ANNEX F: LEED MEASURES (NH102/8)

Annex to :

Lietz, K., Bijoux, D., Saville-Smith, K., Howell, M. (2006). *Testing the Prototype Neighbourhood Sustainability Framework.* Report NH102/2 for Beacon Pathway Ltd

Analysis of suitability for New Zealand conditions after application to three neighbourhoods (Harbour View, Blake Street and Petone) and incorporating comments by David Mead – urban designer and Jenny Fuller – ecologist, by the NBH 2 project, May 2006

LOCATION EFFICIENCY

Prerequisite: Transportation Efficiency

Intent

Reduce air pollution, energy consumption, and greenhouse gas emissions generated by transportation by encouraging new development in locations that reduce automobile dependence. Promote public health by encouraging new development in locations that provide increased opportunities for walking.

Requirements

1) Locate the **project** on either an **infill site** or on a **previously developed site,**
   OR
2) Locate the project near existing **adequate transit service** so that a majority of dwelling units and business entrances within the project are within 400 m **walking distance** of publicly available bus transit service or within 800 m walking distance of adequate rail, light rail, streetcar, or ferry transit service. OR
3) Locate the project near existing neighborhood amenities and services so that the project boundary is **adjacent** to existing development and located within 400 m walking distance of at least four or within 800 m walking distance of at least six examples of the following uses, which must be existing and operational: police/fire station; bank; post office; place of worship; park; library; school; convenience store; laundry/dry cleaner; other neighborhood-serving retail; medical/dental office; other office building or major employment center; stand-alone pharmacy; restaurant; supermarket; community or civic center. Uses may not be counted in two categories, e.g., an office building gets counted only once even if it is also a major employment center, and a store of any kind gets counted only once even if it has a diverse line of products and services. But a mixed use building housing several of the above services as distinct enterprises would count each as a separate use.

Comments:

This prerequisite seems to work well to assess NZ neighbourhoods. Adequate transit for NZ neigbourhoods requires calibration.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

LOCATION EFFICIENCY

Prerequisite: Water and Stormwater Infrastructure Efficiency

Intent

Conserve natural and financial resources required for construction and maintenance of infrastructure. Encourage new development within and near existing communities, in order to reduce multiple environmental impacts caused by haphazard sprawl.

Requirements

1) Locate the **project** on a site served by existing water and sewer infrastructure Replacement or other on-location improvements to existing infrastructure are considered "existing" for the purpose of achieving this compliance path.
   OR
2) Locate the project within a planned water and sewer service area
   AND
   provide the new water and sewer infrastructure.

Comments:

Works fine.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

LOCATION EFFICIENCY

Credit: Contaminated Brownfields Redevelopment (4 Points)

Intent

Conserve land and reduce air, water, and land pollution from contaminated land.

Requirements

1) Locate **project** on a site, part or all of which is documented as contaminated,
   AND
   Remediate site contamination such that the controlling public authority approves the protective measures and/or clean-up as effective, safe, and appropriate for the future use of the site.

Comment:

A prerequisite could be added that required testing and disclosure of the results of all sites with previous uses associated with contamination risks.

For this credit to be met testing should have been undertaken and the clean-up process documented.

Application to next 5 case studies:

Document if contamination records exist.

Reviewed by:

Research Team

LOCATION EFFICIENCY

Credit: High Cost Contaminated Brownfields Redevelopment (1 Point)

Intent

Encourage the cleanup of more complicated or challenging contaminated brownfields sites.

Requirements

1) Earn the Contaminated Brownfields Redevelopment credit,
   AND
   Perform cleanup such that the costs of cleanup are in excess of $1.5 million (NZ).

Comment:

Impossible to determine for older neighbourhoods, but may be worthwhile for new ones.

Application to next 5 case studies:

Not suitable for retrofit neighbourhoods. Try to obtain costs of clean-up if records are accessible at the local Council.

Reviewed by:

Research Team

LOCATION EFFICIENCY

Credit: Adjacent, Infill or Previously Developed Site (3 to 10 Points)

Intent

Encourage development within existing communities and already-developed places to reduce multiple environmental harms associated with haphazard sprawl. Reduce development pressure beyond the limits of existing development. Conserve natural and financial resources required for construction and maintenance of infrastructure.

Requirements

1) Locate **project** on an **adjacent site** (3 points)
   OR
2) Locate project on an **infill site** (7 points)
   OR
3) Locate project on a **previously developed site**. (10 points)

Each project can only earn points for one of the three options.

Comments:

Hard to assess for older neighbourhoods, however easy to work and relevant for new neighbourhoods. The term infill should probably be changed to avoid confusion with cross leasing or smaller subdivisions commonly referred to as infill in New Zealand.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

LOCATION EFFICIENCY

Credit: Reduced Automobile Dependence (2 to 6 Points)

Intent

Encourage development in locations that exhibit superior performance in providing transportation choices or otherwise reducing motor vehicle use.

Requirements

1) Locate **project** on a site with outstanding transit service, defined as 60 or more easily accessible transit rides per day. The number of points available for increasing transit service is indicated in the table below. The total number of rides available is defined as the number of buses stopping within 400 m of a majority of the project's dwelling units and business entrances and the number of light rail trains, rail trains, and ferries stopping within 800 m of the project's dwelling units and business entrances on weekdays. The number of rides available on light rail trains or rail trains shall be multiplied by the number of train cars on each train. The number of rides available on ferries shall be multiplied by three.

Total rides available per weekday	Points earned
60 – 124	2
125 – 249	3
250 – 499	4
500—999	5
1000 or more	5

OR

OR

2) Locate project on a site with a nearby vehicle-sharing program. Such programs include a carshare facility with on-site vehicles such as Zipcar or Flexcar or a free bicycle-sharing facility within the project, or a carshare facility located within 800 m walking distance of a majority of dwelling units and business entrances in the project (1 point).

. A point from (2) may be added to
those earned under paragraphs (1), so long as the total earned does not exceed 6
points.

Comments:

Needs to be checked to see if point range is OK for NZ, otherwise good credit. Option 2) is unlikely to be achieved by any NZ neighbourhoods, but should probably stay in to encourage these kinds of schemes.

Application to next 5 case studies:

Leave as is

Reviewed by:

Research Team

LOCATION EFFICIENCY

Credit: Contribution to Jobs-Housing Balance (4 Points)

Intent

Encourage balanced communities with a diversity of uses and employment opportunities. Reduce energy consumption and pollution from motor vehicles by providing opportunities for shorter vehicle trips and/or use of alternative modes of transportation.

Requirements

For **projects** with residential components, locate the project within 800 m of a number of jobs equal to or greater than 50% of the number of dwelling units in the project.

Comments:

Worthwhile credit. However the data is not always easy to obtain. It is available from Statistics New Zealand by mesh block, which results generally in slightly different areas. However a workable solution should be possible.

Application to next 5 case studies:

Estimate if data is not easily obtainable.

Reviewed by:

Research Team

LOCATION EFFICIENCY

Credit: School Proximity (1 Point)

Intent

Promote children's health through physical activity by facilitating walking to school.
Promote a sense of community.

Requirements

1) Include a residential component in the **project**,
   AND Locate the project so that it borders a school that is open to the public or so that at least half the project's residences are within 800 m walking distance of a school that is open to the public.

Comment:

The requirement seems to not serve the intent well. A better option would be to require this for primary, intermediate and high school (high school may be a longer distance, such as 1600m). Weighting seems low.

Application to next 5 case studies:

Record percentage of dwellings within 800m of early childhood centre, primary and intermediate school and 1600m of a high school. One point for each type of school increasing possible points to 4.

Reviewed by:

Research Team

LOCATION EFFICIENCY

Credit: Access to Public Spaces (2 Points)

Intent

Provide access to public gathering space in order to promote sense of community.

Requirements

1) Locate and/or design **project** so that a public space, such as a park, plaza, town square, village green, etc., lies within 800 m of the all the entrances to the project's residential and commercial buildings.

Comment:

All neighbourhoods easily achieved this, maybe the requirement should be strengthened by requiring two different types of public spaces to be available (catering to different ages – small kids playground, older kids, adult). Needs some work but is worthwhile.

Application to next 5 case studies:

Record all reserves within 800m and what facilities are available. Only count multiple use reserves. One point each for reserves catering for different age groups, up to a maximum of 2 points.

Reviewed by:

Research Team

ENVIRONMENTAL PRESERVATION

Prerequisite: Imperiled Species and Ecological Communities

Intent

Protect imperiled species and ecological communities.

Requirements

1) Locate **project** on a **previously developed site**,

   OR

2) Work with the Department of Conservation to determine if threatened species have been found on the site. If any such species have been found,

   i) Coordinate with the relevant regional authority to perform adequate surveys of threatened species and ecological communities. If a survey finds that a threatened species or ecological community is present, do not disturb land on portions of the site that are within 92 m of the habitat for that species or ecological community. Protect such habitat from development in perpetuity. Analyse the threats that the project poses to identified species and ecological communities (e.g., introduction of exotic species, intrusion of residents into sensitive areas), and develop a management plan, which may include expanded buffers, that eliminates those threats.

Comment:

Local Authorities should also be consulted.
There's little in this section that directs the developer to give any consideration to preserving existing natural areas except if you can demonstrate that they are habitats for endangered species or are imperilled communities. This is not the right baseline here, and is less protective than the RMA s6(c), which talks about significant habitats. Something which clearly directed that any existing native vegetation is avoided as a preference, and any loss is to be mitigated through other remedial or restoration works would be more appropriate. Most natural areas will need, management plans as they will almost certainly have weeds, and in many instances existing natural areas can usefully be buffered.

Application to next 5 case studies:

Obtain any ecological assessments done for new greenfield developments.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Prerequisite: Parkland Preservation

Intent

Protect natural habitat.

Requirements

1) Do not develop on publicly owned parks or refuges or on **in-holdings** in publicly held land. Exemptions will be considered for public park-related facilities.

Comment:

The public consultation requirements under the Local Government Act for the sale of reserves covers this adequately and it can be deleted. It could be replaced with a credit that better reflects the intent.

Application to next 5 case studies:

Delete

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Prerequisite: Wetland and Water Body Conservation

Intent

Conserve water quality, natural hydrology and habitat through conservation of water bodies and wetlands.

Requirements

1) Locate the **project** on a site that includes no **wetlands**, riparian areas, water bodies, or land within 30 m of these areas
   OR
2) Locate on a **previously developed site**. (No further action to achieve prerequisite is necessary, although local, state, or federal regulations may require further action or site design to accommodate, preserve, or restore natural hydrology.)
   OR
3) Locate on an **infill site** and do not build on or disturb 60% of any on-site wetlands, riparian areas, water bodies, and or buffer land that is within 30 m of these areas. Mitigate the development of any wetlands, riparian areas, water bodies, or 30 m buffer land on-site or within the project's sub-basin. (Mitigation is defined as the creation or restoration of wetlands.) Protect the remaining on-site wetlands, riparian areas, water bodies, and undisturbed 30 m buffer land from development in perpetuity
   OR
4) Do not build on or disturb 90% of any on-site wetlands, riparian areas, water bodies , and or buffer land that is within 30 m of these areas. Mitigate the development of any wetlands, riparian areas, water bodies, or 30 m buffer land on-site or within the project's sub-basin. (Mitigation defined as the creation or restoration of wetlands.) Protect the remaining on-site wetlands, riparian areas, water bodies, and undisturbed buffer land from development in perpetuity.

Exemptions from the above requirements:

a) Minor development within the buffer may be undertaken in order to enhance appreciation for wetlands and water bodies. Such development may only include minor pathways, limited pruning and tree removal for safety, habitat management activities, educational structures not exceeding 18.5 sqm, and small clearings for picnic tables, benches, and non-motorized recreational water crafts.

Comments:

Water bodies and wetlands need to also be protected on brownfield and within existing areas. A large percentage of water bodies and wetlands in urban areas have disappeared and the little that is left is therefore precious and requires protection. The current wording gives less protection than current requirements in the Auckland Region.

A requirement to survey watercourses for their aquatic habitat value should be required. The ability of fish to move up and down stream systems needs to be protected. This is now a standard requirement in catchment management plans.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Prerequisite: Farmland Preservation

Intent

Preserve irreplaceable agricultural resources by protecting prime and unique farmland from development.

Requirements

1) Locate on a site with no more than 25% Class 1 and 2 soils ??? (NZLRI)
   OR

Comments:

Need to adapt to NZ
The research team was unable to access soils data for any of the case study neighbourhoods.

Application to next 5 case studies:

Delete

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Support Off-Site Land Conservation (2 Points)

Intent

Protect land that is important for natural or cultural resources from development.

Requirements

1) Acquire fee title or conservation easements on off-site land that is equal to or larger than 50% of the area of the **project** or two hectares, whichever is larger;
   AND
   Ensure protection of the land from development in perpetuity

The land must be within 320 km of the project, and must be identified by a local, regional, or national government as important for conservation for natural or cultural purposes. Land for this credit may not be used as mitigation required by law or by prerequisites for LEED-ND.

Comment:

Could be good to encourage this.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Site Design for Habitat or Wetland Conservation (1 Point)

Intent

Conserve native wildlife habitat, **wetlands** and water bodies.

Requirements

1) Undertake an ecological assessment to determine if significant habitat occurs on the site. If significant habitat is found, do not disturb that significant habitat or portions of the site within 92 m of it. Protect significant habitat and its 92 m buffers from development in perpetuity. Significant habitat includes

   - habitat for species that are threatened (as listed by DOC)
   - locally or regionally significant habitat, patches of natural vegetation at least 60 hectares in size (irrespective of whether some of the 60 hectares lies outside the **project** boundary),
   - or habitat flagged for conservation by a local or regional authority.

   OR

2) If the project is located on a **previously developed site**, use native species for all exterior vegetation. Any green roofs constructed do not have to use native species under this requirement.
   OR

3) Design the project to fully conserve all water bodies, wetlands, and their functions on the site;
   AND
   Conduct an assessment, or compile existing assessments, showing the extent to which water bodies and/or wetlands on the site perform the following functions: 1) water quality maintenance, 2) wildlife habitat protection, and 3) hydrologic function maintenance, including flood protection.
   AND
   Based upon the functions provided, contiguous soils and slopes, and contiguous land uses, assign appropriate (not less than 30 m) buffers from development throughout the site,
   AND
   protect wetlands, water bodies, and their buffers from development in perpetuity.

Comment:

Significant habitats should include any area identified by a local authority or other decision maker as significant in terms of section 6(c) of the RMA 1991.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Restoration of Habitat or Wetlands (1 Point)

Intent

Conserve native wildlife habitat, **wetlands** and water bodies

Requirements

1) Restore native habitat, using only native species, to an area equal to at least 10% of the **development footprint** and protect such habitat from development in perpetuity.

   OR

2) Document any impairment of wetlands, water bodies and their functions from pre-existing uses or off-site factors;
   AND
   Increase the total area of on-site wetlands and water bodies;
   AND/OR
   Improve the function of existing on-site wetlands or water bodies through restoration of hydrology, planting native species, removing exotic species, or other measures.

Comment:

Eco-sourced plants should be used for restoration.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Conservation Management of Habitat or Wetlands (1 Point)

Intent

Conserve native wildlife habitat, **wetlands** and water bodies.

Requirements

1) Create a long-term (at least 10-year) management plan for on-site native habitats and their buffers and create a guaranteed funding source for management. Involve at least one person from a natural resources agency, a natural resources consulting firm, or an academic ecologist in writing the management plan and conducting or evaluating the ongoing management. The plan should include biological objectives consistent with habitat conservation, and it should identify a) procedures, including personnel to carry them out, for maintaining the conservation areas and b) threats that the **project** poses for habitat within conservation areas (e.g., introduction of exotic species, intrusion of residents in habitat areas) and measures to substantially reduce those threats.

   OR

2) Create a long-term (at least 10-year) management plan for any on-site wetlands, water bodies and their buffers and a guaranteed funding source for management. Involve at least one person from a natural resources agency, a natural resources consulting firm, or an academic ecologist in writing the management plan and conducting or evaluating the ongoing management. The plan should include biological objectives consistent with wetland and water body conservation, and it should identify procedures, including personnel to carry them out, for maintaining the conservation areas.

Comment:

It would be good to include something here that encourages conservation covenants for such areas or other means of protection in perpetuity.

Application to next 5 case studies:

Leave as is. However just assess if there is any documentation available.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Steep Slope Preservation (1 Point)

Intent

Minimize erosion to protect habitat, and reduce stress on natural water systems, by preserving steep slopes in a natural, vegetated state.

Requirements

1) Build on sites that have no slopes greater than 15%.
   OR
2) On sites with slopes greater than 15% that are also **previously developed sites**,
   - treat any fractions of the site that have not been **previously developed** by complying with the requirements for sites that are not previously developed set forth below;
     OR
   - restore 100% of slopes over 40%, 45% of the area of slope between 25% to 40%, and 60% of the area of slope between 15% to 25% with native or adapted vegetation.

   AND stipulate in **CC&Rs** or other binding development documents showing that the steep slope requirements will be met for the development as a system, and for each individual **project** and development phase.
   OR
3) On sites with slopes greater than 15% that are not previously developed sites,
   - do not build on slopes greater than 40%
     AND
   - do not build or disturb site within 15 m of the top of the slope, and 23 m from the toe of the slope. The toe of a slope is defined as where there is a distinct break between a 40% slope and lesser slopes;
     AND
   - limit development to no more than 45% of the area of slope between 25% to 40%, and to no more than 60% of the area of slope between 15% to 25%.
     AND
   - stipulate in CC&Rs or other binding development documents showing that the steep slope requirements will be met for the development as a system, and for each individual project and development phase.

For all three compliance paths stated above, slopes up to 6 m in elevation that are more then 9 m from another slope greater than 15% are exempt from the requirements, although more restrictive local regulations may apply.

Comment:
Needs to be simplified!

Application to next 5 case studies:

Note steepness of slopes

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Minimize Site Disturbance During Construction (1 Point)

Intent

Conserve existing natural areas and protect trees to provide habitat and promote biodiversity.

Requirements

1) Locate the **project** on a site that is 100% **previously developed** and for which the zone of construction impact is 100% previously developed.

   OR

2) Identify limits of building area through the creation of building footprint zones
   AND
   limit site disturbance including earthwork and clearing of vegetation to 12 m beyond the building footprint zone perimeter, 1.5 m beyond primary roadway curbs, walkways and main utility trenches, and 7.5 m beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities and playing fields) that require additional staging areas in order to limit compaction in the constructed area;
   AND
   identify all existing trees with a diameter larger than 300 mm, and preserve a minimum of 50% of them;
   AND
   stipulate in CC&Rs or other binding documents that these requirements will be met for the project as a system, and for each individual building and development phase.

Comment:

Seems good, not useful for existing neighbourhoods and quite complex. This could be upgraded to a prerequisite.

Application to next 5 case studies:

Leave as is. Don't do for existing neighbourhoods.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Minimize Site Disturbance Through Site Design (1 Point)

Intent

Preserve existing tree canopy, native vegetation and pervious surfaces while encouraging high density, smart growth communities.

Requirements

1) Locate the **project** on a **previously developed site**.

   OR

2) Depending on the overall density or intensity of the project, do not develop or disturb a proportion of the land that has not been **previously developed** on the site, exclusive of any land excluded from development by law or required to be preserved as a prerequisite of LEED-ND.
   AND
   Stipulate in **CC&Rs** or other binding development documents that the undisturbed area will be protected from development in perpetuity.

   Densities, intensities, and minimum percentages are:

Residential Density per acre of **buildable land**	Commercial Intensity per acre of buildable land	Minimum percentage of previously undeveloped site area to leave undisturbed
< 37 units/hectare	**FAR** < .50	20%
37-52 units/hectare	FAR = .50 – 1.00	15%
> 52 units/hectare	FAR > 1.0	10%

Comment:

Complicated

Application to next 5 case studies:

Delete. Too complicated and not applicable to existing neighbourhoods.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Maintain Stormwater Runoff Rates (1 Point)

Intent

Reduce stormwater pollution, prevent flooding, and promote aquifer recharge.

Requirements

1) Maintain stormwater volume rates, such that the **post-project** development 2 year, 24 hour peak discharge volume does not exceed the **pre-project** development 2 year, 24 hour peak discharge volume.

Comment:

Need to check if this is the best way of expressing hydrological neutrality. It seems that different standards may be appropriate for urban vs. suburban development and depending on impermeability in wider catchment.

Application to next 5 case studies:

Too difficult. However note any stormwater treatment.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Reduce Stormwater Runoff Rates (2 Points)

Intent
Reduce stormwater pollution, prevent flooding, and promote aquifer recharge.

Requirements

1) Implement a stormwater management plan that results in a 25% decrease in the rate and quantity of **post-project** development stormwater runoff when compared with pre-project rates and quantities.

Comment:

See above.

Application to next 5 case studies:

Delete

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Stormwater Treatment (2 Points)

Intent

Reduce surface water pollution from stormwater.

Requirements

1) Implement a stormwater management plan that captures and treats the stormwater runoff from 90% of the average annual rainfall (see note, below) using acceptable best management practices (BMPs) that are capable of removing 80% of the average annual post-development total suspended solids (TSS) load based on existing monitoring reports. BMPs are considered to meet these criteria if
   a) they are designed in accordance with standards and specifications from a regional or local program that has adopted these performance standards, or
   b) there exists in-field performance monitoring data demonstrating compliance with the criteria. Data must conform to accepted protocol for BMP monitoring, for example, (e.g., Technology Acceptance and Reciprocity Partnership (TARP) Washington State Department of Ecology) for BMP monitoring.

Comment:

Current standard in Auckland is removal of 75% of suspended solids not 80%.

Application to next 5 case studies:

Note any treatment and estimate what percentage of neighbourhood is served by this.

Reviewed by:

Research Team and Jenny Fuller

ENVIRONMENTAL PRESERVATION

Credit: Outdoor Hazardous Waste Pollution Prevention (1 Point)

Intent

Reduce stormwater pollution from the use of pesticides and fertilizers

Requirements

1) Provide CC&Rs or other binding documents that stipulate that
   - only the safest and least polluting fertilizers and pesticides may be used to maintain landscapes within the **project** boundaries

     OR

   - that no fertilizers and pesticides may be used to maintain landscapes within the project boundaries.

Comment:

Questionable if this is feasible.

Application to next 5 case studies:

Delete

Reviewed by:

Research Team and Jenny Fuller

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Prerequisite: Open Community

Intent

Promote developments that are good neighbors to their surrounding communities. Foster a sense of community and connectedness beyond the development.

Requirements

1) Ensure that all streets, sidewalks, and public spaces that are built as part of the **project** or serving the project directly are available for general public use, and are not enclosed within a gated enclave.

Comment:

There may need to be a definition of street. It may be possible for a developer to argue that a street that serves many houses is a "laneway" or "accessway", given a lack of definitions. Most District Plans limit accessways to where they serve no more than 10 dwellings, and so a similar standard could be applied. In other words private roads that are gated are permissible, provided that the road serves no more than 10 dwellings.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Prerequisite: Compact Development

Intent

Conserve land. Promote livability, transportation efficiency, and walkability.

Requirements

1) Build residential components of **project** at an average density of 17 or more dwelling units per hectare of **buildable land** available for residential use
   AND
   Build commercial components of project at an average intensity of a floor area ratio of 0.50 or greater.

Comment:

As mentioned, the figure of 17 dwellings per ha needs to be calibrated to the NZ context, and related to the outcomes sought. It is unclear if the required density is to:

- Support PT
- Ensure efficient use of land
- Support local services

Each of these objectives lead to different density figures, depending upon the location of the development eg inner city close to PT, or fringe suburban, for example).

A generally accepted figure is 15 dwellings per ha, for suburban style development in metro areas, where there is pressure on land resources and public transport is available. However, many provincial settlements will question the need for this standard, especially where land is plentiful and public transport is non existent. Either the prerequisite should apply to defined metro areas, or some exemption needs to be provided.

The alternative would be to base the credit on the extent to which the development exceeds existing average densities in the area. This then focuses the credit on more general outcomes about coping with development pressures and change, rather than having to set a minimum level or threshold related to an outcome like PT support..

The prerequisite applies to buildable land. No definition of buildable land is given. We presume it means land that is free of environmental constraints and has been identified for urban use. It is unclear if the standard should apply to land that is "buildable", but has been identified for rural/residential type or large lot development because of landscape or other reasons. Perhaps rather than "buildable", the prerequisite should read 15 or more dwellings per ha of land identified as being suitable for urban-type development.

Is it a net or gross figure? Gross means that when measuring the hectarage to be used in the calculation, roads and reserves are included. This means that the effective density of the built area

needs to be higher than 15 dwellings per ha to compensate for the 15 to 20% of urban areas devoted to roads and reserves. I think the framework should state that the 15 dwellings per ha applies to the net area, in other words it excludes roads, reserves and other larger non-residential areas like schools.

In relation to non-residential uses in mostly suburban areas, it is unreasonable to say that site development should reach a minimum FAR of 0.5. In residential areas it is probably best to leave the requirement at a building density of 15 units per ha, with this density target to also provide for smaller non-residential activities that are likely to occupy a normal residential lot like child care and medical practices.

For mixed use areas like Jackson Street in Petone and Blake Street, where there is a mixture of employment and residential uses, it may be unnecessary to achieve a residential density of 15 dwellings per ha. A better measure would be an FAR based standard, where the intention is to promote an intensity of development, with the question of the appropriate mix of the development left to other criteria. In this case, an FAR of 0.5 for development in suburban mixed use areas is probably appropriate.

Application to next 5 case studies:

Change to just residential density.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Prerequisite: Diversity of Uses

Intent

Promote community livability, transportation efficiency, and walkability.

Requirements

1) Build on a site smaller than 2.8 hectares.

OR

2) Include a residential component in the **project**
AND
ensure that no more than 90% of total interior square meterage comprises any single **use type**.

OR

3) Locate the project such that its boundary is located within 400 m **walking distance** of at least four OR within 800 m walking distance of at least six examples of the following uses: police/fire station; post office; place of worship; park; library; school; convenience store; laundry/dry cleaner; supermarket; other neighborhood-serving retail; medical/dental office; other office building; pharmacy; restaurant; other major employment center; community or civic center. Uses may not be counted in two categories, e.g., an office building gets counted only once even if it is also a major employment center, and a store of any kind gets counted only once even if it has a diverse product line. But a mixed use building with several of the above services included as distinct enterprises would count each as a separate use.

Comment:

The third leg of the criteria will be hard for most new suburban development to meet, given that they will mostly occur in edge city, greenfields type conditions. Harbour View type sites (large undeveloped areas close to existing amenities) are relatively rare in most cities.

The types of local activities listed (medical, child care, local shops) are only likely to be sustained by a population of at least 2,000 people, which implies an area of around 50 ha. Most developments will not be this large, and in greenfields areas, accessibility to the range of factors listed will be out side the control of the development, and will be dependent upon councils promoting the appropriate zonings, something which is very difficult to sustain..

In most cases, the second clause will be used. It is questionable as to whether 10% of interior square meter age is sufficient to provide the diversity of uses sought in these circumstances, even for very suburban areas. Obviously as developments get closer to an activity centre, then the range of non-residential activities should increase, and the scoring should reflect this.

This clause needs further work, with an appropriate evidence base to support the required % of floorspace. In this regard, it be best to limit this clause to mixed uses within a development, and cover off proximity to other activities in the relevant criteria below.

Application to next 5 case studies:

Leave as is.

Review by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Compact Development (1 to 5 Points)

Intent

Conserve land. Promote community livability, transportation efficiency, and walkability.

Requirements

1) Design and build **project** to achieve the the average densities or intensities shown in the table below. To earn specified points, the residential portion of the project must be built to the residential densities in the table below AND all nonresidential components of the project must be built to the non-residential intensities below.

Residential Density Measured as dwelling units per hectare of **buildable land**	Non-residential Intensity Measured as Floor to Area Ratio (**FAR**).	Points Available
37 to 52	0.75 to < 1.0	1
53 to 67	1.0 to < 1.5	2
68 to 84	1.5 to < 2.0	3
85 to 96	2.0 to < 2.5	4
> 97	2.5 and higher	5

Comment

Need to check numbers. It may be better to separate the non residential into a separate credit. Very dense residential development that have a few commercial premises that are not very intense (such as a café and childcare centre or small light industrial workshops) should not loose all their points because of this.

The densities and FARs listed need to be related to proximity to services (eg town centre) , the regional position of the site, and transit accessibility. There is no point have a very dense development remote from services or public transport. Equally, there is a lost opportunity if development is not dense enough on undeveloped sites close to main centres and important PT routes.

Most new suburban developments will be in the 10 to 15 dwellings per ha mark, and so there will be a big gap between this form of development and the first rung of the points system (37 to 52 dwellings per ha). This density usually implies terrace type housing – something which is becoming more common in some suburbs. Over 50 dwellings per ha and FARs in excess of 1.0 will typically involve apartment type developments which will clearly be related to town centre type locations, for example.

It may be better to list a range of spatial conditions (e.g. edge, local centre, bus route, train station, town centre), and then provide a target density for development in these areas, with additional points if the target is exceeded, and negative points if the target is not meet.

The actual calibration of the density table needs a more extensive evidence base than that provided by the three case studies, and needs to be strongly influenced by regional and district growth management policies.

Application to next 5 case studies:

Just assess residential, commercial intensity is just too hard to calculate in the time we have.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Transit-Oriented Compactness (1 Point)

Intent

Maximize walking trips to and from transit stops in the area immediately surrounding the transit stop.

Requirements

1) Design and build the **project** such that the average residential density and nonresidential intensity of all project development within 250 m of a transit stop has a minimum of twice the average density or intensity, as appropriate, of the full project or of the area within 400 m of the transit stop, whichever area is larger.

Comment:

This seems to disadvantage neighbourhoods that are dense throughout.

Relating the densities in the previous table to access to services and transport would avoid the need for a separate criterion related to transit-orientation of density. In many cases, density may need to be related to other features, like areas adjacent to open spaces, or to where views are available. This is to provide market support for the proposed density. So long as the density is within a 5 to 10m walk of transit or a bus route, this may be a perfectly reasonable outcome.

Application to next 5 case studies:

Just assess in terms of residential density. See also above.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Diversity of Uses (1 to 3 points)

Intent

Promote community livability, transportation efficiency, and walkability.

Requirements

1) Include a residential component in the **project**
   AND
   design or locate project such that the majority of the dwelling units are within 800 m of uses in at least two (1 point), four (2 points) or seven (3 points) of the following non-residential use categories:
   - everyday retail (convenience, general, grocery, drug, hardware, gas, laundry),
   - discretionary retail (restaurants, bookstores, departments stores, specialty shops),
   - entertainment (movies, theaters, concert halls, music and performance venues),
   - educational facilities (daycare, schools, college, university),
   - public/private clubs (not open to public) and associated recreational facilities,
   - religious (including cemeteries),
   - government services (city hall, court, jail, police station, fires station, post office, motor vehicle admin),
   - other civic buildings (library, museum, community center, transportation depots/stations/terminal),
   - offices (not counting home-based, small, personal offices),
   - lodging,
   - medical (hospital, clinic, private offices),
   - public recreational facilities: playing courts, sports fields, extensive trail networks,
   - light industrial (including auto repair) warehouses,
   - nurseries, market gardens, public community gardens.

A pedestrian must be able to reach the uses via pedestrian routes that do not necessitate crossing any streets that a) have speed limits of greater than 80 km per hour, or b) have no pedestrian crossings where vehicle traffic stops.

Comment:

As has been pointed out, it will impossible to ensure that all pedestrians can reach the above stated facilities without the need to cross a road which does not have pedestrian crossings where vehicles cross. Perversely, this criterion may promote off street walkways which tend to be less safe than streets, and which are generally frowned upon by new urbanists.

As with the discussion on mix of uses within a development, most new developments will be unable to comply with this provision because the required amenities will not be close by. But it is possible that some of the above uses may "creep" into a residential area over time, provided that

the planning rules allow for this. While the criterion will usefully promote sites near to existing amenities, it will not necessarily promote or encourage the provision of amenities and facilities in new developments on the edge of urban areas.

It would be appropriate to reduce the list of activities to those that are more likely to be found in suburban settings. In other words, proximity to government services, medical or entertainment facilities is unlikely to be a factor in most developments.

Application to next 5 case studies:

Remove the requirement for a crossings, use judgement to determine which roads are crossable without a crossing.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Housing Diversity (4 Points)

Intent

To enable citizens from a wide range of economic levels and age groups to live within a community.

Requirements

1) Include a sufficient variety of housing sizes and types in the **project** such that the total variety of housing within the project or within 400 m of the project achieve at least 0.5 on the Simpson Diversity Index using the housing categories below.

The Simpson Diversity Index score is calculated with the following equation:

Score = $1- \Sigma (n/N)^2$,
where n = the total number of dwellings in a single category, and
N = the total number of dwellings in all categories.

Housing Categories:

- Detached residential large - (greater than 112 sqm)
- Detached residential small - (less than 112 sqm)
- Duplex or townhouse - large (greater than 112 sqm)
- Duplex or townhouse - small (less than 112 sqm)
- Multifamily dwelling in building with no elevator - large (greater than 112 sqm)
- Multifamily dwelling in building with no elevator - small (less than 112 sqm)
- Multifamily dwelling in building with elevator - large (greater than 112 sqm)
- Multifamily dwelling in building with elevator - small (less than 112 sqm)
- Live/work large (greater than 112 sqm)
- Live/work small (less than 112 sqm)
- Accessory Unit – large (greater than 112 sqm)
- Accessory Unit – small (less than 112 sqm)

Score on the Simpson Diversity Index	**Points Earned**
≥ 0.5 and < 0.6	1
≥ 0.6 and < 0.7	2
≥ 0.7 and < 0.8	3
≥ 0.8	4

Comment:

Calculating the 400m beyond the development can be tricky but makes sense.

This criteria needs to be reworked so that it can fit a range of circumstances. In inner city areas, there should be few if any detached houses and possibly limited duplexes and town houses. A range of apartment sizes should probably dominate the stock, and it will be the spread between 1 and 2 and 3 bedroom units that will be important, with diversity coming from more, larger units. On that note, in most apartment developments, unit sizes will be less than 112 sqm, possibly even for some 3 bedroom units. Equally in suburban areas, it's the mix between large stand alone houses and smaller town houses that is likely to be important to securing a diversity of people (setting aside issues of cost).

It is not clear to us why accessory buildings need to be or should be counted. Measuring floor area is not straight forward, especially for apartments. Should outdoor balconies and internal common areas be included for example?

Application to next 5 case studies:

Leave as is.

Review by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Affordable Rental Housing (1 to 2 Points)

Intent

To enable citizens from a wide range of economic levels and age groups to live within a community.

Requirements

Include at least 10 % Housing New Zealand Corporation units.

Comment:

May want to add a prerequisite about not excluding social housing through covenants.

Should this be limited to rental housing, or extended to include affordable owner-occupied housing? However developing a definition of affordable owner-occupied housing is not straight forward.

Using the presence of Housing NZ units as the only way to achieve this score seems limiting, while market dynamics will mean that most developments will not see the criteria achieved.

It may be better to relate this criterion to the previous one concerning a diversity of housing stock, with the principle that a diversity of house sizes should help with affordability issues.

Application to next 5 case studies:

Leave as is. Also attempt to gather information about social housing by other providers. Add: **Prerequisite not to exclude social housing through covenants.**

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Reduced Parking Footprint (2 Points)

Intent

Reduce stormwater runoff per capita. Encourage neighborhood walkability and promote public health through physical activity.

Requirements

1) Use no more than one row of parallel, angled, or perpendicular parking spaces to separate the front of buildings from the street. (1 point)
   AND/OR
2) Use no more than 20% of the **project** land devoted to residential and/or commercial uses for surface parking facilities. Underground or multi-story parking can provide additional capacity if necessary. On-street parallel parking spaces are exempt from this calculation. (1 point)

Comment:

The first criterion may not be achieved by some residential developments (where the parking may be provided on-site, and it may be worthwhile recessing garaging behind the main face of the dwelling. However this criterion is appropriate for neighbourhood level non-residential development. For more regionally orientated commercial development (such as that found in Petone), most development is unlikely to comply, however it is questionable as to whether this is a significant negative, provided that the area involved is not large. The 20% threshold should cover this situation, but perhaps should be limited to commercial areas.

Application to next 5 case studies:

Estimate 2).

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Block Perimeter (1 to 4 Points)

Intent

To promote connectivity.

Requirements

1) Limit average block perimeter within the **project**, as follows:

Average block perimeter	**Points available**
Between 470 and 550 metres	1
Between 400 and 469 metres	2
Between 320 and 399 metres	3
Between 240 and 319 metres	4

The perimeter of each block includes the properties bounded by the sidewalk or the equivalent provision for walking, and does not include the sidewalks themselves.

Comment:

The case studies indicate that the block sizes set out in the above table are far too small, especially for suburban development. In most suburban areas, block perimeters are likely to be in the order of at least 600m. Obviously as development gets closer to activity areas and gets more intense, block sizes may decrease, and as with other criteria, the points should reflect this. Again some form of calibration is needed, based on a range of examples.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Locating Buildings to Shape Walkable Streets (1 Point)

Intent

Encourage pedestrian-oriented streets.

Requirements

1) Design and build **project** such that each building has a front façade that faces a public space such as a street, square, or plaza;
   AND
   the front façades of at least 80% of all buildings are no more than 7.5 m from front property line;
   AND
   the front facades of at least 50% of buildings are no more than 5.5 m from the front property line;
   AND
   the majority of mixed-use and commercial buildings are contiguous to the sidewalk.

Comment:

There is no mention of high fences along front yards, which generally destroy any benefit of buildings being close to road boundaries. The yard distances probably need to be related to road types.

In some cases, buildings will not have a front façade that faces a public road (such as developments served off right of ways and private accessway, like those found in Harbour View). It may be better to re state the criteria with the aim that public spaces such as streets and neighbourhood open spaces should be fronted for the majority of their length. by buildings whose front facades, face these places.

Application to next 5 case studies:

Change to: Design and build the project so that all public spaces are overlooked by residential properties or businesses.

Reviewed by:

Research Team and David Mead.

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Designing Building Access to Shape Walkable Streets (1 Point)

Intent

Encourage pedestrian-oriented streets

Requirements

1) Design and build **project** so that a principal functional entry of every building faces a public space such as a street, square, or plaza;
   AND
   there are functional building entries located every 23 m, on average, or more frequently, along commercial streets
   AND
   there is at least one entry per building facing a public space such as a street, square, or plaza in residential areas.

Comment:

As discussed above, it will not be possible (nor necessary) for every principal entry of every building to face a street. As mentioned, it would be more appropriate to state that the majority of street frontages and the perimeter of neighbourhood reserves should have some form of positive interaction / overlooking from adjacent activities and buildings.

Application to next 5 case studies:

Change first point to: "…so that all buildings that are adjacent to a public space have a principal functional entrance of that space."

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Designing Buildings to Shape Walkable Streets (1 Point)

Intent

Encourage pedestrian-oriented streets.

Requirements

1) Design and build **project** so that each building has a front façade that faces a public space such as a street, square, or plaza;
   AND
   all ground-level non-residential interior spaces that face a public space have transparent glass on at least 33% of the ground-level façade;
   AND
   no blank (without doors or windows) walls longer than 15 m are constructed along sidewalks. Public art installations such as murals may be exempted;
   AND
   Stipulate in **CC&Rs** or other binding documents that owner(s) will keep groundlevel non-residential spaces unshuttered at night.

Comment:

The three above criteria could be combined, and organised clearly into street (or environment) types, such as neighbourhood streets, streets bounding local reserves, local centres, busier main roads / mixed use corridors, and the building edge conditions of streets discussed in these terms.

Application to next 5 case studies:

Change first point to:" … so that all buildings that are adjacent to a public space have a front façade that faces that space."

Review by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Comprehensively Designed Walkable Streets (2 Points)

Intent

Encourage pedestrian-oriented streets.

Requirements

1) Earn all three of the following credits:
    - Locating Buildings to Shape Walkable Streets
    - Accessing Buildings to Shape Walkable Streets
    - Designing Buildings to Shape Walkable Streets

Commet:

See above

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Street Network (1 Point)

Intent

Provide direct and safe connections, for pedestrians and bicyclists as well as drivers, to local destinations and neighborhood centers. Promote public health though increased physical activity.

Requirements

1) Provide at least 116 intersections per square km of newly developed land,
   AND
   Include a pedestrian or bicycle through-connection in a majority of any new culde-sacs unless topographical conditions prohibit them.

The number of intersections required to earn this credit will be prorated for parcels smaller than a square mile.

Comment:

The case studies suggested that the required number of intersections per ha was relatively easy to achieve, however the requirement for most cul-de-sacs to provide pedestrian connections was more problematical.

An alternative may be limiting the number of dwellings that can be accessed from cul-de-sacs, which then forces inter connected street systems.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Pedestrian Network (1 Point)

Intent

Provide direct and safe connections, for pedestrians to local destinations and neighborhood centers. Promote public health though increased physical activity.

Requirements

1) Provide continuous sidewalks or equivalent provisions for walking along all streets within the **project**. New sidewalks must be at least 1200 mm wide.

Equivalent provisions for walking include *woonerfs* and footpaths.

Sidewalks are not required on both sides of the street where the street is designed for a speed of 15 km per hour or lower.

Comment:

None of the case studies had streets with a speed limit of under 50 kmh, even though many of the streets in our neighbourhoods were clearly designed for low speeds. This needs to somehow be acknowledged.

In the great majority of cases foot paths will be provided, and so this criterion is likely to be redundant. It could be recast so that footpaths wider than the minimum (e.g. wider than 1.2m) receive a credit, especially where these foot paths are close to places like a school, or beside a local shop where foot traffic tends to intensify.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Maximize Pedestrian Safety and Comfort (1 Point)

Intent

Provide direct, safe, and comfortable connections, for pedestrians and bicyclists, to local destinations and neighborhood centers. Promote public health though increased physical activity.

Requirements

1) Provide on-street parking on 80% of all new streets,
   AND
   Design and construct all streets within the project, whether new or existing, for a maximum speed of 30kmh for primarily residential streets or 40 kmh for primarily commercial streets,
   AND
   Plant street trees between the vehicle travel way and sidewalk at intervals of no less than 12 m;
   AND
   Ensure that a majority of ground-floor dwelling units have an elevated finished floor no less than 600 mm above the sidewalk grade.

The percentage of on-street parking shall be measured by comparing the length of street designated for parking to the total length of the curb around the perimeter of each block, including curb cuts, driveways, and intersection radii.

Comment:

There are a number of "translational" problems with this criterion:

- Clearly in some areas street trees are impossible to sustain (e.g. exposed coastal settings like Petone , or where it is impossible to find space to plant in narrow road reserves like Blake Street). In other cases, 12 m intervals will be hard to sustain, or not appropriate. Nevertheless the principle of street trees is supported. The question is how to define when it is appropriate. One option would be to provide reference to compliance with any street tree strategy that the council maintains.

- The speeds specified are not necessarily appropriate for every street in new developments. In some cases 50kph streets will be provided (and required by the local authority). Since the criteria is focused on pedestrian safety, it may be more appropriate to focus the criterion on the extent to which the layout of the development helps to calm traffic and enables multiple opportunities for pedestrians to cross streets safely.

- The minimum finished floor of 600mm above the side walk grade will not suit all of the topographical conditions found in our city. The principle is to provide some form of

separation between the street and the interior of the dwelling through a vertical (rather than horizontal) separation. However it may be better to cover this separation off through the building frontage criteria.

Application to next 5 case studies:

Delete point two and four. Award a point if the other two are met.

Reviewed by:

Project Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Superior Pedestrian Experience (1 to 2 Points)

Intent

Provide appealing and comfortable pedestrian street environments in order to promote pedestrian activity.

Requirements

1) In commercial or mixed use **projects**, design and build 50% or more of the total number of office buildings to include ground floor retail;
   AND
   Ensure that all businesses and/or other community services on the ground floor are accessible directly from sidewalks along a public space such as a street, square, or plaza; (1 point)

   AND/OR

2) Place trees or other structures to provide shade when mature over at least half the length of sidewalks included within or contiguous to the project. The estimated crown diameter (the width of the shade if the sun is directly above the tree) is used to calculate the shaded area. (1 point)

Comment:

Creating a superior walking environment is a complex business. The criteria above are fairly coarse. In most office developments, a 50% retail component will be very hard to sustain, especially in suburban settings. As with other criteria, the street tree requirement may be inappropriate in many cases, for example.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Transit Subsidy (3 Points)

Intent

Reduce energy consumption and pollution from motor vehicles by encouraging use of public transit.

Requirements

1) Provide transit passes, subsidized to be half of regular price or cheaper, for at least one year, for residents and employees located within the **project**. Publicize the fact that subsidized transit passes are available to the eligible residents and employees. (3 points)

   OR}

2) Provide transit service (with vans, shuttles, buses) to rail, ferry, or other major transit facilities and/or another major destination such as a retail or employment center, with service no less frequent than 5 rides per weekday peak period. Guarantee service for at least one year. (3 points)

Comment

It is not clear to us if this criterion helps to determine whether a new development has been well planned and located, as it relates to the service quality of public transport and its availability.

A more appropriate provision may require the development of a travel plan for a new development (of a minimum size), one component of which could cover public transport passes and information. Other components could include walking school buses, local walking routes and cycling facilities for example. Such a requirement could only apply to larger developments.

Application to next 5 case studies:

Leave as is.

Review by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Transit Amenities (1 Point)

Intent

Reduce energy consumption and pollution from motor vehicles by encouraging use of public transit.

Requirements

1) Provide covered and at least partially enclosed shelters, adequate to buffer wind, with at least one bench at each transit stop within the **project** boundaries.

   OR

2) Provide kiosks, bulletin boards, and/or signs devoted to providing local transit information as part of the project, including basic schedule and route information at each transit stop that borders or falls within the project.

Comment

Bus shelter and service information are usually provided by the local authority and the bus operator. Often bus shelters are only provided on one side of the road (the inward journey where people have to wait for a service). This criterion probably needs to be removed or altered in some way.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Access to Nearby Communities (1 Point)

Intent

Provide direct and safe connections, for pedestrians and bicyclists as well as drivers, to local destinations and neighborhood centers. Promote public health by facilitating walking and bicycling.

Requirements

1) Design and build **project** such that there is at least 1 through-street every 270 m. This does NOT include connections that cannot physically be made; e.g. wetlands, rivers, railroads, extreme topography, natural gas lines, pipeline easements, highways, expressways and other limited-access roads.

Comment:

The distance specified of 1 through route per 270m (which we presume means 270m between through routes) needs to be tested out for the NZ context. Obviously in most situations, the current road network and the street frontages available within the site will dictate the distances between through routes.

For redevelopment type situations where the project is fitting into an existing pattern, it may be better to have a more general criterion that refers to whether logical and available connections are made with adjacent streets.

Application to next 5 case studies:

Leave as is.

Review by:

Project Team and David Mead

COMPACT, COMPLETE & CONNECTED NEIGHBORHOODS

Credit: Adaptive Reuse of Historic Buildings (1 to 2 Points)

Intent

Encourage use of historic buildings in a manner that preserves their historic materials and character.

Requirements

1) Incorporate into the **project** one or more buildings that have been designated, listed or identified as
   - a historic place under the Historic Places Act.

   AND

   Rehabilitate the building(s), ensuring that each building complies with the guidelines for historic places. (2 points)

Comment

Good credit. Has been hard to assess for older neighbourhood, however should be easy enough for new developments.

Application to next 5 case studies:

Leave as is.

Review by:

Research Team

RESOURCE EFFICIENCY

Credit: On-Site Power Generation (1 Point)

Intent

Reduce air, water, and land pollution from energy consumption and production by increasing the efficiency of the power delivery system. Increase the reliability of power.

Requirements

1) Develop or incorporate into future **project** build out through **CC&Rs** or other binding documents, on-site source(s) of power generation sufficient to meet at least 5% of the energy needs of all building uses and commonly owned infrastructure in the project.

Base energy demand is based on the allowable entitled area for the project, according to the following categories:

> **Category 1:** For non-residential buildings and residential buildings over 3 stories, establish the budget based on a design of 15% below ASHRAE/IESNA Standard 90.1 - 1999 or 15% below the local energy code, whichever is more stringent.
> **Category 2:** For residential buildings 3 stories or fewer, establish the budget based on compliance with Energy Star requirements.

Calculations for total on-site energy can include future site or building-integrated systems stipulated through CC&R**s** or other binding documents.

Comment:

Good credit, but needs re-write for NZ

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

RESOURCE EFFICIENCY

Credit: On-Site Renewable Energy Sources (1 Point)

Intent

Reduce environmental impacts associated with fossil fuel energy generation by increasing the use of on-site renewable energy sources.

Requirements

1) Design and specify, or incorporate into future **project** build-out through **CC&Rs** or other binding documents, the use of shared on-site nonpolluting renewable energy generation technologies such as solar, wind, geothermal, low-impact hydroelectric, and biomass to supply at least 5% of the total energy used by all building uses and commonly owned infrastructure in the project.

Base energy demand is based on the allowable entitled area for the project, according to the following categories:

> **Category 1:** For non-residential buildings and residential buildings over 3 stories, establish the budget based on a design of 15% below ASHRAE/IESNA Standard 90.1 - 1999 or 15% below the local energy code, whichever is more stringent.
> **Category 2:** For residential buildings 3 stories or fewer, establish the budget based on compliance with Energy Star requirements.

Calculations for total on-site energy can include future site or building-integrated systems stipulated through CC&Rs or other binding documents.

Comment:

See above

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

RESOURCE EFFICIENCY

Credit: Efficient Irrigation (1 Point)

Intent

Conserve potable water.

Requirements

1) No in-built irrigation systems in public areas.

Comment

Good credit

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

RESOURCE EFFICIENCY

Credit: Greywater & Stormwater Reuse (2 Points)

Intent

Conserve potable water.

Requirements

1) For common and public areas, design and construct **greywater** and/or stormwater systems to capture and reuse at least 50% of greywater and stormwater,
   AND
2) stipulate **CC&Rs** to mandate this over time.

Comment

Needs work. This should probably mainly concentrate on communal stormwater re-use.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

RESOURCE EFFICIENCY

Credit: Wastewater Management (1 Point)

Intent

Reduce pollution from wastewater and reuse nutrients from the wastewater stream.

Requirements

1) Design and construct shared infrastructure as part of the **project** to reprocess at least 50% of the organic wastes generated by the project into useful nutrient sources. Isolate these wastes and prevent toxic contributions to the designated wastewater stream.

Comment:

It is questionable if this is appropriate in an urban setting

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

RESOURCE EFFICIENCY

Credit: Reuse of Materials (1 Point)

Intent

Promote reuse of materials and resources.

Requirements

1) Use salvaged, refurbished, or reused materials for at least 5% of all materials in new shared infrastructure such as sidewalks, roads, grading subbase, paving, curbs and sewers.

Comments:

Good credit. Hard to measure for existing neighbourhoods, but should be possible for new neighbourhoods.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

RESOURCE EFFICIENCY

Credit: Recycled Content (1 Point)

Intent

Promote use of recycled materials.

Requirements

1) Build *common and public* infrastructure such as sidewalks, roads, grading subbase, paving, curbs, and sewers using materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial recycled content constitutes at least 5% of the total value of the materials (1 point)
   OR
2) or at least 10% of the total value of the materials (2 points).

The value of the recycled content portion of a material shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total value of the item. Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document,
Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e).

Comment:

See above.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

RESOURCE EFFICIENCY

Credit: Comprehensive Waste Management (1 Point)

Intent

Promote safe and efficient disposal or reuse of waste streams generated by occupants.

Requirements

1) Include the following as part of the **project**:

   a) at least one drop-off point available to all project occupants for office or household hazardous wastes such as paints, solvents, oil, batteries.
   OR
   locate project in a municipality that provides services for collecting these materials;

   AND

   b) at least one recycling or reuse station available to all project occupants dedicated to the separation, collection, and storage of materials for recycling including, at a minimum, paper, corrugated cardboard, glass, plastics and metals
   OR
   locate project in a municipality that provides recycling services for these materials;

   AND

   c) at least one compost station available to all project occupants dedicated to the collection and composting of food wastes.

   AND

   d) publicize the availability and benefits of these drop-off point(s), station(s), or services.

Comment

This seems good. In New Zealand there is an issue with space provided for recycling collection in apartment and other higher density developments. This credit could be re-worked to address this issue.

Application to next 5 case studies:

Leave as is.

Reviewed by:

Research Team

LOCATION EFFICIENCY

Credit: Contaminant Reduction in Brownfields Remediation (1 Point)

Intent

Encourage brownfields cleanup methods that reduce contaminant volume or toxicity and thereby minimize long-term remediation or monitoring burdens.

Requirements

1) Earn the Contaminated Brownfields Redevelopment credit,
   AND
   Use cleanup method(s) that treat, reduce or eliminate the volume or toxicity of contaminated material found on the site.

Cleanup methods which include only capping or translocation of contaminated material to an off-site location will not achieve this credit.

Comment

See above for general issues around contaminated sites.

Application to next 5 case studies:

Delete, too difficult to assess retrospectively.

Reviewed by:

Research Team