Fostering Active Transportation in a Small Town: Pilot Project with Clearwater, BC,

ACKNOWLEDGEMENTS

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Photo Credit:

Ian Roth – Figure 8 taken in Clearwater, BC (2013)

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PROJECT SUMMARY

This project has been undertaken for the Heart and Stroke Foundation (HSF) through the Healthy Canada by Design (HCBD) CLASP Initiative that is funded by Health Canada through the Canadian Partnership Against Cancer's (CPAC) *Coalitions Linking Action and Science for Prevention* (CLASP) program. It has been conducted by Opus International Consultants with support from the BC Interior Health Authority (IHA) and the Heart and Stroke Foundation.

The project team partnered in a collaborative study with the District of Clearwater to develop a Transportation Plan focused on active transportation that establishes the groundwork for attaining long term health benefits by planning and designing for active modes of transportation. Leaders from IHA and HCBD imparted localized statistical health evidence to Clearwater Council, which was used to demonstrate how motorized vehicle transport facilities negatively impact long-term health, and how they are being addressed by the transportation plan developed by Opus for Clearwater. The plan consists of a revised road network plan and a multi-modal cross-section framework.

Following the preparation of the draft transportation plan and framework, the project team facilitated an innovative public open house by presenting the study's findings at the outdoor farmer's market, with activity stations spread throughout the community. At each station, potential cross-sections or retrofits of the current road were shown for discussion and feedback from open house participants. The IHA representative lead an activity by which participants were asked to think about the transportation needs of other people in the community.

1 PROJECT INTRODUCTION

The District of Clearwater is located in the central interior of British Columbia, about 125 kilometres north of Kamloops, as shown in Figure 1. Clearwater is a small rural community, nestled in a forested valley with a population of 2,331 and density of 41.9 persons per square kilometer (Statistics Canada, 2011). Additionally, the community's population experienced a growth trend of 4.8% between 2006 and 2011. The community is situated at the junction point of Highway 5 and Clearwater Valley Road, the later of which is used to access Wells Gray Provincial Park, a popular recreational destination. In 2007, Clearwater was incorporated as a District. Previous to incorporation, it was an identified community within the Thompson-Nicola Regional District.

Figure 1: Location of Clearwater

Over a five year transition period from 2008 to 2013, the BC Ministry of Transportation and Infrastructure (MoTI) maintained and operated the District's road network. However, this

contract expired in 2013 and the District became responsible for maintaining and operating roads located within the municipal area, excluding Highway 5 or Clearwater Valley Road north of Highway 5. This change in responsibility for managing Clearwater's road network prompted the District to undertake a planning study for the road network, accounting for future growth and existing road facilities.

With the opportunity to set out a new plan for Clearwater's road network, the Council decided, from the beginning, that the plan should place a greater emphasis on active transportation and sustainability. Opus was retained by the District to develop an innovative plan to meet the community's objectives for a better transportation network.

1.1 STUDY IMPORTANCE

The Clearwater transportation plan study signals a conscious shift in community transportation planning. Instead of preparing a traditional car-centric road network plan, Clearwater approached the study from a holistic perspective, realizing that the road network not only affects transportation, it affects the community's physical and social health, local economy, tourism, attractiveness, municipal budget, land use, and more. Thus, Clearwater and Opus partnered with a specialist from the Healthy Built Communities program of the Interior Health Authority (IHA), and the project manager of the Healthy Canada by Design (HCBD), to collaborate and communicate specialized knowledge in the preparation of this transportation plan.

These two partners, with specialized backgrounds in long-term health and community development, translated their evidence-based research into key focus areas that align with transportation engineering knowledge. The result of this partnership led to a completed transportation study that identified short-term and long-term projects that will provide respective short-term and long-term improvements to community health and mobility.

1.2 BACKGROUND HEALTH EVIDENCE

In order to understand the potential impact of the active transportation plan for Clearwater, the study team first reviewed background health information for the regional area.

The Interior Health Authority publicly provided a series of Local Health Area (LHA) profiles for regional catchment areas within the authority's jurisdiction (Interior Health Authority, 2012). Clearwater falls within the North Thompson LHA where a significant number of the LHA's population resides in Clearwater. Thus it should be noted that although the health evidence provided in this report reflects the entire LHA, the information is closely representative of Clearwater. The profiles provide information and graphics on key health characteristics including: health status/social determinants of health, health system performance, and health services.

Figure 2 illustrates the prevalence rates of chronic disease for depression/anxiety, diabetes mellitus, and heart failure for the North Thompson LHA, the entire IHA jurisdiction, and for all of British Columbia. Chronic disease rates indicate long-term trends in health conditions, and, as the population ages, IHA expects chronic disease rates to increase. For the North Thompson

LHA, depression/anxiety rates are lower than for the province and for IHA. However, diabetes mellitus and heart failure rates are close to the rates of the province and IHA.

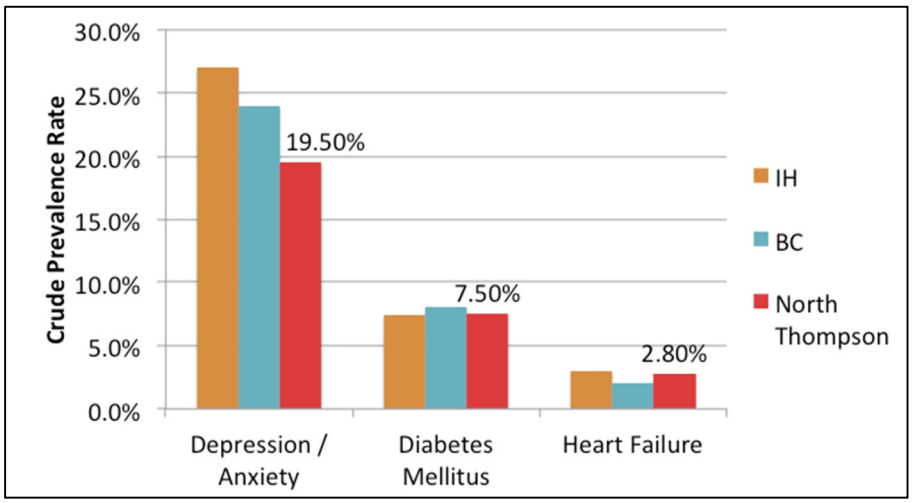

Figure 2: North Thompson chronic disease rates (Interior Health Authority, 2012)

Figure 3 provides health status/social determinants obtained through the Canadian Community Health Survey for the Thompson Cariboo Shuswap Health Service Area (HSA). The North Thompson LHA is located within this HSA, which represents a wider area; however, the data is still relevant to Clearwater. The information is collected through self-reported surveys, which provide a more tangible representation of health-related behaviour for the HSA. The survey data suggests that residents of the Thompson Cariboo Shuswap HSA consume fewer fruits and vegetables per day than residents of the province and the IHA. The HSA survey indicates that 64% of respondents obtain some form of physical activity during leisure time. However, 56.9% of respondents 18 years and above indicate report that they are overweight or obese, which significantly exceeds the rates for IHA (52.9%), and for entire province as a whole (46.6%). There are numerous factors that could contribute to the high percentage of overweight and obese individuals.

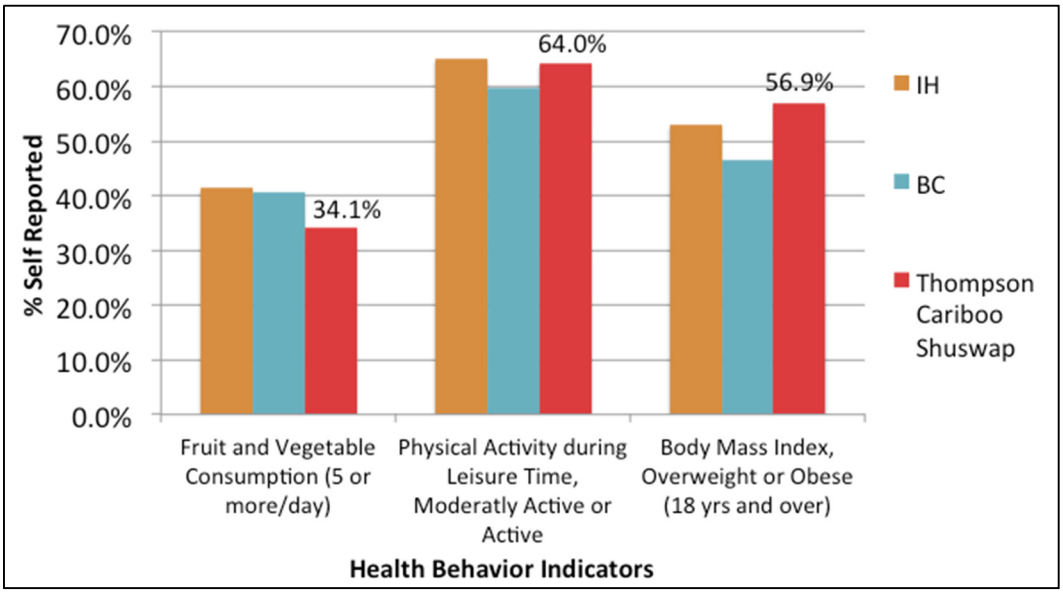

Figure 3: Thompson Cariboo Shuswap health behaviours (Interior Health Authority, 2012)

The self reported health behaviours show a location-based trend that could be contributing to the high percentage of overweight and obese individuals. The North Thompson area profile covers an area that is predominantly rural in land and road use, which can result in a significant majority of trips being taken by vehicle. In addition, communities and services in the area are separated over longer distances, which may lead to longer periods spent sitting in vehicles relative to other parts of the province.

One of the most interesting health data observations for the North Thompson area is found in the standardized mortality ratios (SMRs). The Interior Health Authority defines the SMR as follows:

> *"The Standardized Mortality Ratio is the ratio of the number of deaths occurring to residents of a geographic area (i.e. LHA) to the expected number of deaths in that area based on provincial age-specific mortality rates. An SMR less than 1 indicates fewer observed deaths than expected while an SMR greater than 1 indicates more deaths than expected."* (Interior Health Authority, 2012)

Table 1: Standard mortality ratio for the North Thompson (Interior Health Authority, 2012)

Motor Vehicle Accidents	4.27
Arteries / Arterioles / Capillaries	3.01
Chronic Lung Disease	2.59
Digestive System	2.47
Alcohol- Related Deaths	2.23
Respiratory System	2.07
Smoking-Attributable Deaths	1.57
All Causes of Death	1.48
Circulatory System	1.48
Provincial Total	1.00

Table 1 indicates the SMRs for the North Thompson LHA, which are significantly indicative of the SMRs for Clearwater. Of

serious concern is the SMR for motor vehicle accidents at 4.27. This is one of the highest ratios in the province for this cause of death. This SMR is followed by deaths due to chronic diseases, the digestive system, alcohol, and the respiratory system.

The key observations derived from the North Thompson LHA health indicators provide a better understanding of the health issues in Clearwater.. It also suggests that there could be health-related benefits associated with the development of a transportation plan study that fosters active transportation and reduces reliance on vehicles.

2 METHODOLOGY AND FINDINGS

Clearwater's transportation study was developed over the summer of 2013 and consisted mainly of three components that intertwined together: 1) A re-rationalized road network classification map; 2) A multi-modal road cross-section framework and; 3) An effective stakeholder workshop and community engagement process (discussed later).

Clearwater inherited its road network classification from the Thompson-Nicola Regional District when it incorporated in 2007. The original classification scheme over-classified a few roads as arterials when they were more characteristic of collector roads. The District also desired to provide guidance for future road network connections along Highway 5, which runs through the middle of Clearwater and has significant development potential. Thus, Opus revised the road classification system to better represent the actual use and design of each road. The updated road classification was then used as the basis for preparing the multi-modal road cross-section framework.

The framework that Opus developed for Clearwater uses a range of criteria including defined context zones, land use, road speed, and road classification that are used to identify appropriate cross-sections for each road within the municipality. This framework provides dimensions for each section of the roadway and allows Clearwater to develop multiple multi-modal roadway facility options for any road within the District, prior to conducting conceptual or pre-design projects. Thus, the framework, which is built into the municipality's subdivision and servicing bylaw, sets out clear and flexible guidance on road design with walking and cycling facilities integrated as a core design element.

2.1 LINKING HEALTH TO TRANSPORTATION IN CLEARWATER

Through Clearwater and Opus' partnership with Interior Health Authority and Healthy Canada by Design, the study identified three main health issues that the transportation study seeks to improve: 1) High rates of chronic disease; 2) high rates of vehicle-related deaths; and; 3) Stormwater management.

2.1.1 Chronic Disease Reduction

Chronic diseases are long-term diseases including diabetes, heart disease, depression, dementia, etc., that affect Canadians on a daily basis. Overweight, obesity, physical inactivity and poor eating habits are risks factors that contribute to chronic diseases. For example, common health

research and evidence shows that increasing physical activity opportunities reduces obesity and early onset of chronic diseases. Only 15% of Canadian adults and 7% of children and youth get the recommended amount of physical activity (Statistics Canada, 2011). Further, the risk of obesity has been shown to increase by 6% for each hour spent in a car per day (Lawrence, 2006). Thus, a correlation exists between vehicle transport, a sedentary activity, and an increase in the risk for obesity.

This risk can be reduced through better infrastructure design that will encourage people to obtain more daily physical activity and less time spent in sedentary activities. Transportation design plays a significant role in shaping how residents move throughout a community. A community with a car-centric road network will likely encourage residents to drive and keep driving, even for short distances. It is often the case that by prioritizing motorized vehicle facilities on the community road network, other modes of transport (i.e. walking, scooter, cycling) are discouraged due to physical and psychological barriers (examples: multi-lane roadways, lack of marked crosswalks, personal safety, no sidewalks).

In Clearwater, the road network is predominantly designed for motorized vehicle transport. Currently, there are little to no sidewalks within the municipality, no marked bicycle lanes, and few marked road crossing locations. In addition, Clearwater has a number of physical and topographical barriers as shown in Figure 4. Clearwater's topography essentially splits the community into three plateau areas with no pedestrian or cycle friendly routes to connect these three plateaus.

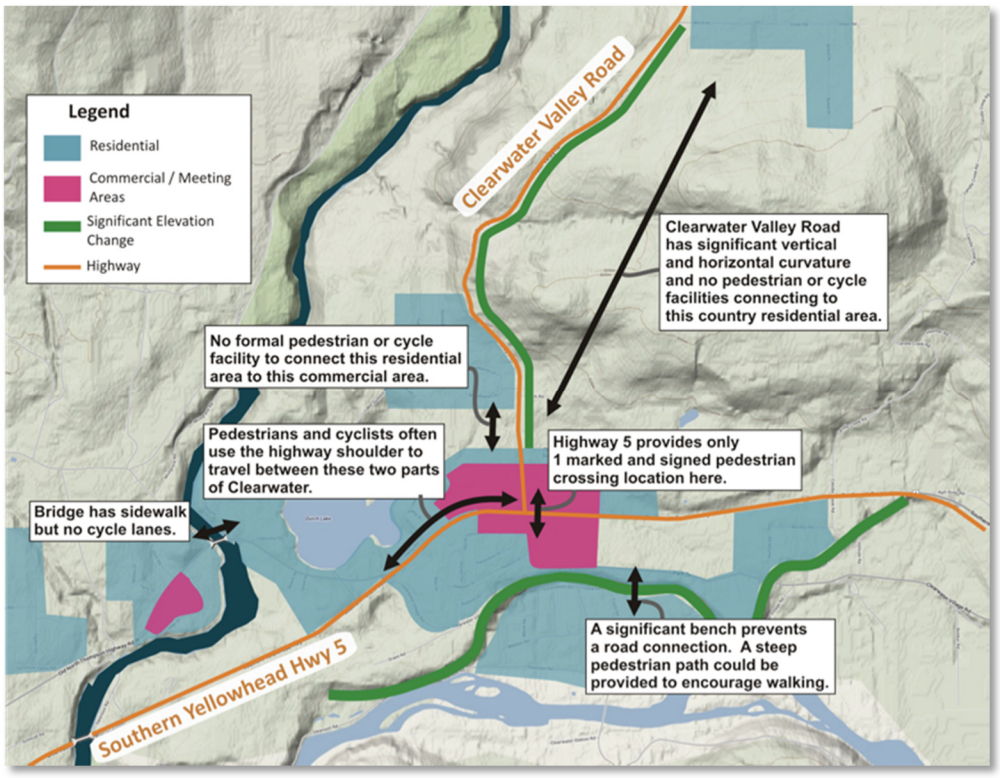

Figure 4: Topographic and physical barriers for pedestrians and cyclists

Clearwater's transportation study provides a new foundation for future road network development and existing road facility improvements. The road cross-section framework that is built into the subdivision and servicing bylaw requires and encourages pedestrian and cycle facilities be constructed. The study also identifies key projects that are likely to receive good community buy-in and be cost effective for the municipality that has a small tax base.

2.1.2 Injury Prevention

Road safety and injury prevention is a high priority issue for almost all communities where the majority of transportation is done by car. In Canada, motor vehicle collisions account for 40% of all major injuries, followed by unintentional falls. Additionally, 32% of all injury-related deaths in Canada occur due to motor vehicle collisions (Vancouver Coastal Health, 2010). This high rate of injury due to motor vehicle collisions contributes to growing health care and economic costs. More importantly, motor vehicle collisions are a preventable sources of injuries that and can be reduced with better road design, signage, driver behaviour, and in the case of this study, better transportation planning.

In Clearwater, the project team identified a few key road projects that would be ideal for the inclusion of walking and cycling facilities. One such project is Robson Street and Murtle Road, two local roads that currently provide access to single family homes. However, many drivers are using these streets as a 'cut-through' road to get to the North Thompson Sportsplex, secondary school, and other services located on Park Drive as shown in Figure 5. This "cut-through" behaviour results in more trips than normal for this road and, based on anecdotal evidence from the community engagement process, invites motorists to drive at or above the speed limit of 50 km/h. In addition, the existing design of Robson Street and Murtle Road primarily serves the automobile with approximately 4.0 metres of driving space in each lane and wide gravel shoulders on both sides. There are no sidewalks or dedicated space for pedestrians and cyclists and the majority of homes along the street have significant setbacks and driveways for vehicles to park on private property.

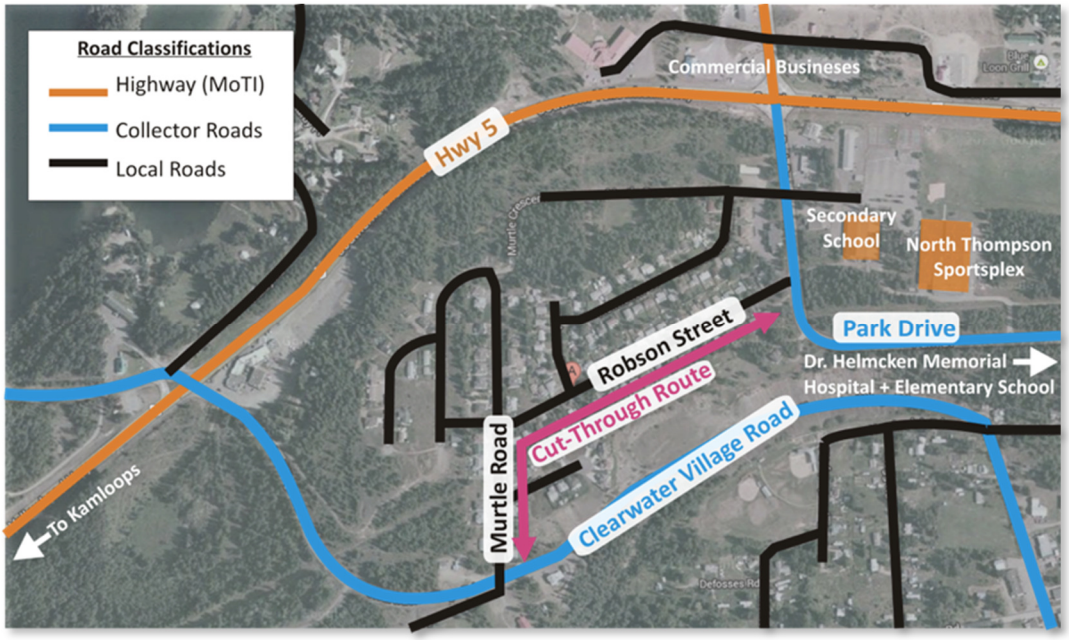

Figure 5: Location of Robson Street, Murtle Road, and major destinations

Using the road cross-section framework developed for Clearwater, the consulting team identified a retrofit option for Robson Street and Murtle Road that provides separation of travel modes and recommends traffic calming measures to reduce vehicle speeds and 'cut-through' trips. Figure 6 shows the existing cross-section for the streets and potential after cross-section that maintains the existing paved road width.

The retrofit reuses the existing pavement width but changes how the space is used for different transportation modes. Retrofitting the use of the roadway instead conducting a complete redesign allows the District to implement active transportation facilities at a fraction of the cost of redesign. This method also allows the District to experiment with the cross-section framework and conduct pilot studies for other roadways.

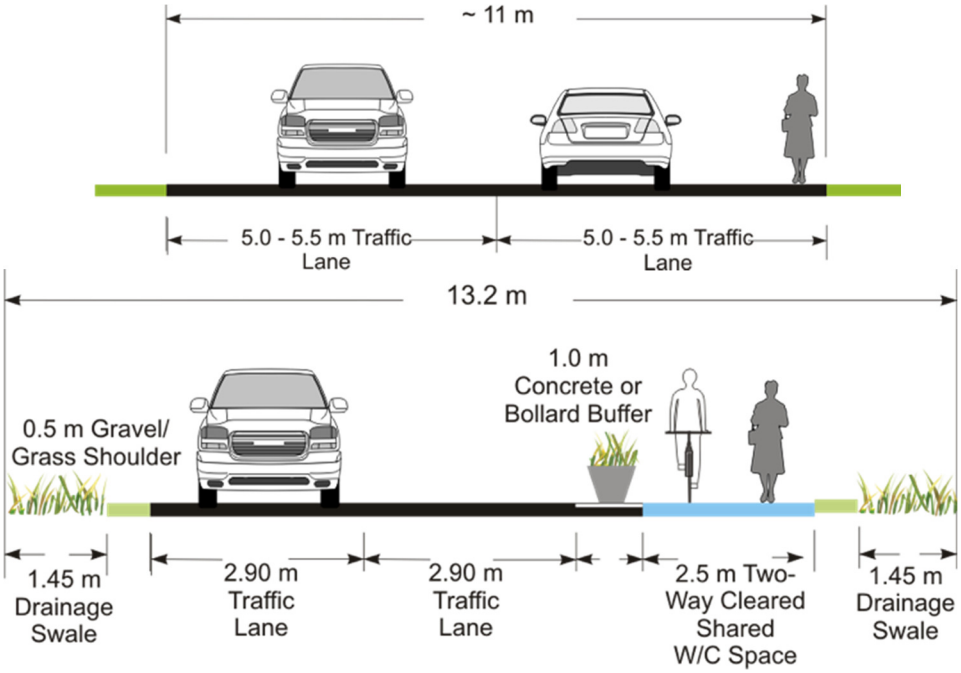

Figure 6: Existing (top) and proposed (bottom) cross-sections for Robson Street

Once complete, the risk of motor vehicle and pedestrian collisions is anticipated to reduce by separating active modes from motorized traffic with a planter or concrete boulevard on this road segment. The driving width along Robson Street would also reduce to 2.90 metres per lane with a posted speed limit of 30 km/h. Although no collision analysis or safety models were conducted in this study, these traffic calming measures are shown in various collision prediction model reports to effectively reduce collision risk and improve safety on urban roads.

2.1.3 Stormwater Management

Traditional methods of stormwater management through pipe and ditch can sometimes lead to unintended consequences for the environment and for long-term health. These methods remove runoff from impervious surfaces quickly and direct the resulting water flows to receiving waters usually faster and at higher volumes than if it were to infiltrate the soil under typical rainfall events. Managing stormwater in this approach can lead to changes in the natural water balance, which may result in flooding, water pollution in receiving water, and loss of aquatic habitat.

Clearwater currently has no underground storm water collection system. Thus, the majority of surface runoff ends up in ditches next to the roadway where some infiltration occurs and the remaining water flows down to the Blue River and other catchment ponds. From a transportation perspective, the greater the paved surface area, the greater the runoff flows will be. The roadway width for motorized vehicles can range between 7-10 metres for a two-lane road whereas a two-way multi-use path only requires around 2.5 to 4 metres of width. As Clearwater continues to develop over the long-term future, there is an inherent advantage to build fewer roads or additional lanes, and build more multi-use pathways, cycle lanes, and sidewalks to reduce stormwater runoff. There are of course a number of additional benefits that

tie into the study including lower economic costs, improved safety, increased physical activity, and potentially more business opportunities. Since Clearwater does not currently have underground stormwater distribution, the District is more likely to consider installing bioswales on retrofit and new transportation projects to reduce runoff and to beautify its public spaces.

2.2 STAKEHOLDER AND COMMUNITY ENGAGEMENT

After developing draft options in the transportation study, Opus conducted a unique open house format to present the plan and obtain feedback from community residents. Instead of hosting the open house at a venue and soliciting invitations for residents to attend, Opus and the District decided to go to where the community would already be. Opus arranged the open house on July 13th, 2013 in the middle of summer and on a Saturday with two local events already planned. The format involved several stations spread across the community. Residents were encouraged to move from one station to the other, using active modes of transportation, to engage in an activity and provide feedback. . The route and location of stations are shown in Figure 7.

Figure 7: Mobile Open House Route and Stations

Prior to the open house, posters and invitations were posted on the District's websites and at community bulletin boards that described the mobile format. Participants were asked to bring bikes, inline skates, scooters, or their walking shoes. The first station of the open house was located at the farmer's market with poster boards displayed and with keynote presentations by Opus and the Interior Health Authority.

The Interior Health Authority representative from the Healthy Communities Initiative presented, outlining the linkages between the built environment, active transportation and health outcomes. The emphasis of the presentation was that communities can successfully design safe and accessible physical activity back into their daily lives to improve their health, reduce risk factors associated with chronic diseases, and improve the safety of their streets.

Prior to embarking towards the next mobile open house stations, the Interior Health Authority facilitator introduced the 'Character Card' activity. Character cards that reflected individuals

with different mobility needs (e.g. a senior with a walker, a parent pushing a stroller, a person in a wheelchair or a youth on a skateboard) were distributed to the participants. The instructions were to imagine your character's needs when using the route to each station. At each station, residents were then asked to discuss and record on cue cards the challenges and opportunities for that mobility need and for themselves as they walked or cycled the route.

The intention of the activity was not to criticize current infrastructure but rather to understand how the built environment impacts active transportation and connectivity within and between neighborhoods. Some of the responses on the cue cards read as follows:

> *"The path (beside Dutch Lake along Old North Thompson Highway) is impassable for a wheelchair."*
>
> *"Couldn't even access the beach."*
>
> *"Going uphill (towards Village Centre) would be impossible too. "*
>
> *"Crossing Highway 5 is scary. Traffic is coming from three different directions."*

At each station, the facilitators displayed new poster boards showing three potential cross-sections that could be used to redesign the adjacent road. This visual-based activity emphasized participants' understanding of the impact a cross-section has on the way a street is used and was very helpful in obtaining thoughtful feedback. Each participant was also asked to reflect on their character cards and make notes. Figure 8 shows the open house in progress. The closing station of the open house was conducted at the North Thompson Sportsplex, where Canfor, a local lumber company, celebrated its 75th Anniversary with a public barbeque.

Many opportunities were identified along the route for improving the District's roadways to better accommodate pedestrians, cyclists and other mobility needs. The stations at Murtle Road and Robson Road sparked much discussion as both roads serve as a main route for locals who both use active transportation and vehicles to get to and from the high school, library, and Sportsplex.

Figure 8: Image taken from the mobile open house

The collaboration between the District of Clearwater, Opus, and the Interior Health Authority, to present the transportation study to the public, proved to be an engaging and experiential process for residents of Clearwater. The common themes summarized above describe opportunities as identified by residents to improve the health and quality of life of residents by increasing the use and safety of active transportation for the future road network development.

3 CONCLUSION

The positive feedback gathered through the mobile open house and over the course of the study demonstrates that small and rural communities can implement short and long-term active transportation design and planning, which is also shown in the health-based evidence to mitigate chronic diseases and improve a community's overall healthiness.

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