EMERALD HILLS URBAN VILLAGE GOALS, INDICATORS AND TARGETS SPREADSHEET

THEMES	GOALS			PERFORMANCE ASSESSMENT									
				Case Study Benchmarks				Scenario Benchmarks			Design Performance		Measurement Protocol
		Indicator	Metric					Status Quo Scenario	Initially Proposed Scenario	Deep Green Scenario	Proposed Target	Master Concept Plan	
LAND	Achieve compact development.	Residential density	du's/ha	Orenco 53 uph	Suter Brook 57 uph	Mole Hill 163 uph	Arbutus 271 uph	19 uph	50 uph	100uph	75uph	81uph	Total number of dwelling units divided by total site area.
		Commercial density	Commercial bldg FAR	Garrison Woods 0.3	East Clayton 0.3-0.5	LEED-ND Average 0.5		0.24	0.25	2.32	1.5	0.57	Total building floor area allocated to commercial uses divided by respective site areas of land dedicated to commercial use. For mixed use buildings, site was area scaled based on the percentage of floor area used as commercial.
	Reduce footprint of transportation infrastructure.	Site coverage roads and parking	% development area allocated to roads and parking	Garrison Woods 21%	Radburn 16%	Village Homes 12%		32%	31%	13%	13%	22%	For each parcel, or functional parcel, land area used by roads and parking drawn and calculated. This area was summed and the total was divided by the total site area.
		Site coverage roads and parking	% development area for residential and commercial uses allocated to surface parking (not including on-street)	LEED-ND Max. 20% (with no individual lot greater than 2 acres)							20%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
	Provide a diversity of land uses.	Use mix	Area of commercial & open space / # dwelling units	East Clayton 0.015	Orenco 0.019	Arbutus Walk 1.5		0.006	0.007	0.004	0.01	0.005	Land area dedicated to open space and the site area allocated to commercial use summed and divided by total number of dwelling units. Mixed use buildgins allocated a proportion of site area based on floor area dedicated to commercial uses.
		Residential dwelling mix	Simpson Diversity Index (reference LEED-ND for description of this indicator)	LEED-ND 1 point 0.5-0.6	LEED-ND 2 points 0.6-0.7	LEED-ND 3 points Greater than 0.7		0.41	0.26	0.59	0.5	0.44	Dwelling units allocated to the categories defined by LEED-ND. Calculation done using LEED-ND formula. Note: the Master Plan results are skewed by the fact that there is no single family land use included within the Urban Village itself. If one includes the surrounding development in the calculation, the Master Plan performance would easily exceed the target.
NATURAL HABITAT	Create mult-functional green spaces with significant ecological value.	Significant habitat	% development area with native habitat protected from development	LEED-ND 10% dev footprint	Pringle Creek 15%			0	0	10%	10%	approximately 2%	Status Quo and Initially Proposed Scenarios were assumed to be 0% based on typical development standards observed in Strathcona County for for similarly-sized developments.For Deep Green Scenario, land that was specifically allocated to habitat preservation measured. Master Plan performance based on intent described during design process.
		Naturalized greenspace	% land area restored to having significant ecological value								100%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
	Maintain connectivity between, and access to, natural habitat areas and greenspace.												
WATER	Maintain health of aquatic ecosystem.	Stormwater runoff	Effective impervious area (including SWMF)	Suter Brook 50%	SEFC Target 40%	Pringle Creek 0%		0.57	0.51	0%	0%		For Status Quo and Initially Proposed Scenarios, assumption was made that no techniques were incorporated into Village design and the effective impervious area = impervious area. Impervious area, for these two scenarios, was measured in GIS by adding the area of building footprints to the area of parking and streets and pedestrian facilities. For the Deep Green Scenario, aggressive techniques such as green roofs, were assumed and incorporated into the calculation. Master Plan performance not calculated due to lack of data and/or applicability at a different scale.
		Stormwater treatment	% runoff filtered / treated naturally	VITP 100%	Bo01 100%	Pringle Creek 100%					100%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
	Reduce the demand for potable water resources	Rainwater harvesting	% rainwater captured for re-use	Westhills 50%	Dockside 100%						50%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
		Water use	% decrease in average potable water use	Westhills 20%	Greenwich 30%	Stapleton 40%	Dockside 60%				50%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
	Minimize long-term costs of water infrastructure.	On-site wastewater treatment	% wastewater solids treated on-site	Westhills 50%	Dockside 100%						50%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
CARBON	Design urban form to optimize energy efficiency of buildings and infrastructure.	Solar orientation	% buildings with good solar orientation	Parkmount 80%	Arbutus Walk 100%	Bo01 100%					80%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
		Natural ventilation	% buildings with natural ventilation					0%	0%	>99%	75%		For Status Quo and Initially Proposed Scenarios, assumption was made that none of the buildings are constructed with natural ventilation (assistance by mechanical ventilation is assumed). For the Deep Green Scenario, all buildings except the Extended Care facility are assumed to use natural ventilation techniques. Master Plan performance not calculated due to lack of data and/or applicability at a different scale.
		Energy efficiency	Ratio exterior skin area to floor area	Kits Mews 1.2	Garrison Woods 0.85			1.9	1.1		0.98		For each building, the skin area (area of exterior walls and roof) calculated. Ratio is total skin area divided by building floor area. Master Plan performance not calculated due to lack of data and/or applicability at a different scale.

		Tree canopy	% parking and road area shaded by trees	Lloyd Crossing 30%	Portland Target 47%	Davis CA 50% parking lot ordinance	Milton 60%				50%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
			# trees / parking space	East Clayton1 tree per 8 spaces	BMP 1 tree per 5 spaces						1 tree per 5 parking spaces.		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
	Incorporate renewable energy sources and a community energy system.	Renewable energy	% total energy consumed generated on-site from renewable sources	LEED-ND 5%	Westhills 50%	Drake Landing 90%	Bo01 100%	0%	0%	74%	60.0%		See paper 'Modeling Energy Alternatives at a Neighbourhood Scale' for details on measurement protocol.
	Ensure the use of green building practices for envelope and mechanical design.												
TRANSPORT	Ensure multiple transportation choices are available.	Sidewalk completeness	% roads with sidewalks	Westhills 100%	False Creek S 100%	East Clayton 100%						100%	No public roads in Village.
		Pedestrian environment	Index of pedestrian route directness	Portland Urban 1.5	Madison Park 1.23			1.8	1.4	1.2	1.2	1.3	Key destinations on site selected, along with a sample of residential units (or their main entrance in the case of apartment buildings). Shortest walking distance between them measured. Final measurement is average walking distance divided by cardinal distance.
	Ensure effectiveness of multi-modal transportation system.	Transit proximity	Average distance from all residents to closest transit stop	UniverCity 400m	Westhills 400m	Orenco 75m					200m		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
		Location efficiency	Density near transit points								2 times average density of full project		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
		Transit network extent	# buses stopping within 400m of major commercial and majority of residential uses	LEED-ND 60-124 rides per day	LEED-ND 125-249 rides per day	LEED-ND 250-499 rides per day					60-124 rides per day		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
FOOD	Promote community-based food production.	Area for food growing	% productive land / dwelling unit	Vancouver 0.3 m2	Village Homes 4.6 m2	Pringle Creek 7.5 m2		0m2	0m2	5.5m2	4.6m2	0.68m2	Area of space dedicated to community gardens summed and divided by total number of dwelling units.
			% dwellings within 200m of a community garden plot	Mole Hill 100%				0%	0%	100	100%	64%	All land designated as community gardens included. (For Deep Green Scenario, this includes substantial roof top gardens). Using GIS, minimum distance of buildings to garden plots calculated. If a building is within 200m of a community garden, all dwelling units in the building are assumed to be within 200m of garden plot.
MATERIALS	Ensure the use of green neighbourhood and building practices.	Green building rating	% buildings designed and constructed in accordance with a green building rating system	LEED-ND 50%	Dockside 100%	Block 39 100%	Westhills 100%				75%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
	Reduce the amount of materials used overall												
WASTE	Ensure the use of green neighbourhood and building waste management practices.	Recycling facilities	# du's within 350m of centralized collection point	BMP 100%				0%	0%	100%	100%	100%	Centralized recycling collection point located in Village. Using GIS, 350m distance calculated to this point. If a building is within 350m of the collection point, all dwelling units in the building are included in calculation.
		On-site composting	% organic waste composted on-site	LEED-ND 50%	Bo01 100% parks/gdns						50%		While a target can be set for this indicator, measurement cannot occur until more detailed design has occurred. The targets serves a purpose of focusing design on achievement of a specific level of performance.
ECONOMY	Ensure a diverse mix of economic opportunities, including local economic development.	Diversity of commercial units	commercial frontage / commercial floor space	Standard supermarket 0.02m/m2	Capers 0.04m/m2			0.0279 m/m2	0.429m/m	0.0541m/m2	0.05m/m2		For each building with commercial space, commercial frontage (defined as portion a building frontage that includes windows or doors for commercial purposes) was measured. This was divided by the commercial floor space of this building. Measure was then summed for entire Village. Master Plan performance not calculated due to lack of data and/or applicability at a different scale.
		Jobs to housing balance	retail floorspace / dwelling units + office floor space /dwelling units	WA state 1.45	Ventura County 1.1-1.34			Retail:4.35 / Office 0	Retail: 10.24 / Office: 0	Retail: 4.76 / Office 5.9	Not set	Retail: 6.5 / Office: 12	Retail and Office Floorspace in square meters was measured for each building and summed for the entire site. Resulting values were divided by the total number of dwelling units in the study site.
		Employment density	# employees / ha land designated for employment uses	King County 448 comm / 285 off	Snohomish 550 comm / 374 off	Portland 470 Retail		41	35	157	250	148	Total building area (m2) that was designated as commercial or retail summed. Total areas multiplied by a jobs/floorspace assumption (Retail: 0.017 jobs/m2; Office: 0.031 jobs/m2). Land allocated to employment uses calculated by summing land area of parcels (or functional parcels). Land use associated with mixed use buildings was scaled based on percentage of building floor area allocated to retail or office use.
WELL-BEING	Provide access to sufficient public gathering spaces.	Public gathering spaces	% site area in park & open space	Stapleton 25%	Arbutus 30%	Coal Harbour 40%	Westhills 40%				30%	12%	Indicator added late in process, not measured for Scenarios 1, 2 and 4.
	Design a vibrant public realm that promotes social interaction.	Building set-backs	% facades within 25' of pedestrian network / property line	LEED-ND 80%						100%	80%		Primarily an indicator for suburban sites where each parcel is owned freehold, rather than mixed-use site with complex ownership / property lines
		Ground-oriented housing	% households in ground-oriented housing units	Lower Hyde Creek 38%	East Clayton 75%			89%	15%	15%	15%	9%	Detached, Duplexes, and ground floor apartments in buildings that were specifically designed to be ground-oriented were summed and divided by the total number of units.
EQUITY	Enable people from a range of economic levels, ages, and abilities to reside in the same community.	Housing types and tenures	Simpson Diversity Index (reference LEED-ND for description of this indicator)	LEED-ND 1 point 0.5-0.6	LEED-ND 2 points 0.6-0.7	LEED-ND 3 points Greater than 0.7		0.41	0.26	0.59	0.5	0.44	Dwelling units allocated to the categories defined by LEED-ND. Calculation done using LEED-ND formula. Note: the Master Plan results are skewed by the fact that there is no single family land use included within the Urban Village itself. If one includes the surrounding development in the calculation, the Master Plan performance would easily exceed the target.
CULTURE	Celebrate the local cultural and natural identity and heritage.	Public art	Presence of public art that addresses contextual issues and values (Y/N)	Portland TriMet 1.5% construction costs	Stapleton PAMP						Y		Measurement not calculated due to lack of data and/or applicability at a different scale.
	Create a unique and strong sense of identity for the Village.	Access to cultural spaces	% residential units within 400m walk of community centre					0%	0%	100%	100%	100%	As site is smaller than 400m radius, values for this indicator were determined by the presence/absence of a community centre in the various scenarios.