Impact of Redevelopment on TSS Loads

Purpose:

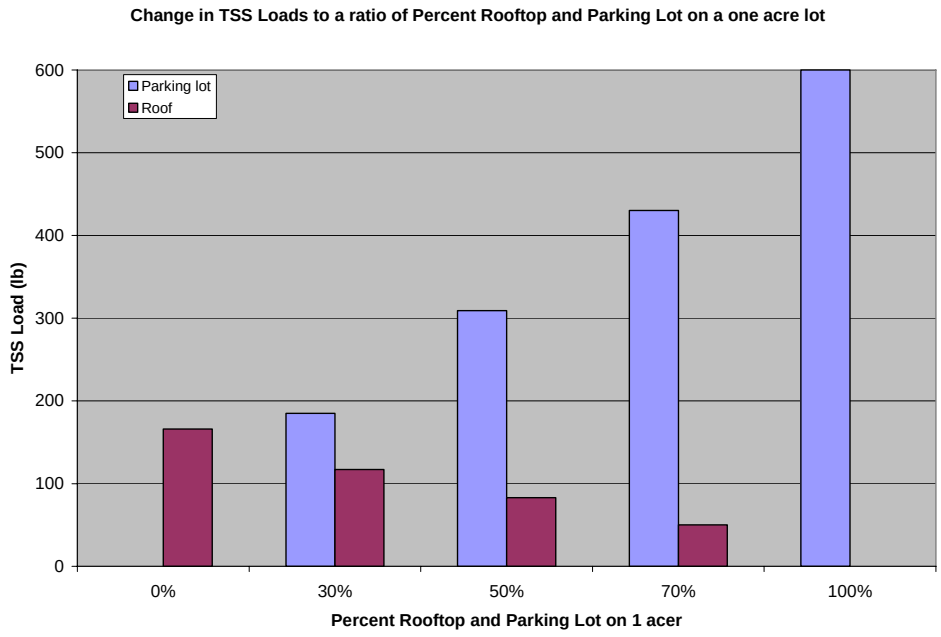
Evaluate changes in TSS loads for different types of redevelopment projects.

Assumption:

Roofs and parking lots are what change the most in redevelopment projects. Streets usually already exist and they do not change in most redevelopment projects.

Facts Concerning Relative TSS Concentrations from Roofs and Parking Lots:

Type of Source Area	TSS, mg/l
Residential Roof	*36*
Commercial Roof	*32*
Industrial Roof	*16*
Commercial Parking Lot	*130*
Industrial Parking Lot	*250*



Types of Redevelopment:

I. Downtown to Downtown TSS Changes

If we assume no surface parking before redevelopment and the roof area does not change, the TSS load and runoff volumes do not change.

Recommendation: Do not require any TSS reduction for downtown redevelopment, but encourage reuse of roof water. This assumes no surface parking lot exists or is created.

II. High Density Residential to Residential High Rise

Although the TSS loads increase with this type of redevelopment, it is caused by the residential lawns being replaced by roof top. The roof TSS loads are relatively small relative to the other sources of TSS.

Recommendation: Do not require any TSS reduction for this type of redevelopment, but encourage reuse or infiltration of roof runoff. This assumes no surface parking lot exists or is created.

Landuse	% Pervious	Total Runoff, cubic feet	% Change Runoff	Total TSS Load, lbs	% TSS Change
High Density Residential	52	3,000,000	0	12,000	0
High Rise	38	4,200,000	40%	13,000	+8%
High Rise	15	6,000,000	100%	16,000	+33%
High Rise	5	6,700,000	123%	17,000	+42%

III. Shopping Center to Commercial With Less Surface Parking

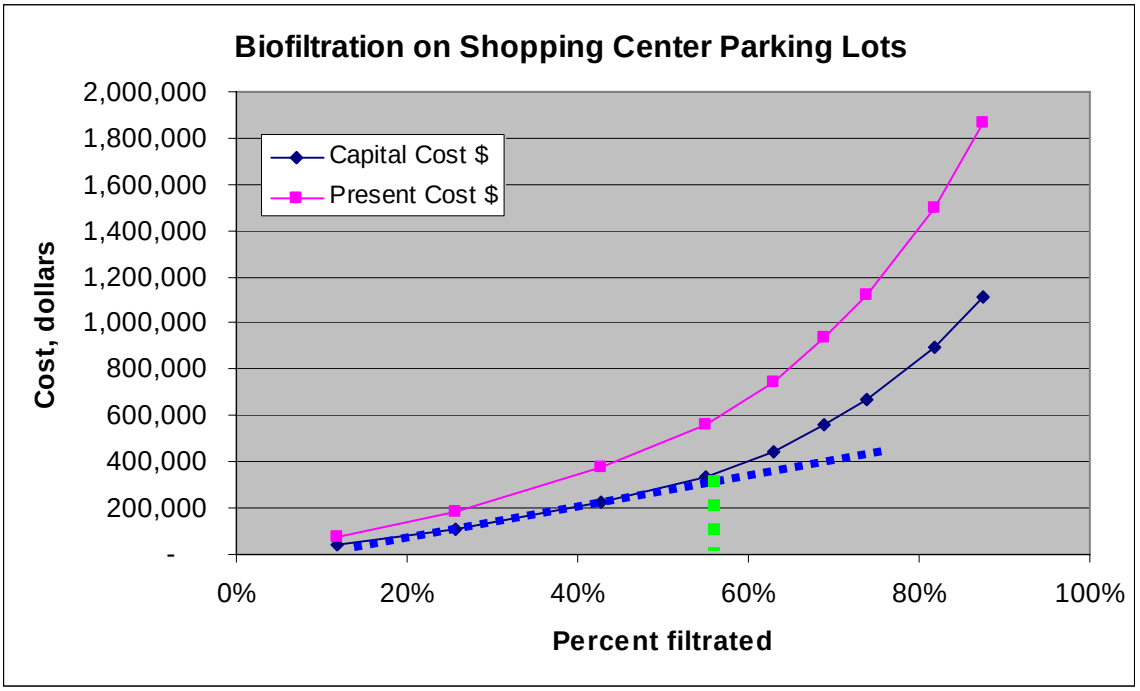
Replacing parking lot with roof top for a commercial site will reduce the amount of TSS and other pollutants in the runoff. If all the surface parking lot is replace with roof top, the annual TSS load from the site could be reduced by as much as 63%. However, the redevelopment of a commercial site will leave some surface parking lot and maybe a street. These two source areas will still be an important source of TSS and other pollutants from the site. Because of the challenges of applying stormwater control practices to a redevelopment site, a more conservative TSS reduction goal must be selected to reflect the potential high cost of the installation.

Recommendation: Require 50% TSS reduction for any remaining surface parking and street on the site. This is in addition to the gains made by reducing the amount of surface parking lot. Roof runoff will be including in the sizing of the stormwater control practice if the roof runoff discharges to the parking lot or street.

Summary Table

I. TSS Reduction for Shopping Center and Commercial Strip to Commercial With and Without Additional TSS Reduction on Parking Lots.

Reduction in Parking Lot Area, %	SC to Com With No BMPs	SC to Com. With 40% Reduction	SC to Com. With 50% Reduction	SC to Com. With 60% Reduction	CST to Com. With No BMPs	CST to Com with 50% Reduction	CST to Com with 60% Reduction
Base	0	0	0	0	0	0	0
Base + BMP	NA	-35	-44	-53	NA	-38	-46
30%	-18	-43	-49	-55	-16	-43	-48
50%	-32	-50	-55	-59	-28	-47	-50
70%	-44	-54	-57	-60	-38	-50	-52
100%	-63	-63	-63	-63	-56	-56	-56



Cost of Installing Stormwater Control Practices on 1 Acre Parking Lot

Purpose:

Estimate cost of reducing TSS by 40 to 60% for 1 acre parking lot.

I. Cost Estimates for Installing Selected Stormwater Control Practices

Name of Control Practice	Percent TSS Control	Cost Per Acre of Parking Lot	Cost Per Square Foot of Practice	$ for 50% Control for 3 Acres Parking
Cartridge Filter	40%	$110,000	NA	$300,00
Hydrodynamic Settling Device	10 – 20%	$15,000	NA	NA
MCTT	80%	$150,000	NA	$300,000
Porous Pavement	30-90%	$45,000 – 100,000	$1 - 2	$210,000
Upflow Filter	60%			
Biofilter	80%	$35,000 - $50,000	$14 - 20	$54,000

II. Cost Estimates for Different Sizes of Biofilters Treating 1 Acre Parking Lot.

Size of Biofilter, Sq. Ft.	TSS Reduction, %	Cost for 1 Acre, $
450	39	9,000
900 (20x45)	58	18,000
1350	68	27,000
1800 (30x60)	75	36,000
2250	80	45,000
2700	84	54,000