

EMERALD HILLS URBAN VILLAGE

FOUNDATION RESEARCH BULLETIN

Design Centre for
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TRANSPORT

1.0 Introduction: Why is this important?

Sustainable communities allow residents to live, work, shop and play in their local areas. Land and public infrastructure are designed for multiple purposes and mixed use. Transportation corridors and commercial arterials provide both commuter mobility and access to multiple services and daily activities. Successful transportation corridors enable multiple transportation choices, including access and movement for pedestrians, bicycles, transit and automobiles.

Socio-demographic and land use characteristics can significantly influence the travel patterns of a community. Neighbourhoods with medium- to high-densities, mixed land uses, interconnected street networks, a strong local employment base, and viable connections to transit can minimize automobile use and encourage walking, bicycling, and using public transit. Communities that are designed to encourage these alternative forms of transportation can significantly reduce average household greenhouse gas emissions and can dramatically improve physical activity and public health levels.

Increasing residential and commercial density is an important first step to creating more sustainable communities. By increasing density, the community becomes more compact and distances between origins and destinations are reduced. A large body of research has shown that by locating activities close together, automobile dependence is reduced and alternative forms of transportation are encouraged. One study, for example, found that doubling urban density in North American cities can result in a 25% to 30% reduction in vehicle kilometres travelled (VKT).¹

Another vital component to reduce automobile dependence is to provide a diverse array of residential and commercial land uses within a given area. As land use mix is increased, the proximity between origins and destinations decreases. Studies have shown that if retail shops are within 90m (300 feet) from residential units, people are more likely to commute by transit, foot or bicycle.² By increasing and diversifying residential, office and retail uses within Emerald Hills Urban Village, residents can be enticed out of their cars.

Traditional development planning separated the bulk of employment from housing, and numerous studies have shown that a job-housing imbalance encourages the use of the automobile. Providing a sufficient supply of jobs within Emerald Hills Urban Village can ensure that as many residents as possible are able to work close to home and reduce the need to commute to other communities. One study found that reductions in work-related trips require an employment density of 123-173 employees per gross hectare

¹ Holtzclaw. 1994. p. 6-8 and 21.

² Cervero, R. 1996. p. 375.

(50-70 employees per gross acre), of which approximately 18% should be residents. For significant reductions in non-work trips, such as shopping, an employment density of 185 employees per gross hectare (75 employees per gross acre) is needed, of which approximately 18% should be residents.³

From a transit standpoint, increasing the employment density and the jobs-to-housing ratio will also increase viability, since transit can service both employees and residents in the area.

An interconnected street network is necessary for encouraging walking and transit use. It is possible, however, to increase the connectivity for pedestrians and bicyclists through the creation and improvement of pedestrian/ bicycle paths or by restricting vehicle traffic on certain streets. Increasing connectivity for pedestrians and bicyclists will increase the utility for pedestrians and bicyclists while decreasing the utility for automobiles. This can help reduce automobile dependence and encourage non-motorized forms of transportation.

2.0 Why is transport important to Emerald Hills Urban Village?

“Strathcona County will strive to accommodate the movement of people and commodities in a safe, economical, efficient and environmentally responsible manner. As growth in the County continues, pressure on the transportation system will continue to increase. Strathcona County will continue to ensure all transportation uses such as trails, public transportation, rail, air and pedestrian walkways that are interconnected. Improving the trail system in both the Sherwood Park Urban and Rural Service Areas will continue to provide more pedestrian friendly routes throughout the County and provide more opportunities for residents to interact.”⁴



Fig. 1 The interconnected, walkable street network in East Clayton, Surrey, B.C. Also note connected greenway running through the site.

3.0 How can EHUV impact on this theme?

A pedestrian- and transit- oriented transportation network is necessary to provide a foundation which can enable Emerald Hills to become a sustainable development. Emerald Hills Urban Village has a unique opportunity to create an interconnected and fine grained multi-modal community, which is walkable, safe and vibrant. Such a community gives residents the option of not requiring a vehicle to access basic goods and services. This can promote better health, economic savings, and a safer, more tightly-knit community.

3.1 What strategies are relevant for EHUV?

Interconnected streets, sidewalks and paths:

Connectivity is important to encourage a variety of transportation modes, both as individual systems, and as a whole. An interconnected street design disperses vehicle traffic and prevents funneling into larger

³ Frank and Pivo. 1994. pp. 9-37.

⁴ Strathcona County. 2006. Section 15.1.



Fig. 2 Local 2-lane Street with pervious parking strips.



Fig. 3 Local 1-lane "Queuing" street with bicycle lane.



Fig. 4 Collector 4-lane street.



Fig. 5 Narrowed street with bike lane and pedestrian crossing median.

arterials, thus avoiding congestion and disruption to the community. This design provides the foundation for integrated sidewalk, path, and bicycle networks which support non-automobile use. Short blocks encourage walking and wayfinding, slow traffic, and together with multiple public transit stops, create a fully integrated system which reduces automobile trips per household and leads to a higher quality of life for individuals of all ages, abilities and economic means.

Design Measures:

- Provide direct connections to local destinations;
- Interconnect all streets and provide parking, sidewalks and bike routes along both sides;
- Optimize size and layout of blocks for non-auto traffic (max. = 150 m long, ideal= 60 to 90 m⁵);
- Design with multiple street scales (ie. local with lane, collector, arterial- see Table 1⁶) to form a dense, finely-grained network;
- Connect trails at ground level.

Table 1: Optimal Street Widths			
Type (pkg both sides)	Vehicle lane	Bicycle lane	Parking lane
Local (2-lane)	3.4m (11ft)	1.8m (6ft)	2.1m (7ft)
Local (1-lane "Queuing")	3.9m (13ft)	multi-modal s/w	2.1m (7ft)
Lane (1-lane)	3.6m (12ft)	n/a	1.2m (4ft) ea. side
Collector (4-lane)	3.4m (11ft)	1.8m (6ft)	2.1m (7ft)
Arterial (4-6 lane)	3.4m (11ft)	1.8m (6ft)	2.1m (7ft) as shoulder

Pedestrian-safe streets and layouts:

Narrow streets slow traffic, making roads safer for pedestrians of all ages. Alternative transportation modes and transit will become more attractive and viable, and will promote community health and neighbourhood cohesiveness. Narrow streets also allow for effective tree canopy shading to prevent a "heat island effect" and provides rainwater management. Available on-street parking throughout the site with rear-lane access for garages and commercial parking will allow building frontages to address the street, ensuring sidewalks are not fragmented by parking lots and driveways. An overall integration of, and contiguously developed, land uses will shorten distances between residents and destinations, lessening the need to drive, and shallow building setbacks with overhangs and other pedestrian-scaled features, will heighten pedestrian comfort⁷.

Design Measures:

- Design narrow street widths in residential areas which are no

⁵ Dom Nozzi. n/d.

⁶ Metro. 2002.

⁷ James Taylor Chair in Landscape & Liveable Environments. 2001. p. 1.

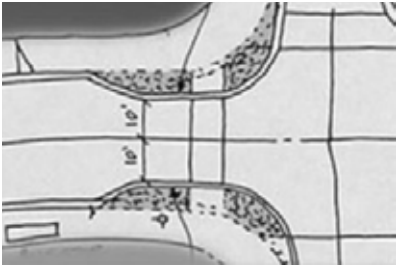


Fig. 6 Corner bulges with 3m (10ft) lane widths.



Fig. 7 Planted corner bulges in a residential neighbourhood.



Figs. 8 (above) and 9 (below) Streets should be designed to prioritize pedestrians, bicycles, and transit.



more than two travel lanes plus on-street parking;

- Reduce pedestrian crossing distances at intersections with bulges or planted median refuges (medians min. 2.4 m [8ft] wide);
- Provide only on-street or underground parking throughout site;
- Provide rear lanes for residential garages and service lanes;
- Plant corner bulges and traffic circles on local (residential) streets;
- Design all street right-of-ways in favour of cyclists and pedestrians (especially children and seniors), with appropriate amenities provided along corridors and at destinations (eg. seating, lighting, bicycle parking, lockers, changing facilities);
- Ensure all streets are planted with a diversity of canopy-forming trees.

Intensify development near transit points:

Compact development supports viable public transit in addition to neighbourhood retail, transit service and active community environments.

- Condense residential land use to at least 30 - 50 uph (12-20 upa)⁸ which can be achieved through small lot single family homes, multiplexes or townhomes, decreasing building footprints by sharing resources;
- Diversify services (mixed use) and share resources as much as possible within one building footprint close to residential areas to encourage “one-stop shopping”;
- Provide infrastructure for local or home-based businesses to reduce product and employee transport vehicle trips.

Promote alternative transportation options:

Continuous automobile use creates pollution, promotes obesity, deteriorates the safety and quality of streetscapes and fragments the community. A sustainable community development will design its neighbourhoods, streets, and building forms to prioritize walking, bicycling and public transit in order to create affordable, efficient transportation options for everyone, including youth and seniors.

Design Measures:

- Contiguous street design;

⁸ Peter Newman. 1996. p. 68.

- Connect development with transit routes and locate transit stops within a 3-5-minute walking distance (approx. 300 m) from residences.⁹
- Create designated bike lanes along all residential streets- widths min. 1.5- 1.8 m (5-6 ft) wide;¹⁰ Sidewalk widths between 2.2 and 3.5 metres (7-12 ft).¹¹
- Design for cycle access and parking in all parts of development and create safe/secure covered parking for bicycles;¹²
- Design an efficient cycle lane network throughout the site and ensure integration with additional cycling routes;
- Co-ordinate land use and infrastructure to facilitate sharing goods-shipment strategies and routes between commercial/ industrial/municipal services;
- Provide basic services and shopping within walking distance (500m radius) for all residents;
- Design pedestrian-scaled and articulated building form;



Fig. 10 Mole Hill, Vancouver, B.C.



Fig. 11 Central Valley Greenway, Vancouver, B.C.

4.0 What policies and/or programs will add value?

- Provide economic incentives and a forum for local or home-based businesses to co-ordinate with each other to reduce product and employee transport vehicle trips, including goods-shipment strategies and routes between commercial/industrial/municipal services;
- Create car- and trip- sharing partnerships (eg. Co-operative Auto Network-CAN) to reduce the number of vehicles owned and operated by residents;
- Create community garden programs which take advantage of marginal street spaces such as narrow lanes- see Fig. 10;
- Support bicycle club programs and create partnerships with NGOs (eg. Better Environmentally Sound Transportation- BEST <http://www.best.bc.ca/>);
- Use initiatives such as "Canada Helps"¹³ to create charitable funding sources for alternative transportation programs.
- Create a policy to require bicycle parking and storage in all development.
- Provide "end of trip" bicycle amenities in commercial and work areas (eg. showers, indoor bicycle storage).

⁹ James Taylor Chair in Landscape & Liveable Environments. 2001.

¹⁰ Virginia Department of Transportation Rural Planning Grant Study. 2004. p. 22.

¹¹ Ibid.

¹² One Planet Living. 2006.

¹³ "Canada Helps" is a non-profit, youth-driven initiative that allows the public to help charities at no cost to the charitable organization- www.canadahelps.org.

- Make employer-provided transit benefits tax-exempt.¹⁴
- Create inter-community and regional greenway trails with the sponsorship and participation of universities, community groups, arts associations and local businesses (eg. “Sponsor the Trail” is such an endeavor, which engaged local volunteers in the creation and stewardship of the regional Central Valley Greenway in the Greater Vancouver Regional District). See Fig. 11.

5.0 What other resources are available?

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¹⁴ Better Environmentally Sound Transportation (BEST) Citizen advocacy.

Photo credits

Figure 1: GreenGuide p.85.

Figure 2: Design Centre for Sustainability (DCS).

Figure 3: Ibid.

Figure 4: Ibid.

Figure 5: Ibid.

Figure 6: Virginia Department of Transportation Rural Planning Grant Study p.25.

Figure 7: DCS.

Figure 8: Ibid.

Figure 9: Ibid.

Figure 10: Ibid.

Figure 11: Translink (Greater Vancouver Transportation Authority).

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