

Sustainable Development and Transportation Design

Environmental Science and Policy Graduate Program, University of Wisconsin-Green Bay

Development Types

Cluster Development Facts

- Compact development with smaller lots
- Increased amounts of land left as permanent open space
- Key natural features conserved through the use of buffers, stormwater facilities, and recreational areas.
- Homes appreciate in value faster than conventional subdivisions
- Open space managed by homeowners' associations, land trusts, or municipalities.

Low-Impact Development Facts

- Pre-development hydrology is used as the integrating framework
- Preserves all hydrologically sensitive areas, including streams, floodplains, wetlands, steep slopes, highly permeable soils, and wooded areas.
- Efforts are taken to minimize the impervious surfaces
- Recommends a gridded street layout be used for relatively flat terrain
- Grid pattern interrupted to avoid environmentally sensitive areas.

New Urbanism Facts

- Emphasizes a village-like design
- Advocates pedestrian traffic instead of the car
- Advocates a denser, mixed-use pattern of development.
- Reduces front setbacks
- Encourages front porches to promote pedestrian-scale neighborhoods.
- Transit facilities provide alternative methods of transportation.

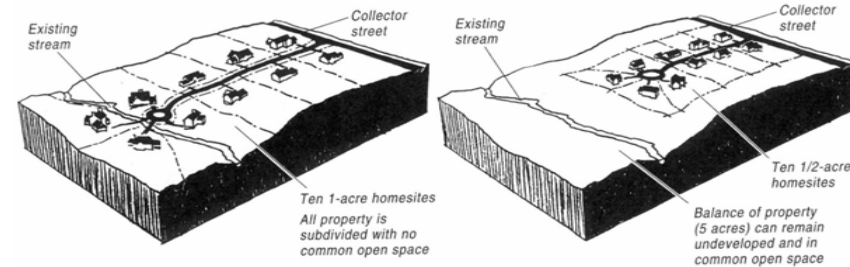


Figure 1. A comparison of conventional and cluster development patterns (Jarvis 1993).

Development Layout Recommendations

Development Layout:

- Use a mixture of new urbanism, low-impact, and cluster development principles
- Promote flexibility of standards to meet unique site conditions.
- Prioritize design for a continuous open space network
- Protect environmentally sensitive areas and minimizes street crossings
- Encourage designs that provide pedestrian-oriented neighborhoods.
- Provide a variety of housing options centered on a mixed-use, "village center" area.

References

Bike Trip With Harry. http://www.azstarnet.com/.../Bike_Trip/bike_trip.htm

Congress for the New Urbanism. 2001. Charter of the New Urbanism. Chicago, IL, Retrieved Dec. 03, 2004 from <http://www.cnu.org>.

Jarvis, Frederick D. 1993. Site Planning and Community Design for Great Neighborhoods. Washington, D.C: Home Builder Press.

Lot Design:

Single Family Residential:

- Encourage gross densities of approximately 7 dwelling units per acre
- Reduce front yard setbacks to a maximum of 20 feet from the right-of-way
- Reduce lot frontage lengths to be in the range of 5 to 8 feet
- Decrease housing footprint size by promoting 2-story homes
- Ensure that all lots have easy access to permanently protected open space

Multifamily Residential:

- Provide multifamily units near transit and commercial opportunities
- Encourage transit and bicycle connections between the multifamily housing and UWGB to attract students
- Utilize structured parking underneath multifamily units to reduce exterior parking space requirements

Commercial / Industrial Development:

- Encourage the use of shared parking facilities.
- Allow provision of compact car spaces
- Utilize porous pavements in overflow parking areas.
- Minimize building footprint size through multi-level structures.



Figure 2. Owner-occupied single family townhomes (Calthorpe Associates, Congress for the New Urbanism website: www.cnu.org).

Open Space Network:

- Require that 30-40% of the total development be set aside as permanent open space.
- Minimize disturbance from construction activities in open space areas to maintain pre-development soil conditions.
- Guarantee that at least 70% of the total open space forms a continuous network.
- Protect all hydrologically sensitive areas, including groundwater recharge areas and soils with high permeability.
- Ensure continued maintenance and public access of open areas through the establishment of responsible homeowner associations or land trusts.

Transportation Network Facts

- Transportation infrastructure makes up 63-70% of the total impervious cover in urban areas (Schueler 1995).
- On-street parking on both sides of the street provides as many as 4.5 to 6.5 parking spaces per residence (Prince George's County Maryland 1999).
- Narrower streets allow street tree canopies to intercept more rainfall, preventing some of the water from ever reaching the storm sewer system (Mitchell 2000).
- Cluster development can cut road lengths to 50-75% of conventional subdivisions (Schueler 1995).
- For relatively flat terrain, interconnected, gridded networks typically support the maximum number of dwelling units with the least amount of pavement (Schueler 1995).

Transportation Recommendations

Street Design:

- Reduce residential street widths to a range of 24- to 30-feet.
- Examine alternative street layouts to select the option that serves the maximum number of homes with the shortest total street length.
- Plan an interconnected street network that disperses traffic yet minimizes the number of crossings of the open space network and trail system
- Minimize the number of cul-de-sac streets, and restrict cul-de-sac size to a maximum radius of 30 feet.
- Encourage replacing cul-de-sacs with loop roads or creating pervious infiltration islands in cul-de-sac centers.



Figure 4. A mixed-use village center with residential dwellings located above a vibrant commercial street level (Cooper Carry & Associates, Congress for the New Urbanism website: www.cnu.org).



Figure 5. A bike trip with Harry on a Wisconsin trail in Sparta. (www.azstarnet.com/.../Bike_Trip/bike_trip.htm).



Figure 3. Aerial photograph of a conventional subdivision (Alex MacLean, Congress for the New Urbanism website: www.cnu.org).

Pedestrian and Bicycle Facilities:

- Provide sidewalks on all streets to encourage walkable neighborhoods.
- Narrow lower-use sidewalks to 4 feet in width.
- Emphasize connectivity between residential areas and commercial or institutional facilities.
- Encourage the use of textured paving and other traffic calming devices in high pedestrian zones.
- Designate bike lanes on arterial and collector streets to promote shared roadways.
- Create a hierarchical trail system that supports multiple uses
- Provide connections to other regional trail systems
- Design a major, multi-use trail to form a continuous loop through the development.
- Provide smaller side trails and interior connections to provide for a variety of uses and trip lengths.
- Provide over- or underpasses for both Highways 54 and 57 to facilitate safe pedestrian, bicycle, and animal crossings.
- Trail design and surfacing material should be sensitive to the intended use and environmental conditions.
- Trails should be center-crowned to promote positive drainage and reduce erosion