

Annual Air Quality Benefits of Public Trees by Species

7/2/2013

Species	Deposition (lb)				Total Depos. (\$)	Avoided (lb)				Total Avoided (\$)	BVOC Emissions (lb)	BVOC Emissions (\$)	Total (lb)	Total (\$)	Standard Error	% of Total Trees	Avg. \$/tree
	O ₃	NO ₂	PM ₁₀	SO ₂		NO ₂	PM ₁₀	VOC	SO ₂								
Narrowleaf cottonwood	335.8	82.9	83.3	36.2	1,236	233.8	49.8	46.7	290.7	1,079	0.0	0	1,159.4	2,315 (N/A)		30.4	3.15
Quaking aspen	23.7	5.8	7.8	2.6	88	90.8	18.4	17.1	104.5	408	-58.8	-154	211.8	342 (N/A)		26.0	0.54
Blue spruce	54.1	13.5	15.2	6.7	201	72.5	14.6	13.7	83.2	325	-342.0	-893	-68.5	-366 (N/A)		21.9	-0.69
Crabapple	3.5	0.9	1.1	0.4	13	4.0	0.8	0.7	4.5	18	-0.1	0	15.8	31 (N/A)		5.6	0.23
Pine	5.6	1.4	1.6	0.7	21	5.5	1.1	1.1	6.5	25	-18.4	-48	5.1	-2 (N/A)		3.0	-0.03
Ponderosa pine	1.7	0.4	0.5	0.2	6	2.5	0.5	0.5	3.0	11	-7.0	-18	2.3	-1 (N/A)		2.5	-0.01
Spruce	7.0	1.7	1.9	0.9	26	8.1	1.7	1.5	9.4	37	-40.4	-105	-8.2	-43 (N/A)		2.4	-0.74
Norway maple	0.6	0.2	0.2	0.1	2	3.9	0.8	0.7	4.5	18	-2.6	-7	8.5	13 (N/A)		1.4	0.40
Green ash	4.3	1.1	1.2	0.5	16	6.1	1.3	1.2	7.4	28	0.0	0	23.0	44 (N/A)		1.1	1.69
OTHER STREET TREES	14.6	3.6	3.8	1.7	54	10.9	2.3	2.1	13.1	50	-7.5	-20	44.7	84 (N/A)		5.9	0.59
Citywide total	451.0	111.5	116.5	50.0	1,664	438.2	91.2	85.4	526.8	1,998	-476.7	-1,244	1,393.9	2,418 (N/A)		100.0	1.00

Aspen

Stored CO2 Benefits of Public Trees by Species

7/2/2013

Species	Total Stored CO2 (lbs)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Narrowleaf cottonwo	4,871,649	36,537	(N/A)	30.4	71.4	49.78
Quaking aspen	663,083	4,973	(N/A)	26.0	9.7	7.92
Blue spruce	846,872	6,352	(N/A)	21.9	12.4	11.98
Crabapple	35,020	263	(N/A)	5.6	0.5	1.95
Pine	27,730	208	(N/A)	3.0	0.4	2.89
Ponderosa pine	11,142	84	(N/A)	2.5	0.2	1.39
Spruce	110,107	826	(N/A)	2.4	1.6	14.24
Norway maple	24,324	182	(N/A)	1.4	0.4	5.53
Green ash	56,244	422	(N/A)	1.1	0.8	16.22
OTHER STREET TR	80,239	1,327	(N/A)	5.9	2.6	9.34
Citywide total	6,823,069	51,173	(N/A)	100.0	100.0	21.16

The value of stored carbon dioxide is calculated as the total amount of carbon dioxide sequestered annually over the life of each tree, summed for the population. This value should not be added to the Replacement Value or double-counting of the carbon dioxide storage benefit will occur.

Aspen

Annual CO₂ Benefits of Public Trees by Species

7/2/2013

Species	Sequestered (lb)	Sequestered (\$)	Decomposition Release (lb)	Maintenance Release (lb)	Total Released (\$)	Avoided (lb)	Avoided (\$)	Net Total (lb)	Total Standard (\$ Error)	% of Total Trees	% of Total \$	Avg. \$/tree
Narrowleaf cottonwood	181,913	1,364	-23,392	-8,592	-240	213,575	1,602	363,504	2,726 (N/A)	30.4	53.2	3.71
Quaking aspen	72,702	545	-3,193	-3,932	-53	76,824	576	142,400	1,068 (N/A)	26.0	20.8	1.70
Blue spruce	58,631	440	-4,070	-4,466	-64	61,298	460	111,393	835 (N/A)	21.9	16.3	1.58
Crabapple	5,339	40	-175	-421	-4	3,505	26	8,248	62 (N/A)	5.6	1.2	0.46
Pine	3,117	23	-133	-482	-5	4,961	37	7,463	56 (N/A)	3.0	1.1	0.78
Ponderosa pine	1,271	10	-54	-245	-2	2,201	17	3,174	24 (N/A)	2.5	0.5	0.40
Spruce	5,969	45	-529	-481	-8	6,907	52	11,866	89 (N/A)	2.4	1.7	1.53
Norway maple	3,171	24	-118	-174	-2	3,300	25	6,180	46 (N/A)	1.4	0.9	1.40
Green ash	4,905	37	-270	-218	-4	5,425	41	9,842	74 (N/A)	1.1	1.4	2.84
OTHER STREET TREES	11,094	83	-853	-631	-11	9,809	74	19,419	146 (N/A)	5.9	2.8	1.03
Citywide total	348,114	2,611	-32,789	-19,642	-393	387,806	2,909	683,489	5,126 (N/A)	100.0	100.0	2.12

Annual Energy Benefits of Public Trees By Species

7/2/2013

Species	Total Electricity (MWh)	Electricity (\$)	Total Natural Gas (Therms)	Natural Gas (\$)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Narrowleaf cottonwood	96.7	6,147	8,399.3	7,615	13,762	(N/A)	30.4	50.5	18.75
Quaking aspen	34.8	2,211	4,212.5	3,819	6,030	(N/A)	26.0	22.1	9.60
Blue spruce	27.7	1,764	3,349.5	3,037	4,801	(N/A)	21.9	17.6	9.06
Crabapple	1.6	101	194.4	176	277	(N/A)	5.6	1.0	2.05
Pine	2.2	143	255.0	231	374	(N/A)	3.0	1.4	5.19
Ponderosa pine	1.0	63	110.3	100	163	(N/A)	2.5	0.6	2.72
Spruce	3.1	199	367.7	333	532	(N/A)	2.4	2.0	9.17
Norway maple	1.5	95	187.8	170	265	(N/A)	1.4	1.0	8.04
Green ash	2.5	156	243.0	220	376	(N/A)	1.1	1.4	14.48
OTHER STREET TREES	4.4	282	450.7	409	691	(N/A)	5.9	2.5	4.87
Citywide total	175.5	11,162	17,770.3	16,111	27,272	(N/A)	100.0	100.0	11.28

Annual Stormwater Benefits of Public Trees by Species

7/2/2013

Species	Total rainfall interception (Gal)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Narrowleaf cottonwood	1,319,388	14,250	(N/A)	30.4	41.4	19.41
Quaking aspen	474,703	5,127	(N/A)	26.0	14.9	8.16
Blue spruce	1,032,053	11,147	(N/A)	21.9	32.4	21.03
Crabapple	11,900	129	(N/A)	5.6	0.4	0.95
Pine	83,175	898	(N/A)	3.0	2.6	12.48
Ponderosa pine	32,879	355	(N/A)	2.5	1.0	5.92
Spruce	115,135	1,244	(N/A)	2.4	3.6	21.44
Norway maple	19,871	215	(N/A)	1.4	0.6	6.50
Green ash	30,875	333	(N/A)	1.1	1.0	12.83
OTHER STREET TREES	68,088	735	(N/A)	5.9	2.1	5.18
Citywide total	3,188,068	34,434	(N/A)	100.0	100.0	14.24