Impervious Surface/Lot Coverage ratios and stormwater

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- Greater lot coverage results in higher runoff – see EPA illustration

- In the absence of regulations that limit surface coverage by impervious surface, modeling of stormwater runoff is based on assumptions that may be inaccurate at time of initial construction or become inaccurate over time as additional impervious surfaces are added

- Many neighboring jurisdictions limit impervious surface coverage, either expressly (City of Atlantic Beach; St. Johns County) or by defining lot coverage to include impervious surfaces in addition to buildings (City of Jacksonville Beach) ("Lot coverage means the number determined by dividing that area of a lot which is occupied or covered by the total horizontal projected surface of all buildings, including covered porches, and accessory structures, driveways, and paved, bricked, or wooden walkways, pool decks and patios, by the lot area.")

- COJ does not regulate impervious surface and expressly refers to "Lot Coverage *by all buildings and structures*"

- The % of impervious surface allowed in other jurisdictions varies widely, and lower coverage is driven by multiple policy goals such as preservation of trees and buffers in addition to the accuracy and adequacy of stormwater designs (COAB recently lowered from 50% to 45%; St. Johns is 70%)

- Most jurisdictions require initial stormwater design based on max impervious surface allowed, so allowing greater lot coverage by impervious surface increases the expense and design capacity of the stormwater system

- The % applicable to a subdivision is often different than % applicable to an individual lot since the roadway system may be a substantial % of the total impervious surface in a subdivision (i.e. if standard in zoning category is 70% ISR and roadways consume 30% of the land in the project site, then no more than 40% of a lot could be IS)

- COAB and St. Johns re-calculate ISR with each addition or change on the property to verify compliance with the maximum but also to require enhanced stormwater design for increases considered significant

- COAB requires individual infill lots to retain on-site the first 24 hours of a 25 year storm event (9.3 inches)

Table 2-2a Runoff curve numbers for urban areas [1]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c)					

[1] Average runoff condition, and $I_a = 0.2S$.

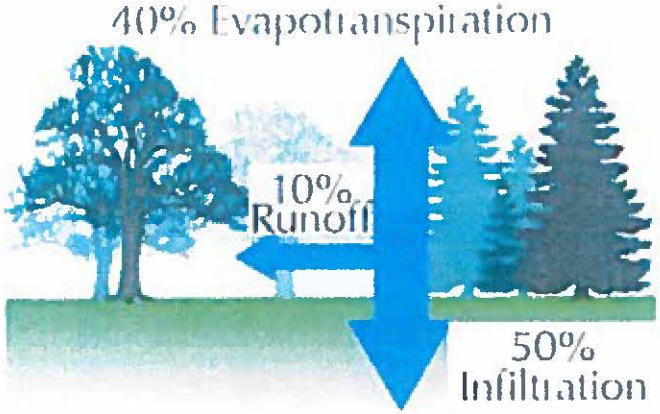
[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4] Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

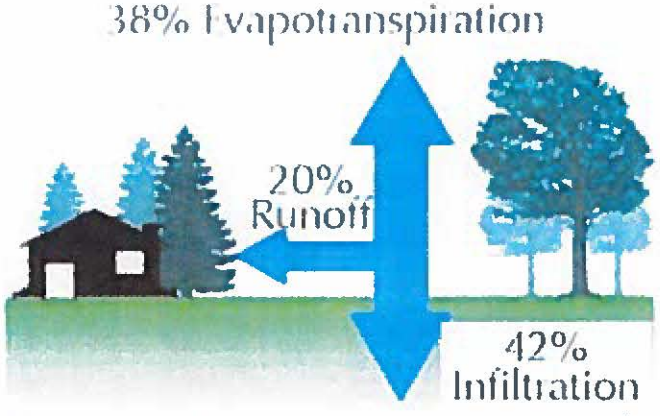
[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

EFFECTS OF IMPERVIOUSNESS ON RUNOFF AND INFILTRATION



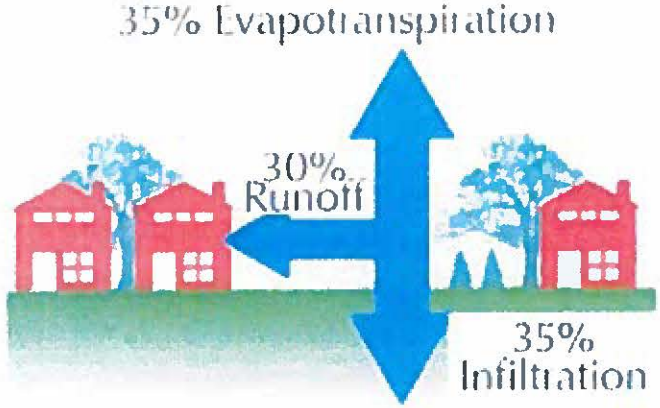
Natural Ground Cover

0% Impervious Surface



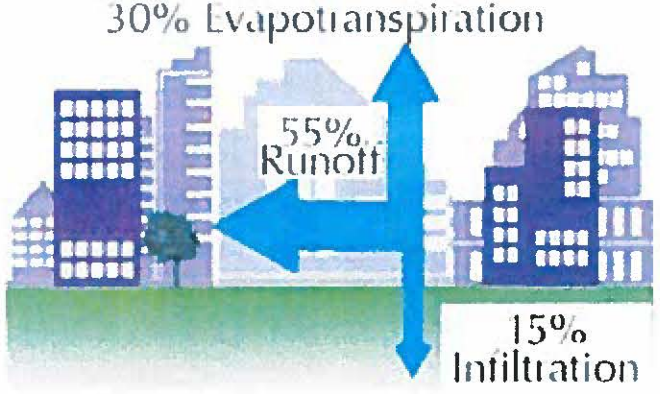
Low Density Residential (e.g. rural)

10–20% Impervious Surface



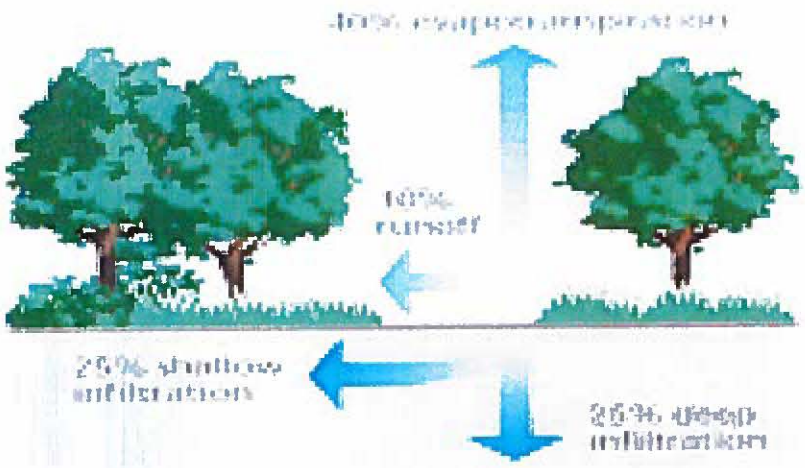
Medium Density Residential
(e.g. subdivision)

30–50% Impervious Surface

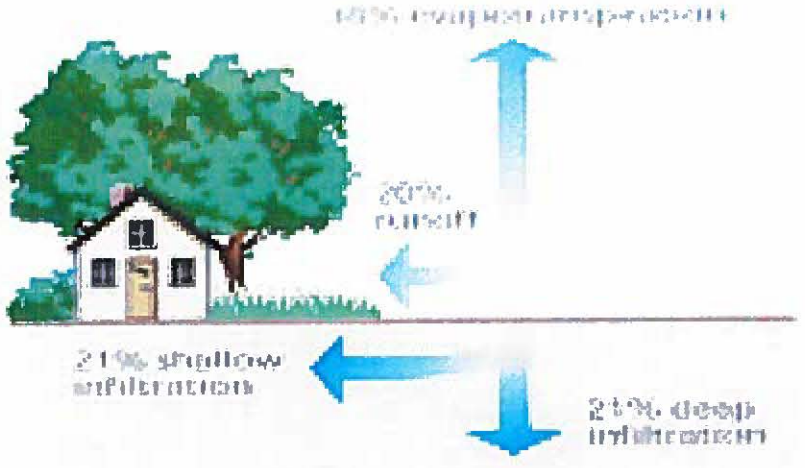


High Density
Residential / Industrial / Commercial

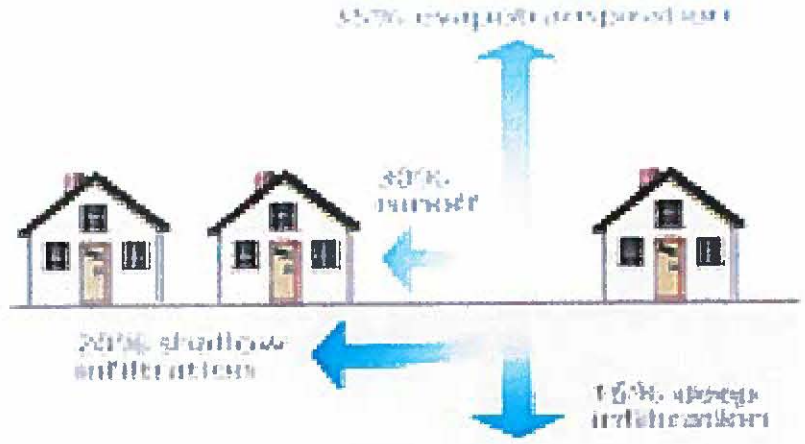
75–100% Impervious Surface



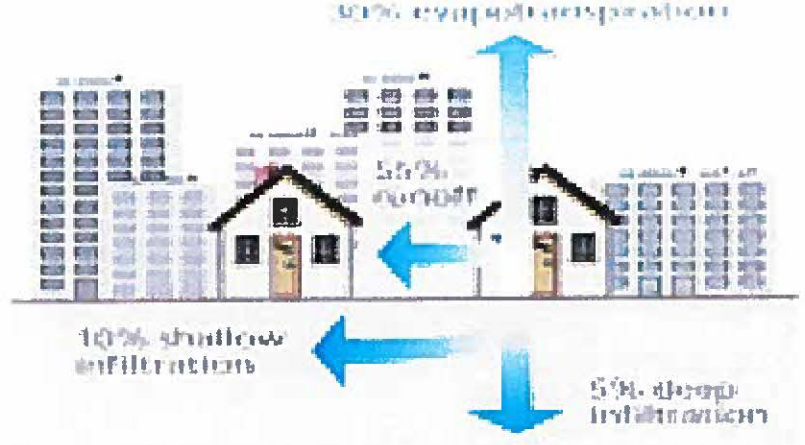
Natural Ground Cover



10%-20% Impervious Surface



35%-50% Impervious Surface



75%-100% Impervious Surface

Development increases the volume and rate of runoff from a site, and reduces groundwater recharge and evapotranspiration.