

Best Practices Manual of LEED New Development Section for Neighborhood Pattern and Design



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1.0-Introduction

Sustainable development has become increasingly popular on an individual, community, and corporate scale. The popularity of sustainable development in the marketplace is evident in the development of LEED for Neighborhood Development (LEED-ND) Rating System.

LEED-ND was started as a pilot study in 2007, and since then has attracted 238 projects in 39 states and 6 countries to participate in the study. The purpose of the study is to create standards for assessing and rewarding development using the best sustainable development practices. The success of the pilot study led to the approval of LEED-ND in October 2009 as a national rating system for neighborhood design.

Unlike other LEED products, LEED-ND goes beyond the design and construction of buildings to emphasize the relationship of the neighborhood to its larger region and landscape by incorporating smart growth and new urbanism practices. The principals of smart growth and new urbanism advocate compact, bicycle-friendly, transit-oriented, and walkable land-use. These two practices seek to combine the components of daily life (housing, workplace, shopping, and recreation) into an integrated, accessible, and pedestrian friendly mixed-use neighborhood. The objective is to avoid urban sprawl and provide an environment where all the services that residents need are easily accessible and conveniently reached by walking.

Since the early 1950s, Stantec has helped clients create neighborhoods using low-impact techniques that emphasize conservation. With the desire to be an industry leader in providing standards in urban planning and development, as well as maintaining a competitive edge in an aggressive market, Stantec standardized different methods of sustainable development in the form of a best practices manual (BPM).

The term best practices refer to methods and techniques that consistently show superior results when compared to those achieved by other means. However, there is no practice that is best for everyone or in every situation, and no best practice remains best for long as people keep developing better methods. Because testing and marketing unproven ideas are costly with little guarantee of consumers' acceptance, building on successful best practices is more cost effective. Since the BPM is based on tested methods, the time and money associated with implementing unproven ideas is saved.

This BPM is a subsection of the existing electronic BPM (eBPM) on Stantec's intranet. The BPM focuses on the 15 credits outlined in the Neighborhood Pattern and Design (NPD) section of LEED-ND. The BPM focuses on the NPD section because 40% of LEED-ND total points are allocated to the credits in this section; thereby, emphasizing the importance of the category. In addition, the NPD section focused more on smart growth and new urbanism practices, principals that set LEED-ND apart from other LEED products.

1.1- Manual's Structure

The BPM is separated into 2 sections. The first section is a comprehensive formatted table that outlines the goal and implementation methods for each of the 15 credits. The second section provides additional details on the implementation methods on some of the credits.

2.0-Best Practices Manual (BPM)

2.1-BPM Table Introduction

The formatting of the table aims to assist clients in making a decision based on their goals rather than “chasing credits” in order to get a LEED-ND certification. The table directs clients to focus on what aspects of sustainable development they find to be most important and applicable.

This is meant to serve as a cursory overview on the implementation methods of the 15 NPD credit in a project. It is not meant to serve as the only guide to a project, but rather a starting point to be used in the initial planning phase. For an explanation of the table itself, see the example below.

Credit: Title of LEED Credit		
Intent: This section provides the objectives of the credit named above, as provided in LEED-ND handbook.		
A. To easily present information on a variety of topics, this section subdivides the credit into smaller goals.		
Goal	Associated Best Practices	Concerned Agencies
1. This column provides the goal of the subdivision named above. While it may share a common theme with the intent of the entire LEED credit, it focuses more on one aspect of the credit, rather than the whole.	1. This column lists the best practices associated with achieving the goal mentioned in the adjacent left column.	Since achieving many of these goals may require changes to zoning, streets design, bus routes etc, this column provides the name of any agencies or bodies that may need to be involved in the planning process in an effort to expedite completion of the project.

2.1.1-BPM Table

Credit 1: Walkability		
Intent: To promote transportation efficiency, including reduced vehicle miles traveled. To promote walking by providing safe, appealing, and comfortable street environments that support public health by reducing pedestrian injuries and encouraging daily physical activity.		
A. Sidewalk Design and Layout		
Goal	Associated Best Practices	Concerned Agencies
1. To provide adequate sidewalk connectivity throughout a neighborhood, and promote walking as a viable form of transportation.	<p>1. Connect all residential areas with commercial centers via sidewalks (16,19).</p> <p>2. Vary sidewalk width depending on expected foot traffic volume; i.e., wider in downtown shopping areas, narrow in residential areas (5, 19, 23).</p> <p>3. Utilize pervious pavement when pouring sidewalks, reducing stormwater runoff (21).</p> <p>4. Provide ramps at each corner to maintain connectivity for handicapped residents (16, 19, 23).</p> <p>5. Plant trees along sidewalk to increase shading for pedestrians (5, 16).</p> <p>6. Follow planting system described in Credit 14 when planting trees.</p> <p>7. Provide adequate lighting to promote a feeling of safety (17,16).</p>	<p>Department of Transportation</p> <p>Department of Public Works</p>

B. Traffic Easement Measures		
<p>1. Promote walking and reduce traffic risks to pedestrians by restricting or controlling traffic flow.</p>	<ol style="list-style-type: none"> 1. Limit traffic speeds through residential areas (9, 14, 16, 23, 25). 2. Provide adequate pedestrian crosswalks at every major intersection and at mid-block points on larger streets (9). 3. Install raised pedestrian crosswalks, forcing cars to slow down (9,16). 4. Utilize sidewalk bulbouts to slow traffic at necessary points (16). 5. Force car traffic to slow down by using narrow street design alternatives (14). 6. Utilize alternative paving surfaces, such as interlocking pavers, at some intersections or on smaller side streets (21). 	<p>Department of Transportation</p>
C. Alley Revitalization		
<p>1. Reclaim alleys as walking paths for pedestrians, providing alternate routes throughout a city's center, and promote connectivity.</p>	<ol style="list-style-type: none"> 1. Increase lighting and signage, giving the alleys more of a "street" feeling (7, 26). 2. Relocate or centralize garbage pickup at the end of alleys, limiting the need for trash trucks to use the whole alley. 3. Replace asphalt with more pervious materials in an effort to reduce stormwater runoff (3, 26). 	<p>Department of Public Works</p> <p>Local Business Owners</p>

	<p>4. Promote alleys as viable space to local businesses, especially for outdoor restaurant seating (3, 7).</p> <p>5. Where applicable, alleys could be turned into small public parks, provided it does not interfere with firefighter access to buildings (3).</p>	
<p>D. Storefront/ Street front Beautification</p>		
<p>1. To create a more welcoming town center that would encourage foot traffic.</p>	<p>1. Encourage businesses to utilize window displays, inviting pedestrians to walk and look (2, 4).</p> <p>2. Encourage street front restaurants to use outdoor seating, either on patios or sidewalks, provided the sidewalk is wide enough to still accommodate pedestrians (29).</p> <p>3. Maintain plantings and trees along sidewalk for shading (5,16).</p> <p>4. Place benches at regular intervals along streets, creating small personal spaces that encourage pedestrians to use the sidewalk for more than just walking (15).</p>	<p>Local Business Owners/ Organizations</p>

Credit 2: Compact Development

Intent: To encourage development in existing areas to conserve land and protect farmland and wildlife habitat. To promote livability, walkability, and transportation efficiency, including reduced vehicle miles traveled. To improve public health by encouraging daily physical activity associated with alternative modes of transportation and compact development.

A. Standards for New Construction

Goal	Associated Best Practices	Concerned Agencies
1. To promote or enforce principles of compact development concerning new construction.	1. Provide exemptions from development fees in high-density development areas (5). 2. Reduce impact fees for high-density development projects (5). 3. If possible, alter local zoning to effectively force compact development (5). 4. Set a minimum floor to area ratio (FAR) for new construction, providing the above incentives to developers who follow these guidelines.	Local Zoning Body

B. Public Transit Access

1. Provide adequate access to various forms of public transit, reducing resident dependence on automobiles, and promoting walkability.	1. Encourage high-density development near existing public transit (8, 11, 13, 27). 2. Encourage use of public transit through incentives, such as lower fares on monthly passes (10, 13). 3. If public transit is not currently available in development area, coordinate with local transit authority to provide bus service to new community.	Public Transit Authority
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C. Public Relations		
1. Increase public opinion of high-density living, educating the public on both the environmental and economic benefits over traditional suburban living.	<p>1. During project development, hold town hall meetings or information sessions for potential residents (29).</p> <p>2. Promote the project throughout its duration, again showing the benefits of high-density living (29).</p>	
Credit 3: Mixed-use Neighborhood Centers		
Intent: To cluster diverse land uses in accessible neighborhood and regional centers to encourage daily walking, biking, and transit use, reduce vehicle miles traveled and automobile dependence, and support car-free living.		
A. Standards for New Construction		
1. To develop an area of the community specifically for mixed-use development	<p>1. Designate an area for mixed-use in initial project development (23).</p> <p>2. Design the area to have high walkability, as outlined in Credit 1 (5, 11).</p> <p>3. Limit amount of parking available in mixed-use areas, reducing dependency on cars, as well as reducing stormwater runoff (11, 13).</p>	Local Zoning Body
Credit 4: Mixed-income Diverse Communities		
Intent: To promote socially equitable and engaging communities by enabling residents from a wide range of economic levels, household sizes, and age groups to live in a community.		
A. Implementation		
Goal	Associated Best Practices	Concerned Agencies
1. To provide various housing types within a community, opening up residency to many different income brackets	<p>1. Offer various forms of housing, including but not limited to apartments, condominiums, and stand alone houses (5).</p> <p>2. Evenly distribute the housing types; i.e. mixing condos in among single family houses.</p>	

	3. Ensure transit access for all housing types (11, 27).	
B. Public Relations		
1. To encourage the adoption mixed-income housing in a community.	<p>1. Develop an information campaign to dispel any reservations residents may have. Topics to address include:</p> <ul style="list-style-type: none"> • Decreased real estate value due to lower income housing within the neighborhood (6, 11). • Increased crime due to low income residents. (6, 11) • Negative impact on local school system, either due to overcrowding or the influx of lower income students (6, 11). 	
Credit 5: Reduced Parking Footprint		
Intent: To design parking to increase the pedestrian orientation of projects and minimize the adverse environmental effects of parking facilities. To reduce public health risks by encouraging daily physical activity associated with walking and bicycling.		
A. Parking Reduction		
Goal	Associated Best Practices	Concerned Agencies
1. To physically reduce the amount of parking available, reducing stormwater runoff and promoting alternative transportation	<p>1. Where applicable, simply remove parking spots.</p> <p>2. Promote alternative transportation by providing walking and bicycle access to public areas (13).</p> <p>3. Provide adequate bicycle storage where needed, such as in town centers or office parks (13).</p>	

	4. To minimize the impact of reduced parking, businesses should provide incentives to employees for carpooling or using alternative transportation (11, 13).	
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B. Parking Alteration

1. Where reduction in parking is not a viable solution, implement alternative design methods to reduce the environmental impact of the parking facility	<p>1. Replace traditional asphalt with pervious pavement to reduce stormwater runoff (1, 12, 21)</p> <p>2. For lower impact parking, traditional asphalt may also be replaced with interlocking pavers (12, 21).</p> <p>3. Centralize spread out downtown parking into a single garage, offering the same amount of parking in a much smaller ecological footprint (11).</p>	
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Credit 6: Street Network

Intent: To promote projects that have high levels of internal connectivity and are well connected to the community at large. To encourage development within existing communities, thereby conserving land and promoting multimodal transportation. To improve public health by encouraging daily physical activity and reducing the negative effects of motor vehicle emissions.

A. Multimodal Access

Goal	Associated Best Practices	Concerned Agencies
1. To reduce residents' dependence on automobiles for transportation, thereby reducing emissions and promoting alternative transportation	<p>1. Encourage high-density development, creating a more walkable community (5, 6, 11).</p> <p>2. Follow principles of walkability, as outlined in Credit 1.</p> <p>3. Encourage the use of bicycles for transportation, providing adequate storage facilities where necessary (10, 13, 27).</p>	Department of Transportation

	<p>4. Provide a bicycle lane on all major roads, increasing the safety for those who choose to use alternative transportation (14).</p> <p>5. Follow the principles of compact development, as outlined in Credit 2.</p> <p>6. Minimize available parking in commercial centers, further encouraging walking or bike riding (11).</p>	
<p>B. Street Design</p>		
<p>1. To increase connectivity of streets, for both pedestrian and auto use, and in doing so reduce traffic congestion and excess vehicle emissions.</p>	<p>1. The network of streets should allow for multiple routes to the same destination, providing options in the event of construction, accidents etc (14, 20, 22, 25).</p> <p>2. Street design should again incorporate the principles of walkability, as outlined in credit 1 (14,16, 23).</p> <p>3. Block size should be limited to a reasonable distance, with crosswalks installed at adequately spaced distances (19, 23, 25).</p> <p>4. To still allow vehicle access but promote safety for pedestrians, street width should be limited, size depending in road type; i.e. residential road, main street, etc (14, 23).</p>	<p>Department of Transportation</p>

Credit 7: Transit Facilities

Intent: To encourage transit use and reduce driving by providing safe, convenient, and comfortable transit waiting areas and safe and secure bicycle storage for transit users.

A. Community Access

Goal	Associated Best Practices	Concerned Agencies
1. To provide residents of the community with easy access to public transit.	1. Build near preexisting transit systems, so that all house are within walking distance of transit access (1/2 mile maximum distance) (8, 16, 27). 2. Follow guidelines for public transit as set forth in Credit 2. 3. Limit on site parking, rather opting for connectivity via walking paths and bicycle paths (5, 11).	

B Facility Design

1. Provide residents with adequate transit facilities, for both safety and comfort.	1. Provide overhead cover for protection from the weather, be it stand-alone canopies, or overhangs off preexisting buildings (4, 15). 2. Depending on the climate, indoor facilities should be kept at a comfortable temperature. 3. Provide adequate onsite bicycle storage for commuters (27). 4. Maintain connectivity with the community via walking paths and bicycle paths (27).	Public Transit Authority
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Credit 8: Transportation Demand Management

Intent: To reduce energy consumption, pollution from motor vehicles, and adverse public health effects by encouraging multimodal travel.

A. Public Implementation

Goal	Associated Best Practices	Concerned Agencies
1. To promote alternative transportation among residents, thereby decreasing emissions and increasing physical activity.	<p>1. Provide adequate bicycle storage in town centers, as well as at public and civic spaces (11, 13).</p> <p>2. Promote the use of public transit through discounted fares or other incentives (11, 13, 28).</p> <p>3. Maintain bicycle lanes, as well as walkable sidewalks.</p> <p>4. Limit parking in downtown areas, as noted in Credit 5.</p> <p>5. Improve area of operations for public transit, making it an inviting option to residents (27).</p>	

B. Business Implementation

1. To promote the use of alternative or fuel saving transportation among employees of local businesses.	<p>1. Provide adequate bicycle storage in business centers.</p> <p>2. Provide lockers and shower facilities to employees who choose to utilize bicycle for transportation to work (10).</p> <p>3. Promote carpooling among employees by offering incentives, such as a mileage matching service (10, 28).</p>	
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	<p>4. Provide a car sharing service for errands while at work; i.e. Zipcar service.</p> <p>5. If public transit is not within walking distance, implement a shuttle service for employees wishing to use public transit (10).</p> <p>6. Provide employee incentives for alternative transportation i.e. awards for most miles biked to work, most miles carpoled, etc (28).</p>	
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Credit 9: Access to Civic and Public Spaces

Intent: To improve physical and mental health and social capital by providing a variety of open spaces close to work and home to facilitate social networking, civic engagement, physical activity, and time spent outdoors.

A. Connectivity

Goal	Associated Best Practices	Concerned Agencies
1. To provide access to public spaces to all residents of a community.	<p>1. Maintain walkable sidewalks and bicycle trails throughout the community, connecting to all public areas (14, 16, 19).</p> <p>2. Provide spaces accessible by all residents, regardless of age or physical ability (16, 19).</p> <p>3. Limit parking in an effort to promote alternative transportation (11).</p> <p>4. Provide adequate bicycle storage facilities.</p>	Department of Public Works

B. Distribution of Public Space

1. To allow all residents an equal opportunity to use public spaces.	1. Rather than centralizing public space in one location, create smaller public areas throughout a community (15).	
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	<p>2. Create a variety of spaces, such as parks, plazas, town squares, etc. to meet the different needs of residents.</p> <p>3. Promote the use of these spaces through public events, such as concerts and markets (5).</p>	
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Credit 10: Access to Recreation Facilities

Intent: To improve physical and mental health and social capital by providing a variety of recreational facilities close to work and home to facilitate physical activity and social networking.

A. Connectivity

Goal	Associated Best Practices	Concerned Agencies
1. To provide access to recreation facilities for all residents.	<p>1. Maintain walkable sidewalks and bicycle trails throughout the community, connecting to all public areas (14, 16, 19).</p> <p>2. Provide spaces accessible by all residents, regardless of age or physical ability (16, 19).</p> <p>3. Limit parking in an effort to promote alternative transportation (11).</p> <p>4. Provide adequate bicycle storage facilities.</p>	Department of Recreation

B. Facility Usage

1. To provide a variety of usages for recreational facilities.	<p>1. Form afterschool programs that utilize recreational facilities.</p> <p>2. Encourage recreational sports leagues to use the facilities, creating a greater sense of community among residents.</p>	
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Credit 11: Visitability and Universal Design

Intent: To enable the widest spectrum of people, regardless of age or ability, to more easily participate in community life by increasing the proportion of areas usable by people of diverse abilities.

A. Building Accessibility

Goal	Associated Best Practices	Concerned Agencies
1. To provide access to all potential residents of the community.	<p>1. Incorporate handicap access into all buildings, public or private, by having at least one zero rise entrance to every building.</p> <p>2. If a zero step entrance is not possible due to grade, a ramp of appropriate length and angle should be provided.</p> <p>3. Incorporate ramps at all sidewalk intersections, as outlined in Credit 1 (16, 19, 23).</p> <p>4. Regardless of implemented parking reductions for normal use vehicles, incorporate handicap parking into public space design.</p>	<p>Local Zoning Body</p> <p>Code Enforcement Authority</p> <p>Local Disability Services Coordinator</p>

Credit 12: Community Outreach and Involvement

Intent: To encourage responsiveness to community needs by involving the people who live or work in the community in project design and planning and in decisions about how it should be improved or how it should change over time.

A. Community Involvement and Participation

Goal	Associated Best Practices	Concerned Agencies
1. To involve residents in decisions affecting their community.	1. Create and implement a public awareness campaign to alert residents to any meetings or votes that may affect the community (19).	<p>Local Governing Body</p> <p>Town Council</p>

	<p>2. Regular town meetings should be held, with residents encouraged to voice their opinions about changes they deem necessary.</p> <p>3. Utilize surveys, either paper or electronic, to gather residents’ opinions about the community as a whole.</p> <p>4. Create committees concerned with various aspects of the community, and encourage resident to join (19).</p>	
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Credit 13: Local Food Production

Intent: To promote community-based food production, improve nutrition through increased access to fresh produce, support preservation of small farms producing a wide variety of crops, reduce the negative environmental effects of large-scale industrialized agriculture, and support local economic development that increases the economic value and production of farmlands and community gardens.

A. Resident Participation

Goal	Associated Best Practices	Concerned Agencies
<p>1. To involve residents in both the growing and purchase of local food.</p>	<p>1. Create a community garden with available public space, encouraging residents to use it for personal food production (29).</p> <p>2. Ensure that the community garden only grows low maintenance fruits and vegetables, keeping water consumption to a minimum.</p> <p>3 Create farmer’s markets in public spaces, for small local farms to sell their produce directly to the residents (29).</p>	

B Local Business Participation		
1. To involve local businesses in supporting small local farms.	1. Encourage local markets to buy locally, highlighting the benefits of doing so.	
Credit 14: Tree-Lined and Shaded Streets		
Intent: To encourage walking, bicycling, and transit use and discourage excessive motoring speeds. To reduce urban heat island effects, improve air quality, increase evapotranspiration, and reduce cooling loads in buildings.		
A. Implementation		
Goal	Associated Best Practices	Concerned Agencies
1. To provide shading along pedestrian pathways and streets, encouraging further foot traffic	<p>1. Plant trees at regular intervals along street (5).</p> <p>2. Ensure species is a native, low-maintenance species (15).</p> <p>3. Utilize gravel-planting trenches, running parallel to the street, to allow plant roots to grow laterally without disturbing either the sidewalk or street pavement (21).</p> <p>4. Plant trees along bicycle paths, providing necessary shade.</p>	<p>Department of Transportation</p> <p>Department of Public Works</p>
2. To further reduce the heat island effect felt in all major communities by way of alternate paving methods.	<p>1. In warm weather climates, concrete can be used rather than asphalt for roadways; lighter color absorbs less heat (18, 21).</p> <p>2. Implement principles of cool paving, either using concrete pavement, or adding pigments to asphalt to change its color (18).</p> <p>3. Pavements should also all be permeable, to aid in stormwater runoff as well as keep the pavement cool by way of evaporation (18).</p>	

Credit 15: Neighborhood Schools		
Intent: To promote community interaction and engagement by integrating schools into the neighborhood. To support students' health by encouraging walking and bicycling to school.		
A. School Location		
Goal	Associated Best Practices	Concerned Agencies
1. To provide local schooling in a convenient location, thus encouraging alternative transportation	1. If building a new facility, try to locate it within ½ mile of the majority of housing (Error! Reference source not found.).	
B. School Connectivity and Design		
1. To provide safe and easy access to schools, making it feasible for children to not rely on buses for transportation.	1. Incorporate bicycle paths that tie into school grounds (29). 2. Provide adequate bicycle storage for both students and employees who choose alternative transportation. 3. Provide sidewalk access to school grounds, with adequate crosswalks in place, as outlined in Credit 6 (19). 4. Increase the use of traffic easement measures in the immediate area of schools; these measures are outlined in Credit 1 (19).	

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2.2-Additional Information on NPD Credits

This section provides a description on some of principal objective in the 15 NPD credits. The aim of this section is to provide a more detailed guideline on some of the implementation methods. This section does not provide additional information on all of the 15 credits because some objectives in the 15 credits overlap with each other, and the BPM table provide sufficient information.

2.2.1-Credit 1: Walkability

Traffic Easement

Traffic easement, when properly employed, can increase the safety of pedestrians and bicyclists while still allow drivers to use motor vehicles for efficient transportation. The simplest form of traffic easement is reducing speed limits in high traffic areas, such as downtown shopping areas or in roads adjacent to schools. This strategy is only effective if speed limits are thoroughly enforced, which in many areas is not always possible due to understaffed police forces. To effectively control traffic without policemen involvement, physical measures must be installed or incorporated into road design. Below are a few examples of these physical measures.

- Reduction in Street Width
 - Many residential roads offer parking on both sides, making roads almost 40 feet wide
 - Wide roads offer more margin for error, and thus more opportunities to speed
 - By narrowing street width, traffic is forced to slow down
 - Associated benefits
 - Narrower roads cover less surface area with impervious material, resulting in less stormwater runoff
 - Reduction in asphalt will reduce the heat island effect present in many communities
- Crosswalks
 - Offer a safe way for pedestrians to move about in both residential and commercial areas
 - Installing speed bumps before crosswalks slows traffic
 - By raising crosswalks (to be level with the curb), visibility is increased
 - Also acts as a larger speed bump, requiring traffic to slow down
- Bulb-outs (curb extensions)
 - Curb extensions can be used to drastically narrow roadways
 - Ideal for crosswalks and high foot traffic areas
 - Shorten the crossing distance for pedestrians
 - Increase visibility of pedestrians to oncoming motorists
 - Also useful at transit centers
 - Allows riders to step directly onto grade with the sidewalk

- Handicapped accessibility to public transit is made easier



Figure 1: Diagram of a Street That Includes Bulb-outs

References:

Road Width Control

http://www.deq.state.id.us/water/data_reports/storm_water/catalog/sec_3/bmps/19.pdf

Traffic Calming

<http://www.vtpi.org/tdm/tdm4.htm>

Effects of Traffic Calming

http://www.ci.berkeley.ca.us/uploadedFiles/Public_Works/Level_3_-_General/ch5.pdf

Street Lighting

Street lighting should be considered in community design because it gives the community a sense of well-being and security.

Adequate street lighting can be defined as:

- Staggered lights spaced 150' within 1300' of transit facilities
 - This spacing is also ideal for alleys to provide maximum illumination in an attempt to deter crime
- Staggered lights spaced 300' outside of 1300' from transit facilities

To reduce light pollution, installed lights should be dark-sky compliant fixtures.

Examples include:

- LED light arrays
- High Pressure Sodium (HPS)
- Pulse Start Metal Halides (PSMH)

References

Dark Sky, and organization dedicated to reducing light pollution

<http://www.darksky.org/mc/page.do?sitePageId=59690>

San Diego guide to street light design

<http://www.sandiego.gov/undergrounding/pdf/streetdgnman.pdf>

British Study on Crime Reduction by Street Lights

www.celfosc.org/biblio/seguridad/atkins.pdf

Chicago Alley Lighting Project

<http://www.icjia.org/public/pdf/ResearchReports/Chicago%20Alley%20Lighting%20Project.pdf>

Alley Revitalization

Alley revitalization can be as simple as replacing the paving surface, or as complex as converting the alley into useable public places such as parks and squares. The goal is to turn a neglected space into a more welcoming environment for a variety of uses.

References

Chicago Green Alley Handbook

http://brandavenue.typepad.com/brand_avenue/files/greenalleyhandbook.pdf

Sacramento Alley Activation Report

http://www.cityofsacramento.org/dsd/customer-service/AlleyActivation_FINAL.pdf.pdf

Los Angeles Alley Treatment Options

http://csc.usc.edu/documents/mwd_brochure_june_30_09.pdf

2.2.2-Credit 2: Compact Development Standards for New Construction

Commercial developers will build what they see to be the most economically viable option. In many areas, the most viable option will be large houses on large lots, giving residents the personal space they desire. However, there are some communities that are calling for a reduction in lot size and increase in density, thereby reducing the environmental impact caused by the community. This can be achieved in several ways, each listed in the table.

References

Guide to compact Development

http://www.metrocouncil.org/planning/TOD/Compact_dev.pdf

Developer Incentives for Compact Development

http://www.ecy.wa.gov/climatechange/2008GMAdocs/Concept_DeveloperIncentives.pdf

Public Transit Access

Increased access to public transit is one of the easiest and most effective ways to reduce vehicle miles traveled (VMTs), thereby reducing excess carbon emissions in the community. For this to be an effective strategy, however, there must be access for the majority of residents, with a maximum walking distance of ½ mile to the access point. Compact development aims to meet this goal of public access by building near preexisting public transit and providing safe walking and bicycle access to these facilities.

Public transit use can be increased through public policies, such as providing fare free zones, offering reduced fares to daily riders, or working with local businesses to reduce the amount of free parking available to both workers and customers. Some countries, Canada included, have also offered a tax credit for public transit use, covering up to 15% of the yearly cost of using public transit.

References

Ottawa Master Plan for Increased Public Transit Use

http://www.ottawa.ca/city_services/planningzoning/2020/transpo/7_en.shtml

Canada Transit Use Tax Credit

http://www.transitpass.ca/about_e.asp

Public Relations

Gathering public support for any project is a vital step, and in some cases can be one of the most difficult. Both the U.S. and Canada have seen the growth of suburbs over the last 60 years. This trend towards suburban life led to residents becoming accustomed to more land per capita, much more than would be present in a newly constructed compact development. As such, it may be difficult to find buyers for these new homes, seeing as it goes against what many people see as the traditional family dwelling. By showing the positive benefits of compact development, residents for a new development should be easier to find.

References

Compact Development Fact Sheet

<http://www.greatcommunities.org/intranet/library/sites-tools/great-communities-toolkit/CompactDevl.pdf>

High Density Development Myths and Facts

<http://www.nmhc.org/Content/ServeFile.cfm?FileID=4647>

2.2.3-Credit 3: Mixed-use Neighborhood Centers

Mixed-Use Construction

Mixed-use construction is very common in most U.S. cities, with apartments located above first floor stores. It helped increase the density in cities, having the positive effect of reducing the strain on utilities such as electrical and water infrastructure. This high density was developed in the past partly out of necessity, since many people who lived in cities didn't have access to automobiles and as such had to have all services located within the city. With the rise of automobile ownership and the increase in urban sprawl, residential and commercial spaces were gradually isolated from one another.

In an effort to reduce vehicle use and increase pedestrian activity, many urban centers and some new developments are going back to mixed-use development. While not necessarily having housing located above shops, the same goal is achieved by having stores and services in very close proximity to housing units. This can be an issue in some areas, however, due to zoning regulations regarding multiple uses for the same location. By working with the local zoning body, this issue should be addressed in the initial development of the project by showing the benefits, both economic and social, of mixed-use construction.

References

Mixed-Use Master Plan

https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/7633/Lebanon_Russell_Drive_Plan_Final.pdf?sequence=1

Minneapolis Housing Initiative Mixed-Use Plans

http://www.housinginitiative.org/pdfs/Mixed%20Use%20Developments/mixed_use_MD_C.pdf

Mixed-Use Code Handbook (Oregon)

<http://egov.oregon.gov/LCD/docs/publications/commixedusecode.pdf>

2.2.4- Credit 4: Mixed-income Diverse Communities Implementation

In reality, creating a mixed-income community has little to do with sustainability. The intent behind it, however, is clear; to promote a sense of community among people of different income brackets, ending the traditional practice of separating communities based on housing type. By having a mix of apartments, condominiums, and standalone houses, the community will be affordable to a variety of residents.

One community that achieved this mix of housing types successfully is Griesbach Village. Located in north Edmonton, this new development offers a variety of housing styles in close proximity to one another, ranging from single family homes, to small rental homes for low-income residents. The land was not zoned for any particular housing type, so houses and apartments could both be built with ease. In some communities this may not be the case, and there made to be changes made to the building code to allow for denser housing.

References

Griesbach Village

<http://www.villageatgriesbach.com/>

Sustaining Urban Mixed-Income Communities

<http://www.uli.org/ResearchAndPublications/Reports/~//media/Documents/ResearchAndPublications/Reports/Affordable%20Housing/SustainingMixedIncome.ashx>

Public Relations

Overcoming initial resistance to mixed-income housing could prove to be a difficult step for many communities. Many people have an idea that low income is associated with crime, which is not necessarily the case. Through a campaign of public information, these concerns could be readily addressed, allowing the community to move forward without concerns or reservations being held by some of its members.

References

Housing and Urban Development- Study on Mixed-Income Housing

<http://www.hud.gov/offices/cpd/affordablehousing/library/modelguides/2004/200315.pdf>

Urban Land Institute Strategies for Mixed-Income Communities

<http://www.uli.org/~//media/Documents/ResearchAndPublications/Reports/Community%20Catalyst/Report%208.ashx>

2.2.5-Credit 5: Reduced Parking Footprint

Parking Reduction

By reducing available parking, a community is essentially pushed into the mindset of walkability. While this may not be an option for all areas, it is fairly easy to implement in those that can afford the limited parking. New opportunities for public spaces also arise. Much as alley revitalization was described in Credit 1, the same could be done to a no longer necessary parking lot, turning into urban green space. Restaurants could also utilize these new spaces for outdoor seating.

In some business districts removing parking may cause problems for many employees. If this may be the case, employers or the local government could offer incentives for public transportation, as outlined in Credit 2.

Parking Alteration

In some communities, reducing the available parking may not be an option. The community may be too spread out, and therefore not walkable, or there just may be too many businesses that rely on automobile transportation. If this is the case, several steps can be taken to reduce the negative environmental effects often associated with asphalt paving.

Porous pavement and interlocking pavers allow stormwater to penetrate into the soil, reducing stormwater by as much as 90%. This drastic reduction in runoff can be achieved at relatively low initial cost, and will have effects on the built environment as a whole. Flooding will be reduced for most major storm events, and any preexisting drainage systems will see much less water flow, and thus need less maintenance. Even a mix of porous and traditional pavements will make a difference, and will also last longer.

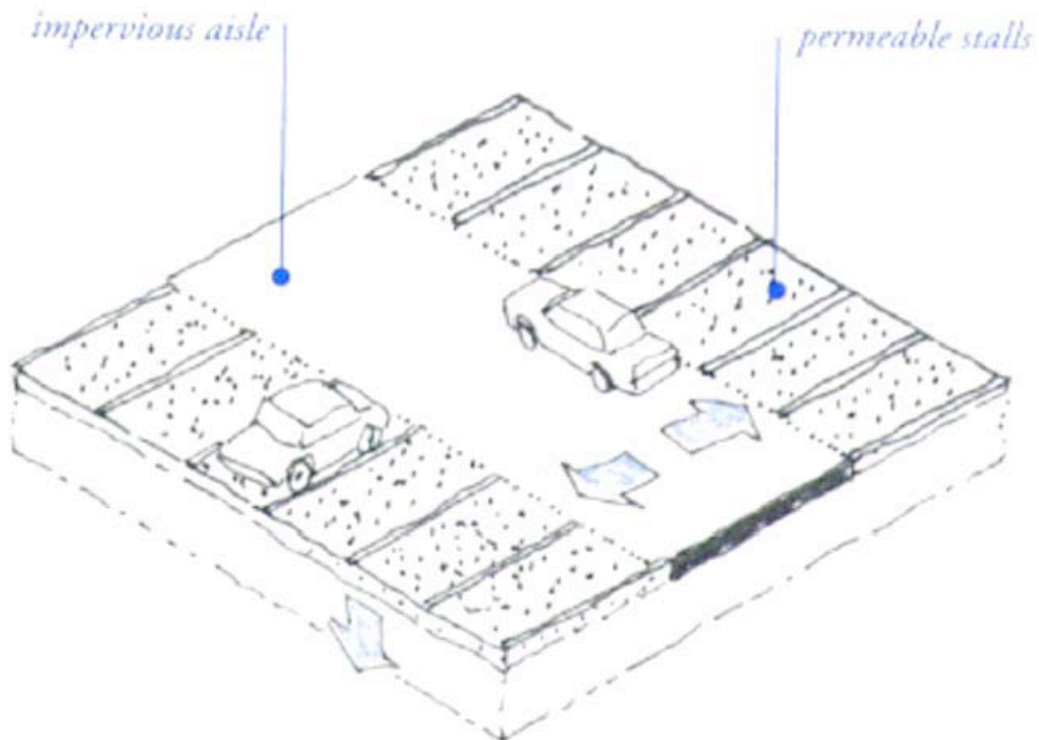


Figure 2: Parking Lot With Porous Parking Spaces¹

References

Pennsylvania Stormwater Management Guide (covers benefits and installation of porous pavement)

http://www.dep.state.pa.us/dep/subject/advoun/stormwater/manual_draftjan05/section06-structuralbmps-part1.pdf

The San Mateo Countywide Water Pollution Prevention Guide (includes more porous pavement information)

http://www.flowstobay.org/documents/business/new-development/4.7_Pervious_Paving_Technical_Guidance.pdf

Sample Alley Redesign (shows stormwater runoff reduction as well as cost estimation for porous pavement installation)

(See Appendix B)

¹ San Mateo Countywide Water Pollution Prevention Guide. Page 42.

2.2.6-Credit 8: Transportation Demand Management Transportation Management Implementation

In many downtown areas, heavy traffic congestion is an everyday sight. This congestion is caused by an overdependence on cars, brought on in part by urban sprawl and the resulting decentralization of services. In an effort to combat this inefficient form of transportation, many cities around the world utilize some form of transportation demand management. These management practices are usually implemented on a governmental level, but individual business owners and employers could also help in the effort to reduce traffic flow.

- Governmental
 - Limiting available parking makes driving a less feasible option
 - Also opens up new opportunities for open space
 - Discounted or tax deductible public transit use are great options
 - Canada has implemented a plan to refund 15% of public transit cost to the individual
 - Many suburban areas are not served by public transit
 - Adding train line isn't feasible due to development
 - Extending/expanding bus routes is possible, may result in higher taxes
 - Public should be educated on the benefits of public transit
- Business
 - Encouraging the use of multimodal transportation can be quite beneficial
 - Awards based on number of miles walked/biked can be implemented
 - Many offices have wellness programs, biking could easily be incorporated; e.g. Stantec's program with Kersh Wellness
 - Implement monthly parking rate if not already in place
 - If already existent, increase rate
 - Carpooling
 - See "vanpooling" in Washington State

References

Basic Transportation Management Policies

<http://www.walkinginfo.org/develop/policies-transportation.cfm>

Arlington VA TDM Plan

http://www.commuterpage.com/TDM/pdf/TDM_Policy1990_2008.pdf

Washington State TDM

<http://www.wsdot.wa.gov/tdm/>

2.2.7-Credit 11: Visibility and Universal Design

Universal Design

Several laws, such as the Americans with Disabilities Act, have addressed the issue of handicapped accessibility but these laws only apply to public buildings or businesses. To fully participate in the community, handicapped access should be incorporated into all aspect of the neighborhood.

Most houses are not handicap accessible; they only become so when a resident requires it. By making all houses accessible, visitabilty is achieved. Visitabilty calls for three basic requirements of any house:

- 1) One zero-step entrance.
- 2) Doors with 32 inches of clear passage space.
- 3) One bathroom on the main floor accessible by wheelchair.

By incorporating these three requirements into new construction, it allows persons of any mobility to have access to the houses of friends and family where they usually might not, further increasing their feeling of being part of the community.

Universal design could be an issue in older communities or many urban areas, where front doors are raised with a raised basement below it. If this is the case for a community undergoing redevelopment, then this credit simply isn't achievable without major dedication of funding and time for the remodeling of all residential units.

References

Visitability

<http://www.visitability.org/>

Visitabilty Initiative

<http://www.ap.buffalo.edu/idea/Visitability/index.asp>

Center for Universal Design

<http://www.design.ncsu.edu/cud/>

Iowa Program for Assistive Technology. *A Practical Guide to Universal Home Design: Convenience, Ease, and Livability.*

<http://www.uiowa.edu/infotech/universalthomedesign.pdf>

2.2.8-Credit 13: Local Food Production

Food Production

Community gardens provide a number of benefits, first and foremost being fresh fruits and vegetables. They also provide a space for social interaction, further increasing the sense of community felt by residents. If those who used the garden chose to, the produce could be sold at local markets, providing extra income for residents and stimulating the local economy. Community gardens can also serve as green space for urban communities that may be lacking in outdoors areas.

Community gardens can be made to suit the needs of the community, i.e. crops, size, and location are all variable. Vacant lots are present in many communities and can serve as a prime location for a garden. Soil conditions, however, can be variable and as such the previous use of the land should be known before planting to ensure that the site is not contaminated.

Another option is Community Supported Agriculture. Information is available from the sites listed below.

References

American community Gardening Association

<http://www.communitygarden.org/learn/>

City Farms and Community Gardens

<http://www.farmgarden.org.uk/>

Vertical Farm (an interesting idea to provide adequate crops in limited space)

<http://www.verticalfarm.com/>

Ontario CSA Directory

<http://csafarms.ca/index.html>

CSA in the US

<http://www.attra-pub/PDF/csa.pdf>

University of Massachusetts information for US/Canada

http://www.umassvegetable.org/food_farming_systems/csa/

2.2.9-Credit 14: Tree-Lined and Shaded Streets

Benefits of Trees

While many people think of trees as just a decorative feature used to increase residential property value, they do offer many environmental, economic, and safety benefits:

- Environmental
 - Reduction in stormwater runoff
 - 10% increase in canopy cover reduces runoff by 5%
 - Reduced “heat-island” effect
 - Temperatures of shaded pavement is considerably lower, thus a lower ambient air temperature is achieved
- Economic
 - Lower ambient air temperatures result in lower cooling costs for residents
 - Shade streets last longer without the need for resealing
 - The cooler temperatures allow the slurry seal to last longer
 - 20% shading will result in 60% cost reduction over 30 years
- Safety
 - Shaded streets result in lower light levels, so drivers tend to slow down
 - Trees along the side of the road can show a curve in the road long before they reach it, especially helpful at night
 - Trees act a natural barrier between drivers and pedestrians in the event of an accident

References

U.S. Forest Service

<http://www.forestsforwatersheds.org/reduce-stormwater/>

Safety Benefits of Trees

<http://www.coloradotrees.org/benefits.htm#16>

EPA- Heat Island Reduction Strategies

<http://www.epa.gov/hiri/resources/pdf/TreesandVegCompendium.pdf>

Cool Pavements

Traditional asphalt has a very low albedo, or reflectivity, causing it to hold large amounts of heat. This heat more rapidly deteriorates the asphalt and also increases the ambient air temperature, which causes the heat-island effect. By adding lighter pigments to asphalt mixtures the albedo can be greatly improved, resulting in pavement that retains much less heat. Lighter pavements also increase visibility on roads at night, further increasing driver safety.

References

Heat Island Research

<http://heatisland.lbl.gov/Pavements/LowerTemps/>

Economic Benefits of Cool Pavements

<http://www.ci.gilbert.az.us/planning/urbanheatisland.cfm?style=print>