



CHAPTER 8

Public Health & Safety

Introduction

Relationship Between Land Use and Population Health

Population Health Impacts in Comox Valley

Healthy Built Environments and Active Transportation

Variables That Influence Active Transportation Choices

Active Transportation Plans and Policy

Public Safety

Trends and Issues

Points for Discussion

Introduction

This chapter summarizes the connections between how communities in the Comox Valley are built and the health and safety of the people living in them. Pulling from recent and new research, it provides an overview of current land use planning-related health trends in the Comox Valley, and highlights potential land use choices that could generate more positive population health outcomes and better support public safety.

This chapter is unique in that community health and safety has not been included as a topic in any previous Regional Growth Strategy in B.C. The CVRD Board, with the support of the regional Medical Health Officer, recommended the inclusion of the broader concept of community health. More traditional public safety concerns such as fire and emergency services are also included.

While this chapter recognizes that there is a broad range of health and public safety issues, it focuses on those topics with the strongest land use connections that are most relevant to the RGS.

Relationship Between Land Use and Population Health¹

There is a large body of research that suggests a significant relationship between urban and rural form and population health outcomes. There are particularly strong links between personal transportation choices and health risk factors, such as between the lack of physical activity and obesity, which in turn are linked to chronic diseases, notably cardiovascular disease, chronic respiratory disease, diabetes and cancer. Here it should be noted that physical activity is one of the most significant modifiable behavioural factors that can influence the likelihood of becoming overweight or obese and, by extension, developing a chronic disease or dying prematurely.

The built environment² has also been shown to influence a range of other factors that can influence an individual's ability to make healthy choices, as well as ultimately the state of their physical and mental health, as well as life expectancy. From a land use perspective, access to affordable housing, healthy food, recreational opportunities, education, and early childhood development opportunities can all promote better health. Health professionals refer to these factors as the "social determinants" of health or "health inequities" and believe strongly that they must be addressed to improve population health. A 2001 Senate report on the health of Canadians estimated that the social and economic environment was the major determinant of population health outcomes in Canada, responsible for 50% of the ultimate health outcome of individuals, while the physical or built environment was responsible for an estimated 10%.

Linking the Built Environment to Population Health: The “Ripple Effect”

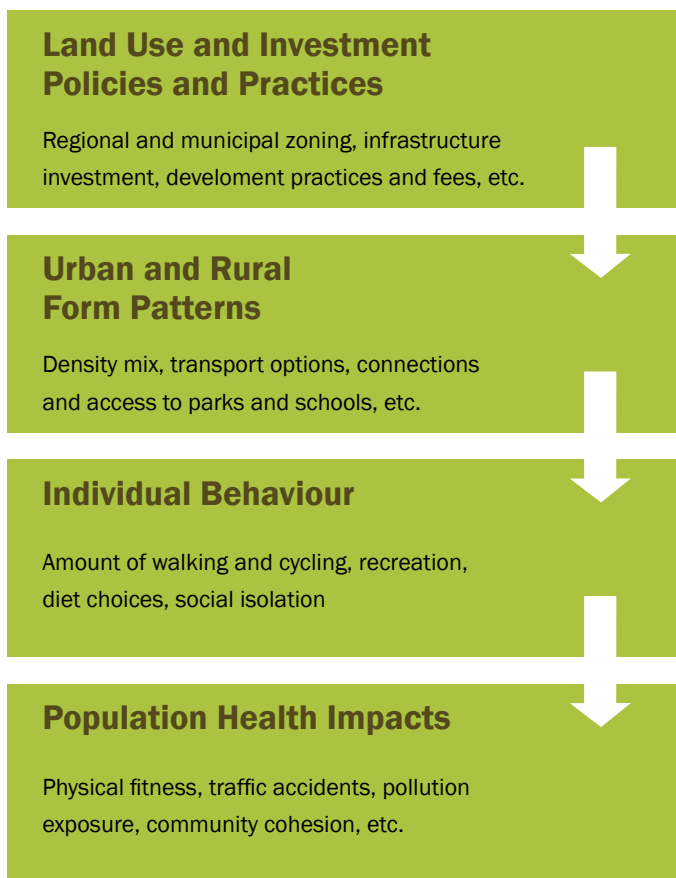


Figure 8.1

This figure illustrates how planning policies, such as those expressed in Regional Growth Strategies and Official Community Plans, influence individual behaviour that ultimately generates direct and indirect population health impacts. Planning and public health researchers refer to the land use influences as the “Ripple Effect”.

BC’s Provincial Health Services Authority (PHSA) – the province’s overarching health authority – recognizes the role of community and neighbourhood design in improving population health. Since 2003, PHSA and other health and local government partners have worked together on a province-wide Healthy Living Alliance initiative to support and promote “healthy” built environments that create more opportunities for physical activity, healthier lifestyles and active transportation.³

Awareness around healthy built environments is still growing in both the health and planning communities. Similar to planning for climate change, PHSA and other organizations (e.g., BC Recreation and Parks Association, BC Cancer Association, etc.) believe that healthy built environments will emerge as a driving land use planning concern as the awareness of health impacts and costs (human and financial) continues to grow.

Population Health Impacts in Comox Valley

The so-called ripple effect is present in the Comox Valley where land use policies have helped separate land uses and made active transportation a more challenging undertaking for many residents. However, there is also an opportunity to build on the Comox Valley’s natural setting and impressive recreational opportunities to develop healthier built environments and support more active, healthy lifestyles.

In terms of population health impacts, physical fitness levels have declined and obesity rates have increased to near epidemic proportions in Comox Valley and province-wide. Exposure to air pollutants has also gone up and with it childhood asthma rates to alarming, near epidemic levels. Research conducted by national, provincial and regional health agencies confirms the following facts:

- Over 18% of the population aged 18+ in the North Vancouver Island Health Service Delivery Area (HSDA)⁴ are obese, the highest of the three HSDAs on the Island;
- Approximately 20% of seniors (65+) in the Comox Valley are obese, the highest rate of anywhere in the province;
- The number of individuals with high risk Body Mass Indexes⁵ in the North Vancouver Island HSDA increased between 5% and 10% between 2001 and 2005;
- The Courtenay Local Health Area (LHA)⁶ had the second highest rate of deaths due to diabetes on Vancouver Island, and the highest of any predominantly non-aboriginal community for 2000-2004;
- The Courtenay LHA had the second highest rate of deaths due to chronic lung disease on Vancouver Island for 2000-2004;
- The Courtenay LHA had the highest rate of deaths due to diseases of the respiratory system for any non-industrial LHA;⁷
- The leading cause of death in the Courtenay LHA is circulatory system related diseases, accounting for over 30% of all deaths in the region, or roughly the same as provincial and national rates (circulatory system diseases have been closely linked to lifestyle and fitness levels);
- The rate of overweight children in BC nearly tripled since 1981;
- In BC, the “inactivity level” in youth averages 58%;
- One in three overweight or obese children will become diabetic in BC; and,
- Asthma is the most common chronic childhood disease in BC (and across Canada).

Public Health and Recreation

Comox Valley is widely regarded as an outdoor recreation paradise that is also served by a good range of public recreation facilities. Together, they present a considerable opportunity to support and encourage healthy, active living in the Comox Valley. Recreation providers and health professionals could also work together to better promote and engage residents in indoor and outdoor physical activities and advocate for healthy change in the community.

Further illustrating the links between land use, neighbourhood design and population health, a major study of Metro Vancouver just released in April 2009 made the following findings:⁸

- Residents living in the most walkable areas of each region (i.e., the top quartile of walkability) were half as likely to be overweight than those in the least walkable neighbourhoods;
- Residents living in the most connected areas (i.e., in the highest quartile of intersection density) were half as likely to be overweight as those living in the lowest quartile;
- Residents living in areas with the highest quartile of retail floor space ratio (where retail is set up against the street) were half as likely to be overweight as those living in the lowest quartile (where retail is set behind surface parking lots); and,
- Each additional grocery store within about a kilometre distance was associated with an 11% reduction in the likelihood of being overweight.

Healthy Built Environments and Active Transportation

While there are many factors that influence population health outcomes in the Comox Valley (i.e. access to clean air and water, affordable housing, recreation, education, healthy food, etc.), primary consideration should be given to active transportation strategies because it can help to facilitate more active lifestyles and physical activity, thereby improving the long term health status of individuals in the Comox Valley. A focus on active transportation in no way discounts the importance of the other health influences, but recognizes that of all the health factors, it is perhaps most closely related to regional land use planning and the RGS.

To be sure, the relationship between the built environment and active transportation is key to understanding the broader concept of healthy built environments. Many studies, including the recent UBC study discussed above, have shown a significant relationship between the built environment and active transportation choices. The UBC study, and many studies like it, explored how the built environment affects active transportation choices and “which variables in the built environment exert the most significant relationships with physical activity patterns”.⁹

Variables That Influence Active Transportation Choices

In general, research has identified three interdependent variables in the built environment that have the most significant influence on active transportation choices: density, land use mix, and street network connectivity. Together, these variables affect how close destinations are to each other and how easy it is to get to those destinations. Each variable is broadly defined below.

- 1. Density:** As a measure of urban and rural form, density can be measured in a number of different ways including the number of people, jobs or buildings in a given area. Higher densities typically increase the number of potential destinations located within a geographic area, increase proximity between destinations, reduce travel distances, and increase the likelihood of walking, bicycling or transit use. Current research suggest that most people will readily walk to destinations up to 800 metres away, with one kilometre being the distance that most people will decide to drive to the store, school, service, etc.
- 2. Land Use Mix:** Land use mix refers to the number of different types of land uses (residential, recreational, commercial, institutional, etc.) within a given area. Mixing land uses increases the diversity of destinations in a given area, thereby reducing the distance required to travel to a variety of destinations. Land use mix is positively associated with physical activity because it shortens trip distances, encourages people to walk and/or bicycle, and makes recreational opportunities easier to access.
- 3. Street Network Connectivity:** Connectivity is a measure of the efficiency of the transportation network and refers to the directness of links and the number of connections in the path or road network. A well-connected road or path network has many short links, numerous intersections, and minimal dead-ends (cul-de-sacs). Street networks influence the specific route and mode of transportation that people use. As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations and encouraging more active transportation choices.

The figure on the following page summarizes the general state of each of the built environment variables in the Comox Valley.

Active Transportation Plans and Policy

None of the region's current OCPs specifically address community health and well-being, or make the link between land use and population health. Both Courtenay's and Comox's OCPs do, however, seek to encourage active, or alternative transportation.

The Comox Valley Cycling Plan (2007) was prepared by The Comox Valley Cycling Task Force with the expressed goal being to help standardize terminology, standards and bikeway design throughout the Comox Valley. The plan recommended that all jurisdictions recognize and promote cycling as a viable mode of transportation in addition to recreations and that a comprehensive communication strategy be designed to encourage this activity.

The draft Town of Comox Bicycle Plan (1995) gives emphasis to bicycle routes and lanes "chosen on the basis of their proximity to significant bicycle destination points, and their ability to meet the needs of each user group." The proposed network received strong support from the public and a limited number of on-street routes have been developed.

Courtenay's Bicycle Planning Strategy was adopted in 1995 as well, and is intended to "promote and encourage cycling as a commuting alternative to the automobile and as a means of active recreation." There are currently limited on-street bicycle routes, signage and amenities (e.g., bike racks).

Built Environment Variables That Affect Transportation Behaviour

Variable	Comox Valley Highlights
Density	<ul style="list-style-type: none"> • Population density in Comox Valley is 5.1 people per square kilometre, slightly higher than the provincial average of 4.2 people per square kilometre. • Current population densities in Courtenay and Comox are comparable to similar BC cities and towns, but 30% to 50% below conventional density thresholds required for “intermediate” or “frequent” local bus service (20 to 40 buses per day respectively).¹⁰ • Region-wide, transit mode share is below BC averages (2% vs. 10%)¹¹ • Cumberland and the Electoral Areas have lower population densities and correspondingly limited services, amenities and jobs.
Land Use Mix	<ul style="list-style-type: none"> • Limited to moderate mix of land uses in central town centres and activity centres. • In Comox town centre there is some mixing of uses (e.g., retail shops, offices and apartments) in very close proximity and/or in the same building, while Courtenay and Cumberland town centres tend to be primarily commercial retail. • Single-use residential areas dominate away from town centres, with very limited land use mix.
Street Network Connectivity	<ul style="list-style-type: none"> • More traditional street grid in older areas near town centres. • Less connected cul-de-sac and curvilinear street pattern in more recent residential developments (i.e. mid-1960s to present). • Limited bike, trail and pedestrian connections/networks. • Region-wide, private vehicle mode share (as a driver) is higher than BC averages (79% vs. 72%). • No regional bike, pedestrian or greenway network is currently in place, although Comox Valley is currently preparing a Regional Greenway Strategy and a Comox Valley bicycle was prepared in December 2007. • Locally, internal bike and pedestrian networks are basic with few traffic-separated routes. • Courtenay and Town of Comox have older bicycle network plans(1995), and the latter has not been adopted. • No inter-city/town connections in place. • Sidewalk standards vary across the region. • No integrated, region-wide, active or alternative transportation plans.

Figure 8.2

Public Safety

Public safety includes ambulance, police, health and fire protection services. Currently, the Comox Valley is served by the BC Ambulance Service, which has three ambulance stations in the region – in Courtenay, Cumberland and Denman Island. Policing services are provided region-wide by the RCMP whose main, 30-member detachment is located in downtown Courtenay.

Twenty-nine long-term, locum GPs and 64 specialists with hospital privileges at St. Joseph's provide health services in the area. The specialists include general surgeons, orthopedics, dermatology, obstetrics/gynecology, ear nose and throat, dental, anesthesiologists, emergency room physicians, internists, pediatricians, radiologists, urologists, psychiatrists, and ophthalmologists.

Comox Valley boasts a regional hospital facility in Comox at St. Joseph's General Hospital, a 234-bed acute care and continuing care facility with 940 employees, including 360 regular full-time employees, 240 regular part-time employees and 340 casual employees. The facility is operated in partnership with the Vancouver Island Health Authority.

Currently, the Vancouver Island Health Authority is considering a new 140-150 bed regional hospital to replace St. Joseph's. The services currently provided by St. Joseph's would be provided in the new hospital. The new Comox Valley hospital would include 40 to 50 beds for regional services such as psychiatric emergency and intensive care and enhanced cancer care. Should the new facility be developed, it will be of significant benefit to the community, particularly if the facility is developed as a

community-focused health promoting hospital rather than a more conventional "institutional" facility. As a more community-focused facility, the new hospital could help bring more community programs to its site and make some services more accessible in the community. Additionally, the location of a new hospital could have significant land use implications for the region.

The CVRD has established plans and programs for emergency preparedness, mitigation, response and recovery. The Comox Valley Emergency Program provides coordinated assistance and organizational structure in dealing with emergency situations and disasters in the Valley. Neighbourhood emergency preparedness (NEPP) courses are held throughout the year to train residents.

Fire service is a particularly important issue that has demanded extra attention in the RGS planning process. Comox Valley contains 18 Fire Protection Areas, serviced by 10 fire departments. The various fire halls operate independently, but have a mutual aid agreement with neighbouring jurisdictions. Fire Protection Areas generally have an 8-kilometre service range. Response times vary considerably, depending on availability of volunteer crews, time of year, and time of calls.

Five full-time and approximately forty paid-on-call employees staff the Comox Fire Department, while Courtenay's fire department has a total of 5 career and 42-45 paid on-call firefighters who respond to both emergency and non emergency calls within Courtenay and surrounding fire protection districts. Cumberland's fire department has one paid, full-time member.

Currently, there are gaps in fire protection service in the Comox Valley, perhaps most notably the resort area of Mount Washington. A referendum held in 2003 asking landowners to contribute to the cost of services was rejected. A solution to this issue is currently being sought by the CVRD Board.

Fire protection services in Comox Valley

Planning Area	Fire Department
City of Courtenay	Courtenay Fire Department
Town of Comox	Comox Fire Department
Village of Cumberland	Cumberland Fire Department
Electoral Area A	Courtenay, Ships Point, Union Bay and Fanny Bay Fire Departments
Electoral Area B	Courtenay and Comox Fire Departments
Electoral Area C	Courtenay and Oyster River Fire Departments

Figure 8.3

Another potential fire safety concern involves some of the major new developments proposed for the Comox Valley. Two developments in particular, Sage Hills and Kensington, propose adding approximately 5,100 new housing units to areas covered by volunteer fire services. The scale of the developments may pose some logistical challenges and, potentially, could require the responsible departments to acquire additional equipment and/or crewmembers. Both of the developments are also located on former forestry land, pushing development further into the wildland urban interface zone. This zone is defined as the areas where structures and other human development meet with wildland areas containing flammable vegetation such as trees and grasses. A fire in this area is called an interface fire.

In 2004, the province initiated a review called Firestorm 2003, after the devastating fires in the Thompson-Okanagan. The review resulted in recommendations for reducing fire fuel build up in British Columbia's interface including:

- Fuel-treatment pilot projects in locations of high interface fire risk (i.e., controlled burning);
- On-site removal or burning of forest slash to reduce fire fuel hazards; and,
- Assessment of fire-prone ecosystems within or adjacent to a wildland urban interface zone for risk reduction.

The review stated that, "governments and individuals share responsibility for fireproofing communities and developments that may be affected by interface wildfires". As recommended by the province, the CVRD has begun interface fire hazard mapping to identify high-risk areas. This work has yet to be completed and a region-wide Wildfire Protection Plan has yet to be developed.

This section summarizes major land use planning-related population health and public safety trends and issues identified through chapter research.

Growing awareness of population health – land use connections: The CVRD is the first regional district in BC to formally recognize the connections between land use planning and population health outcomes. This awareness will continue to grow through the development of the RGS and its implementation. The regional Medical Health Officer is also a proponent of healthy built environments and will be able to support and encourage a better understanding of the population health impacts of land

Trends and Issues

use decisions. As a new field of interest and engagement, the Provincial Health Services Authority is planning on developing a formal position and work plan to promote healthy built environments which will support the Vancouver Island Health Authority to gradually become more engaged in the review of land use developments from a population health perspective. Additionally, should a new regional hospital come to fruition, the location of the hospital will need to be planned carefully to maximize its benefits and integrate it into the surrounding community.

Increasing physical inactivity and obesity: Body Mass Index (a method of classifying body weight according to health risk) in the Comox Valley is increasing. Currently, over 18% of the population aged 18+ in the local Health Service Delivery Area (HSDA) are obese, the highest of the three HSDAs on the Island. In addition, approximately 20% of seniors (65+) in Comox Valley are obese, the highest rate of anywhere in the province. Obesity is a major health risk and considered by health professionals to be a “conveyor belt” to developing a chronic disease or dying prematurely. Obesity rates are likely to continue without the development of improved local and intra-regional active transportation networks.

Below average active transportation mode share: Although regional mode share rates have declined marginally since 2001, the percentage of people using cars (as driver) for their primary mode of work transportation remains above BC averages (79% versus 72%). The more rural Electoral Areas had the highest rates (84%), while the three municipalities ranged between 74.2% and 76%. Regionally, walking/biking mode share is roughly on par with provincial averages at 9.9%, and is highest in Courtenay at 14.3%, the densest community in region. Transit mode share is well below provincial averages (1.6% versus 10.3%), ranging between 0.9% and 2.7% in Comox, Courtenay and Cumberland.

Stagnant densities: The municipal boundaries of Cumberland and Courtenay have grown substantially since 1996 (75% in Cumberland and 42% in Courtenay), making longer term density trend analysis difficult. Still, taking into account the increased size of Cumberland and Courtenay, neither have become significantly denser communities over the past decade, and neither has Comox. Growth and development have occurred horizontally and the three town centres have remained virtually unchanged, although some newer mixed-use residential development has occurred in downtown Comox. Overall, Courtenay’s population density decreased 25% from 1,119 people per square kilometre in 1996, to 822 people per square kilometre in 2006. Cumberland’s population density decreased 75% from 343 people per square kilometre in 1996, to 95 people per square kilometre in 2006. Higher densities typically increase the number of potential destinations located within a geographic area, increase proximity between destinations, reduce travel distances, and increase the likelihood of walking or bicycling or transit.

Rising chronic disease rates: Chronic diseases, notably cardiovascular disease, chronic respiratory disease, diabetes, and cancer are all on the rise in the Local Health Area (which closely corresponds to Comox Valley’s boundaries). While the region’s larger than average senior population can account for some of the increase, the increases parallel those found across BC and Canada and could be related to increasing risk factors like the lack of physical inactivity and obesity.

Increasing wild fire risk: New development and growth pressure is pushing development further from both professional and volunteer fire services. Advanced fire suppression efforts in the last fifty years have also resulted in high levels of fuel loading in wildfire interface areas. From the standpoint of community fire protection, interface fires have the potential to develop into catastrophic wildfires of a scale and intensity beyond the range of historical variability, as has already been demonstrated in communities throughout BC (i.e., Okanagan).

Points for Discussion

When considering the public health and safety trends and issues identified in the previous section, the policy ideas below could be considered while formulating the Regional Growth Strategy.

Increase densities in the region's town centres and activity centres to support and encourage active transportation and more active lifestyles. Research clearly shows that walkable, bikable and wheelable communities are healthier, safer than more auto-dependent places. Creating such healthy built environments could be addressed through strategies like:

- Supporting the development and implementation of a settlement area to limit development to existing developed areas and to encourage infill development.
- Targeting infrastructure development and the location of public facilities to encourage urban redevelopment and infill.
- Increasing density in town centres to help make increased transit service more feasible.

Improve street network and greenways connectivity to, through and between town centres and activity centres to support and encourage active transportation and more active lifestyles. Street networks influence the specific route and mode of transportation that people use. As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations and encouraging more active transportation choices. Improving local, regional and intra-regional connections could be addressed through such strategies as:

- Supporting the CVRD's Regional Greenways Strategy initiative and ensure that municipal connections to the new greenway network are developed and linked to, through and between centres.

- Supporting the development and implementation of a settlement containment boundary to limit development to existing developed areas and to encourage infill development.
- Targeting infrastructure development and the location of public facilities to encourage urban redevelopment and infill.
- Developing consistent, region-wide street, sidewalk and intersection standards to reduce automobile traffic speeds, support alternative and active transportation modes, and to create more attractive, healthier built environments.
- Identifying regionally important, priority street connections and mandate that those connections be established as a condition of redevelopment.
- Supporting development of regional bicycle and pedestrian master plans integrated with local-level strategies to improve active transportation connections to, through and between regional centres and activity nodes.

Increase land use mix in regional town centres and activity centres to support and encourage active transportation and active living.

Land use mix is positively associated with physical activity because it shortens trip distances, encourages people to walk and/or bicycle, and makes recreational opportunities easier to access. Land use mix could be improved through such strategies as:

- Supporting a greater range of mixed use development in regional centres through greater mixing of uses and through the introduction of complementary land uses (e.g. residential uses in employment centres and conversely commercial uses in residential areas) in places which are currently single use in nature.
- Ensuring that local recreation opportunities are within close proximity of town centres and activity areas.

Create an enabling environment to support development of healthy built environments and to address land use – population health linkages.

Building awareness of the connections between resident health and the physical layout and design of our communities is critical to achieving healthier built environments and maintaining the region's high quality of life. Re-engaging health professionals in land use planning and educating the region's planning and development community on healthy built environments is of critical importance. Achieving this awareness and engagement could be addressed through such strategies as:

- Establishing a regional Healthy Built Environment Advisory Committee to provide a formal avenue for residents and regional health professionals to explore the potential health impacts of both policy and project initiatives.
- Supporting the CVRD's Regional Greenways Strategy initiative and ensure that municipal connections to the new greenway network are developed.
- Linking regional recreation providers and health professionals to promote and engage residents in indoor and outdoor physical activities and advocate for healthy change in the community.
- Supporting local governments to modify current planning practices to better count active transportation (for example, by improving analysis of non-motorized modes in travel surveys) and value its benefits (for example, by taking into account benefits such as roadway and parking cost savings, consumer cost savings and improved health).
- Prioritizing funding for transit and non-motorized improvements, including projects such as sidewalks, traffic calming, bike lanes, and better transit service or access.
- Adopting regionally consistent zoning, development cost charges, and development permit approval processes that support healthy objectives.
- Seeking out opportunities to enhance public health and safety in local building codes, such as applying Bill 10, the Housing Statutes Amendment Act (2008), which allows local governments to adopt and enforce Green Building standards that improve energy efficiency and thus reduce GHG emissions.

Improve fire safety in the region through the completion of interface fire hazard mapping to identify high-risk areas and the development of a Comox Valley Wildfire Protection Plan.

The CVRD and some member municipalities are currently working on interface fire hazard mapping. This important work needs to be completed for the whole region to ensure that the highest standards of public safety are achieved.