Developing sustainability indicators to improve community access to public transit in rural residential areas

Robert Patrick
Department of Geography
University of Guelph
Guelph, ON Canada

Mark Roseland
Centre for Sustainable Community Development
Simon Fraser University
Burnaby, BC Canada

Abstract

The focus of this paper is on the development of sustainable transportation indicators for rural residential areas. While sustainable transportation indicators exist for urban regions the transfer of those indicators to rural residential areas is problematic, in part owing to differences in settlement density and land-use intensity. The continued spread of ex-urban growth to the rural fringe of the Georgia Basin, British Columbia is commensurate with increased automobile dependency that threatens the sustainability of these non-urban areas. With the extension of regional public transit service into many rural residential areas in BC it is now prudent to develop sustainability indicators to assist local governments intent on improving the sustainability of their communities through improved access to public transit.

A set of sustainable transportation indicators is developed based on three indicator types: land-use, community design and transit policy. Using these indicators a mail-out questionnaire was sent to eight municipal transit systems serving non-urban areas within the Georgia Basin of British Columbia. These sustainability indicators offer a first step toward reducing automobile dependency in rural residential areas through improved community access to public transit.

Keywords: Sustainability indicators, public transit, automobile dependency, Georgia Basin

1.0 Introduction

Throughout the late 1980s and 1990s the growth rate of non-urban regions within British Columbia's Georgia Basin[1] consistently outpaced the growth rate of

[1] The Georgia Basin is defined as the watershed area of the Strait of Georgia, British Columbia (Figure 1)

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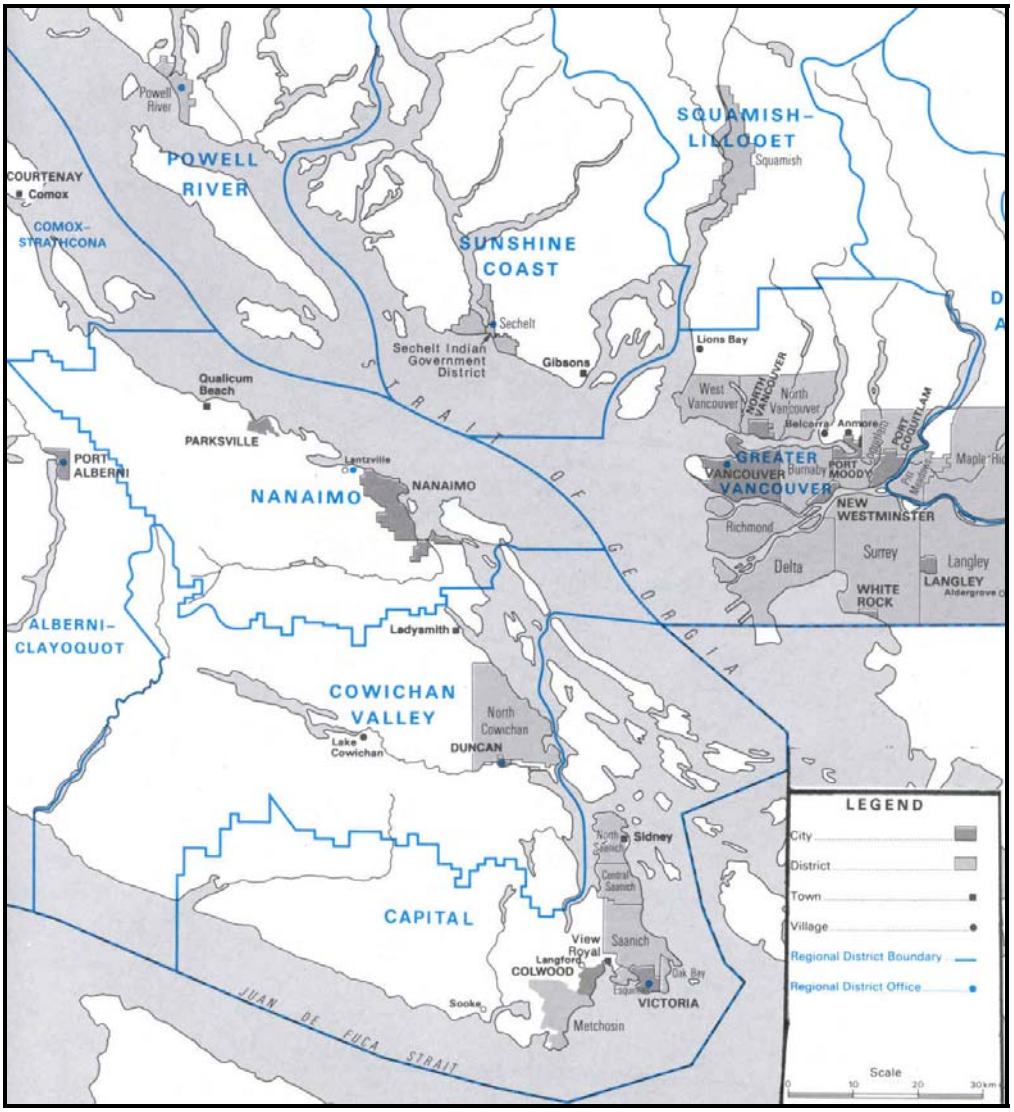
adjacent urban areas, including Victoria and Vancouver[2] (Figure 1). A wide range of economic, social and environmental reasons explain this phenomenon including the availability of affordable land for housing, a desire for lifestyle change removed from the urban fray, and the notion of living closer to, and thus more harmoniously with, the natural environment.

Figure 1: The Georgia Basin



Source: Statistics Relating to Regional and Municipal Governments in BC, 1990. Province of BC

[2] Non-urban regional growth during the 1990s included Squamish (26%), Whistler (24%), Sunshine Coast (20%), Comox (18%), and Cowichan Valley (17%). Urban growth rates for same period include Vancouver (9%), Victoria (3%) – Province of BC, Ministry of Finance and Corporate Relations (2001).

The demand for non-urban, rural residential settlement continues to fuel the conversion of vacant and 'green-field' resource land to residential use. The cumulative effect of this land conversion is what Engwicht (1992) describes as the spreading-out of settlement and consequent separation of home from schools, shops and recreation. The literature further reveals that low residential density combined with land-use separation serves to reduce community accessibility to public transit while increasing the demand for private mobility (Ross, 1998; Alexander and Tomalty, 2001). Within rural residential areas, the form of this mobility is the private automobile (Litman, 1998; Newman and Kenworthy, 1999; Smith Lea, 2000). Such a development pattern represents the antithesis of sustainable community development and begs the question: What opportunities exist in rural residential areas to improve community access to public transit and thereby improve the sustainability of these areas?

Sustainable development, as presented in the Brundtland Report (WCED, 1987) advanced an agenda to simultaneously solve the impending global environmental crisis as well as facilitate the economic and social development of Third World nations. Yet, sustainable development is not the exclusive domain of nation states to be operationalized only at the global scale. Proponents of sustainability correctly note that individuals must "lead by example" to affect change that will improve the long-term condition of the environment. As Beesley (1994) states, 'sustainability must include humanistic dimensions, regardless of scale from global through national to local, urban, rural or fringe areas'. In the words of Wilkerson and Baruah (2001), while sustainability has local, regional, national, and international dimensions, ultimately, it must be achieved at the local level where people live, work, and interact with each other and with nature. Recognizing the importance of a multi-scalar perspective in sustainability research, this paper focuses on a specific rural residential region, the Georgia Basin of British Columbia.

The methodology of this research employed a mail-out survey questionnaire sent to eight Regional Transit Authorities within British Columbia's Georgia Basin. The survey questionnaire was designed to provide data for each of the identified sustainability indicators. The sustainability indicators were organized around three broad themes relating to transportation efficiency based on Blowers (1978) and include community design, land-use and transit policy.

This research recognizes that a single survey cannot provide definitive conclusions regarding the appropriateness and effectiveness of otherwise untested indicators. Moreover, the indicators developed in this research represent only a small sampling of all the potential factors that influence access to public transit. Notwithstanding these limitations, the results indicate that small adjustments in the way we design our communities, organize our land-use, and implement transit policy all have potential to impact access to public transit.

The use of sustainability indicators as presented in this paper will enable local governments and transit authorities a means of monitoring community progress towards, or away from, access to public transit. In this sense the indicator framework provides a practical guide for transit planners, local government planners and policy makers who are intent on pursuing an alternative to automobile dependency in rural residential areas.

1.1 Automobile dependency

The term *automobile dependency* was coined by Australians' Peter Newman and Jeff Kenworthy in their seminal work *Sustainability and Cities: Overcoming Automobile Dependence* (1999). Although intended for application in urban areas, this term has special significance in rural residential areas owing to increased mobility requirements in rural residential areas (Cullinane and Stokes, 1998). Automobile dependency has two important consequences directly related to the concept of sustainability: the first consequence is the contribution of automobile emissions to the local and global environment; the second consequence is the assumption that everyone in rural residential areas owns, or has access to, an automobile. The first consequence relates to the principle of global environmental stewardship as well as inter-generational equity while the second consequence relates to intra-generational equity (Engwicht, 1992; Haughton and Hunter, 1994; Roseland, 1998).

The literature has shown that a planning approach dependent on automobile dependency is antithetical to the concept of sustainable development for reasons that include, but are not restricted to, mobility deprivation[3], greenhouse gas emissions, and traffic congestion (Engwicht, 1992; Litman 1999; Patrick, 2002). Public transit offers significant potential for reducing automobile dependency in rural residential areas (Federation of Canadian Municipalities, 1997; Cullinane and Stokes, 1998). The following sub-section provides a brief overview of the concept of sustainable transportation.

1.2 Sustainable transportation

The Transportation Association of Canada states that any sustainable system must be based on a balanced blend of economic, environmental, and social factors. In addition to referencing the three spheres of sustainability, the Transportation Association of Canada defines a sustainable transportation system as one that:

- meets the access needs of the present generation
- allows future generations to meet their own access needs
- is powered by renewable (inexhaustible) energy resources
- does not pollute air, land or water beyond the planet's ability to absorb/cleanse, especially carbon dioxide (CO_2)
- is technologically possible
- is economically and financially affordable
- supports a desired quality of life
- supports local, national and global sustainable development goals

Sustainable transportation requires using each mode of transportation for what it does best, which means greater reliance on non-motorized transport for local travel, increased use of public transit in urban areas and a reduction, but not necessarily the elimination of, personal automobile use (Geerlings, 1999; Wadhwa, 2000). The concept of indicators, and more specifically sustainability indicators, are described in the next section.

[3] This group includes youth, elderly, under-employed, and those with disabilities

2.0 Sustainability Indicators

Indicators, as the term implies, provide for a qualitative and quantitative test that serves to "indicate" the results of a given action. Indicators, according to Babbie (1983), are real and observable things that give evidence of the presence or absence of the concept we are studying. In the words of Hart (1999), indicators provide a means of measurement to describe a condition or issue. However, deciding what to measure is an important consideration in sustainability research. As noted by Klein (1997) determining what to measure (and what not to measure) is a difficult task. The following section identifies some of the limitations of conventional indicators.

2.1 Limitations of conventional transportation indicators

Transportation planners and engineers have long made use of indicators to measure automobile mobility. Consequently, many transportation indicators were in use prior to the introduction of the sustainability paradigm on the world political stage. As a result, most transportation indicators today continue to focus on mobility as opposed to community accessibility, with a bias towards the unfettered movement of private cars over public roads (Ross, 1998). In the words of Litman (1999) conventional transportation indicators emphasize costs and barriers to motor vehicle usage resulting in solutions that only encourage more, not less, motor vehicle travel. Examples of conventional indicators have been taken from the literature and are shown in Table 1.

Table 1: Conventional transportation indicators

Conventional transportation indicator	**Assumption**
Number of cars on the road per hour	More cars, and capacity for cars, is better
Average traffic speed	Faster flowing traffic is better
Percent of parking that is free	Free parking facilitates community economy
Annual roadway capacity expansion	Road expansion means "road improvement"
Traffic congestion occurrence	Rationale for expanded road capacity

Source: (Litman 1999; Newman and Kenworthy, 1999)

The following sub-section briefly examines conventional public transit indicators and outline their limitations respecting rural residential areas.

2.2 Limitations of conventional public transit indicators

Where conventional transportation indicators favour overzealous roadway expansion to facilitate private automobile mobility, conventional public transit indicators display a bias toward urban transit service. For this reason, conventional urban transit indicators are poorly suited to rural residential areas. Examples of conventional public transit indicators have been taken from the literature and are shown in Table 2.

Table 2: Conventional public transit indicator

Conventional public transit indicator	**Bias**
Transit cost recovery	Higher ridership in urban areas
Urban density	Density always higher in urban versus rural areas
Service frequency	Frequency not feasible in rural areas
Number of buses per capita	Larger bus fleets service urban versus rural regions
Percent of road space dedicated to transit	Dedicated transit lanes not practical in rural areas

Transit cost recovery, measured as total operating cost divided by ridership revenue, is commonly used by transit managers and decision makers to rationalize service routes in urban regions. However, transit cost recovery fails to recognize the transit needs within rural residential areas and is an inappropriate indicator in such areas. For example, a low cost recovery on a given route may be the symptom of poor route design or scheduling. Moreover, low settlement density, a defining feature of rural residential areas, can never be expected to generate a high cost recovery. Consequently, the use of an "urban " transit indicator in a rural residential setting may result in service removal without consideration of impacts on a specific socio-economic group (Smith Lea, 2000, 55). Additionally, cost recovery is exclusive to public transit as there is no similar cost recovery measure for the private automobile. Public subsidization of private automobile mobility has been well documented in the literature (Shoup, 1995; Litman, 1998; Pucher, 1998; Newman and Kenworthy, 1999). Service frequency[4], buses per capita, and transit road space are similarly ineffective and inappropriate as indicators of public transit service needs in rural residential areas. Clearly, a new set of indicators needs to be developed and put into more common practice among transit planners and land-use policy makers.

2.3 Indicators for community access to public transit

Indicators for community access to public transit in rural residential areas must take account of a wide range of costs and barriers to community access and equity issues (Newman and Kenworthy, 1999; MacDonald, 2000; Litman, 2001). Another distinction between conventional (or non-sustainable) indicators and sustainability indicators is that the former tend to focus on quantitative objectives, which are relatively easy to measure, while the latter focus on qualitative objectives which are more difficult to measure but better reflect society's goals (Litman 1999). Recent examples of sustainability indicators have been taken from the literature and are shown in Table 3.

[4] Service frequency is calculated by transit authorities on the basis population density. A density of at least 25 residential units per hectare is required in order to make frequent transit service feasible (BC Sprawl Report, 2001). The highest density on the lower Sunshine Coast is Gibsons at 2.6 residential units per hectare (Province of BC, 2001).

Table 3: Sustainability Indicators

Sustainability Indicators
Proportion of population able to walk or bike to work, school, and shops
Resident participation in transportation decision-making
Proportion of commuting workforce using public transport
Proportion of population within 10 minute walk to bus stop
Proportion of total roads serviced by public transport
Quality of public transit service (service frequency, safety, cleanliness, number of bus shelters)
Bus transit integration with other transportation modes

Source: The Sheltair Group, 1998; Newman and Kenworthy, 1999; Hart, 1999; Litman, 1999; Sarmento et al*., 2000; Patrick, 2002*

3.0 Research Method

The research method is described in two steps. The first step developed suitable sustainability indicators based on access to public transit in rural residential areas. The second step saw development of a mail-out questionnaire based on the aforementioned list of sustainability indicators. The questionnaire was sent to eight municipal transit managers within the study area. The purpose of the questionnaire was to gather information respecting specifics of each transit authority (transit policy indicators) as well as the relationship of that authority to local government (land-use and community design indicators).

3.1 Selecting indicator types

Three indicator types have been identified in the literature as applying to sustainable transportation (MacDonald, 2000; Alexander and Tomalty, 2001; Litman, 2001). The three indicator types are described below. The three indicator types include land-use, community design, and transit policy described as follows. Land-use indicators focus on the way in which the land base is put to use. Land-use indicators will look towards land-use practices, including the subdivision of land that is integrated with community access to public transit. Community design indicators will seek to identify those built-form features of the community that support access to public transit. Community design indicators will look towards community design features such as the presence of village centres, improved subdivision design, reduced roadway capacity, and commercial building design features. The indicators listed here are not intended to be conclusive. For brevity, land-use and community design indicators have been combined in this section and are listed in Table 4.

Transit policy indicators will seek to identify institutionalized policies and procedures that serve as barriers to public transit accessibility. Transit policy indicators include transit scheduling, bus stop environs, intermodal fare transfers, and use of alternate fuels. This list of indicators is not intended to be conclusive. Transit polity indicators are listed in Table 5.

Table 4: Land-use and Community Design Indicators

Land-Use And Community Design Indicators
1. Mandatory referral of subdivision and rezoning applications from local government to transit authority (Yes/No).
2. Percent of major local employers that offer employee incentives to ride transit as opposed to providing (free) on-site parking.
3. Mandatory building permit referrals from local government building and engineering departments to local transit authority for all development permits and non-residential building permits.
4. Percent of community design features favouring access by public transit versus access by private automobile (store front transit access, centralized interchange, dedicated pull-outs).

Table 5: Transit policy Indicators

Transit Policy Indicators
1. Taxi passenger component as a percent of total Dial-A-Ride custom service
2. Intermodal travel with transfer fares
3. Percentage of transit vehicles with low floor, wheelchair access
4. Percentage of transit vehicles equipped with bike racks
5. Percentage of transit stops with posted schedule, all weather cover, seating, telephone, regular maintenance
6. Percent of transit vehicles using alternate fuels

4.0 Results And Discussion

The results from the survey questionnaire are presented here in two sections. The first section reports the survey results of the combined land-use and community design indicators shown in Table 4. The second section reports the survey results of the transit policy indicators shown in Table 5.

4.1 Land-use and community design indicators

Land-use and community design indicator #1 reveals those jurisdictions that collaborate with the relevant transit authority on matters of land-use development, namely subdivision and rezoning applications. The lack of local government collaboration with public transit authorities is captured in at least two of Pucher's (1998) eight steps to rejuvenate transport in Canada and is the subject of Geerlings (1999) argument regarding institutional barriers to effective public transit.

Referral of development applications that involve the subdivision of land to create additional land parcels to the local transit authority represent institutional cooperation. Surprisingly, in the case of subdivisions, the planning departments of Campbell River, Comox, Cowichan Valley and Powell River do not make referrals to the local transit provider (see Table 6). Within these jurisdictions, new subdivisions are approved without consideration of how local transit could better serve the development. Furthermore, transit operators are unaware of pending approvals for new subdivisions and expected demands from the public for extended transit service.

Table 6: Referrals from local government to transit authority

Transit System	Subdivision Application	Rezoning Application
Nanaimo	Yes	Yes
Whistler	Yes	No
Campbell River	No	No
Comox Valley	No	No
Cowichan Valley	No	No
Sunshine Coast	Yes	No
Port Alberni	Yes	No
Powell River	No	No

The rezoning of land has the potential for significant change in transportation demand. For example, a change in land-use from light industrial to residential use has the potential to increase local traffic. The lack of a rezoning referral from local government to the transit provider (all jurisdictions except Nanaimo) illustrates yet another institutional barrier facing community access to public transit imbedded in the local government planning process.

Land-use and community design indicator #2 identifies those jurisdictions where major employers offer employee incentives to ride transit to work as opposed to providing free parking (see Table 7). This indicator provides a useful measure of employer responsibility towards issues such as road congestion, air pollution and community accessibility.

The work of Donald Shoup at the University of California has shown that society undervalues the space occupied by free parking. The term “free parking” implies there is no cost. However, land is rarely free. Free parking represents a subsidy to automobile users paid by everyone, including those without access to an automobile. The cost of free parking, according to Shoup (1995) is hidden in the cost of goods and services. In the case of local government, free parking is an employee benefit paid for by the taxpayer. Therefore, converting the subsidy of free parking into something more environmentally benign, such as free transit passes, serves to improve access to public transit.

Employer-based transit pass subsidies seek to reduce free parking and the proliferation of private automobile usage. The conversion of parking spaces into other uses such as green space or usable building area will, over time, improve the economic, social, and environmental condition of local communities. Only the jurisdiction of Whistler reports having employer based programs that offer the option of transit pass subsidies to employees.

Land-use and community design indicator #3 measures the commitment of local government to refer development applications to the local transit authority. This indicator represents what Geerlings (1999) and The Centre for Sustainable Transportation (1997) identify as the main barrier to sustainable transportation, namely the institutional barrier. Table 8 provides the results of the survey questionnaire respecting mandatory referrals from local government to transit authorities for development permits and commercial/institutional building permits.

Table 7: Employer based transit pass subsidy

Jurisdiction	Transit pass subsidy to employees
Nanaimo	No
Whistler[5]	Yes
Campbell River	No
Comox Valley	No
Cowichan Valley	No
Sunshine Coast	No
Port Alberni	No
Powell River	No

Table 8: Referrals from local government to local transit authority

Jurisdiction	Development Permits	Commercial / Institutional Building Permits
Nanaimo	No	No
Whistler	No	No
Campbell River	No	Yes
Comox Valley	Yes	Yes
Cowichan Valley	No	No
Sunshine Coast	Yes	No
Port Alberni	No	No
Powell River	Yes	No

This indicator provides a strong measure of community accessibility to public transit by monitoring the co-ordination of development application referrals between local government and the local transit authority. The survey questionnaire results reveal considerable variability respecting local government referrals to transit authorities. Only one jurisdiction (Comox Valley) refers both types of development applications while four jurisdictions (Nanaimo, Whistler, Cowichan Valley, and Port Alberni) refer neither.

Land-use and community design indicator #4 inventories the community design features that facilitate access to public transit. Based on the work of Cervero (1997) and Newman and Kenworthy (1999) transit features including storefront transit stops, centralized bus interchange, and dedicated bus stops facilitate access to public transit.

Storefront transit stops facilitate transit access by reducing the walking distance between a transit stop and a store. Any reduction in distance will increase rider convenience. In addition to convenience, covered storefront transit stops provide security to lone transit riders, safety from moving vehicles in parking lots, comfort from inclement weather, and transit service visibility. Centralized bus interchanges provide convenience to customers and visibility to the transit service. These are point of transfer locations and transit schedule information areas. Finally, dedicated bus pull-outs in rural residential areas allow transit vehicles the

[5] The Whistler questionnaire indicated only a "few" local employers offered this access incentive

opportunity to leave the travelled road surface for customer pick-up and drop-off. Within rural residential areas, roadways are typically narrow and curvy, a feature that contributes to rural identity and character. Unfortunately, narrow roads are not always conducive to transit safety. To promote rider safety and convenience the use of pull-outs from the travelled road surface is necessary in rural residential areas. These pull-outs also serve to increase the visibility of transit service.

While most transit authorities in the Georgia Basin make use of a centralized bus exchange few offer dedicated bus pull-outs for their passengers (see Table 9). In addition, the majority of those surveyed have no storefront transit stops (except Nanaimo and Powell River). This situation not only inconveniences riders but also reduces the visibility and profile of public transit in rural residential areas.

Table 9: Community design features favouring public transit

Jurisdiction	Store-front transit stops	Centralized bus interchange	Dedicated pull-outs
Nanaimo	25%	Yes	5-15%
Whistler	None	Yes	50%
Campbell River	None	Yes	5-15%
Comox Valley	None	Yes	5-15
Cowichan Valley	None	Yes	5-15%
Sunshine Coast	None	Yes	5-15%
Port Alberni	None	No	50%
Powell River	50%	Yes	75%

4.2 Transit policy indicators

Transit policy indicator #1 assesses the taxi passenger component of each transit system's Dial-A-Ride custom service. Custom transit, a program of BC Transit, serves the mobility needs of the elderly and infirm. This form of public transit is provided by the handyDART[6], a dedicated service operating on a pre-booking, door to door service. Fixed cost of a driver's salary, combined with lower ridership, contribute to significantly raise the cost per ride. For example, on the Sunshine Coast the cost per ride for handyDART service is approximately $21.00, while cost per ride of conventional service is approximately $3.00.

In response to lower cost recovery experienced by special transit service providers, public transit operators have begun integrating their service with private taxi service. The use of private taxis as a form of custom transit service has been successfully used in the United Kingdom countryside where low ridership in rural areas precludes conventional transit service (Cervero, 1997; Cullinane and Stokes, 1998). Table 10 indicates low rates of private taxi integration into public transit service in the Georgia Basin.

Where handyDART cost per ride is high (Georgia Basin) the introduction of taxi service would complement regular handyDART service. By measuring the level of intermodal integration between public bus transit and private taxi, transit policy indicator #1 provides a useful measure of cost effective transportation.

[6] Dail-A-Ride-Transit

Table 10: Taxi passenger component as percent of HandyDART transit service

Jurisdiction	Taxi passenger component as percent of HandyDART transit service
Nanaimo	7.5
Whistler	N/a
Campbell River	3
Comox Valley	1
Cowichan Valley	0
Sunshine Coast	0
Port Alberni	0
Powell River	1.5

Transit policy indicator #2 measures the extent to which intermodal travel is promoted via provision for transfer fares. Intermodal travel is travel that includes more than one mode of transportation (Newman and Kenworthy, 1999). For example, public transit commuters on the Sunshine Coast begin a single day's journey to Vancouver aboard Sunshine Coast Transit to be followed as a foot passenger aboard BC Ferries to be followed once again as a bus passenger aboard the West Vancouver Blue Bus service into Vancouver. Seven or eight hours later the travel pattern is reversed on the return trip.

On the Sunshine Coast (served by Sunshine Coast Transit Service) clearly 34% of all public bus travel involves a British Columbia Ferry connection (BC Transit Two Week On-Board Survey, 2000). The high demand for intermodal connections between BC Ferries and the Sunshine Coast Transit System provides a real opportunity for the introduction of intermodal fares. The introduction of intermodal travel fares would promote foot passenger travel aboard BC Ferries. This approach would reward non-automobile travelers by offering a pricing incentive while relieving automobile congestion at the BC Ferries' Langdale and Horseshoe Bay terminals. The advantage of intermodal fare transfers is more than financial. Intermodal fare transfers improve customer convenience and raise the profile of public transit.

Table 11 records intermodal travel and transfer fare allocation within the Georgia Basin. All areas reported that reduced rates were not offered for intermodal travel. Only one transit authority (Cowichan Valley) allows transfer fares for intermodal travel (between public and private bus service).

Table 11: Intermodal travel accepting transfer fares

	Bus transit connection with other modes	**Transfer fares for intermodal travel**	**Reduced rates on intermodal travel**
Nanaimo	Ferry/Train	No	No
Whistler	No	No	No
Campbell River	Ferry/Private bus	No	No
Comox Valley	Private bus/Train	No	No
Cowichan Valley	Private bus	Yes	Yes
Sunshine Coast	Ferry	No	No
Port Alberni	Private bus	No	No
Powell River	Airport/private bus/ferry	No	No

This indicator is extremely useful in determining community access to public transit by providing a measure of transit system integration. Where a significant percent of travel involves an intermodal connection there is opportunity for system integration. In the case of system integration, co-ordinated schedules and intermodal fare transfers should be pursued by transportation agencies.

Transit policy indicator #3 indicates percentage of conventional transit vehicles offering low floor access and bike rack carrier racks (see Table 12). With the onset of low floor bus technology in the 1990s transit riders of all types benefitted with faster boarding and alighting times. The presence of low floor buses represents improved community access to public transit especially for the elderly and those with a physical disability. The wide range of survey responses for this indicator illustrates great variability in access offered to transit riders within the Georgia Basin. Specifically, four jurisdictions reported no low floor buses, while only Whistler and Sunshine Coast reported exclusive use of low floor conventional buses. Similarly, the presence of bike racks represents improved community access to public transit especially for youth. In addition, the presence of bike racks facilitates multi-modal travel consistent with the sustainable mobility paradigm (Newman and Kenworthy, 1999). Again, the wide range of survey responses for this indicator illustrates great variability in access offered to transit riders within the Georgia Basin. Specifically, four jurisdictions reported using no bike carrier racks, while only Whistler and Sunshine Coast reported bike carrier racks on all conventional buses.

Table 12: Conventional transit vehicles offering low floor access, bike carrier racks

	Percent buses with low floor access	**Percent buses with bike racks**
Nanaimo	75	75
Whistler	100	100
Campbell River	0	0
Comox Valley	50	50
Cowichan Valley	0	0
Sunshine Coast	100	100
Port Alberni	0	0
Powell River	0	0

Transit Policy Indicator #4 provides information on the percentage of transit stops with visible amenities such as posted schedule, all weather covering, seating, telephone, regular maintenance (see Table 13). Comeau (1999) discusses the lack of profile and visibility in mainstream advertising given to public transit especially when compared to the private automobile. The provision of transit stop amenities adds to customer convenience and helps to raise the profile and visibility of public transit. Comfort, security and reliability all play a factor in drawing transit ridership, especially the 'choice' rider[7].

Table 13: Transit company priorities for bus stops

	Posted schedules	**Covered bus stop**	**Seating**	**Telephone**	**Regular maintenance**
Nanaimo	low	Low	low	Zero	high
Whistler	low	Low	low	Zero	medium
Campbell River	low	Low	medium	low	low
Comox Valley	zero	Low	low	low	low
Cowichan Valley	low	Low	low	low	low
Sunshine Coast	low	Low	low	zero	zero
Port Alberni	low	Low	low	low	high
Powell River	low	Low	medium	low	high

Table 13 shows that bus stop amenities remain a low priority in most surveyed jurisdictions. More times than not, public bus passengers within the Georgia Basin will not have access to posted bus schedule times, will be exposed to all types of weather conditions, will be required to stand while waiting for a bus, and will have no access to a public payphone. Moreover, public bus passengers within the Georgia Basin will likely experience poorly maintained bus stop environs, an experience that is unlikely to raise the profile of public transit.

[7] Choice riders are those individuals owning an automobile yet choosing to regularly ride public transit

5.0 Conclusions

Improving community access to public transit is a concern of local government, transit authorities and national organizations including the Federation of Canadian Municipalities (Comeau, 1999). These concerns are founded on social, environmental, and economic reasons. A social benefit of improved community access to public transit is the potential reduction in mobility deprivation experienced by youth, the elderly, and those physically challenged. Environmental and economic benefits include reduced traffic congestion, reduced personal injury and property loss, reduced greenhouse gas emissions, and improved local air quality. To date, most of the attention around sustainability indicators and improved access to public transit has been focused on urban areas. This paper has attempted to make a contribution toward the development of sustainability indicators for rural residential areas with respect to improved community access to public transit.

The sustainability indicators presented in this paper are intended for transit planners, land-use planners, and policy makers for the purpose of monitoring trends toward improved community access to public transit. The list of indicators presented in this paper is not intended to be conclusive nor site specific. Indeed many other indicators should be added to this list with the goal of enhancing the sustainability of all rural residential areas. By reducing automobile dependency and increasing community access to public transit, rural residential areas of the Georgia Basin and elsewhere will continue to be attractive and sustainable regions.

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