calming process, view displays of traffic data from their neighbourhood and find out how traffic calming measures could be used to improve safety and livability in the neighbourhood. Attendees were also asked to complete a questionnaire to identify additional traffic issues and indicate which traffic calming measures they would like to see in the neighbourhood (see **Appendix A**).
- **A community questionnaire** was distributed to every household and business in the neighbourhood, describing the proposed Traffic Calming Plan. Residents and business owners were asked to indicate whether they supported the plan, felt neutral, or did not support the plan. They were also asked to indicate their support for localized parking restrictions at intersections to improve safety. Residents were invited to return the questionnaire by e-mail, mail, fax, or in person at City Hall. In addition, the questionnaire could be completed directly on-line from the dedicated webpage. Approximately 4,200 questionnaires were distributed to every household and business in the community, and 294 completed questionnaires were returned by neighbourhood residents. As summarized in Section 6, this represents an overall response rate of approximately 7%, which is comparable to the response rate in several other neighbourhoods for which Traffic Calming Plans have been prepared, but represents the second largest absolute number of responses in any Traffic Calming Plan in the City of

North Vancouver to date. A copy of the community questionnaire is included in **Appendix A**.

- **A second open house** was held on March 10, 2010 at Ridgeway Annex Elementary School, coinciding with the distribution of the community questionnaire. The open house was advertised by sending a notice in the Community Questionnaire to all residents and businesses in the neighbourhood, and by placing an advertisement in the local newspaper (see **Appendix A** for a copy of the Community Questionnaire and newspaper advertisement). The open house provided residents with an opportunity to obtain more information regarding the proposed traffic calming plan, and to ask questions of NTRA members, City staff and the consultants. Approximately 20 people attended the open house.
- **A third open house** was held on April 29, 2010 at Ridgeway Annex Elementary School to present the results of the survey and the preferred Traffic Calming Plan (see **Appendix A** for a copy of the flyer and newspaper advertisement and **Appendix B** for the materials that were provided at this open house). The open house was advertised by sending a notice to all residents and businesses in the neighbourhood, and by placing an advertisement in the local newspaper. Approximately 30 people attended the open house.

Throughout the process, NTRA members provided a vital link to the community, and were involved in all community activities as well as development of the Traffic Calming Plan. The proposed Traffic Calming Plan was developed with NTRA members prior to distribution to residents. The consultants and City staff wish to thank NTRA members for their involvement and valuable contribution.

As described in the City's *Traffic Calming Program*, a permanent Neighbourhood Transportation Committee (NTC) could be established following approval of the Traffic Calming Plan. The NTC would liaise with City staff in monitoring the implementation of the plan and in identifying any additional problems in follow-up study areas. The NTC would also function as a "sounding board" for all concerns and requests for transportation improvements from residents and other members of the community.

### 3.0 NEIGHBOURHOOD CHARACTERISTICS

There are approximately 4,200 households and businesses in the neighbourhood, including businesses along Lonsdale Avenue, Esplanade Street, 1<sup>st</sup> Street, and 3<sup>rd</sup> Street. In addition, there are a number of community facilities, including the North Shore Neighbourhood House and Ridgeway Annex Elementary School. There are also a number of parks in the neighbourhood, including Derek Inman Park, Emerald Park, Hamersley Park, Moodyville Park, Chief Dan George Park, and Chief Mathias Joe Park (see **Figure 3**).

**Figure 3 – Neighbourhood Characteristics**

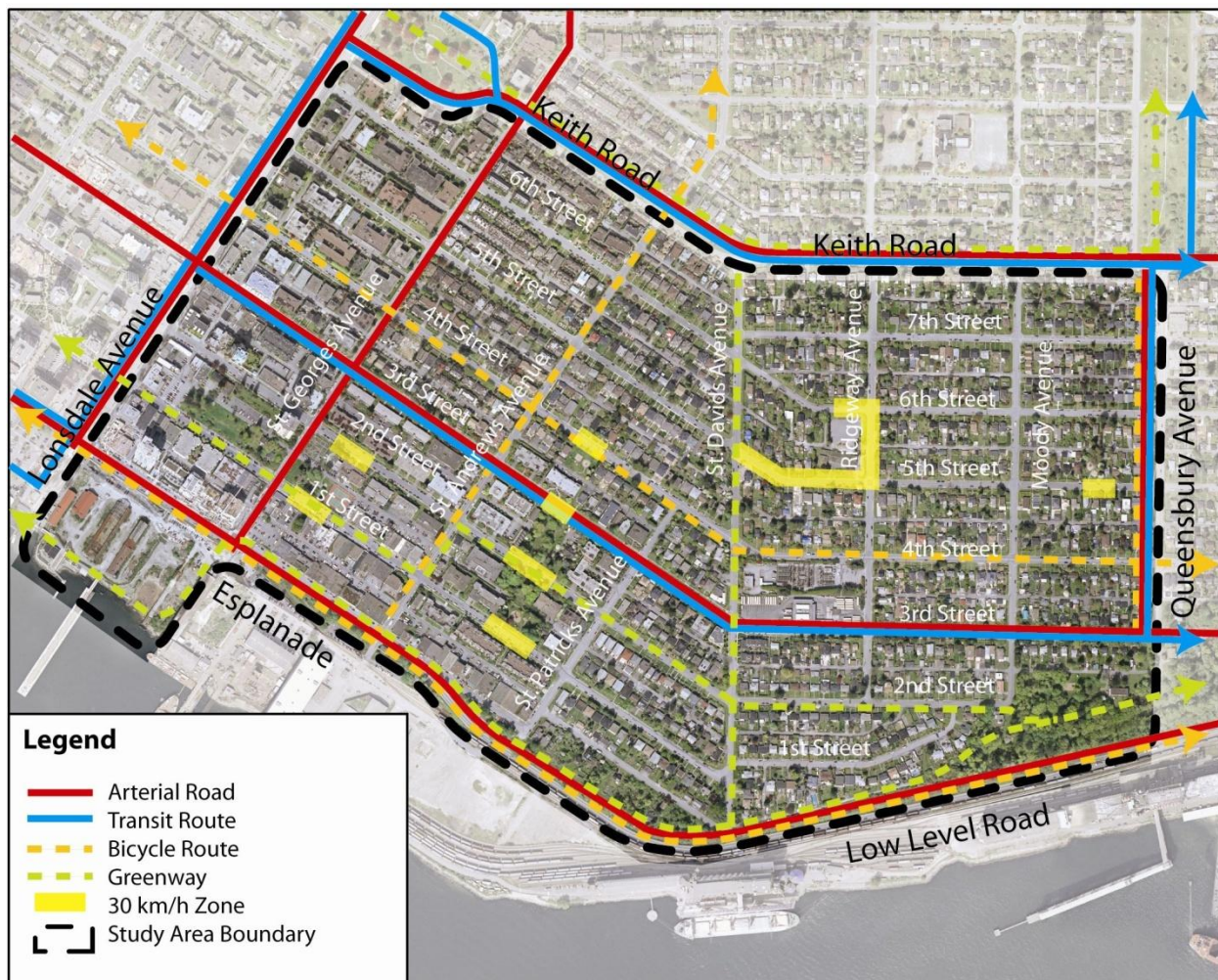


The neighbourhood is characterized predominantly by a rectangular grid network of east-west streets and north-south roadways, with the orientation of the grid changing at St. David's Avenue. The road classification system is illustrated in **Figure 4** and includes:

- **Major arterial roads** include Lonsdale Avenue, Esplanade Street, and Low Level Road;
- **Minor arterial roads** include St. George's Avenue, Queensbury Avenue, 3<sup>rd</sup> Street, and Keith Road; and
- **Local roads**, which include all other roads in the neighbourhood.

There are no Collector roads in the neighbourhood.

**Figure 4 — Road Network Classification**



The identification of arterial roads is particularly important, as the City's Traffic Calming Policy states that traffic calming measures are generally not appropriate on arterial roads.

In addition, there are several 30 km/h zones within the neighbourhood, including:

- 1<sup>st</sup> Street between St. George's Avenue and St. Andrew's Avenue, adjacent to Derek Inman Park;
- 1<sup>st</sup> Street between St. Andrew's Avenue and St. Patrick's Avenue, adjacent to Hamersley Park;
- 2<sup>nd</sup> Street between St. George's Avenue and St. Andrew's Avenue, adjacent to North Shore Neighbourhood House;
- 2<sup>nd</sup> Street between St. Andrew's Avenue and St. Patrick's Avenue, adjacent to Hamersley Park and Emerald Park;
- 3<sup>rd</sup> Street between St. Andrew's Avenue and St. Patrick's Avenue, adjacent to Emerald Park;
- 4<sup>th</sup> Street between St. Andrew's Avenue and St. Patrick's Avenue, adjacent to Chief Mathias Joe Park;
- 5<sup>th</sup> Street between Moody Avenue and Queensbury Avenue, adjacent to Chief Dan George Park; and
- 5<sup>th</sup> Street between St. David's Avenue and Ridgeway Avenue, 6<sup>th</sup> Street west of Ridgeway Avenue, and Ridgeway Avenue between 5<sup>th</sup> Street and 6<sup>th</sup> Street, adjacent to Ridgeway Annex Elementary School.

**Figure 4** also indicates transit routes, bicycle routes, and greenways in the neighbourhood, as summarized below:

- **Buses** operate along Lonsdale Avenue, Queensbury Avenue, 3<sup>rd</sup> Street, and Keith Road.
- **Designated bicycle routes** include bicycle lanes on Esplanade Street and Low Level Road, and a shared bicycle route on St. Andrew's Avenue. A shared bicycle route is also planned on 4<sup>th</sup> Street.
- **Greenways** include the Green Necklace Greenway, which runs along Queensbury Avenue, St. David's Avenue, and Keith Road; the Waterfront Greenway, which runs along 1<sup>st</sup> Street and 2<sup>nd</sup> Street; and the Spirit Trail, which runs along Esplanade Street, 1<sup>st</sup> Street, St. David's Avenue, 2<sup>nd</sup> Street, and through Moodyville Park.

It should also be noted that the only designated truck routes in the neighbourhood are Lonsdale Avenue, Esplanade Street, and Low Level Road.

**Figure 5** summarizes the existing roadway infrastructure in the Lower Lonsdale East Neighbourhood. This includes:

- **Traffic signals** on Lonsdale Avenue and St. George’s Avenue at Esplanade Street and 3<sup>rd</sup> Street, respectively;
- **Pedestrian activated signal** on Esplanade Street between Lonsdale Avenue and St. George’s Avenue, 3<sup>rd</sup> Street at Ridgeway Avenue, and Keith Road at both East and West Grand Boulevard;
- **Speeds humps** on 1<sup>st</sup> Street between St. Andrew’s Avenue and St. Patrick’s Avenue, 4<sup>th</sup> Street between St. Andrew’s Avenue and St. Patrick’s Avenue, and 5<sup>th</sup> Street between St. David’s Avenue and Ridgeway Avenue;
- **Right-in / Right-Out Island** at Keith Road and St. David’s Avenue; and
- **Marked pedestrian crosswalks** at several locations throughout the neighbourhood.

Figure 5 — Roadway Infrastructure



## 4.0 OTHER PLANS AND STUDIES

The City has adopted or is currently conducting a number of plans and policies that are relevant to this study. Most recently, the City adopted a Long-Range Transportation Plan, with the following goals being used to guide and measure the success of the Transportation Plan:

- **Livability.** The Transportation Plan will contribute toward the City's overall Vision of becoming a vibrant, diverse and highly liveable community, where quality of life and community well-being are vital.
- **Mobility.** The Transportation Plan will support the safe, efficient, and accessible movement of people, goods, and services throughout the City and beyond our boundaries.
- **Integration.** The Transportation Plan will support the development and integration of all modes of travel in order to offer more choice to the residents, workforce, and visitors of the City.
- **Affordability.** The Transportation Plan will recognize the financial constraints of the City and promote the development of transportation infrastructure and services that will best support the goals of the Plan.
- **Environment.** The Transportation Plan will support alternative means of transportation, namely walking, cycling and transit and promote strategies to manage travel demand in an attempt to reduce local greenhouse gas emissions.

The development of Traffic Calming Plans directly supports each of these five goals. In addition, one of the key directions in the Transportation Plan was to "Protect Neighbourhoods", which includes promoting the development of traffic calming plans to help achieve the goals of the Transportation Plan and broader City goals outlined in the OCP (see **Figure 6**).

In addition, the Transportation Plan identified existing and projected traffic volumes in 2021 along the collector and arterial roads within the City (see **Figure 7**). The projections show modelled traffic volumes currently and projected forward to the year 2021. The traffic forecasts indicate that the most significant volumes are on the major east-west roads through the neighbourhood, such as Esplanade Street, Low Level Road, 3<sup>rd</sup> Street, and Keith Road, each of which have existing and projected traffic volumes of between 10,000 – 17,500 vehicles per day. The model also indicates that Lonsdale Avenue south of Keith Road has existing and projected traffic volumes under 10,000 vehicles per day, with St. George's Avenue having existing and projected volumes of 8,400 and 9,100 vehicles per day, respectively.

Figure 6 – Key Features of the Long-Term Transportation Plan



During the development of the Traffic Calming Plan, the City was also involved in several studies in the Lower Lonsdale East neighbourhood that should be considered as part of the Traffic Calming Plan. These include:

- **Lonsdale Avenue Safety Study**, which is being conducted jointly with ICBC for the Lonsdale Corridor between Esplanade Street and 8th Street / 11th Street; and
- **North Shore Trade Area Study**, which is being conducted jointly with Transport Canada, Port Metro Vancouver and other stakeholder and has looked at key issues along road and railway corridors adjacent to the port terminals and industrial activities along the North Shore. The study is examining options for improvements to the Low Level Road and adjacent rail corridors.
- **Spirit Trail**, which is a multi-use greenway that will ultimately provide access to pedestrians, cyclists, inline skaters and people with wheeled mobility aids across the North Shore, from Horseshoe Bay to Deep Cove. Through the Lower Lonsdale East neighbourhood, the Spirit Trail will follow along the Waterfront Escarpment from St. Patrick's Avenue to St. David's Avenue and continue along 2<sup>nd</sup> Street to Moodyville Park. Curb extensions will be provided on St. David's Avenue at Alder Street, 1<sup>st</sup> Street, and 2<sup>nd</sup> Street.
- **3<sup>rd</sup> Street Bicycle and Pedestrian Improvements**, which includes bicycle lanes on the 3<sup>rd</sup> Street hill between Kennard and Queensbury Avenues, and pedestrian improvements at the intersection of 3<sup>rd</sup> Street and Queensbury. Phase 1 improvements

include bicycle lanes that will be provided utilizing the existing road space, by converting most of the uphill curb lane into a westbound bicycle lane, separated by a solid white line and knock down bollards or other physical dividers. Phase 2 improvements also include the provision of a multi-use path along the 3<sup>rd</sup> Street hill.

- **4<sup>th</sup> Street Bicycle Improvements**, which involves providing bicycle facilities along 4<sup>th</sup> Street as per the Bicycle Master Plan. This includes intersection treatments at key intersections, including curb extensions at St. George's Avenue, a diverter at St. David's Avenue, and re-orienting stop bars from an east-west to north-south orientation at Ridgeway Avenue.
- **Emerald Park and Hamersley Parks Improvement Project**, which includes a number of improvements focused on replacing deteriorating infrastructure and improving sightlines, including stair and retaining wall replacement, simplified trail layout, and replacement of overgrown vegetation.

**Figure 7 – Existing and Projected Daily Traffic Volumes**



## 5.0 TRAFFIC AND SAFETY ISSUES

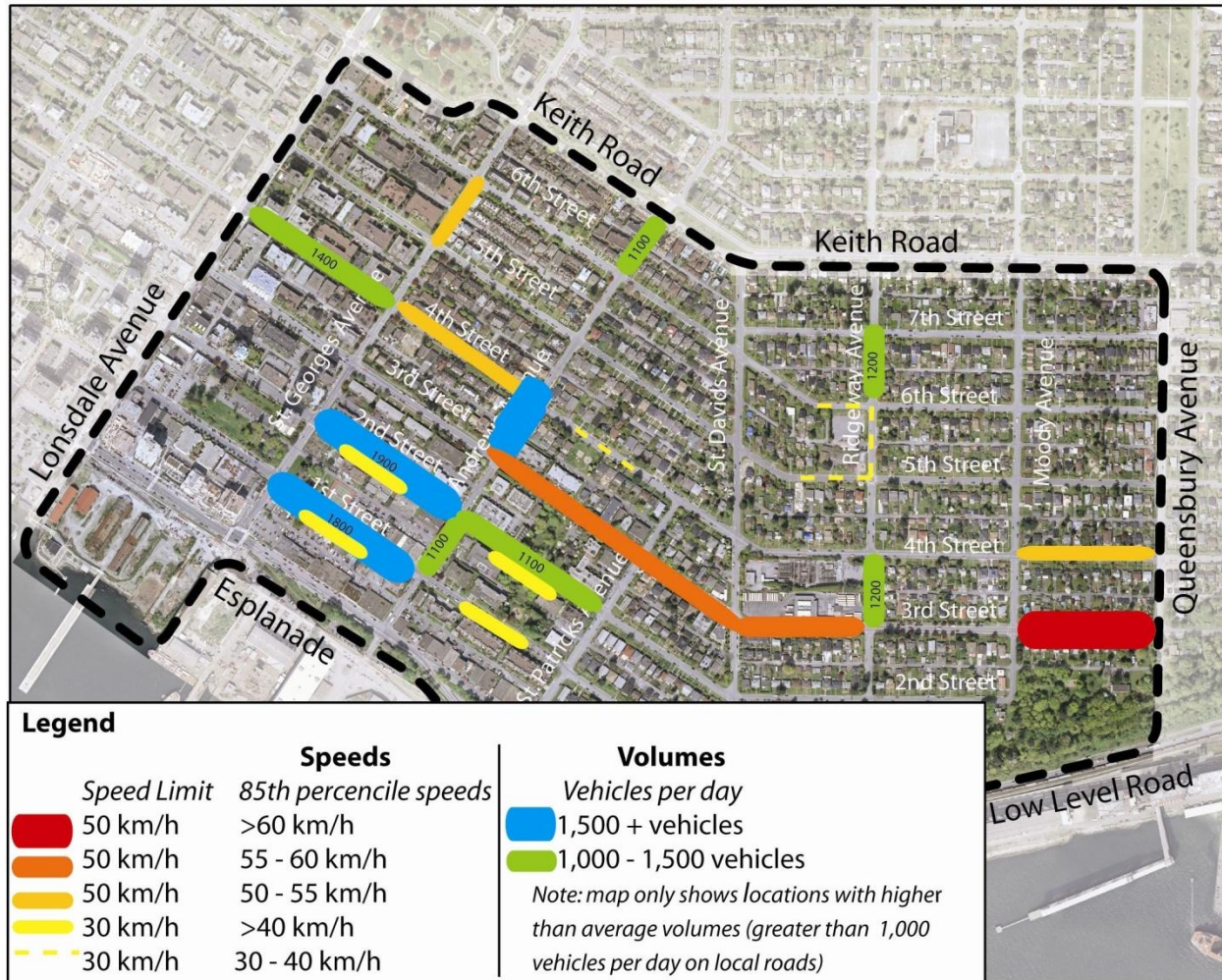
Residents in the Lower Lonsdale East neighbourhood reported problems regarding traffic short-cutting through the neighbourhood, speeding, pedestrian safety, stop sign compliance and other intersection safety issues. These issues are illustrated in **Figure 8**.

**Figure 8 — Reported Issues**



Based on reports from residents, data were collected regarding traffic volumes, traffic speeds and collisions, to provide a basis for developing the Traffic Calming Plan. Traffic volume and speed data were collected for a total of 48 locations throughout the neighbourhood. Volume and speed data were typically collected for a minimum of four weekdays (96 hours). Traffic volume and speed data are presented in **Figure 9** and described in further detail in the sections below.

Figure 9 – Motor Vehicle Speeds and Volumes



Collision data was collected for all collisions reported to ICBC over a period of 5 years from 2003 through 2008. **Figure 10** illustrates all the locations within the Lower Lonsdale East neighbourhood recorded at least one collision on average per year between 2003 and 2008. For each of these locations, the figure shows the collision rate, which is the defined as the number of collisions per million motor vehicles. **Figure 10** also shows any locations where a pedestrian or a cyclist was reported to be involved in a collision between 2003 and 2008.

Figure 10 – Collisions



Significant issues are described below, as identified by residents and stakeholders and — where applicable — verified through data collection. A detailed summary of issues is included in **Appendix C**, including a detailed summary of traffic volume and speed data.

### 5.1 Vehicle Speeds

Speed data were collected both with automatic tube counters, which use tubes placed across the road, and with NuMetric counters, which measure the magnetic field distortion caused by vehicles. Both data collection methods can measure vehicle speeds and count the numbers of vehicles. Vehicle speeds are presented as 85<sup>th</sup> percentile speeds. This is the standard measure of vehicle speed, and represents the speed at or below which 85% of vehicles are travelling. This means that 15% of vehicles are travelling faster than the 85<sup>th</sup> percentile speed.

The speed limit on neighbourhood streets is 50 km/h, except for several 30 km/h zones (indicated in **Figure 4**). For the purposes of developing the Traffic Calming Plan, any 85<sup>th</sup> percentile speeds observed in excess of the applicable speed limits are considered to indicate that there is speeding issue.

As shown in **Figure 9**, speeds over the posted speed limit were observed on several neighbourhood streets, including

- **Keith Road**, where observed 85<sup>th</sup> percentile speeds between St. George's Avenue and St. Andrew's Avenue, and between Moody Avenue and Ridgeway Avenue, were 52.2 km/h and 59.6 km/h in the westbound direction, and 57.0 km/h and 58.6 km/h in the eastbound direction, respectively, over a 24-hour period.
- **2<sup>nd</sup> Street** between Ridgeway Avenue and Moody Avenue, where observed 85<sup>th</sup> percentile speeds were 52.1 km/h in the westbound direction over a 24-hour period.
- **3<sup>rd</sup> Street** where observed 85<sup>th</sup> percentile speeds over a 24-hour period were:
  - 61.3 km/h in the westbound direction and 64.5 km/h in the eastbound direction between Moody Avenue and Ridgeway Avenue;
  - 59.0 km/h in the westbound direction and 57.7 km/h in the eastbound direction between St. Patrick's Avenue and St. David's Avenue;
  - 58.1 km/h in the westbound direction and 57.3 km/h in the eastbound direction between St. Andrew's Avenue and St. Patrick's Avenue; and
  - 57.4 km/h in the westbound direction and 57.3 km/h in the eastbound direction between St. David's Avenue and Ridgeway Avenue.
- **4<sup>th</sup> Street** between Moody Avenue and Queensbury Avenue and between St. George's Avenue and St. Andrew's Avenue, where observed 85<sup>th</sup> percentile speeds were 50.1 km/h and 50.8 km/h in the westbound direction over a 24 hour period.
- **Queensbury Avenue** between 5<sup>th</sup> Street and 6<sup>th</sup> Street where observed 85<sup>th</sup> percentile speeds were 58.7 km/h in the northbound direction and 56.2 km/h in the southbound direction over a 24-hour period.
- **St. George's Avenue** between 5<sup>th</sup> Street and 6<sup>th</sup> Street where observed 85<sup>th</sup> percentile speeds were 54.6 km/h in the northbound direction and 50.9 km/h in the southbound direction over a 24-hour period.
- **In the 30 km/h zones** on 1<sup>st</sup> Street between St. George's Avenue and St. Andrew's Avenue, 1<sup>st</sup> Street between St. Andrew's Avenue and St. Patrick's Avenue, 2<sup>nd</sup> Street between St. George's Avenue and St. Andrew's, 2<sup>nd</sup> Street between St. Andrew's Avenue and St. Patrick's Avenue, 3<sup>rd</sup> Street between St. Andrew's Avenue and St. Patrick's Avenue, 4<sup>th</sup> Street between St. Andrew's Avenue and St. Patrick's Avenue, 5<sup>th</sup> Street between St. David's Avenue and Ridgeway Avenue, 6<sup>th</sup> Street between St. David's Avenue and Ridgeway Avenue, and Ridgeway Avenue between 5<sup>th</sup> Street and 6<sup>th</sup> Street, all of which had observed 85<sup>th</sup> percentile traffic speeds over 30 km/h over a 24-hour period; and

- Several other locations where 24-hour 85<sup>th</sup> percentile speeds were slightly above 50 km/h over a 24-hour period, or above 50 km/h at certain times of day.

Detailed speed data is presented in **Appendix C**.

## 5.2 Traffic Volumes

Because of the central location of the Lower Lonsdale East neighbourhood in the City, its proximity to the Lonsdale Avenue and Esplanade Street commercial areas, its grid street network, and high population, some local streets experience traffic volumes which are higher than usual for typical local streets (typical volumes for local streets are less than 1,000 vehicles per day). As shown in **Figure 9**, local roads with higher traffic volumes include:

- **1<sup>st</sup> Street** between St. George's Avenue and St. Andrew's Avenue, where daily traffic volumes are approximately 1,800 vehicles per day;
- **2<sup>nd</sup> Street** between St. George's Avenue and St. Andrew's Avenue, where daily traffic volumes are approximately 1,900 vehicles per day;
- **2<sup>nd</sup> Street** between St. Andrew's Avenue and St. Patrick's Avenue, where daily traffic volumes are approximately 1,100 vehicles per day;
- **4<sup>th</sup> Street** between Lonsdale Avenue and St. George's Avenue, where daily traffic volumes are approximately 1,400 vehicles per day;
- **Ridgeway Avenue** between 3<sup>rd</sup> Street and 7<sup>th</sup> Street, where daily traffic volumes are approximately 1,200 vehicles per day; and
- **St. Andrew's Avenue**, where daily traffic volumes range from approximately 1,100 to 1,500 vehicles per day.

Detailed traffic volume data is presented in **Appendix C**.

## 5.3 Pedestrian Safety

A number of locations were identified by residents and stakeholders where pedestrian safety is an issue, including:

- Several intersections along St. George's Avenue including intersections at 2<sup>nd</sup> Street, 4<sup>th</sup> Street, 5<sup>th</sup> Street and 6<sup>th</sup> Street, where residents reported difficulty crossing due to motorists who do not yield to pedestrians;
- Several intersections along 3<sup>rd</sup> Street including intersections at St. David's Avenue, Moody Avenue and Queensbury Avenue, where residents reported difficulty crossing due to relatively high traffic volumes and speeds and motorists who do not yield to pedestrians;
- Several intersections along 2<sup>nd</sup> Street, including intersections at St. Andrew's Avenue, St. Patrick's Avenue, and St. David's Avenue, where residents indicated that motorists frequently do not comply with stop signs.

- 2<sup>nd</sup> Street mid-block between St. Andrew's Avenue and St. Patrick's Avenue adjacent to Emerald Park and Hamersley Park;
- 6<sup>th</sup> Street at St. Andrew's Avenue, where residents indicated that is difficult for pedestrians to cross.

#### 5.4 Other Traffic and Safety Issues

In addition to short-cutting, speeding and pedestrian safety issues, residents also reported a number of other traffic and safety issues in the neighbourhood. These include:

- Limited visibility due to parked vehicles when entering a street from side streets and laneways;
- Limited visibility at several intersections where the stop bar is oriented north-south on the hill and is set back from the intersection;
- Intersection safety at several locations due to change in road geometry; and
- Intersection safety due to vehicles short-cutting the corner.

Residents also identified a number of issues in the neighbourhood that are beyond the scope of the neighbourhood Traffic Calming Plan. These issues include lack of sidewalks or narrow sidewalks on several streets in the neighbourhood, lack of curb letdowns at some intersections, poor illumination levels on many streets (including 1<sup>st</sup> Street and 2<sup>nd</sup> Street), poor visibility on several streets due to topography and vegetation encroaching onto the sidewalk, parking enforcement, and road maintenance. Although these issues cannot be addressed through the Traffic Calming Plan, comments regarding these issues have been forwarded to the appropriate departments within the City.

## 6.0 TRAFFIC CALMING PLAN

### 6.1 Draft Traffic Calming Plan

An initial draft Traffic Calming Plan was developed by the consulting team, with the involvement of neighbourhood residents and with the assistance of City staff. The initial Traffic Calming Plan was developed based on input received by the NTRA as well as comments from the Neighbourhood Walkabout and first Open House. The initial Traffic Calming Plan was presented to the NTRA for comments before being circulated in the Community Questionnaire and at the Second Open House. The Traffic Calming Plan is intended to address identified traffic and safety problems, and achieve the community's goals of improving safety and livability.

In general, the draft Traffic Calming Plan primarily recommends traffic calming features on local streets on which issues related to speeding, short-cutting, or safety have been identified. The City's Traffic Calming Policy states that traffic calming measures are generally not appropriate on arterial roads, such as St. George's Avenue and 3<sup>rd</sup> Street. This is consistent with current practices in traffic calming throughout North America, as there is a more limited 'toolbox' of traffic calming features that can be applied on arterial roads.<sup>1</sup> In general, physical measures that reduce traffic volumes and speeds (such as traffic circles and speeds humps) are not appropriate on arterial roads, as the primary function of this class of roadway is traffic movement<sup>2</sup>. However, measures that improve pedestrian and cyclist safety, while not compromising the mobility function of the road, can be considered along arterial roads.

A summary of the features included in the initial Traffic Calming Plan is provided below:

- **Speed humps** on 4<sup>th</sup> Street and 6<sup>th</sup> Street;
- **Traffic circles** at 1<sup>st</sup> Street and St. Andrew's Avenue, 2<sup>nd</sup> Street at St. Patrick's Avenue, 5<sup>th</sup> Street at St. Andrew's Avenue, and 6<sup>th</sup> Street at Ridgeway Avenue;
- **Curb extensions** on St. George's Avenue at 2<sup>nd</sup> Street, 4<sup>th</sup> Street, and 6<sup>th</sup> Street, as well as 2<sup>nd</sup> Street between St. Andrew's Avenue and St. Patrick's Avenue;
- **Median islands** on 3<sup>rd</sup> Street and St. David's Avenue and Moody Avenue,
- **Painted pedestrian crosswalks** on St. George's Avenue at 2<sup>nd</sup> Street, 4<sup>th</sup> Street and 6<sup>th</sup> Street,
- **Special crosswalks with flashing lights** 3<sup>rd</sup> Street and St. David's Avenue;
- **Pedestrian and bicycle activated signal** at 3<sup>rd</sup> Street and St. Andrew's Avenue;
- **Right-in/Right-out island** at Esplanade Street and St. Andrew's Avenue;

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<sup>1</sup> Reid Ewing and Steven J. Brown, 2009. [U.S. Traffic Calming Manual](#). American Planning Association / American Society of Civil Engineers: Chicago.

<sup>2</sup> Transportation Association of Canada, 1999. [Geometric Design Guide for Canadian Roads](#).

- **Stop sign re-orientations** at 1<sup>st</sup> Street and St. Patrick's Avenue and 2<sup>nd</sup> Street and St. Andrew's Avenue;
- **Driver feedback sign** on 3<sup>rd</sup> Street east of Queensbury Avenue; and
- **Several additional measures** that have been recommended through other processes, including curb extensions proposed as part of the Spirit Trail, as well as a diverter and stop sign re-orientation proposed as part of the 4<sup>th</sup> Street Bicycle Route.

Further details regarding each of the features of the recommended Traffic Calming Plan (including a description of each feature and the rationale for selecting each feature), is provided in **Section 6.3**.

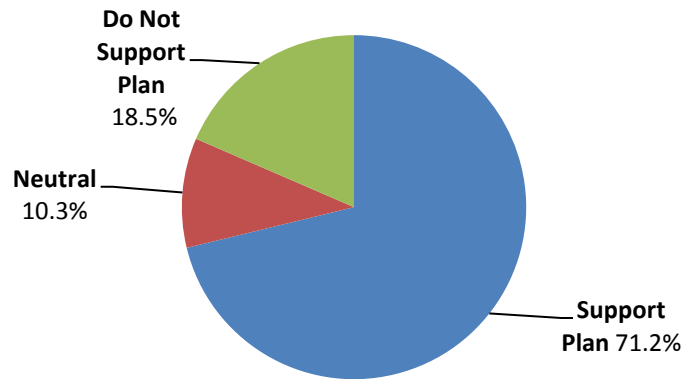
## 6.2 Questionnaire Results

As noted previously, a community questionnaire was distributed to every household and business in the neighbourhood, describing the proposed Traffic Calming Plan. Residents and business owners were asked to indicate whether they supported the plan, felt neutral, or did not support the plan. They were also asked to indicate their support for localized parking restrictions at intersections to improve safety. Approximately 4,200 questionnaires were distributed to the community and 294 completed questionnaires were returned by neighbourhood residents. This represents an overall response rate of approximately 7%, which is comparable to the response rate in several other neighbourhoods for which Traffic Calming Plans have been prepared, but represents the second largest absolute number of responses in any Traffic Calming Plan to date. A copy of the community questionnaire is included in **Appendix A**.

**Figure 11** and **Table 1** provide a summary of the level of support in the neighbourhood for the Traffic Calming Plan. Overall, approximately 71% of respondents to the community questionnaire indicated that they support the plan. Nineteen percent indicated that they did not support the plan, and ten percent indicated that they were neutral. Detailed questionnaire results are included in **Appendix A**.

Seventy-one percent is a relatively strong indication of community support for the Traffic Calming Plan. This result exceeds the desired minimum two-thirds support indicated in the City's *Traffic Calming Program*. Compared with other neighbourhoods in the City for which traffic calming plans have been developed, the 71% support rate in Lower Lonsdale East is higher than the level of support in Cloverley, but lower than other previous plans, such as 73% support in Ridgeway, 77% in Central Lonsdale East and Central Lonsdale West, 79% in Lower Lonsdale West, 80% in Sutherland, and 84% in Marine-Hamilton (see **Figure 12**).

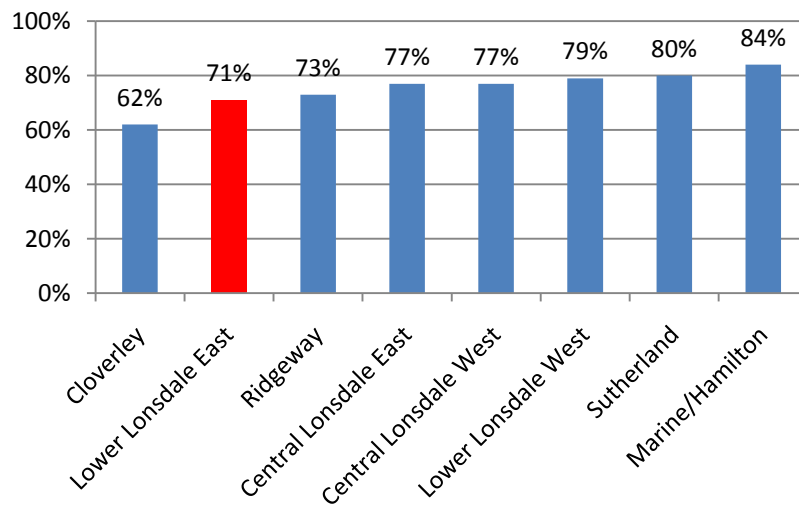
**Figure 11 — Support for the Traffic Calming Plan**



**Table 1 — Support for the Traffic Calming Plan**

	Responses	Percentages
I support the proposed plan	208	71.2%
I am neutral	30	10.3%
I do not support the plan	54	18.5%
Totals	292	100%

**Figure 12 — Level of Support for Traffic Calming Plans**



Within the Lower Lonsdale East neighbourhood, 54 respondents indicated that they do not support the plan, representing approximately 18% of the total 292 respondents who provided a response to this question. **Table 2** provides a summary of reasons which residents gave for not supporting the plan (some respondents gave more than one reason for not supporting the plan). In general, the majority of reasons reflect opposition to spending limited tax dollars on traffic

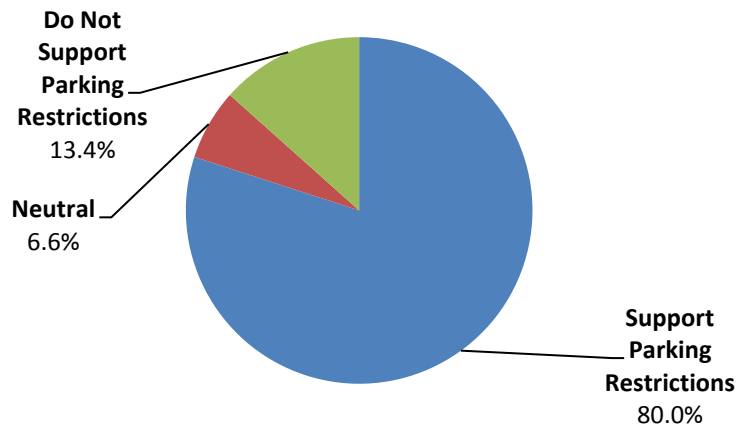
calming, the concept of traffic calming in general, and opposition to specific traffic calming measures.

**Table 2 — Reasons why residents did not support the Traffic Calming Plan**

Reasons		Numbers of Responses
Traffic Circles	Don't like traffic circles in general	13
	Tall vegetation blocks drivers views at traffic circles	4
	Don't like traffic circles at certain locations	3
	Plants are unnecessary at traffic circles	1
Speed Humps	Don't like speed humps in general	12
Right-In/Right-Out Island	Don't like right-in/right-out island at certain location	1
Curb Extensions	Don't like curb extensions in general	7
	Don't like curb extensions at certain locations	2
Driver Feedback Signs	Don't like driver feedback signs in general	2
Diverter	Don't like traffic diverters in general	2
Other Concerns	Would like to see 4-way stops	4
	Would like to see slower speed limit signs	1
	Plan will move traffic problems to other streets	1
	Would prefer less expensive pedestrian crossings	1
General	Waste of tax dollars	17
	Would rather see measures in other locations	10
	Don't support traffic calming in general	7
	Don't agree with parking restrictions	6
	Don't think traffic calming plan is needed	5

Several respondents to the questionnaire also provided suggestions for changes to the Traffic Calming Plan. Many of the respondents suggested additional speed humps throughout the neighbourhood, particularly on 1<sup>st</sup> Street, 2<sup>nd</sup> Street, and 4<sup>th</sup> Street. Several respondents also provided comments suggesting additional measures to help pedestrians and cyclists cross 3<sup>rd</sup> Street, such as special crosswalks, pedestrian activated signals, or full traffic signals.

Residents were also asked to indicate whether or not they support parking restrictions within one to two car lengths of corners at certain intersections where parked vehicles obstruct sight lines. As shown in **Figure 13**, eighty percent of respondents indicated support for parking restrictions, and only 13% indicated that they do not support such restrictions.

**Figure 13 – Support for Localized Parking Restrictions**

### 6.3 Revisions to the Traffic Calming Plan

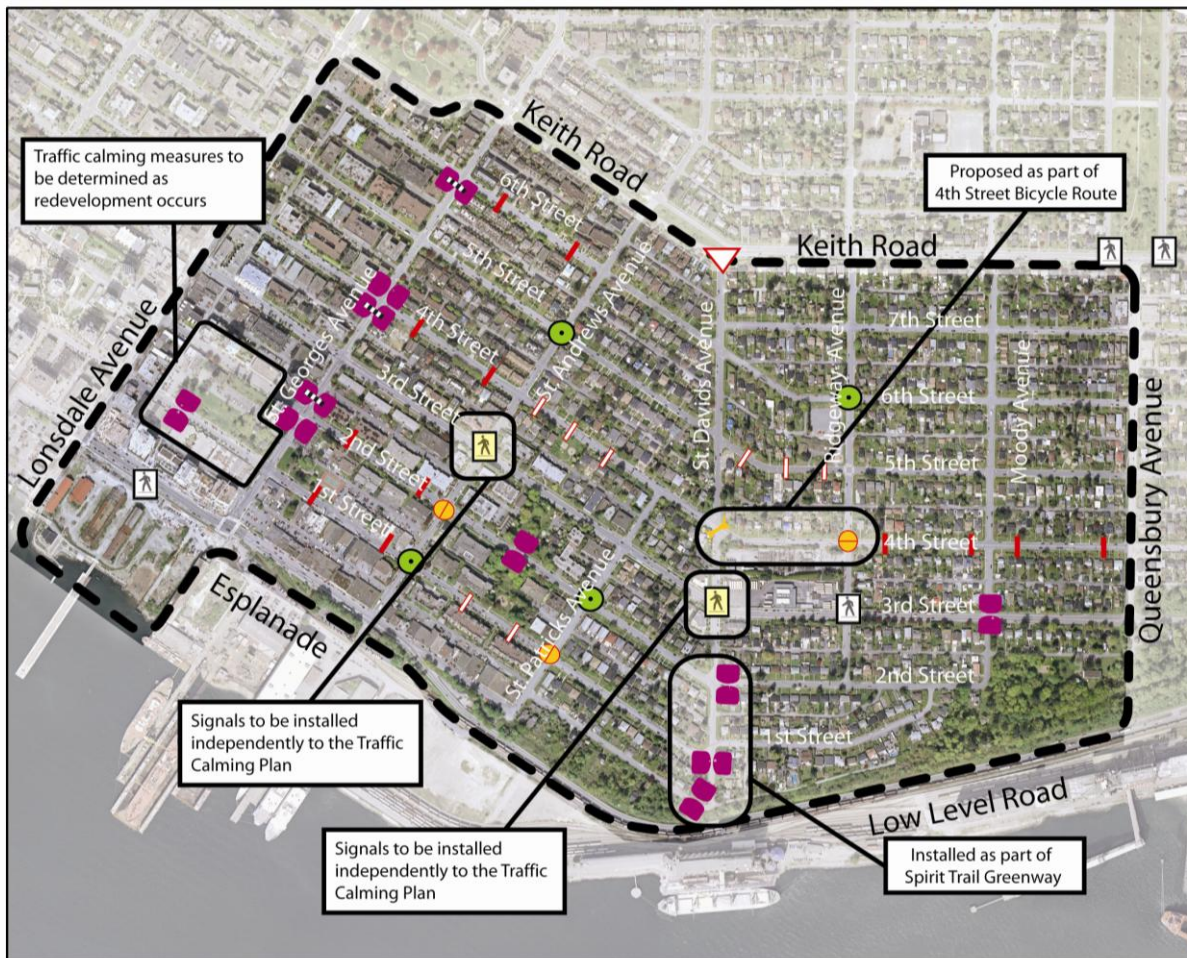
Based on comments received from the Community Questionnaire and at the Open Houses, several minor changes were made to the Traffic Calming Plan. Revisions to the draft Traffic Calming Plan include:

- Additional speed humps on 4<sup>th</sup> Street and 6<sup>th</sup> Street between St. George's Avenue and St. Andrew's Avenue to more effectively reduce speeds at these locations.
- New speed humps on 1<sup>st</sup> Street and 2<sup>nd</sup> Street between St. George's Avenue and St. Andrew's Avenue to reduce speeds and short-cutting traffic.
- New speed humps on 4<sup>th</sup> Street between Ridgeway Avenue and Queensbury Avenue to reduce speeds, based on comments that the re-orientation of the stop sign at Ridgeway may increase traffic speeds.
- Remove driver feedback sign due to the 3<sup>rd</sup> Street Bicycle Lanes project.
- Remove right-in/right-out island at St. Andrew's Avenue and Esplanade Street. This was originally proposed to reduce short-cutting on St. Andrew's Avenue but it was felt that the other measures proposed on St. Andrew's Avenue may help fulfill this objective. Traffic volumes and speeds should be evaluated and a right-in/right-out island should be considered as a possible further addition if necessary.
- Replace special crosswalk and median island with a pedestrian activated signal at 3<sup>rd</sup> Street and St. David's Avenue, due to concerns about the traffic operations and safety of implementing a median island at this location due to the curvature of the street.
- Replace median island at 3<sup>rd</sup> Street and Moody Avenue with curb extensions on the southwest and northeast corners of the intersection based on a separate safety assessment of this intersection.

### 6.4 Features of the Recommended Traffic Calming Plan

The recommended Traffic Calming Plan for the Lower Lonsdale East neighbourhood is illustrated in **Figure 14**. Specific features of the Traffic Calming Plan are described on the following pages.

**Figure 14 — Recommended Traffic Calming Plan**



#### Legend

- |  |                                                    |  |                                      |
|--|----------------------------------------------------|--|--------------------------------------|
|  | Pedestrian and Bicycle Activated Signal (Existing) |  | Speed Hump (Proposed)                |
|  | Pedestrian and Bicycle Activated Signal (Proposed) |  | Curb Extension                       |
|  | Speed Hump (Existing)                              |  | Diverter                             |
|  | Marked Pedestrian Crossing                         |  | Right-In/Right-Out Island (Existing) |
|  | Traffic Circle                                     |  |                                      |
|  | Stop Sign Re-Orientation                           |  |                                      |

- **Speed humps** are proposed on several neighbourhood streets. Speed humps are rounded raised areas placed across the roadway and are effective in preventing speeding, and also improve safety. At moderate vehicle speeds, speed humps gently rock a car, whereas at higher speeds, there is more of a jolt. The result is that motorists typically slow to about 30 to 35 km/h traveling over speed humps. Studies have shown that speed humps are the most effective traffic calming devices at reducing speeds, typically reducing 85<sup>th</sup> percentile speeds by an average of more than 11 km/h, or over 20%. Speed humps have also been shown to reduce traffic volumes by approximately 20% and reduce the number of collisions by 14%.<sup>3</sup> Speed humps do not affect parking — motorists can park on top of a speed hump. Speed humps do not typically increase traffic noise, and are safe for bicycles. Speed humps are not the same as the speed “bumps” used in shopping mall parking lots or residential lanes. Speed humps are 4 metres (13 feet) long, 0.08 metres (3 inches) in height, and sinusoidal in shape.

Speed humps are already located on several streets in the neighbourhood, including 1<sup>st</sup> Street, 4<sup>th</sup> Street, and 5<sup>th</sup> Street. Speed humps are proposed on 1<sup>st</sup> Street and 2<sup>nd</sup> Street to address identified speeding issues through the 30 km/h zones on these streets, and to discourage short-cutting by reducing the relatively high traffic volumes on these streets (with 1,800 and 1,900 vehicles per day on 1<sup>st</sup> Street and 2<sup>nd</sup> Street, respectively). Speed humps are also proposed on 4<sup>th</sup> Street to address identified speeding issues and discourage short-cutting. They are also proposed on 6<sup>th</sup> Street to address speeding issues, particularly during the AM peak period.

A typical speed hump is illustrated in **Figure 15**. A schematic drawing of a speed hump is provided in **Figure 16**. A local example of speed humps is on Ridgeway Avenue between 16<sup>th</sup> and 22<sup>nd</sup> Streets

Speed bumps have been installed in some lanes in the Lower Lonsdale East neighbourhood. Residents who wish to have speed bumps installed in their lanes can do so through the Local Improvement Program, whereby residents contribute a portion of the cost of speed bumps.

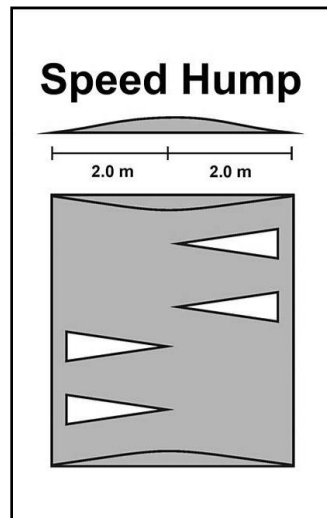
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<sup>3</sup> Reid Ewing and Steven J. Brown, 2009. U.S. Traffic Calming Manual. American Planning Association / American Society of Civil Engineers: Chicago.

Figure 15 — Speed Hump



Figure 16 — Speed Hump Schematic



- **Traffic circles** are raised landscaped islands placed in the centre of an intersection to safely control traffic without using stop signs or traffic signals. They are usually circular but may be oblong to fit the specific dimensions of an intersection. A typical traffic circle is illustrated in **Figure 17**. Navigating a traffic circle requires that motorists slow down and drive around the circle in a counter-clockwise direction. The design of a traffic circle accommodates large vehicles, which can drive onto the concrete apron around the circle. Traffic circles improve safety for pedestrians and other road users, and have been shown

to reduce collisions by up to 73%. Traffic circles also discourage speeding and have been shown to reduce speeds by over 10%.<sup>4</sup>

**Figure 17 — Traffic Circle**



Traffic circles work best at intersections of local streets. Traffic circles are proposed at the intersections of 1<sup>st</sup> Street and St. Andrew's Avenue, and 2<sup>nd</sup> Street and St. Patrick's Avenue primarily to improve intersection safety, as both of these intersections have relatively high collision rates of greater than 2 collisions per million vehicles. They are also proposed at these locations to reduce speeding and short-cutting. A traffic circle is also proposed at the intersection of 5<sup>th</sup> Street and St. Andrew's Avenue to reduce short-cutting traffic along St. Andrew's Avenue, which currently has traffic volumes between 1,100 and 1,500 vehicles per day. A traffic circle is also proposed at the intersection of 6<sup>th</sup> Street and Ridgeway Avenue to discourage short-cutting on Ridgeway, which currently has traffic volumes of approximately 1,200 vehicles per day, and to reduce address speeding issues in the 30 km/h zones on Ridgeway Avenue and 5<sup>th</sup> Street. Local examples of traffic circles are on St. Andrews, Ridgeway and Moody south of 13<sup>th</sup> Street.

- **Curb extensions** involve extending the curb on one or both sides of the roadway, narrowing the width of the road between the curb extensions, as illustrated in **Figure 18**. Curb extensions improve pedestrian safety by increasing the visibility of pedestrians

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<sup>4</sup> Reid Ewing and Steven J. Brown, 2009. U.S. Traffic Calming Manual. American Planning Association / American Society of Civil Engineers: Chicago.

and reducing the crossing distance. Curb extensions also improve safety by improving sight lines for motorists turning to and from a side street, and by discouraging high-speed turns.

Existing curb extensions have recently been installed in the neighbourhood on St. David's Avenue as part of the Spirit Trail. New curb extensions are proposed on 2<sup>nd</sup> Street mid-block between St. Andrew's Avenue and St. Patrick's Avenue to improve pedestrian safety at the existing marked crossing between Emerald and Hamersley Parks. Curb extensions are also proposed on 3<sup>rd</sup> Street at Moody Avenue and on St. George's Avenue at several locations to address reported issues of the difficulty of pedestrians crossing St. George's Avenue. Since speed humps only have limited effects on reducing speeds and volumes, they are appropriate to consider on a minor arterial roads such as St. George's Avenue.

**Figure 18 — Curb Extension**



- **Diverters** are barriers placed diagonally across an intersection, blocking all through movement. A diverter is proposed at the intersection of 4<sup>th</sup> Street and St. David's Avenue as part of the 4<sup>th</sup> Street bicycle route project. This diverter will reduce short-cutting along 4<sup>th</sup> Street and will address reported issues related to intersection safety. An example of a diverter is provided in **Figure 19**.

Figure 19 — Diverter



- **Marked “zebra” crosswalks** are proposed on St. George’s Avenue on 2<sup>nd</sup> Street, 4<sup>th</sup> Street, and 6<sup>th</sup> Street in conjunction with the curb extensions noted above to improve pedestrian safety. A marked crosswalk is currently located on the south side of the intersection of 2<sup>nd</sup> Street at St. George’s Avenue. The plan recommends an additional crosswalk on the north side of the intersection based on community input suggesting the demand for pedestrian crossing is high on the north side. The marked crosswalks at 4<sup>th</sup> Street and 6<sup>th</sup> Street are recommended on the south side of the intersection due to visibility issues.
- **Stop signs** at the intersection at 1<sup>st</sup> Street and St. Patrick’s Avenue and 2<sup>nd</sup> Street and St. Andrew’s Avenue would be re-oriented to face east and west. These measures would work in conjunction with the traffic circles in 1<sup>st</sup> Street and 2<sup>nd</sup> Street to address short-cutting and speeding issues, and to improve safety, particularly at the intersection of 2<sup>nd</sup> Street and St. Andrew’s Avenue which has a relatively high collision rate of over 2 collisions per million vehicles.

### Parking Restrictions at Intersections

Many residents expressed concerns regarding obstructed sight lines at intersections due to vehicles parked close to the intersection. Pedestrians crossing these streets can be blocked from

motorists' view by parked vehicles, and motorists turning onto these streets from side streets and lanes can find it difficult to see approaching traffic due to parked vehicles.

To address this issue — and in addition to the features of the Traffic Calming Plan described above — the City will work towards implementing parking restrictions at problem locations. These restrictions would prohibit motorists from parking within one to two car lengths of the corner, so as to improve sight lines, and would be indicated with “No Parking” signs. Implementation of parking restrictions is supported by 83% of respondents to the community questionnaire, and would occur independently of implementation of the Traffic Calming Plan.

### **Emergency Vehicles**

Emergency vehicles - particularly fire trucks - can be affected by some traffic calming measures. Research has shown that speed humps and speed tables can add 3 to 10 seconds delay per device, and traffic circles can add a few seconds delay as well. On the route between the fire hall/dispatch centre to an incident, a responder may encounter several devices; In many other communities throughout North America, most residents consider this an acceptable trade-off given the benefits that traffic calming can provide on a daily basis. The North Vancouver RCMP, Ambulance Services and North Vancouver Fire Department have been consulted as part of the design process and no objections to the Traffic Calming Plan were raised.

## 7.0 IMPLEMENTATION

In this section, a strategy is presented for implementing the recommended Lower Lonsdale East Neighbourhood Traffic Calming Plan.

### 7.1 Costs

For implementation, the two pedestrian and bicycle activated signals, which represent a large component of the financial cost of the plan, have been isolated from the remaining Traffic Calming features in the plan. There may be opportunities for the City to implement these signals in conjunction with other projects or through other funding sources.

As summarized in **Table 3**, the cost of implementing the recommended Lower Lonsdale East Neighbourhood Traffic Calming Plan (excluding the two pedestrian and bicycle activated signals) is estimated to be approximately \$250,000, including a 20% contingency, HST and Capital Overhead Allocation. This includes the costs of the majority of the traffic calming measures described in the previous section. This estimate does not include the cost of the diverter at 4th Street and St. David's Avenue which will be implemented as part of the 4th Street bicycle route project. In addition, the estimated costs in **Table 3** do not include any allowance for additional traffic calming measures which might be added to the plan through follow-up monitoring. **Table 4** summarizes the costs for the two pedestrian and bicycle activated signals, which total \$359,000 including a 20% contingency, HST and Capital Overhead Allocation.

**Table 3 — Estimated Costs for Traffic Calming Plan**

Measure	Unit Cost	Quantity	Total Cost
Speed hump	\$3,000	12	\$36,000
Traffic circle	\$14,000	4	\$56,000
Curb extension	\$5,000	14	\$70,000
Diverter*	n/a	n/a	n/a
Signage, pavement markings and miscellaneous			\$10,000
<b>Sub-Total</b>			<b>\$172,000</b>
Contingency (20%)			\$35,000
<b>Total (Including Contingency)</b>			<b>\$207,000</b>
HST (12%)			\$25,000
Capital Overhead Allocation (7%)			\$16,000
<b>Grand Total</b>			<b>\$250,000</b>

\* Diverter to be included in funding for 4<sup>th</sup> Street bicycle route

**Table 4 — Estimated Costs for Pedestrian and Bicycle Activated Signal**

Measure	Unit Cost	Quantity	Total Cost
Pedestrian and bicycle activated signal - St. Andrew's	\$120,000	1	\$120,000
Pedestrian and bicycle activated signal - St. David's	\$130,000	1	\$130,000
<b>Sub-Total</b>			<b>\$250,000</b>
Contingency (20%)			\$50,000
<b>Total (Including Contingency)</b>			<b>\$300,000</b>
HST (12%)			\$36,000
Capital Overhead Allocation (7%)			\$23,000
<b>Grand Total</b>			<b>\$359,000</b>

The estimated costs in **Table 3** are based on recent costs for similar measures implemented in other neighbourhoods in the City, and are intended as order-of-magnitude estimates for budgeting purposes. City staff has provided these costs, and will prepare more accurate estimates at the time when detailed designs are prepared. In the implementation of the traffic calming plan, the City should pursue other funding opportunities, such as ICBC's Road Improvement Program partnership.

Some of the measures recommended in the Traffic Calming Plan have been recommended primarily to improve safety for pedestrians, cyclist and motorists, particularly along arterial roads. In addition, a number of measures have been recommended on local roads within the neighbourhood based on relatively high collision rates or identified safety issues. If limited funds are available to implement the traffic calming plan, it is recommended that those measures which have a primary purpose of improving safety be implemented first. These safety-related measures include:

- Pedestrian and bicycle activated signals on 3rd Street at St. David's Avenue and St. Andrew's Avenue to improve pedestrian safety crossing 3rd Street (priority to be determined);
- Curb Extensions on 3rd Street at St. David's Avenue to improve pedestrian safety crossing 3rd Street;
- Marked pedestrian crossings and curb extensions on St. George's at 2nd Street, 4th Street, and 6th Street to improve pedestrian safety crossing St. George's Avenue;
- Traffic circles and stop sign re-orientations on 1st Street and 2nd Street at St. George's Avenue and St. Andrew's Avenue, respectively, to address identified safety issues at these intersections.

The remaining measures recommended in the traffic calming plan are intended primarily to reduce motor vehicle speeds and volumes and could be implemented as a second priority if necessary.

## 7.2 Timing

After the Traffic Calming Plan has been approved by City Council, some traffic calming measures might be implemented on a temporary basis to provide an opportunity to assess their effectiveness and fine-tune the geometrics. Measures which might be implemented temporarily include traffic circles. **Figure 22** provides an example of a temporary traffic circle implemented in the Ridgeway neighbourhood (this is the same location as the traffic circle in **Figure 17**).

**Figure 22 — Temporary Traffic Circle**



Implementation of the Traffic Calming Plan would begin with the construction of speed humps as well as appropriate signage and pavement markings. Some or all curb extensions, median islands, and traffic circles could be constructed on a temporary basis, with permanent construction to occur following evaluation.

## 7.3 On-Going Monitoring

It is important to note that the Traffic Calming Plan is not “cast in stone.” Although analysis of traffic conditions in the Lower Lonsdale East neighbourhood — as well as experience in other neighbourhoods and communities — indicates that the plan will be effective in resolving traffic problems, every neighbourhood is different. The Traffic Calming Plan may need to be fine-tuned

based on actual experience, to ensure that existing problems are adequately addressed. As well, new issues might arise as a result of changes in the neighbourhood and elsewhere on the North Shore.

To ensure that the Traffic Calming Plan is effective and that traffic and safety issues are addressed, City staff will monitor conditions following implementation of the plan. This will involve collecting traffic volume and speed data after the plan is implemented, in the same locations as data were collected during development of the plan. These data and input from the permanent Neighbourhood Transportation Committee will indicate whether there are any outstanding traffic and safety problems. Where problems persist or new problems are identified, staff can work with the Neighbourhood Transportation Committee to modify the plan as necessary.

# Appendix A

## Issues

## Lower Lonsdale East TRAFFIC CALMING PLAN

*Lower Lonsdale East neighbourhood residents are invited to participate in the development of a Traffic Calming Plan.*

If you live in this area, your participation and input will be an important part of the decision-making process.

### How To Get Involved

Development of the Lower Lonsdale East Traffic Calming Plan will begin this fall, with implementation planned for next spring/summer.

You can participate by:

- Joining the Lower Lonsdale East Neighbourhood Traffic Residents' Association (NTRA).
- Participating in upcoming community events. The first will be a neighbourhood walkabout one Sunday in early October. Detailed information about the time and route will be distributed in late September, as well as information about other community events.
- Checking the City's Traffic Calming webpage for updates and information about upcoming events: <http://www.cnv.org/LowerLonsdaleEast>

### Neighbourhood Traffic Residents' Association

The Neighbourhood Traffic Residents' Association (NTRA) will include approximately eight residents from the Lower Lonsdale East neighbourhood. The NTRA will provide knowledge of local issues, help coordinate community events, and provide input into the development of a neighbourhood Traffic Calming Plan.

As a member of your Neighbourhood's Traffic Residents' Association, you must be able to:

- Represent the interests of the neighbourhood
- Commit to approximately four meetings between October 2009 and March 2010
- Participate in a three-hour neighbourhood walkabout
- Participate in community events (up to three)

If you are interested in being a member of the NTRA, you can obtain an application from [www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast) or from the Engineering department at City Hall. Applications should be submitted by September 20.

### More Information

A newsletter will be distributed in late September to every household in the Lower Lonsdale East neighbourhood, detailing community events including the date, time and route of the walkabout.

## Lower Lonsdale East

## Traffic Calming Plan

### Traffic Calming Goals:

- **Safety** – to make streets safe for everyone – pedestrians, cyclists, motorists and residents
- **Liveability** – To preserve and enhance the liveability of the neighbourhood

### Lower Lonsdale East Study Area



### For more information:

#### Website:

[www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast)

#### Telephone Information Line:

604-278-5496 Extension 6208

## Lower Lonsdale East TRAFFIC CALMING PLAN

October 1, 2009

Work has begun on a Traffic Calming Plan for your neighbourhood. The plan will address traffic issues on neighbourhood streets and examine ways to improve safety and accessibility for pedestrians, cyclists and transit users. There are several opportunities available to participate in developing the Traffic Calming Plan and we invite you to share to comments and concerns.

### Neighbourhood Walkabout

**Sunday, October 18 from 1pm – 5pm**

We will be walking through the neighbourhood to discuss traffic issues with residents firsthand. Meet us anywhere along the route (shown on reverse) to tell us about any traffic concerns you may have.

### Traffic Calming Open House #1

**Thursday, November 19 from 5pm – 8pm**

**North Shore Neighbourhood House, 225 East 2<sup>nd</sup> Street**

Drop in anytime between 5pm - 8pm to identify issues in your neighbourhood and discuss possible traffic calming solutions.

### Traffic Calming Open House #2

**January 2010, exact date and time TBD**

In January 2010, you will receive a newsletter and questionnaire describing a proposed Traffic Calming Plan for your neighbourhood. An Open House will be held to provide an opportunity for you to ask questions about the proposed plan prior to returning your questionnaire.

### Traffic Calming Open House #3

**Spring 2010, exact date and time TBD**

This final Open House will present the results of the questionnaire and explain how the Traffic Calming Plan will be implemented.

The City has established a **Neighbourhood Traffic Residents Association** comprised of neighbourhood residents who will work with City staff and consultants in preparing the plan.

If you're unable to join us on the walkabout, you can still let us know how you feel about traffic in your neighbourhood. Review the City's Traffic Calming webpage and submit your comments by phone, email or fax as indicated below.

## Lower Lonsdale East

## Traffic Calming Plan

### Traffic Calming Goals

- **Safety** – to make streets safe for everyone – pedestrians, cyclists, motorists and residents
- **Liveability** – to preserve and enhance the liveability of the neighbourhood

### Lower Lonsdale East Study Area



### For more information:

#### Website:

[www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast)

#### Telephone Information Line:

604-278-5496 Extension 6208

#### Contact:

Daniel Watson  
Transportation Planner  
City of North Vancouver  
Email: [dwatson@cnv.org](mailto:dwatson@cnv.org)  
Fax: 604-985-8439

## WALKABOUT ROUTE

Sunday October 18, 2009  
1pm – 5pm

The Neighbourhood Walkabout will begin at 1pm at the corner of Lonsdale Avenue and East 6<sup>th</sup> Street.

Join us along the route at any time between 1pm and 5pm, as we walk through your neighbourhood to discuss traffic and safety issues.

Lower Lonsdale  
East

Traffic Calming  
Plan



# CityView

[www.cnv.org](http://www.cnv.org)



## Green City Living Film & Speaker Series

### Zero Waste: The "Cradle to Cradle" Concept

Tuesday, October 20 from 7pm - 9pm

City of North Vancouver Council Chambers, 141 West 14th Street

The film 'WASTE = FOOD' explores the revolutionary "cradle to cradle" concept through interviews with its leading proponents, American architect William McDonough and German ecological chemist Michael Braungart. This new theory of ecologically intelligent design argues that manufacturers' products, when discarded, should either be completely recyclable in the Technosphere or become biodegradable food for the Biosphere. Their "intelligent product system" utilizes sustainable production methods and has been adapted by major corporations around the world with demonstrated social and financial success. After the film, the creators of the Clean Bin Project ([cleanbinproject.com](http://cleanbinproject.com)) will share ideas from their experience of living for a year with zero waste. Hosted by Councillor Rod Clark. Details at [www.cnv.org/GreenCityLiving](http://www.cnv.org/GreenCityLiving).



## Game Plan 2009 Open House

Thursday, October 22 from 5pm - 7pm  
Centennial Theatre, 2300 Lonsdale Ave

Join VANOC, the City of North Vancouver, District of North Vancouver, TransLink and the Vancouver 2010 Integrated Security Unit for an update on 2010 Winter Games planning and a look ahead to the daily operations of the Games.

**Game Plan 2009** will help people better understand the daily operations leading up to and during the Games in an Open House setting with stations focused on areas such as venue and transportation operations, security and public safety.

The Open House will provide an opportunity for those living or working in a Games-venue neighbourhood to learn more, ask questions and find out how they can get involved in the Games.

Details at [vancouver2010.com/gameplan](http://vancouver2010.com/gameplan).

## Lower Lonsdale East Traffic Calming Plan

Neighbourhood Walkabout, Sunday, October 18 from 1pm - 5pm

This fall, the City will begin work on a **Traffic Calming Plan** for the Lower Lonsdale East neighbourhood. The plan will address traffic issues on neighbourhood streets and examine ways to improve safety and accessibility for pedestrians, cyclists and transit users. The neighbourhood walkabout is the first of several opportunities to learn more and share your comments. Join us anywhere along the route to tell us about any traffic concerns you may have. Details at [www.cnv.org](http://www.cnv.org).

141 West 14th Street, North Vancouver BC V7M 1H9 | Tel: 604.985.7761 | Fax: 604.985.9417 | [www.cnv.org](http://www.cnv.org)

## Lower Lonsdale East Traffic Calming Plan Open House Notice

### Traffic Calming Open House #1

Thursday, November 19 from 5pm – 8pm

North Shore Neighbourhood House

225 East 2<sup>nd</sup> Street

Drop in anytime between 5pm - 8pm to identify issues in your neighbourhood and discuss possible traffic calming solutions.

Work has begun on a Traffic Calming Plan for your neighbourhood. The plan will address traffic issues on neighbourhood streets and examine ways to improve safety and accessibility for pedestrians, cyclists and transit users.

There are several opportunities available to participate in developing the Traffic Calming Plan and we invite you to share to comments and concerns. In January 2010, you will receive a newsletter and questionnaire describing a proposed Traffic Calming Plan for your neighbourhood. An Open House will be held in January to provide an opportunity for you to ask questions about the proposed plan prior to returning your questionnaire. A third Open House will be held in March 2010 to present the results of the questionnaire and explain how the Traffic Calming Plan will be implemented.

The City has established a **Neighbourhood Traffic Residents Association** comprised of neighbourhood residents who will work with City staff and consultants in preparing the plan.

If you're unable to join us at the Open House, you can still let us know how you feel about traffic in your neighbourhood. Review the City's Traffic Calming webpage and submit your comments by phone, email or fax as indicated below.

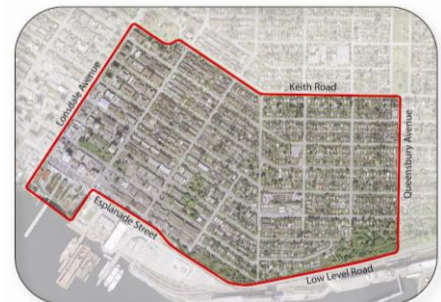
## Lower Lonsdale East

## Traffic Calming Plan

### Traffic Calming Goals

- **Safety** – to make streets safe for everyone – pedestrians, cyclists, motorists and residents
- **Liveability** – to preserve and enhance the liveability of the neighbourhood

### Lower Lonsdale East Study Area



### For more information:

#### Website:

[www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast)

#### Telephone Information Line:

604-278-5496 Extension 6208

#### Contact:

Daniel Watson  
Transportation Planner  
City of North Vancouver  
Email: [dwatson@cnv.org](mailto:dwatson@cnv.org)  
Fax: 604-985-8439

# CityView



[www.cnv.org](http://www.cnv.org)

## Green City Living Film & Speaker Series

Tuesday, November 17 from 7pm - 9pm  
City of North Vancouver Council Chambers, 141 West 14th Street  
Hosted by Councillor Pam Bookham

EARTH DAYS is a feature length documentary about the origins of the modern environmental movement told through the eyes of nine Americans who were inspired to act on what they believed was the most important challenge facing mankind. The film features active participants representing a diverse cross section of life and politics. Each reflects on their awakening to an environmental crisis, and the unprecedented movement that grew out of their response to that crisis. Earth Days examines both the groundbreaking achievements and missed opportunities of a decade of activism. Details at [www.cnv.org/GreenCityLiving](http://www.cnv.org/GreenCityLiving).

## Lonsdale East Traffic Calming Plan Open House

Thursday, November 19 from 6pm - 8pm  
North Shore Neighbourhood House, 225 East 2nd Street

Work has begun on a Traffic Calming Plan in the Lonsdale East neighbourhood. The plan will address traffic issues on neighbourhood streets and examine ways to improve safety and accessibility for pedestrians, cyclists and transit users.

Drop in anytime between 6pm - 8pm to identify issues in your neighbourhood and discuss possible traffic calming solutions. If you're unable to join us at the Open House, you can still let us know how you feel about traffic in your neighbourhood. Visit [www.cnv.org](http://www.cnv.org) for details and submit your comments by calling 604-985-8439 or by email to Daniel Watson at [dwatson@cnv.org](mailto:dwatson@cnv.org).



## Heritage Award Nominations

Each year, the City recognizes those who have made a significant effort to support heritage conservation in the community. Awards are presented in five categories:

- Residential Heritage Conservation
- Commercial Heritage Conservation
- Small Scale Heritage Improvement
- Heritage Awareness Achievement
- Heritage Project Achievement

Nomination forms are available City Hall and [www.cnv.org/heritage](http://www.cnv.org/heritage). Submission deadline is December 1, 2009.

## City Adds Two Electric Bikes to Green Fleet

The City has expanded its fleet of green transportation with the addition of two electric bikes. Designed for short-haul trips up to 10km, the new bikes will be used by City staff in their daily corporate operations. Supported by the City's network of multi-use greenways, they offer a healthy, sustainable alternative to the single-occupancy vehicle.

141 West 14th Street, North Vancouver BC V7M 1H9 | Tel: 604.985.7761 | Fax: 604.985.9417 | [www.cnv.org](http://www.cnv.org)



## NOTICE TO RESIDENTS OF THE LOWER LONSDALE EAST NEIGHBOURHOOD

# TRAFFIC CALMING QUESTIONNAIRE

This booklet describes the *proposed* Traffic Calming Plan that has been developed for your neighbourhood, and includes a questionnaire for your completion and return. The City of North Vancouver initiated the traffic calming process in your neighbourhood in response to concerns expressed by residents regarding speeding, pedestrian safety, short-cutting traffic and other safety issues on neighbourhood streets.

The primary objectives of the proposed Traffic Calming Plan are:

- **Safety** — make neighbourhood streets safer for everyone, including pedestrians, cyclists, children and motorists.
- **Liveability** — restore and enhance the liveability of the neighbourhood.

### CONTENTS

Questionnaire	insert
Features of the Traffic Calming Plan	3
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More information	7
How to return completed questionnaires	8

The proposed Traffic Calming Plan was developed by traffic calming consultants with the assistance of City staff and a Neighbourhood Traffic Residents' Association (NTRA) comprised of eight resident volunteers from the neighbourhood. The NTRA assisted consultants in identifying neighbourhood issues, soliciting input from other residents and reviewing various solutions to include in the Traffic Calming Plan.

### We need to hear from you!

We want to know what you think of the proposed Traffic Calming Plan. Please review the plan described in this booklet, then complete and return the enclosed questionnaire.

You can also complete the questionnaire online at:  
[www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast).

We want to be sure that the best possible plan is carried forward, and that the community supports the Traffic Calming Plan.

Please examine the plan, fill out the questionnaire, and **return your completed questionnaire to us by Monday, March 15.**

If you would like more information about the Traffic Calming Plan, we invite you to drop in at our **Open House on Wednesday, March 10** at the **Ridgeway Annex Elementary School Gym** (450 East 5th Street), **any time between 5:30 pm and 8:00 pm.** City staff, consultants and NTRA members will be available to answer your questions.

### **How did this come about?**

In March 2001, City Council adopted a Traffic Calming Policy as the City's first step in addressing reported traffic and safety issues on neighbourhood streets. Lower Lonsdale East will be the eighth neighbourhood for which a Traffic Calming Plan has been developed.

The neighbourhood walkabout last October was the first community event held, followed by an Open House in November. These events local residents told us their concerns and provided ideas for improving safety and traffic conditions in the neighbourhood.

### **The Traffic Calming Plan**

The proposed Traffic Calming Plan is illustrated on page 7 and is described on the following pages. The plan addresses the traffic concerns that residents have identified: speeding, short-cutting traffic and pedestrian safety.

Please examine the proposed Traffic Calming Plan, and think of how it would affect the safety and liveability of your neighbourhood streets.

**NOTE:** some topics identified by residents cannot be addressed by the Traffic Calming Plan. These include street lighting, road maintenance, parking enforcement and noise issues. These and other related issues will be addressed separately by the City. Enquiries regarding sidewalks and parking should be directed to the Engineering Department at 604-983-7333 or [eng@cnv.org](mailto:eng@cnv.org).

## Features of the Traffic Calming Plan

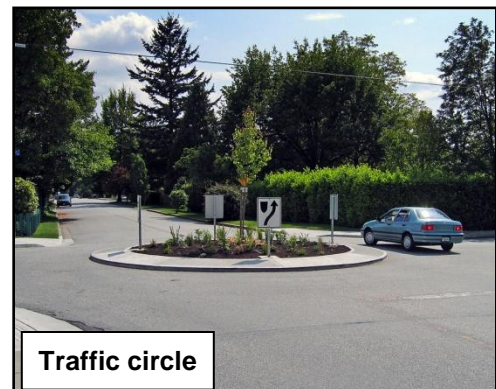
The proposed Traffic Calming Plan includes the following features:

**Speed humps** are effective in preventing speeding, and also improve safety. Speed humps are not the same as the speed “bumps” used in shopping mall parking lots or residential lanes. Speed humps are 4 metres (13 feet) long, and are used on local streets. At moderate vehicle speeds, speed humps gently rock a car, whereas at higher speeds, there is more of a jolt. The result is that motorists typically slow to about 30 to 40 km/h traveling over speed humps. They do not affect parking; motorists can park on top of a speed hump. They also do not typically increase traffic noise, and are safe for bicycles. Each speed hump typically costs approximately \$3,000 to implement. A local example of speed humps is on Ridgeway between 16<sup>th</sup> and 22<sup>nd</sup>.



Existing speed humps are located at several locations throughout the neighbourhood, including 1<sup>st</sup> Street, 4<sup>th</sup> Street, and 5<sup>th</sup> Street. Additional speed humps are proposed on 4<sup>th</sup> Street and 6<sup>th</sup> Street to address speeding problems and discourage shortcutting along these streets.

**Traffic circles** are raised landscaped islands placed in the centre of an intersection to control traffic safely without using stop signs or traffic signals. Motorists have to slow down to drive around the traffic circle. Traffic circles improve safety for pedestrians and other road users, and have been shown to reduce collisions by up to 80%. Traffic circles also discourage speeding. Each traffic circle typically costs approximately \$14,000 to implement.



Traffic circles work best at intersections of local streets. Four traffic circles are proposed at the following intersections: 1<sup>st</sup> Street and St. Andrew's Avenue, 2<sup>nd</sup> Street at St. Patrick's Avenue, 5<sup>th</sup> Street and St. Andrew's Avenue, and 6<sup>th</sup> Street and Ridgeway Avenue. These are recommended in order to improve intersection safety, discourage speeding, and discourage shortcutting through the neighbourhood. Local examples of traffic circles are on St. Andrew's, Ridgeway and Moody south of 13<sup>th</sup> Street.

**Curb extensions** involve extending the curb on one or both sides of the roadway, narrowing the width of the road between the curb extensions. Curb extensions improve pedestrian safety by increasing the visibility of pedestrians and reducing the crossing distance. Curb extensions also improve safety by improving sight lines for motorists turning to and from a side street, and by discouraging high-speed turns. Curb extensions typically costs approximately \$5,000 to implement at each corner.



Curb extensions are proposed on St. George's Avenue at 2<sup>nd</sup> Street, 4<sup>th</sup> Street and at 6<sup>th</sup> Street. Curb extensions are also proposed on 2<sup>nd</sup> Street between Emerald Park and Hamersley Park to improve pedestrian safety and reduce speeding. Curb extensions are also proposed on St. David's Avenue and 1<sup>st</sup> Street as part of the Spirit Trail Greenway.

**Median islands** are an alternative to curb extensions. Rather than narrowing the roadway from the outside in, as with a curb extension, a raised median island narrows the roadway from the inside out. Median islands can help reduce traffic speeds and help pedestrians cross the street. Each median island typically costs approximately \$5,000 to implement. Median islands with marked "zebra" crosswalks are proposed on 3<sup>rd</sup> Street at the intersections with St. David's Avenue and Moody Avenue to improve pedestrian safety.



**Driver feedback signs** incorporate a radar speed detector and an illuminated display to provide immediate feedback to approaching motorists, advising them of their speed relative to the posted speed limit. Driver feedback signs are similar to those used by Speed Watch patrols, with the key difference being that driver feedback signs are installed permanently, and function 24/7. US and UK experience indicates that driver feedback signs are effective in discouraging speeding. Driver feedback signs typically cost approximately \$10,000 to implement. A driver feedback sign is proposed on 3<sup>rd</sup> Street east of Queensbury Avenue.



**Marked crosswalks.** New marked "zebra" crosswalks with curb extensions are proposed on St. George's Avenue at 2<sup>nd</sup> Street, 4<sup>th</sup> Street and 6<sup>th</sup> Street to make it easier to cross St. George's Avenue.

**Stop signs would be re-oriented** at the intersections of 1<sup>st</sup> Street and St. Patrick's Avenue, 2<sup>nd</sup> Street and St. Andrew's Avenue, and 4<sup>th</sup> Street and Ridgeway Avenue to improve safety for pedestrians and cyclists, and to help reduce speeding.

**Diverters** are barriers placed diagonally across an intersection, forcing motorists to turn rather than travel straight through. Diverters incorporate gaps for pedestrians and bicycles. Diverters can have significant reductions in traffic volumes and traffic speeds and improve safety. A diverter has been proposed through a separate study (the 4<sup>th</sup> Street Bike Route Design) at the intersection of 4<sup>th</sup> Street and St. David's Avenue.



**Right-In / Right-Out Islands** are raised triangular islands located on one approach to an intersection, and are intended to obstruct short-cutting traffic. Vehicles can only turn right into and out of the street. A right-in/right-out island typically costs approximately \$5,000 to implement. A right-in/right-out island is proposed on St. Andrew's Avenue at Esplanade Street.

**Pedestrian activated signal** is proposed along 3<sup>rd</sup> Street at St. Andrew's Avenue to improve pedestrian and cyclist safety. Pedestrian activated signals cost over \$150,000.

**Special Crosswalk** (crosswalk with flashing yellow lights) would be implemented on 3<sup>rd</sup> Street at St. David's Avenue to improve pedestrian safety. Flashing lights are located at the side of the road or overhead, and are activated by pushbuttons at curbside. Special crosswalks cost approximately \$100,000.

## Parking restrictions at intersections

Many residents have expressed concerns regarding obstructed sight lines at intersections due to vehicles parked close to the intersection. Pedestrians crossing these streets can be blocked from motorists' view by parked vehicles, and motorists turning onto these streets from side streets and lanes can find it difficult to see approaching traffic due to parked vehicles.

To address this issue the City can implement parking restrictions which prohibit motorists from parking within one to two car lengths of the corner, so as to improve sight lines. These restrictions would be indicated with "No Parking" signs. Please

answer Question 2 on the questionnaire to indicate whether or not you support such parking restrictions.

## Emergency vehicles

Emergency vehicles — particularly fire trucks — can be affected by some traffic calming measures. Speed humps and traffic circles can add 3 to 10 seconds delay per hump or circle. This could mean up to an additionally 30 second for emergency response time. However, most residents in other City areas have considered this an acceptable trade-off given the safety and liveability benefits that traffic calming measures provide on a daily basis.

## Speed bumps in lanes

Speed bumps can be installed in lanes to discourage speeding. Residential speed bumps are available through the Local Improvement Petition. At least half of the benefiting property owners must sign a schedule or petition in order for speed bumps to be installed.

Typically, three speed bumps are installed per lane depending upon the length and configuration of the lane. Property owners' share of the cost of installing residential speed bumps is approximately \$600 each (plus any costs to pave lanes that are not already paved).














More information about speed bumps in lanes is available on the City's web site at <http://www.cnv.org/speedbumps>.

## What happens next?

Questionnaire responses received by **Monday, March 15** will be tabulated, and the results will be presented at an open house on **Thursday, April 29** at **Ridgeway Annex Elementary School Gym** (450 East 5th Street) — drop in any time between 5:30 and 8:00 p.m.

The results of the questionnaire will determine whether the Traffic Calming Plan has neighbourhood support, and is ready to be presented to City Council. It should be noted that funding is not yet in place for the implementation of the Traffic Calming Plan. If Council approves the Traffic Calming Plan, a request for funding will be included for the City's 2011 Capital Plan. Many of the items included in the Traffic Calming Plan may be implemented through other initiatives, such as the Spirit Trail Greenway, 4<sup>th</sup> Street Bike Lane, or through development opportunities.

**Legend**

-  Pedestrian Activated Signal
-  Special Crosswalk
-  Marked Pedestrian Crossing
-  Traffic Circle
-  Stop Sign Re-Orientation
-  Driver Feedback Sign
-  Median Island
-  Speed Hump (Existing)
-  Speed Hump (Proposed)
-  Curb Extension
-  Diverter
-  Right-In/Right-Out (Existing)
-  Right-in/Right-Out Island (Proposed)



## IMPORTANT DATES:

### **Open House — Wednesday, March 10 any time from 5:30 to 8:00 p.m.**

Drop in any time between 5:30 and 8:00 p.m. at the Ridgeway Annex Elementary School Gym, 450 East 5th Street to ask questions about the proposed Traffic Calming Plan.

### **Return completed questionnaires by Monday, March 15**

### **Open House — Thursday, April 29 any time from 5:30 to 8:00 p.m.**

Drop in any time between 5:30 and 8:00 p.m. at the Ridgeway Annex Elementary School Gym to find out the results of the questionnaire.

## More information

Information regarding the Lower Lonsdale East Traffic Calming Plan is available on the City's website at [www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast). This questionnaire is available to download, plus copies of the display boards from the November Open House, and a brief "Introduction to Traffic Calming." The City's *Traffic Calming Program* is also available on the City's website, as well as information on traffic calming plans in other neighbourhoods.

If you do not have web access and would like more information regarding the proposed Traffic Calming Plan, please call the Engineering Department at 604-983-7333.

## How to return completed questionnaires

Please take the time to complete this questionnaire and **return your completed questionnaire by Monday, March 15** to any of the locations below.

- **Complete online at:** [www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast).
- **Mail** to City Hall at Engineering Dept., City of North Vancouver, 141 West 14th Street, North Vancouver, BC V7M 1H9.
- **E-mail** to [eng@cnv.org](mailto:eng@cnv.org) (indicate subject: Traffic Calming Plan).
- **Drop off** at City Hall at 141 West 14<sup>th</sup> Street, between 8:30 a.m. and 4:30 p.m.
- **Fax** to City Hall at 604-985-8439.



## Lower Lonsdale East Neighbourhood Traffic Calming Plan

# Community Questionnaire

1. How do you feel about the proposed Traffic Calming Plan? Please indicate whether or not you support it, and if you do not feel strongly one way or the other, please indicate that you are neutral.

- I support the proposed plan
- I am neutral
- I do not support the plan

2. Please indicate how you feel about the option to restrict parking within one to two car lengths of corners at certain intersections where parked vehicles obstruct sight lines.

- I support parking restrictions at corners
- I am neutral about parking restrictions
- I do not support parking restrictions

3. Do you have any suggested changes to the Traffic Calming Plan?

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4. Would you like to add any additional comments?

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Please provide your address (it will be used for verification purposes only and will remain confidential): \_\_\_\_\_

***Thank you for your response!***

**Please return this questionnaire by Monday, March 15** to any of the locations below.

- **Complete online at:** [www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast).
- **Mail** to City Hall at Engineering Dept., City of North Vancouver, 141 West 14th Street, North Vancouver, BC V7M 1H9.
- **E-mail** to [eng@cnv.org](mailto:eng@cnv.org) (indicate subject: Traffic Calming Plan).
- **Drop off** at City Hall at 141 West 14<sup>th</sup> Street, between 8:30 a.m. and 4:30 p.m.
- **Fax** to City Hall at 604-985-8439.



## OPEN HOUSE

### Lower Lonsdale East Traffic Calming Plan

Wednesday, March 10 from 5:30pm - 8pm  
Ridgeway School Annex Gymnasium (Ridgeway and East 5th)

The City is preparing a Traffic Calming Plan for the Lower Lonsdale East neighbourhood to address local traffic issues and examine ways to improve safety and accessibility. A proposed Plan has been developed based on suggestions and feedback provided by neighbourhood residents at previous public input opportunities.

The proposed Traffic Calming Plan and a questionnaire will be sent to neighbourhood residents at the beginning of March. The Open House is an opportunity to ask questions about the proposed Traffic Calming Plan prior to returning the questionnaire. Details at [www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast).

### Do You Know a Community Hero?

The City's Community Heroes Award Program recognizes volunteers whose initiative, effort and commitment has made a significant positive impact in our community. Names of nominees may be submitted by any member of the community including City residents, non-profit agencies, groups, and businesses.

The deadline for nominations is **March 31, 2010**. Nomination forms are available at [www.cnv.org](http://www.cnv.org) and at City Hall. Please submit completed forms to Penny Lurbiecki, City Clerk's Department, 604-990-4231, [plurbiecki@cnv.org](mailto:plurbiecki@cnv.org).



### Civic Youth Awards Program

DEADLINE MARCH 26, 2010

Do you know an outstanding youth who deserves to be recognized? The Civic Youth Awards Program recognizes youth between the ages of 10 and 24 years for noteworthy achievements and contributions to our community. The Youth Centennial Scholarship is available to Grade 12 students who are pursuing post-secondary education. Nomination forms are available at [www.cnv.org/youth](http://www.cnv.org/youth).



### Children and Youth Grants

DEADLINE MARCH 26, 2010

The City offers annual grants that provide financial support for programs and services for children and youth in the City of North Vancouver. Details at [www.cnv.org/youth](http://www.cnv.org/youth).

### City Welcomes Russian Tall Ship

The City welcomes the Russian tall ship Kruzenshtern to the Lower Lonsdale waterfront. The vessel will moor at the Burrard Dry Dock Pier until February 28 and is open to the public from 10am - 4pm daily. Conducted tours are also available for a fee. Details at [www.cnv.org](http://www.cnv.org).



## Lower Lonsdale East Traffic Calming Plan Open House Notice

*Drop in anytime between 5:30pm and 8pm to view the results of the Community Questionnaire and the final Traffic Calming Plan.*

The City of North Vancouver has prepared a **Traffic Calming Plan** for the Lower Lonsdale East neighbourhood in response to concerns expressed by residents about speeding, pedestrian safety, short-cutting traffic and other safety issues. The plan addresses traffic issues on neighbourhood streets and examines ways to improve safety and accessibility for pedestrians, cyclists and transit users.

The proposed Traffic Calming Plan was developed by traffic calming consultants with the assistance of City staff and a Neighbourhood Traffic Residents' Association (NTRA) comprised of eight resident volunteers from the neighbourhood. The NTRA assisted consultants in identifying neighbourhood issues, soliciting input from other residents and reviewing various solutions to include in the Traffic Calming Plan.

The Traffic Calming Plan has been developed based on extensive input from the community, including:

- A neighbourhood walkabout on Sunday, October 18
- A first public Open House on Thursday, November 19
- A newsletter and community questionnaire distributed to all households and businesses in this neighbourhood in February
- A second Open House on Wednesday, March 10

We received valuable input from residents through the Community Questionnaire. The results showed that over 70% of respondents support the proposed Traffic Calming Plan. The draft Traffic Calming Plan will be revised and finalized based on comments received in the Community Questionnaire and presented at this final Open House.

If you would like more information about the Traffic Calming Plan, visit the City's Traffic Calming webpage at:

[www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast) or submit your comments by phone, e-mail or fax.

**Open House #3**  
**Thursday, April 29**  
**5:30pm – 8pm**  
**Ridgeway Annex**  
**Elementary School Gym**  
**450 East 5<sup>th</sup> Street**

### Traffic Calming Goals

- **Safety** – to make streets safe for everyone – pedestrians, cyclists, motorists and residents
- **Liveability** – to preserve and enhance the liveability of the neighbourhood

### Lower Lonsdale East Study Area



### For more information:

#### Website:

[www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast)

#### Telephone Information Line:

604-278-5496 Extension 6208

#### Contact:

Daniel Watson  
Transportation Planner  
City of North Vancouver  
Email: [dwatson@cnv.org](mailto:dwatson@cnv.org)  
Fax: 604-985-8439

# CityView

Find the City on Facebook | [www.cnv.org](http://www.cnv.org)



## OPEN HOUSE City of North Vancouver Parks Master Plan Thursday, April 22 from 5:30pm - 7pm, City Hall Foyer

The City of North Vancouver offers a diverse range of parks and trails, including all-weather sports fields, playgrounds and wilderness parks. As the community grows, the City aims to accommodate the changing needs of residents while achieving the City's sustainability objectives in a fiscally responsible way.

The 2010 Parks Master Plan provides direction for the development and renewal of the City's parks and open spaces for the next 10 years. This final Open House is an opportunity to provide comments on the proposed plan before it is finalized. Details at [www.cnv.org/ParksMasterPlan](http://www.cnv.org/ParksMasterPlan).



## OPEN HOUSE Lower Lonsdale East Traffic Calming Plan

Thursday, April 29 from 5:30pm - 8pm  
Ridgeway School Annex Gymnasium (Ridgeway and East 5th)

The City has prepared a Traffic Calming Plan for the Lower Lonsdale East neighbourhood to address local traffic issues and examine ways to improve safety and accessibility. The plan has been developed based on suggestions and feedback provided by neighbourhood residents at previous public input opportunities. This final Open House will present the results of the recent questionnaire and explain how the Traffic Calming Plan will be implemented. Details at [www.cnv.org/LowerLonsdaleEast](http://www.cnv.org/LowerLonsdaleEast).



## Environmental Stewardship Award Nominations

The Environmental Stewardship Award recognizes the efforts of City residents and businesses who demonstrate leadership in environmental stewardship. Any program or project that provides a benefit to the environment may be nominated. Examples include environmental education, climate action and energy conservation, ecological restoration projects and waste reduction.

The submission deadline is **April 19 at 4pm**. Contact Clark Husk, [chusk@cnv.org](mailto:chusk@cnv.org), 604-983-7334 for more information. Details at [www.cnv.org](http://www.cnv.org).

## Parks & Environment Grant Program

The City's Parks & Environment Grant Program is an annual grant that provides funding opportunities for small-scale, community-based parks and environmental initiatives. Registered not-for-profit agencies and unincorporated local community associations, groups or service clubs may apply. The submission deadline is **April 19 at 4pm**. Contact Clark Husk, [chusk@cnv.org](mailto:chusk@cnv.org), 604-983-7334 for more information. Details at [www.cnv.org](http://www.cnv.org).

141 West 14th Street, North Vancouver BC V7M 1H9 | Tel: 604.985.7761 | Fax: 604.985.9417 | [info@cnv.org](mailto:info@cnv.org)

# Appendix B

## Open House Materials



## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010

# Welcome

Welcome to the third open house for the Lower Lonsdale East Neighbourhood Traffic Calming Plan.

The purpose of this open house is to:

- Summarize the response to the Community Questionnaire
- Present the recommended Traffic Calming Plan
- Describe the implementation of the plan
- Provide an opportunity for residents to ask questions about the Traffic Calming Plan

Your involvement is an essential part of the development of a Traffic Calming Plan.

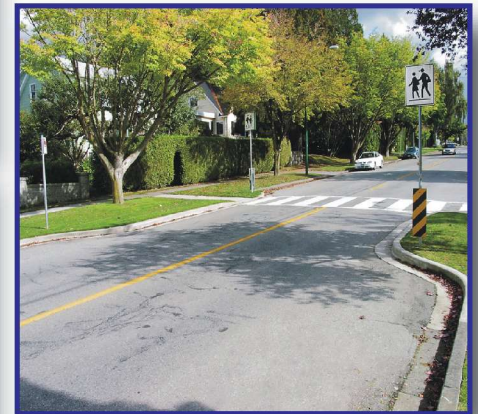
***Thanks for coming!***

# What is Traffic Calming?

## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010



## Goals:

- **Safety** - Improve safety for all road users, including pedestrians, cyclists and motorists
- **Livability** - Maintain and enhance the livability of the neighbourhood

## Actions:

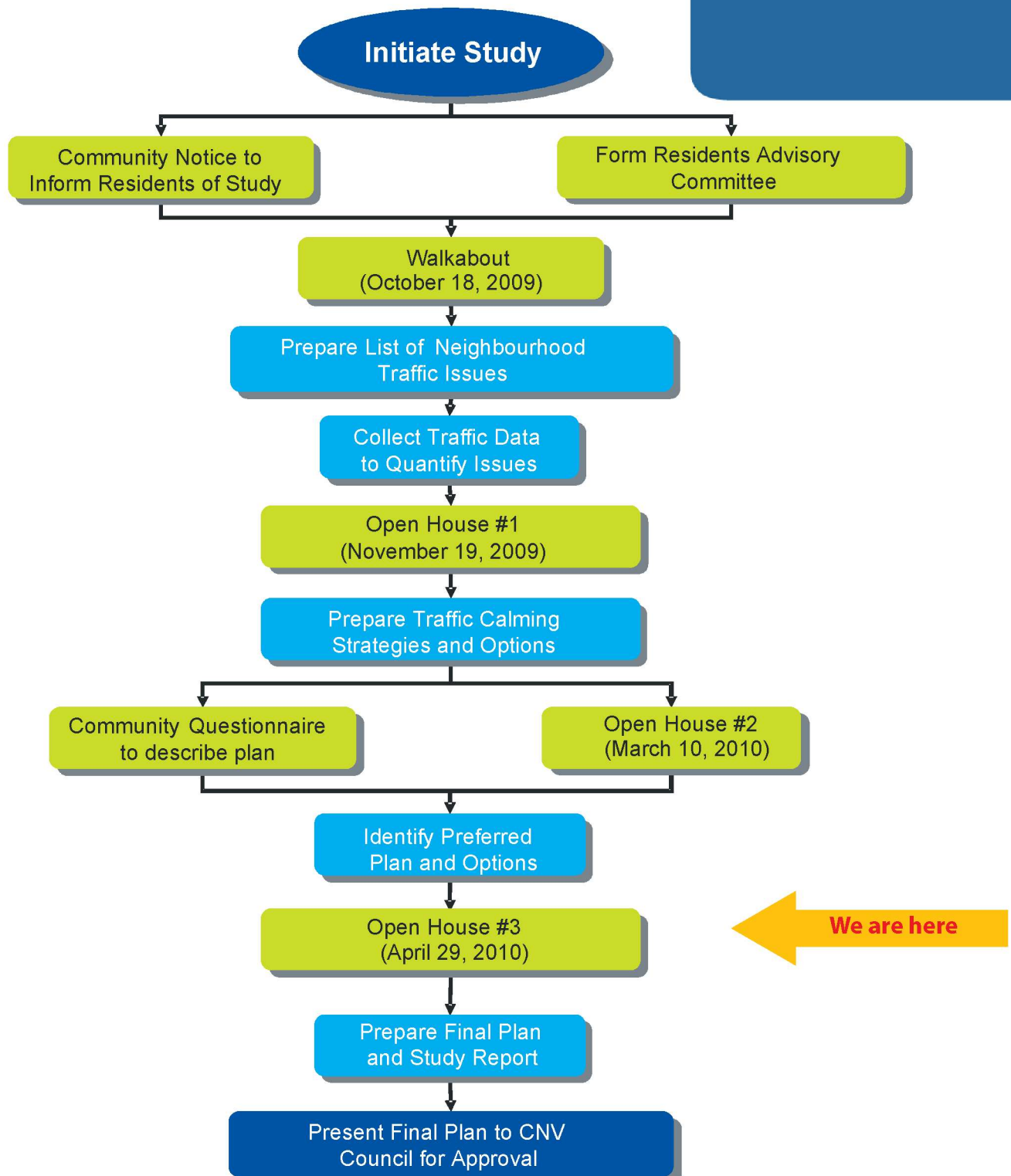
- Discourage speeding
- Discourage short-cutting
- Minimize conflicts between road users
- Enhance the street appearance

# Study Process

## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010



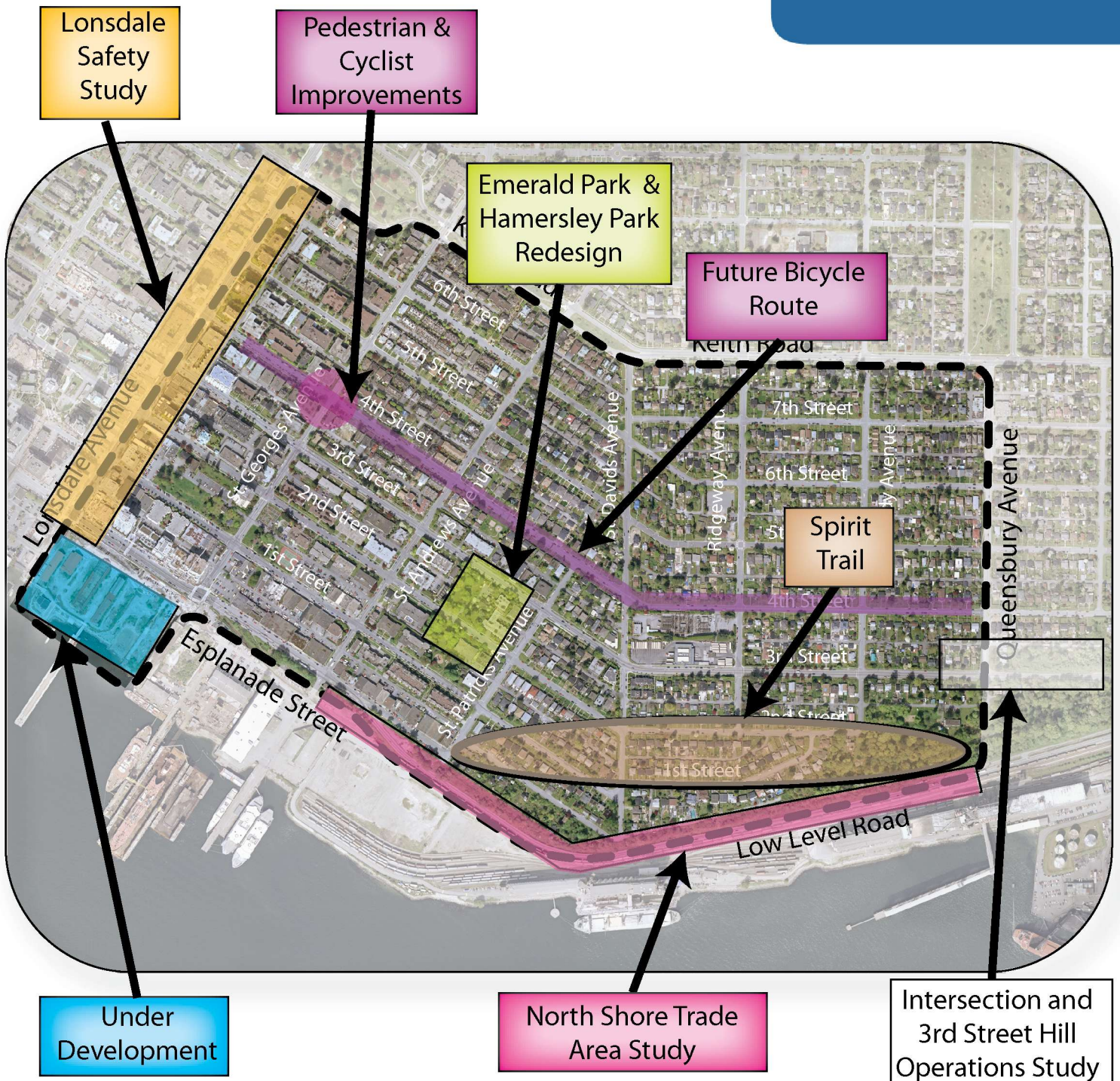
# Other Studies

## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010

The City of North Vancouver and other agencies are currently conducting a number of other studies in and around the Lower Lonsdale East neighbourhood. Some of the issues identified through this study may be addressed through these other studies.



# Roadway Characteristics

## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010

### Legend

- Arterial Road
- Transit Route
- Bicycle Route
- Greenway
- Study Area Boundary
- Park
- School
- Recreation Centre
- 30 km/h Zone











# Roadway Infrastructure

## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010

### Legend

-  Traffic Signal
-  Pedestrian Activated Signal
-  Marked Pedestrian Crossing
-  Study Area Boundary
-  2-Way Stop (north-south)
-  2-Way Stop (east-west)
-  Existing Traffic Island
-  Existing Speed Hump



# Reported Issues

## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010

### Legend

The following types of traffic concerns have been identified in your neighbourhood. These concerns were identified by the Neighbourhood Traffic Residents Association, by stakeholders, and by residents during the Neighbourhood Walkabout, Open Houses, and Questionnaires.

- Speeding
- Short-Cutting
-  Stop Sign Non-Compliance
-  Pedestrian Crossing
- Intersection Safety



A number of other issues were identified that are beyond the scope of the Traffic Calming Plan, including: visibility/lighting, curb drop locations, location of stop bar lines, location of sidewalks, and vehicles parked too close to intersections. These issues will be addressed separately.

# Speed & Volume








## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010

### Legend

Traffic data has been collected throughout the Lower Lonsdale East neighbourhood. The data shown on the map shows locations where the 24 hour 85th percentile speed is above the posted speed limit in at least one direction, and where daily traffic volumes on local roads are higher than average (greater than 1,000 vehicles per day).

Speeds		Volumes
Speed Limit	85th percencile speeds	Vehicles per day
	50 km/h >60 km/h	 1,500 + vehicles
	50 km/h 55 - 60 km/h	 1,000 - 1,500 vehicles
	50 km/h 50 - 55 km/h	
	30 km/h >40 km/h	
	30 km/h 30 - 40 km/h	



# Collision Data






## Lower Lonsdale East Traffic Calming Plan

### Legend

Collision data has been collected throughout the Lower Lonsdale East neighbourhood. Data is based on the total number of collisions reported to ICBC between 2003 and 2008. The data shown on the map identifies all locations which had an average of at least 1 collision per year between 2003 and 2008. For each of these locations, the image shows the number of collisions per million vehicles.

Open House #3

April 29, 2010

-  Greater than 2 collisions / million vehicles
-  1.5 - 2 collisions / million vehicles
-  1 - 1.5 collisions / million vehicles
-  Less than 1 collision / million vehicles
-  Pedestrian or cyclist involved in collision
















# Traffic Calming Plan

## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010

### Legend

-  Pedestrian and Bicycle Activated Signal (Existing)
-  Pedestrian and Bicycle Activated Signal (Proposed)
-  Special Crosswalk (Activated by Pedestrians and Bicycles)
-  Speed Hump (Existing)
-  Speed Hump (Proposed)
-  Marked Pedestrian Crossing
-  Curb Extension
-  Traffic Circle
-  Diverter
-  Stop Sign Re-Orientation
-  Right-In/Right-Out Island (Existing)
-  Median Island
-  Right-in/Right-Out Island (Proposed)



# Questionnaire Results

## Lower Lonsdale East Traffic Calming Plan

Open House #3

April 29, 2010

In February 2010 a questionnaire was distributed to all households and businesses in the Lower Lonsdale East neighbourhood describing the proposed Traffic Calming Plan. Respondents were asked to indicate whether they supported the Traffic Calming Plan, were neutral, or did not support the Traffic Calming Plan. Respondents were also asked to indicate their support for localized parking restrictions.

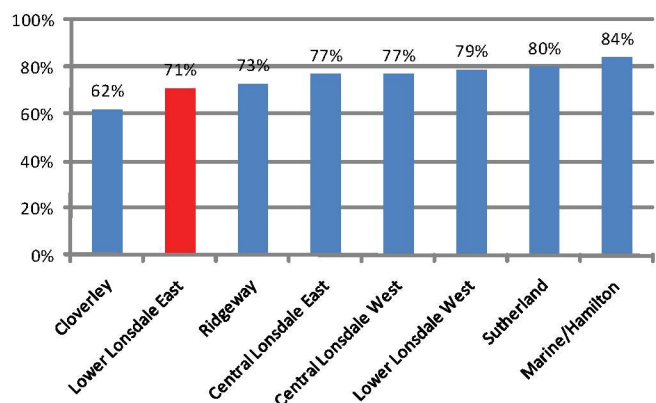
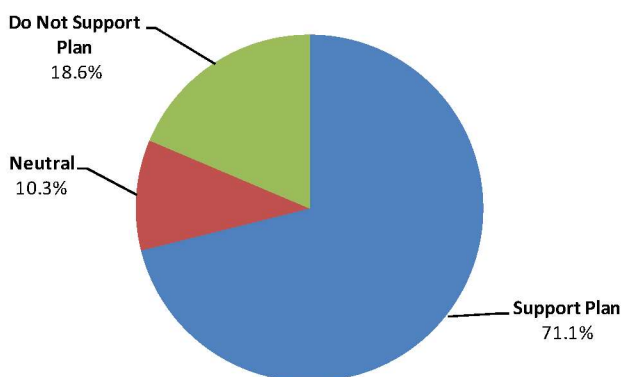
### 1. Overall response rate:

290 Questionnaires were submitted, out of nearly 4,200 that were distributed. This represents a response rate of approximately 7%.

Neighbourhood	Year	Surveys Distributed	Surveys Returned	Response Rate
Ridgeway	2001	2,000	148	7.4%
Marine/Hamilton	2002	1,100	141	12.8%
Cloverley	2003	600	92	15.3%
Central Lonsdale East	2005	2,160	248	11.5%
Sutherland	2006	170	49	28.8%
Central Lonsdale West	2007	4,090	289	7.1%
Lower Lonsdale West	2009	6,109	331	5.4%
<b>Lower Lonsdale East</b>	<b>2010</b>	<b>4,200</b>	<b>293</b>	<b>7.0%</b>

### 2. Support for the Proposed Traffic Calming Plan

Approximately 71% of respondents support the plan. This is consistent with other neighbourhoods for which Traffic Calming Plans have been prepared.



# Questionnaire Results

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### 3. Suggested changes

A number of suggestions were provided to modify the plan. The most common suggestions have been incorporated into the final Traffic Calming Plan.

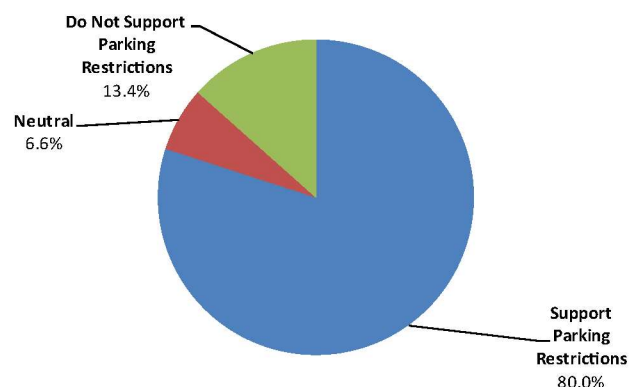
Location	Suggestion	Responses
2 <sup>nd</sup> St (St. George's Ave to St. David's Ave)	Speed humps	4
1 <sup>st</sup> St (Lonsdale Ave to St. George's Ave)	Speed humps	3
3 <sup>rd</sup> St @ Moody Ave	Flashing crosswalk sign	3
3 <sup>rd</sup> St @ St. Andrew's Ave	Traffic light	3
3 <sup>rd</sup> St @ St. David's Ave	Reduce speed limit to 30 km/h	3
4 <sup>th</sup> St (Ridgeway Ave to Queensbury Ave)	Speed humps	3
5 <sup>th</sup> St @ Lonsdale Ave	Speed reduction measures and curb extensions	3

### 4. Reasons for not supporting plan

Reasons for not supporting Traffic Calming Plan	Responses
Waste of tax dollars / tax dollars can be better spent	17
Don't support traffic circles in general	13
Don't support speed humps in general	12
Would rather see traffic calming measures in other locations	10
Don't support curb extensions in general	7
Don't support traffic calming in general	7
Don't agree with parking restrictions; already lack of parking	6
Don't think traffic calming plan is needed – issues don't warrant plan	5
Tall vegetation blocks drivers view at traffic circle	4
Would like to see 4-way stops implemented	4
Don't support traffic circles at certain locations	3

### 5. Support for Parking Restrictions

Approximately 80% of respondents support localized parking restrictions.



# Next Steps

## Lower Lonsdale East Traffic Calming Plan

Open House #3

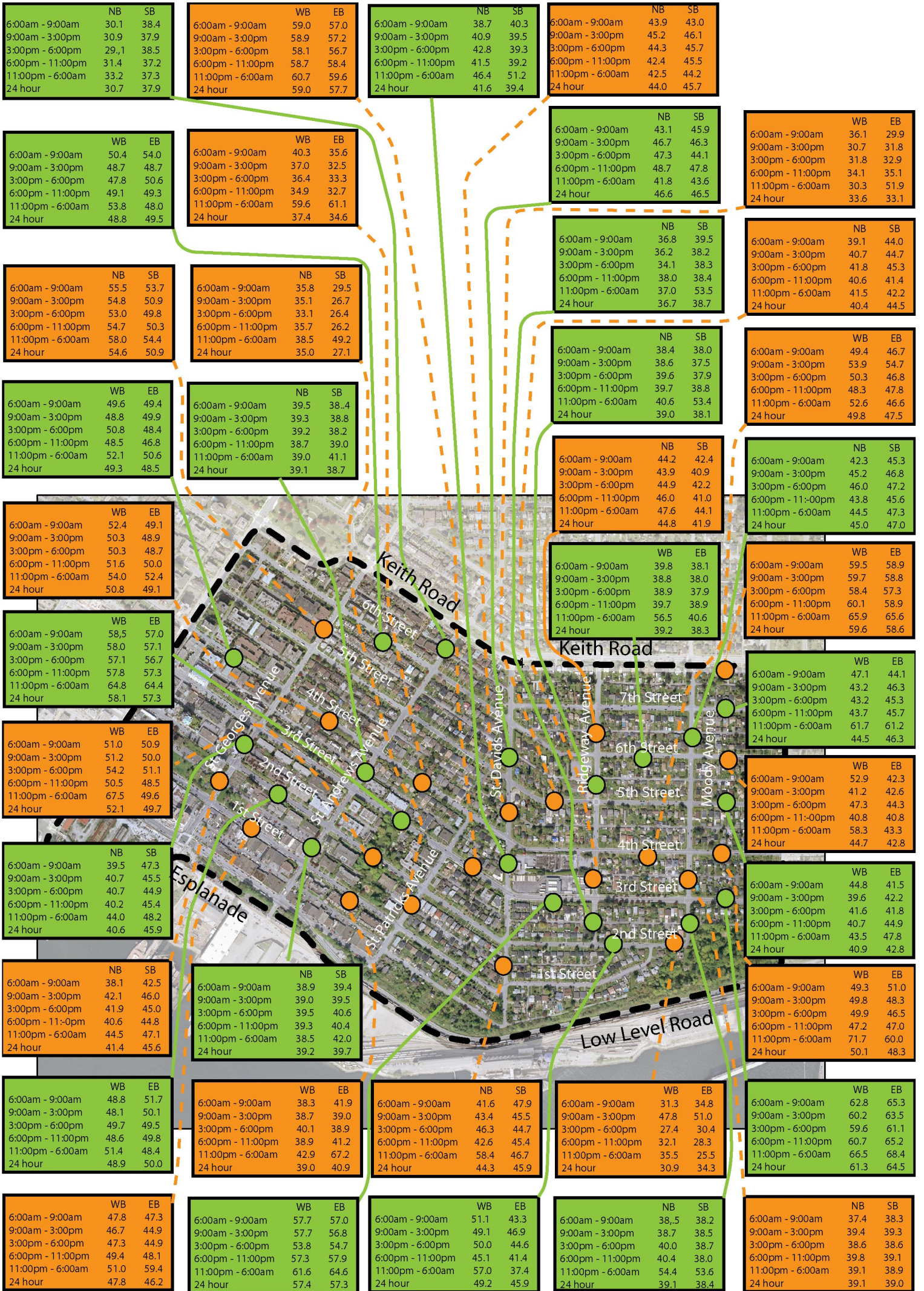
April 29, 2010

Implementation of the Traffic Calming Plan will involve the following steps:

- Prepare a Final Traffic Calming Plan Report and present to Council in June 2010
- Implementation plan to be developed subsequent to the third open house
- Many of the items included in the Traffic Calming Plan may be implemented through other initiatives, such as the Spirit Trail, 4th Street Bike Lane, or through other development opportunities.
- When implemented, some traffic calming measures (i.e. Traffic Circles) may be implemented on a temporary basis at first, and constructed permanently once the geometry has been tested
- Follow-up monitoring will be completed approximately one year after implementation, with adjustments and additional measures if needed to address any outstanding issues
- On-going liaison with residents through the Neighbourhood Traffic Residents Association

# Appendix C

## Data



	NB	SB
6:00am - 9:00am	30.1	38.4
9:00am - 3:00pm	30.9	37.9
3:00pm - 6:00pm	29.1	38.5
6:00pm - 11:00pm	31.4	37.2
11:00pm - 6:00am	33.2	37.3
24 hour	30.7	37.9

	WB	EB
6:00am - 9:00am	59.0	57.0
9:00am - 3:00pm	58.9	57.2
3:00pm - 6:00pm	58.1	56.7
6:00pm - 11:00pm	58.7	58.4
11:00pm - 6:00am	60.7	59.6
24 hour	59.0	57.7

	NB	SB
6:00am - 9:00am	38.7	40.3
9:00am - 3:00pm	40.9	39.5
3:00pm - 6:00pm	42.8	39.3
6:00pm - 11:00pm	41.5	39.2
11:00pm - 6:00am	46.4	51.2
24 hour	41.6	39.4

	NB	SB
6:00am - 9:00am	43.9	43.0
9:00am - 3:00pm	45.2	46.1
3:00pm - 6:00pm	44.3	45.7
6:00pm - 11:00pm	42.4	45.5
11:00pm - 6:00am	42.5	44.2
24 hour	44.0	45.7

	WB	EB
6:00am - 9:00am	50.4	54.0
9:00am - 3:00pm	48.7	48.7
3:00pm - 6:00pm	47.8	50.6
6:00pm - 11:00pm	49.1	49.3
11:00pm - 6:00am	53.8	48.0
24 hour	48.8	49.5

	WB	EB
6:00am - 9:00am	40.3	35.6
9:00am - 3:00pm	37.0	32.5
3:00pm - 6:00pm	36.4	33.3
6:00pm - 11:00pm	34.9	32.7
11:00pm - 6:00am	59.6	61.1
24 hour	37.4	34.6

	NB	SB
6:00am - 9:00am	43.1	45.9
9:00am - 3:00pm	46.7	46.3
3:00pm - 6:00pm	47.3	44.1
6:00pm - 11:00pm	48.7	47.8
11:00pm - 6:00am	41.8	43.6
24 hour	46.6	46.5

	WB	EB
6:00am - 9:00am	36.1	29.9
9:00am - 3:00pm	30.7	31.8
3:00pm - 6:00pm	31.8	32.9
6:00pm - 11:00pm	34.1	35.1
11:00pm - 6:00am	30.3	51.9
24 hour	33.6	33.1

	NB	SB
6:00am - 9:00am	55.5	53.7
9:00am - 3:00pm	54.8	50.9
3:00pm - 6:00pm	53.0	49.8
6:00pm - 11:00pm	54.7	50.3
11:00pm - 6:00am	58.0	54.4
24 hour	54.6	50.9

	NB	SB
6:00am - 9:00am	35.8	29.5
9:00am - 3:00pm	35.1	26.7
3:00pm - 6:00pm	33.1	26.4
6:00pm - 11:00pm	35.7	26.2
11:00pm - 6:00am	38.5	49.2
24 hour	35.0	27.1

	NB	SB
6:00am - 9:00am	36.8	39.5
9:00am - 3:00pm	36.2	38.2
3:00pm - 6:00pm	34.1	38.3
6:00pm - 11:00pm	38.0	38.4
11:00pm - 6:00am	37.0	53.5
24 hour	36.7	38.7

	NB	SB
6:00am - 9:00am	39.1	44.0
9:00am - 3:00pm	40.7	44.7
3:00pm - 6:00pm	41.8	45.3
6:00pm - 11:00pm	40.6	41.4
11:00pm - 6:00am	41.5	42.2
24 hour	40.4	44.5

	WB	EB
6:00am - 9:00am	49.6	49.4
9:00am - 3:00pm	48.8	49.9
3:00pm - 6:00pm	50.8	48.4
6:00pm - 11:00pm	48.5	46.8
11:00pm - 6:00am	52.1	50.6
24 hour	49.3	48.5

	NB	SB
6:00am - 9:00am	39.5	38.4
9:00am - 3:00pm	39.3	38.8
3:00pm - 6:00pm	39.2	38.2
6:00pm - 11:00pm	38.7	39.0
11:00pm - 6:00am	39.0	41.1
24 hour	39.1	38.7

	NB	SB
6:00am - 9:00am	38.4	38.0
9:00am - 3:00pm	38.6	37.5
3:00pm - 6:00pm	39.6	37.9
6:00pm - 11:00pm	39.7	38.8
11:00pm - 6:00am	40.6	53.4
24 hour	39.0	38.1

	WB	EB
6:00am - 9:00am	49.4	46.7
9:00am - 3:00pm	53.9	54.7
3:00pm - 6:00pm	50.3	46.8
6:00pm - 11:00pm	48.3	47.8
11:00pm - 6:00am	52.6	46.6
24 hour	49.8	47.5

	WB	EB
6:00am - 9:00am	52.4	49.1
9:00am - 3:00pm	50.3	48.9
3:00pm - 6:00pm	50.3	48.7
6:00pm - 11:00pm	51.6	50.0
11:00pm - 6:00am	54.0	52.4
24 hour	50.8	49.1

	WB	EB
6:00am - 9:00am	58.5	57.0
9:00am - 3:00pm	58.0	57.1
3:00pm - 6:00pm	57.1	56.7
6:00pm - 11:00pm	57.8	57.3
11:00pm - 6:00am	64.8	64.4
24 hour	58.1	57.3

	NB	SB
6:00am - 9:00am	44.2	42.4
9:00am - 3:00pm	43.9	40.9
3:00pm - 6:00pm	44.9	42.2
6:00pm - 11:00pm	46.0	41.0
11:00pm - 6:00am	47.6	44.1
24 hour	44.8	41.9

	NB	SB
6:00am - 9:00am	42.3	45.3
9:00am - 3:00pm	45.2	46.8
3:00pm - 6:00pm	46.0	47.2
6:00pm - 11:00pm	43.8	45.6
11:00pm - 6:00am	44.5	47.3
24 hour	45.0	47.0

	WB	EB
6:00am - 9:00am	51.0	50.9
9:00am - 3:00pm	51.2	50.0
3:00pm - 6:00pm	54.2	51.1
6:00pm - 11:00pm	50.5	48.5
11:00pm - 6:00am	67.5	49.6
24 hour	52.1	49.7

	WB	EB
6:00am - 9:00am	57.1	56.7
9:00am - 3:00pm	57.8	57.3
3:00pm - 6:00pm	57.1	56.7
6:00pm - 11:00pm	57.8	57.3
11:00pm - 6:00am	64.8	64.4
24 hour	58.1	57.3

	WB	EB
6:00am - 9:00am	39.8	38.1
9:00am - 3:00pm	38.8	38.0
3:00pm - 6:00pm	38.9	37.9
6:00pm - 11:00pm	39.7	38.9
11:00pm - 6:00am	56.5	40.6
24 hour	39.2	38.3

	WB	EB
6:00am - 9:00am	59.5	58.9
9:00am - 3:00pm	59.7	58.8
3:00pm - 6:00pm	58.4	57.3
6:00pm - 11:00pm	60.1	58.9
11:00pm - 6:00am	65.9	65.6
24 hour	59.6	58.6

	WB	EB
6:00am - 9:00am	51.0	50.9
9:00am - 3:00pm	51.2	50.0
3:00pm - 6:00pm	54.2	51.1
6:00pm - 11:00pm	50.5	48.5
11:00pm - 6:00am	67.5	49.6
24 hour	52.1	49.7

	WB	EB
6:00am - 9:00am	58.5	57.0
9:00am - 3:00pm	58.0	57.1
3:00pm - 6:00pm	57.1	56.7
6:00pm - 11:00pm	57.8	57.3
11:00pm - 6:00am	64.8	64.4
24 hour	58.1	57.3

	NB	SB
6:00am - 9:00am	39.5	47.3
9:00am - 3:00pm	40.7	45.5
3:00pm - 6:00pm	40.7	44.9
6:00pm - 11:00pm	40.2	45.4
11:00pm - 6:00am	44.0	48.2
24 hour	40.6	45.9

	WB	EB
6:00am - 9:00am	47.1	44.1
9:00am - 3:00pm	43.2	46.3
3:00pm - 6:00pm	43.2	45.3
6:00pm - 11:00pm	43.7	45.7
11:00pm - 6:00am	61.7	61.2
24 hour	44.5	46.3

	WB	EB
6:00am - 9:00am	51.0	50.9
9:00am - 3:00pm	51.2	50.0
3:00pm - 6:00pm	54.2	51.1
6:00pm - 11:00pm	50.5	48.5
11:00pm - 6:00am	67.5	49.6
24 hour	52.1	49.7

	NB	SB
6:00am - 9:00am	39.5	47.3
9:00am - 3:00pm	40.7	45.5
3:00pm - 6:00pm	40.7	44.9
6:00pm - 11:00pm	40.2	45.4
11:00pm - 6:00am	44.0	48.2
24 hour	40.6	45.9

	WB	EB
6:00am - 9:00am	52.9	42.3
9:00am - 3:00pm	41.2	42.6
3:00pm - 6:00pm	47.3	44.3
6:00pm - 11:00pm	40.8	40.8
11:00pm - 6:00am	58.3	43.3
24 hour	44.7	42.8

	WB	EB
6:00am - 9:00am	44.8	41.5
9:00am - 3:00pm	39.6	42.2
3:00pm - 6:00pm	41.6	41.8
6:00pm - 11:00pm	40.7	44.9
11:00pm - 6:00am	43.5	47.8
24 hour	40.9	42.8

	NB	SB
6:00am - 9:00am	38.1	42.5
9:00am - 3:00pm	42.1	46.0
3:00pm - 6:00pm	41.9	45.0
6:00pm - 11:00pm	40.6	44.8
11:00pm - 6:00am	44.5	47.1
24 hour	41.4	45.6

	NB	SB
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9:00am - 3:00pm	39.0	39.5
3:00pm - 6:00pm	39.5	40.6
6:00pm - 11:00pm	39.3	40.4
11:00pm - 6:00am	38.5	42.0
24 hour	39.2	39.7

	WB	EB
6:00am - 9:00am	48.8	51.7
9:00am - 3:00pm	48.1	50.1
3:00pm - 6:00pm	49.7	49.5
6:00pm - 11:00pm	48.6	49.8
11:00pm - 6:00am	51.4	48.4
24 hour	48.9	50.0

	WB	EB
6:00am - 9:00am	49.3	51.0
9:00am - 3:00pm	49.8	48.3
3:00pm - 6:00pm	49.9	46.5
6:		

	NB	SB	Total
AM Peak	21	7	28
PM Peak	62	19	80
24 hour	856	265	1121

	WB	EB	Total
AM Peak	308	497	804
PM Peak	353	512	865
24 hour	4814	6961	11775

	WB	EB	Total
AM Peak	17	17	34
PM Peak	24	22	46
24 hour	273	322	595

	WB	EB	Total
AM Peak	10	21	31
PM Peak	27	25	52
24 hour	3146	298	614

	NB	SB	Total
AM Peak	120	176	296
PM Peak	290	259	549
24 hour	2792	3462	6254

	NB	SB	Total
AM Peak	7	13	20
PM Peak	28	23	51
24 hour	268	264	532

	WB	EB	Total
AM Peak	32	34	66
PM Peak	59	46	105
24 hour	740	688	1428

	NB	SB	Total
AM Peak	19	67	86
PM Peak	68	57	125
24 hour	639	887	1526

	WB	EB	Total
AM Peak	17	24	41
PM Peak	52	27	79
24 hour	443	421	864

	WB	EB	Total
AM Peak	287	427	714
PM Peak	536	474	1010
24 hour	6314	7015	13329

	WB	EB	Total
AM Peak	15	41	56
PM Peak	50	43	92
24 hour	551	584	1134

	NB	SB	Total
AM Peak	63	140	203
PM Peak	191	232	423
24 hour	2206	3109	5315

	NB	SB	Total
AM Peak	50	153	203
PM Peak	184	184	368
24 hour	1808	2491	4299

	NB	SB	Total
AM Peak	22	52	74
PM Peak	57	32	89
24 hour	559	602	1161

	WB	EB	Total
AM Peak	25	59	84
PM Peak	80	62	142
24 hour	933	953	1886

	WB	EB	Total
AM Peak	29	33	62
PM Peak	49	25	74
24 hour	470	354	824

	NB	SB	Total
AM Peak	13	11	24
PM Peak	23	22	45
24 hour	292	304	596

	WB	EB	Total
AM Peak	6	12	18
PM Peak	16	21	37
24 hour	150	266	416

	WB	EB	Total
AM Peak	347	423	770
PM Peak	395	554	949
24 hour	5360	7401	12761

	WB	EB	Total
AM Peak	53	37	90
PM Peak	92	49	141
24 hour	1042	787	1829

	WB	EB	Total
AM Peak	336	451	787
PM Peak	478	523	1001
24 hour	6482	7372	13854

	WB	EB	Total
AM Peak	3	8	11
PM Peak	29	10	39
24 hour	208	127	335

	NB	SB	Total
AM Peak	11	6	17
PM Peak	17	23	40
24 hour	227	204	431

	NB	SB	Total
AM Peak	8	19	27
PM Peak	18	25	43
24 hour	262	352	614

	NB	SB	Total
AM Peak	9	17	26
PM Peak	66	27	93
24 hour	361	345	706

	NB	SB	Total
AM Peak	15	15	30
PM Peak	23	24	47
24 hour	359	266	625

	NB	SB	Total
AM Peak	37	17	54
PM Peak	33	17	49
24 hour	345	252	597

	WB	EB	Total
AM Peak	5	5	10
PM Peak	14	12	26
24 hour	179	163	342

	NB	SB	Total
AM Peak	6	4	10
PM Peak	3	11	14
24 hour	60	138	198

	NB	SB	Total
AM Peak	17	49	66
PM Peak	58	58	116
24 hour	458	718	1176

	NB	SB	Total
AM Peak	15	26	41
PM Peak	24	25	49
24 hour	373	353	726

	WB	EB	Total
AM Peak	8	10	18
PM Peak	18	21	39
24 hour	212	186	399

	NB	SB	Total
AM Peak	21	29	50
PM Peak	53	68	121
24 hour	510	673	1183

	NB	SB	Total
AM Peak	10	8	18
PM Peak	22	35	57
24 hour	301	351	652

	WB	EB	Total
AM Peak	7	5	12
PM Peak	11	14	25
24 hour	162	176	338

	WB	EB	Total
AM Peak	223	355	578
PM Peak	441	564	1005
24 hour	5642	6127	11769

	WB	EB	Total
AM Peak	4	5	9
PM Peak	6	19	25
24 hour	98	177	275

	WB	EB	Total
AM Peak	2	3	5
PM Peak	10	11	21
24 hour	111	116	227

	WB	EB	Total
AM Peak	3	5	8
PM Peak	10	9	19
24 hour	120	130	250

	WB	EB	Total
AM Peak	14	12	26
PM Peak	42	13	55
24 hour	265	169	434

	WB	EB	Total
AM Peak	3	5	8
PM Peak	10	9	19
24 hour	120	130	250

	WB	EB	Total
AM Peak	14	12	26
PM Peak	42	13	55
24 hour	265	169	434

	WB	EB	Total
AM Peak	14	12	26
PM Peak	42	13	55
24 hour	265	169	434

	WB	EB	Total
AM Peak	14	12	26
PM Peak	42	13	55
24 hour	265	169	434

	WB	EB	Total
AM Peak	29	33	62
PM Peak	49	25	74
24 hour	470	354	824

	WB	EB	Total
AM Peak	29	33	62
PM Peak	49	25	74
24 hour	470	354	824

	WB	EB	Total
AM Peak	29	33	62
PM Peak	49	25	74
24 hour	470	354	824

	WB	EB	Total
AM Peak	29	33	62
PM Peak	49	25	74
24 hour	470	354	824

	WB	EB	Total
AM Peak	29	33	62
PM Peak	49	25	74
24 hour	470	354	824

	WB	EB	Total
AM Peak	29	33	62
PM Peak	49	25	74
24 hour	470	354	824

	WB	EB	Total
AM Peak	29	33	62
PM Peak	49	25	74
24 hour	470	354	824

	WB	EB	Total
AM Peak	29	33	62
PM Peak	49	25	74
24 hour	470	354	824

