

# Sustainability Planning Matrix<sup>1</sup>

<i>Sustainable Community Planning Issues</i>		<i>Land Use</i>	<i>Transportation</i>	<i>Open Space</i>	<i>Built Form</i>	<i>Infrastructure</i>	<i>Institutional Considerations</i>	<i>Local Programs</i>
Sustainability Issue	<b>Energy &amp; Air Quality</b>	<ul style="list-style-type: none"> <li>* Provide mixed use development at densities high enough to support a convenient transit system</li> <li>* Provide a diversity of housing types.</li> <li>* Layout with high densities near transit systems and in regional town centers</li> <li>* Ensure a pedestrian-permeable and flexible urban structure</li> <li>* Ensure land area is allocated for new green infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>* Develop priorities system (pedestrians, bicyclists, transit, goods movement, automobiles)</li> <li>* Design the narrowest roads possible</li> <li>* Design streets so pedestrians have dominance and auto speeds are slow.</li> <li>* Set parking requirements as low as possible; explore a car-free zone.</li> <li>* Offer commuter cyclist paths.</li> </ul>	<ul style="list-style-type: none"> <li>* Lay out open space networks to support pedestrian/bicycle network and surface runoff system</li> <li>* Reduce lawn in park areas to an absolute minimum and maximize treed areas.</li> <li>* Ensure public open space is interesting and safe.</li> </ul>	<ul style="list-style-type: none"> <li>* Design green, energy-efficient buildings</li> <li>* Keep building dimensions consistent with passive heating, cooling and ventilation systems.</li> <li>* Consider integration of energy production systems into building design.</li> </ul>	<ul style="list-style-type: none"> <li>* Develop alternative energy infrastructure on site where possible (solar, wind, microhydro, biomass, geothermal)</li> <li>* Introduce district heating systems to link buildings and land uses for heat where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>* Identify regulatory changes needed to support energy efficient patterns.</li> <li>* Identify regulatory and policy review systems to address energy issues in development.</li> <li>* Develop proposals for tax and other incentives to support green development patterns.</li> <li>* Establish institutional systems to monitor energy consumption</li> </ul>	<ul style="list-style-type: none"> <li>* Establish relationship with utilities for energy-efficient design.</li> <li>* Develop relationships with key interest groups and stakeholders and develop educational programs related to energy use, efficiency and conservation.</li> </ul>
Sustainability Issue	<b>Water and Liquid Waste</b>	<ul style="list-style-type: none"> <li>* Use watershed network as an ordering pattern for the site</li> <li>* Preserve existing waterways and establish new water courses as needed to manage runoff and water supply &amp; treatment systems.</li> <li>* Integrate innovative sewage treatment infrastructure into land use patterns.</li> </ul>	<ul style="list-style-type: none"> <li>* Ensure road runoff management system offers ecological habitat value where possible and is designed to treat contaminants in runoff.</li> <li>* Ensure road network preserves the integrity of streams and riparian areas.</li> <li>* Use permeable materials where possible.</li> <li>* Minimize conventional curb and gutter systems in favour of surface runoff systems.</li> </ul>	<ul style="list-style-type: none"> <li>* Use local watershed network as an ordering pattern for the open space network.</li> <li>* Integrate grey/black water treatment systems into the open space network and use as an amenity where possible</li> <li>* Utilize runoff and other water flows as opportunities for public art and interest in the public realm.</li> <li>* Maximize permeability in open space.</li> </ul>	<ul style="list-style-type: none"> <li>* Design buildings to minimize runoff from roofs (green roofs), or provide systems to store runoff for use in landscape</li> <li>* Consider ways to reduce toxicity of runoff from building / roof materials.</li> <li>* Ensure building siting and design preserves integrity of riparian areas.</li> <li>* Integrate grey/black water treatment systems into building and site design.</li> </ul>	<ul style="list-style-type: none"> <li>* Minimize water and waste infrastructure systems where possible.</li> <li>* Provide on-site systems for grey/black water treatment and recycling – provide for future adaptability if not possible at present.</li> <li>* Use surface runoff management systems including percolation where possible, instead of conventional stormwater sewer system.</li> </ul>	<ul style="list-style-type: none"> <li>* Consider regulatory changes required to support innovative water and liquid waste systems.</li> <li>* Identify organizations that could be responsible for new systems and consider education / management systems needed.</li> </ul>	<ul style="list-style-type: none"> <li>* Identify potential educational and community identity building initiatives associated with new water / waste system designs.</li> <li>* Identify possible linkages between new systems and water-oriented stakeholder / interest group programs.</li> </ul>



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Sustainability Issue	<b>Solid Waste</b>	<ul style="list-style-type: none"> <li>* Address industrial ecology systems in land use planning to find synergies between companies in use/recycling of resources and wastes.</li> <li>* Consider land required for on-site composting systems to reduce waste haulage.</li> <li>* Consider recycling depots and other systems required to reduce on-site waste.</li> <li>* Develop robust land use and built form pattern that can adapt over time without requiring demolition.</li> </ul>	<ul style="list-style-type: none"> <li>* Design waste management system to minimize the need to truck waste off-site.</li> <li>* Choose road surfacing materials that can be reused.</li> </ul>	<ul style="list-style-type: none"> <li>* Integrate recycling drop-offs / depots into public realm along with conventional waste systems.</li> <li>* Integrate composting facilities into park and greenway design</li> <li>* Use recycled, recyclable and re-usable materials in open space areas.</li> </ul>	<ul style="list-style-type: none"> <li>* Develop well-built and robust buildings that can adapt to changes in use over many decades without requiring demolition.</li> <li>* Preserve existing structures on a site for re-use where possible, or recycle building materials from existing structures in new development.</li> <li>* Use recycled materials in new buildings.</li> <li>* For new buildings, consider deconstruction strategy at the design stage (cradle-to-cradle).</li> </ul>	<ul style="list-style-type: none"> <li>* Ensure facilities for recycling and composting are included in site infrastructure plan.</li> </ul>	<ul style="list-style-type: none"> <li>* Integrate existing solid waste programs into design.</li> <li>* Identify progressive changes needed to support proposed waste management systems.</li> </ul>	<ul style="list-style-type: none"> <li>* Identify educational programs on waste that could be integrated into project, and include relevant stakeholders and their programs where possible.</li> </ul>
Sustainability Issue	<b>Biodiversity / Ecological integrity</b>	<ul style="list-style-type: none"> <li>* Preserve existing important natural areas and sensitive areas.</li> <li>* Develop network of greenways and "ecological infrastructure areas" throughout site, with an eye to connecting existing natural areas or corridors.</li> </ul>	<ul style="list-style-type: none"> <li>* Design roadways to preserve integrity of existing waterways, habitat and wildlife migration routes.</li> <li>* Design roadway edges and easements as habitat corridors.</li> </ul>	<ul style="list-style-type: none"> <li>* Design open space to serve as ecological infrastructure.</li> <li>* Ensure natural areas, parks and greenways are designed to provide habitat for local species.</li> <li>* Link local greenspace, greenways and riparian areas to those in surrounding region, to preserve overall habitat function.</li> </ul>	<ul style="list-style-type: none"> <li>* Design buildings to provide ecosystem benefits through green roofs, green walls, and water runoff design.</li> </ul>	<ul style="list-style-type: none"> <li>* Design infrastructure systems to share similar rights-of-way to minimize ecosystem disruptions.</li> <li>* Design local decentralized infrastructure where possible.</li> </ul>	<ul style="list-style-type: none"> <li>* Integrate existing policy and guidelines where they provide a good foundation for green design.</li> <li>* Identify additional policy, guidelines, and regulatory change needed to promote a stronger site ecosystem.</li> <li>* Introduce monitoring programs to track biodiversity.</li> </ul>	<ul style="list-style-type: none"> <li>* Propose programs to increase ecosystem health (tree planting, stream keepers, nesting boxes, etc.)</li> <li>* Integrate existing stakeholders working to preserve and enhance ecosystem health into project.</li> </ul>



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Sustainability Issue	<b>Economic Health</b>	<ul style="list-style-type: none"> <li>* Ensure land use patterns will support a strong local economy, a diversity of uses, employment &amp; business opportunities.</li> <li>* Ensure land uses are appropriately sited for business success and for easy transit access.</li> <li>* Integrate uses as flexibly as possible recognizing some don't mix well.</li> <li>* Consider industrial ecology networks and types of businesses that can benefit from locating next to each other (to share systems and resource and/or waste streams).</li> <li>* Consider evolution of land uses and changes in demand for uses over time and ensure plan will accommodate predictable changes in demand and supply.</li> </ul>	<ul style="list-style-type: none"> <li>* Provide appropriate access to commercial and industrial areas for customers, workers and goods movement.</li> <li>* Focus retail where transit is convenient.</li> <li>* Provide for telecommuting infrastructure</li> <li>* Develop pedestrian-oriented and/or car-free zones in retail and commercial areas.</li> </ul>	<ul style="list-style-type: none"> <li>* Integrate well-used public open space (recreational areas and greenways) into and around commercial areas to promote a mix of activities.</li> <li>* Provide adequate public open space near high density residential, especially in areas with family housing to maintain land values.</li> </ul>	<ul style="list-style-type: none"> <li>* Design buildings that are flexible and can accommodate a range of uses over time.</li> <li>* Ensure retail spaces are located and designed to be commercially successful.</li> <li>* Provide a range of housing types to encourage a wide range of income groups to live in higher density areas – provide workers and customers.</li> </ul>	<ul style="list-style-type: none"> <li>* Provide necessary communications infrastructure for all businesses.</li> <li>* Consider scale of infrastructure needed for planned or projected density of commercial uses.</li> </ul>	<ul style="list-style-type: none"> <li>* Identify key elements of economic development strategy that are relevant to the site's design.</li> <li>* Consider incentives or regulatory changes needed to realize innovative economic strategies for site.</li> </ul>	<ul style="list-style-type: none"> <li>* Consider existing economic programs and how they could be improved to support the vision of sustainable community.</li> <li>* Consider how disadvantaged groups could be included in economic activity on site</li> </ul>



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<b>Social Health</b>	<ul style="list-style-type: none"> <li>* Ensure housing and commercial land uses are mixed appropriately so as to support a diverse and locally vibrant social community.</li> <li>* Consider the land use needs for each type of resident, worker &amp; visitor.</li> </ul>	<ul style="list-style-type: none"> <li>* Promote non-auto oriented communities that encourage walking and cycling to improve local air quality and individual health.</li> <li>* Consider pedestrian and cyclist safety in transportation network.</li> </ul>	<ul style="list-style-type: none"> <li>* Ensure open space design includes programs that support a balanced and healthy life, including recreation, reflection, pedestrian and bicycle movement, play, etc.</li> <li>* Allocate land to community gardens where appropriate.</li> <li>* Design public open spaces which encourage and support interaction between people.</li> </ul>	<ul style="list-style-type: none"> <li>* Design buildings to provide interest and transparency to public open space areas.</li> <li>* Design buildings with crime and safety in mind.</li> <li>* Design buildings to contribute to livability both inside and out.</li> </ul>	<ul style="list-style-type: none"> <li>* Ensure water supply and waste management systems are secure and adequate to preserve public health.</li> <li>* Design systems so they contribute to all residents' learning about the function and impacts of the infrastructure systems upon which they rely.</li> </ul>	<ul style="list-style-type: none"> <li>* Create a strong vision of a healthy sustainable community.</li> <li>* Identify key priorities for a monitoring system for public and community health indicators in the project.</li> </ul>	<ul style="list-style-type: none"> <li>* Integrate existing progressive social programs into the project design.</li> <li>* Consider additional programs for education or change that need to be implemented to realize the vision for community.</li> </ul>

<sup>1</sup> From Crofton, F.S. (2001) Sustainable community planning and development: Design charrette planning Guide. Ottawa: CMHC. (Originally titled “Sustainable Urban Development Issues Matrix”) Please note: The matrix above has since been updated to include, e.g., food security and accessibility under social issues; this additional information was not provided in time for the original publication.

