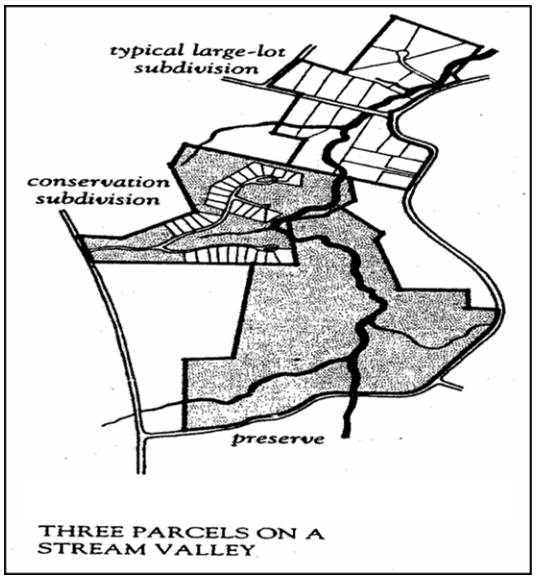
# Infrastructure Planning




## Practice Description

Infrastructure planning involves changes in the regional growth planning process to contain "sprawl" development. Sprawl development is the expansion of low-density development into previously undeveloped land. The American Farmland Trust has estimated that the United States is losing about 50 acres an hour to suburban and exurban development (Longman, 1998). This sprawl development requires local governments to extend public services to new residential communities whose tax payments often do not cover the cost of providing those services. For example, in Prince William County, Virginia, officials have estimated that the cost of providing services to new residential homes exceeds what is brought in from taxes and other fees by $1,600 per home (Shear and Casey, 1996).

Infrastructure planning concentrates public services such as water, sewer, roads, schools, and emergency services in the suburban fringe and directs new growth into previously developed areas, discouraging low-density development. Generally, this is done by drawing a boundary or envelope around a community, beyond which major public infrastructure investments are discouraged or not subsidized. Meanwhile, economic and other incentives are provided within the boundary to encourage growth in existing neighborhoods. By encouraging housing growth in areas that are already provided with public services, communities not only save infrastructure development costs, but reduce the impacts of sprawl development on urban streams and improve water quality within the watershed.

## Planning Considerations

Sprawl development occurs in all regions of the country and has recently become the subject of many new programs to counteract its impacts. These programs seldom focus on the water quality implications of sprawl growth, instead concentrating on economic and transportation issues. Even so, methods such as infrastructure planning can reduce

the impact of new development. Promoting the infill and redevelopment of existing urban areas in combination with other better site design techniques will decrease impervious cover levels and lessen the amount of pollution discharged to urban streams.

Sprawl development negatively impacts water quality in several ways. One of the most significant impacts comes from the increase in impervious cover that is associated with "sprawl" growth. Rooftops, extension of road systems, and additional paved surfaces from driveways create an overall increase in imperviousness. This increase in the impervious cover level of an area directly influences local streams and water quality by increasing the volume of stormwater runoff. These elevated runoff levels impact urban streams in several ways, including enlarging stream channels, increasing sediment and pollutant loads, degrading stream habitat, and reducing aquatic diversity (Schueler, 1995). Sprawl has been reported to generate 43 percent more runoff that contains three times greater sediment loads than traditional development (South Carolina Coastal Conservation League, 1995).

## Design Criteria

Various techniques have been used to manage urban growth while conserving resources. Although none of these techniques specifically concentrates on infrastructure planning, each of the techniques recognizes that directing growth to areas that have been previously developed or promoting higher density development in areas where services exist prevents sprawl development and helps communities to mitigate the water quality impacts of economic growth. Two of these techniques are described below.

### Urban Growth Boundaries

This planning tool establishes a dividing line that defines where a growth limit is to occur and where agricultural or rural land is to be preserved. Often, an urban services area is included in this boundary that creates a zone where public services will not be extended.

### Infill/Community Redevelopment

This practice encourages new development in unused or underutilized land in existing urban areas. Communities may offer tax breaks or other economic incentives to developers to promote the redevelopment of properties that are vacant or damaged.

## Common Problems

Intense development of existing areas can create a new set of challenges for stormwater program managers. Stormwater management solutions can be more difficult and complex in ultra-urban areas than in suburban areas. The lack of space for structural stormwater controls and the high cost of available land where structural controls could be installed are just two problems that program managers will face in managing stormwater in intensely developed areas.

Infrastructure planning is often done on a regional scale and requires a cooperative effort among all the communities within a given region in order to be successful. Stormwater managers will need to develop lines of communication with other state and local agencies and community leaders to ensure that infrastructure plans direct growth to those areas that will have the least impacts on watersheds and water quality.