

Research on the Costs Associated with Development at Different Densities

The information below presents research on the costs of development at varying densities. “Smart growth” is often used to describe a more compact development pattern, and “sprawl” refers to a less dense development in greenfields. The research shows that costs are lower for more dense (smart growth) developments across a variety of measurable factors.

1. Research conducted by Burchell and Mukherji (2003) found that sprawl increases local road lane-miles 10%, annual public service costs about 10%, and housing costs about 8%, adding about \$13,000 per dwelling unit.

Robert Burchell and Sahan Mukherji (2003), “Conventional Development Versus Managed Growth: The Costs of Sprawl,” *American Journal of Public Health*, vol. 93, no. 9 (www.ajph.org)

2. The table below shows how school, road and utility costs per residential unit vary depending on development density. Rural Sprawl costs are about 60% more than denser urban development. Per household annual municipal service costs increase as density decreases, based on a prototypical community of 1,000 units housing 3,260 people, and 1,200 students.

Annualized Municipal Costs for Different Densities (Smythe 1986)

Costs	Higher Density	Medium Density	Rural Cluster	Rural Sprawl
Units/Acre	4.5	2.67	1	0.2
Schools	\$3,204	\$3,252	\$4,478	\$4,526
Roads	\$36	\$53	\$77	\$154
Utilities	\$336	\$364	\$497	\$992
Totals	\$3,576	\$3,669	\$5,052	\$5,672
Incremental Cost	NA	3%	41%	59%

Robert Smythe (1986), *Density-Related Public Costs*, American Farmland Trust (www.farmland.org).

3. William Coyne (2003) found that in Colorado, “dispersed rural residential development costs county governments and schools \$1.65 in service expenditures for every dollar of tax revenue generated.”

William Coyne (2003), *The Fiscal Cost of Sprawl: How Sprawl Contributes to Local Governments’ Budget Woes*, Environment Colorado Research & Policy Center (www.environmentcolorado.org); at www.impactfees.com/publications%20pdf/fiscalcostofsprawl12_03.pdf.

4. The Center for Energy and Environment compared public infrastructure costs of “Sprawl” and “Smart Growth” scenarios in the Twin City region. Costs more than double under the sprawl scenario, increasing infrastructure capital costs \$565 annually per unit. This does not include ongoing costs such as utility maintenance, emergency response and school busing.

Twin Cities Development Patterns Compared (Center for Energy & Environment, 1999)

	Sprawl (2.1 units/acre)	Smart Growth (5.5 units/acre)
Miles of local roads	3,396	1,201
Costs of local roads per unit	\$7,420	\$2,607
Other infrastructure costs per unit	\$10,954	\$5,206
Total	\$18,374	\$7,813

CEE (1999), *Two Roads Diverge: Analyzing Growth Scenarios for the Twin Cities*, Center for Energy and Environment, Minnesotans for an Energy-Efficient Economy (www.me3.org).

- The City of Calgary *Plan-it* program compared the costs of providing infrastructure and public services to more compact and dispersed development patterns. The study found that the more compact land use saves about a third in capital and operating costs for roads, transit services, water and wastewater, emergency response, recreation services and schools.

Public Service Capital Costs, \$Bil (IBI Group, 2008)

	Dispersed	Compact	Difference
Roadways	\$17.6	\$11.2	\$6.4 (-36%)
Transit	\$6.8	\$6.2	\$0.6 (-9%)
Water and Wastewater	\$5.5	\$2.5	\$3.0 (-54%)
Fire Stations	\$0.5	\$0.3	\$0.2 (-46%)
Recreation Centers	\$1.1	\$0.9	\$0.2 (-19%)
Schools	\$3.0	\$2.2	\$0.8 (-27%)
Totals	\$34.5	\$23.3	\$11.2 (-33%)

Public Service Operating Costs, Annual \$Bil (IBI Group, 2008)

	Dispersed	Compact	Difference
Roadways	\$0.23	\$0.19	\$0.04 (-18%)
Transit	\$0.30	\$0.30	\$0.00 (0%)
Water and Wastewater	\$0.06	\$0.03	\$0.03 (-55%)
Fire Stations	\$0.28	\$0.23	\$0.05 (-18%)
Recreation Centers	\$0.23	\$0.19	\$0.04 (-18%)
Totals	\$0.99	\$0.86	\$0.13 (-14%)

IBI (2008), *Implications Of Alternative Growth Patterns On Infrastructure Costs*, Plan-It Calgary, City of Calgary (www.calgary.ca); at www.calgary.ca/docgallery/BU/planning/pdf/plan_it/plan_it_calgary_cost_study_analysis_april_third.pdf.