Table S1. Statistics of road networks in the five cities.

City	Number of road segments	Number of nodes	Total length (km)
Chicago	46335	27651	8821.991
Los Angeles	72577	50151	13426.865
New York	84761	51137	13743.299
Phoenix	67641	48602	10904.518
Washington	15094	9292	2395.258

Table S2. Rates of land use classes in the five cities.

City	Water	Trees	Flooded vegetation	Crops	Built Area	Bare ground	Snow/Ice	Clouds	Rangeland
Chicago	3.41%	1.39%	0.01%	0.15%	92.56%	0.13%	0	0	2.35%
Los Angeles	1.47%	0.65%	0	0.09%	89.17%	0.63%	0	0	7.99%
New York	13.07%	5.01%	0.20%	0.04%	77.66%	0.32%	0	0	3.70%
Phoenix	0.11%	0.02%	0	1.48%	80.38%	1.45%	0	0	16.56%
Washington	5.82%	8.70%	0.15%	0	82.56%	0.02%	0	0	2.75%

Table S3. Statistics of elevation and slope in the five cities.

City	Elevation				Slope			
	Min	Max	Avg	Stdev	Min	Max	Avg	Stdev
Chicago	105	255	186.27	6.28	0	43.28	1.97	1.71
Los Angeles	-25	804	192.73	135.89	0	55.73	4.95	5.67
New York	-56	131	16.60	16.78	0	55.92	3.08	3.17
Phoenix	266	797	395.49	73.61	0	59.11	3.24	3.75
Washington	-42	137	47.49	33.15	0	47.29	4.5	3.56

Table S4. Regression result for generated road networks (water area vs. road length).

	Coef.	Std. Err.	*p*-value
Water area	-6.8124	0.462	0.000
Intercept	7.2692	0.234	0.000
R^2	0.3323		
Observations	439		

Table S5. Regression result for real road networks (water area vs. road length).

	Coef.	Std. Err.	*p*-value
Water area	-6.4778	0.705	0.000
Intercept	8.3466	0.357	0.000
R^2	0.1619		
Observations	439		

Table S6. Regression result for generated road networks (mountain area vs. road length).

	Coef.	Std. Err.	*p*-value
Mountain area	-2.5283	0.764	0.000
Intercept	4.8329	0.397	0.001
R^2	0.0648		
Observations	160		

Table S7. Regression result for real road networks (mountain area vs. road length).

	Coef.	Std. Err.	*p*-value
Mountain area	-2.8406	0.769	0.000
Intercept	5.6192	0.400	0.000
R^2	0.0796		
Observations	160		

Table S8. Regression result for generated road networks (vegetation area vs. road length).

	Coef.	Std. Err.	*p*-value
Vegetation area	-2.6512	0.416	0.000
Intercept	6.1383	0.249	0.000
R^2	0.0773		
Observations	487		

Table S9. Regression result for real road networks (vegetation area vs. road length).

	Coef.	Std. Err.	*p*-value
Vegetation area	-4.1866	0.364	0.000
Intercept	6.6857	0.217	0.000
R^2	0.2147		
Observations	487		