Public Costs by Development Type

Erie-Niagara Framework *for* Regional Growth

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INTRODUCTION

This paper offers an overview of methods used to assign costs associated with patterns of regional development and provides a preliminary assessment of public costs associated with the Scenarios for Regional Growth and Development presented in the "Preliminary Principles and Scenarios" paper.

A wide array of studies completed over the past 40 years address issues associated with the public costs of development patterns. Although these so-called "Cost of Sprawl" studies—sponsored by organizations concerned with resource consumption, infrastructure construction, regional competitiveness, taxation, and equity (with Rutgers University's Center for Urban Policy Research leading the way)—vary in how they assess development costs, identify triggering variables, and parse the relationship between who pays and who benefits, they share a similar conclusions: that scattered development patterns lead to higher costs in providing public services, both for capital expenditures and ongoing operations.

Development Dispersal & Associated Costs

Impacts of sprawl generally fall into the following categories stemming from accelerated land conversion:

- resource impacts associated with the loss of habitat, prime farmland, ridgelines, etc.;
- infrastructure burden associated with the need to build more roads, water and sewer systems, schools, recreational facilities, parks, libraries, etc.;
- operations and maintenance expenses accruing to public service providers, utilities, homeowners associations, etc.; and
- personal costs ranging from quantifiable (commuting time) to temporal (quality of life)

A large body of research focuses on the fiscal impact of development patterns, assessing the public costs of providing infrastructure and other public services. Such research tends to focus on the following:

Road Infrastructure. All new development requires roads, but sub-divisions and other areas featuring large lots and inefficient designs require more paving. Moreover, many new developments feature roads with much greater widths than deemed acceptable in traditional neighborhoods. These wide road beds result from a desire for grandeur, to facilitate access by emergency vehicles (especially when there's only one way to approach a dwelling unit thanks to dead end streets and no grid system), and to enable snow plows turn around easily in cul-de-sacs. The increased length and width creates huge costs for local government and, ultimately, tax payers. Rutgers researchers found that cost of building local roads is

estimated to be 25 percent lower in compactly developed areas. and clustering units can create a 50 percent to 75 percent reduction in road length, and thus cost.

Water & Sewer Infrastructure. Depending on the municipality and the development, the cost of constructing water and sewer lines is born by the public, the developer, or a combination. If the developer pays for and installs new lines, costs usually get passed on to the first round of homebuyers. Water districts and local governments without impact fee systems tend to charge all residents in the service area a share of the cost of installing water and sewer lines to service new development. Regardless of how they are financed water and sewer services constitute a large portion of the capital costs of new communities. Dispersed development patterns can inflate the costs of this new infrastructure by 20 to 40 percent

Public Safety & Emergency Services. Emergency response times are how communities determine whether residential areas are adequately protected. For example, no more than six minutes should elapse between the call for help and the arrival of firefighters. Relative to compact approaches to accommodating growth, dispersed development patterns create a situation where either additional dispatch points (police sub-stations, fire stations, etc.) and the personnel to staff them are provided or more homes must accept the risk of decreased quality of service.

Dispersed communities ultimately require more fire and police stations per capita than those in more compactly developed areas. In many communities, a single fire station could perhaps serve about 7 square miles and still maintain acceptable response times. From an efficiency standpoint (relative to a full complement of equipment and manpower), a station should expect to handle at least 450 calls annually. This volume in turn requires a service area population of 9-12,000 people and hence a density of at least one house for every 1.6 acres. Of course a fire station in a dense inner city neighborhood would be affected by congestion and could never support a seven square mile service area. Nonetheless, it's clear that dispersal could create a need to increase the number of stations dramatically, even doubling the number required, with concomitant increases in both capital and operating costs. The same logic holds true for police and EMS services.

Although any impact fees charged by local government would help offset the capital costs, the public sector burden for ongoing operations is significant, especially since the tax base per station also, on average, declines. Individuals that choose to accept increased risk pay for this decision, often in the form of higher insurance premiums. Some localities requires builders to provide sprinkler systems to reduce the damage to structures and their occupants.

Public Education. Sprawling development affects school costs in two ways. First, many newly developed areas on the urban fringe require that entirely new school facilities be built. Second, dispersed development imposes significant transportation costs on school districts that must bus children who live too far away to walk. Ironically, schools in urban areas often have extra capacity and/or are being converted into other uses, while on the outskirts of town new schools must be built. The alternative to building a school is to bus children to an existing school instead of a new one. However, operating a bus twice a day, once to carry 60

grade school students and once to carry 40 high school students to and from school, costs about $35,000 per year. This does not include the bus purchase, which cost $100,000 - $125,000.

Unfortunately, most communities conduct a only a cursory fiscal impact analysis, if any, and rarely examine future expected costs and benefits. Most fiscal impact analyses examine costs on an average basis, which ignores any expenses or savings associated with development patterns like infill (close to existing services) or sprawl (distant from them and perhaps requiring new facilities).

Focusing on the immediate problem—capital infrastructure—communities give services short shrift, even though they comprise most of the costs associated with a new development. Requiring developer contributions up front helps (and makes elected officials feel that they're exercising fiscal stewardship), but even then the monies often fall short of what communities require.

Fairness--parity between who pays and who benefits—is another function which relates to dispersal and infrastructure costs reflecting the proportional relationship between any given development and its impact catchment area: the less dense the development pattern, the larger the affected area. This dynamic is most obvious with roads and other transportation infrastructure, the costs of which are typically born by the public sector.

Certainly some communities require developers to address offsite infrastructure costs in a limited way. Usually, negotiation ensues that ensures that this investment is closely related to the project itself, for example, adding a turn lane or traffic light to improve a nearby intersection. Further downstream, at intersections blocks or miles away, perhaps across jurisdictional boundaries, no new money is available to deal with the traffic volume increases attributable to the project. The more dispersed the region, the more dispersed the traffic and the more neighborhoods and jurisdictions that must bear the cost in both traffic delays and capital budget items.

Who Pays?

Clearly development costs associated with sprawl vary with lot sizes, distance to central facilities, proximity to existing development, community demographics, existing service capacity and the requirements of local codes and standards. So, who pays for sprawl? Some "on-site" development costs (e.g. sidewalks, sewer laterals, etc.) are passed on to buyers by developers as part of the price of a home, off-site sprawl-related costs (trunk sewers, water mains, schools, fire stations, treatment plants, widening roads, etc.) are managed differently throughout the country.

Some governments charge impact fees to developers to hook up to community infrastructure, frequently the full costs of off-site infrastructure go unpaid. Most impact fees (for both residential and commercial development), however, are calculated on an average cost basis. For example, the impact fees on new homes located ten miles from a treatment plant tend to be the same as those levied on homes two miles distant, even though in the former case, the actual costs of providing services may be much higher. From another perspective, school impact fees are charged regardless of who builds a home, on the theory that we

all amortize the cost of our children's education over time and that building a house creates the potential to accommodate more pupils.

To address this equity issue, some jurisdictions (especially in Florida, Arizona and other places with a long history of impact fees) have launched geographically variable fees, a variation of "marginal cost" pricing. Other jurisdictions sell "pre-paid subscriptions" to landowners and developers who plan on hooking into public service systems within the next 20 years. Again in Florida, a doctrine known as "concurrency" requires that developers pay for their share of the costs of required infrastructure before occupancy takes place.

Even though the analytical capacity to create more sophisticated marginal pricing systems is readily available, acceptance has been slow. Politicians cringe at the notion of charging voters different fees. Fees based on average costs are easy to understand and *appear* to be fair.

Rutgers studied what would happen if communities reduced sprawl by 25 percent (the "controlled growth" scenario) and compared expected costs with those likely to accrue under current development patters. The charts below present their results for water and sewer infrastructure, lane miles of roadway, development costs per dwelling unit, and gross fiscal impact.

Water and Sewer Infrastructure—Uncontrolled- and Controlled-Growth Scenarios
United States and by Region: 2000 to 2025

	Total Water and Sewer Demand			Total Water and Sewer Laterals			Total Infrastructure Costs		
Region	Uncontrolled Growth (Mgal/day)	Controlled Growth (Mgal/day)	Demand Savings (Mgal/day)	Uncontrolled Growth (000)	Controlled Growth (000)	Lateral Savings (000)	Uncontrolled Growth ($M)	Controlled Growth ($M)	Cost Savings ($M)
Northeast	1,451	1,444	7	3,406	3,068	338	16,015	14,751	1,264
Midwest	2,935	2,915	21	7,110	6,604	505	30,393	28,839	1,556
South	7,942	7,870	72	21,243	19,116	2,126	84,573	79,026	5,547
West	5,794	5,737	56	14,108	12,456	1,652	58,786	54,544	4,242
United States	18,121	17,965	156	45,867	41,245	4,621	189,767	177,160	12,609

Source: Center for Urban Policy Research, Rutgers University.

Local Road Infrastructure—Uncontrolled- and Controlled-Growth Scenarios
United States and by Region: 2000 to 2025

	Total Lane-Miles Required			Total Road Cost		
Region	Uncontrolled Growth (miles)	Controlled Growth (miles)	Savings (miles)	Uncontrolled Growth ($B)	Controlled Growth ($B)	Savings ($B)
Northeast	288,059	281,251	6,809	135.77	129.57	6.20
Midwest	284,164	266,614	17,550	130.76	122.15	8.61
South	885,944	806,955	78,989	376.99	338.07	38.92
West	586,011	501,055	84,957	283.49	227.52	55.98
United States	2,044,179	1,855,874	188,305	927.01	817.31	109.70

Source: Center for Urban Policy Research, Rutgers University.
Note: Alaska is not included in the West region.

Property Development Costs per Unit—Uncontrolled- and Controlled-Growth Scenarios
United States and by Region: 2000 to 2025
(in Dollars)

Region	Uncontrolled Growth		Controlled Growth		Residential Savings		Nonresidential Savings	
	Residential	Non-residential	Residential	Non-residential	Unit Savings	Percentage Savings	Unit Savings	Percentage Savings
Northeast	246,418	85,705	228,329	84,277	18,089	7.3	1,428	1.7
Midwest	150,377	73,643	140,907	72,789	9,470	6.3	854	1.2
South	140,118	71,945	128,381	71,033	11,737	8.4	912	1.3
West	196,747	77,695	181,793	77,119	14,954	7.6	576	0.7
United States	167,038	75,463	154,035	74,598	13,003	7.8	865	1.1

Source: Center for Urban Policy Research, Rutgers University.

Fiscal Impact—Uncontrolled- and Controlled-Growth Scenarios
United States and by Region: 2000 to 2025
(in $Million)

Region	Uncontrolled-Growth Scenario			Controlled-Growth Scenario			Difference: Controlled minus Uncontrolled
	Costs	Revenues	Impact	Costs	Revenues	Impact	
Northeast	9,329	11,170	1,841	9,252	12,928	3,676	1,835
Midwest	18,914	15,352	-3,562	18,340	16,339	-2,001	1,561
South	58,441	38,845	-19,532	57,655	39,062	-18,531	1,001
West	56,558	34,023	-22,535	53,942	31,215	-22,728	-192
United States	143,242	99,389	-43,788	139,190	99,544	-39,583	4,205

Source: Center for Urban Policy Research, Rutgers University.

Developer Contributions

As noted above, impact fees can offset the costs of capital infrastructure. However, fees often can't be applied to such necessary equipment expenses as trucks or snowplows and, in any event, only cover the initial round of expenditures. Impact fees are often calculated on an average basis, thus failing to reflect the higher costs associated with distant development (e.g., additional linear feet of pipe, need for additional interim pumping stations, etc.).

To avoid this problem some communities encourage developers to pay for associated infrastructure up front. Negotiating this concession often comes about from a short term need to raise revenues in the face of disappointing public revenues and/or demands for additional or improved services. In many communities where voters have succeeded in decreases tax rates, a developer planning a thousand-unit subdivision right on the fringe of the city who offers to roads and sewer lines in the subdivision, give land to the city for a new school and pay hefty development fees for the expansion of a wastewater treatment facility looks pretty attractive.

Examining the costs the new development will impose on the municipality in the future can be illuminating. Up front, there will be immediate costs to the city for less obvious and less readily quantified services including use of city roads, libraries, landfill, etc. Later, the infrastructure originally funded by the developer

will need maintenance and repair. Eventually, the project is likely to become a net drain on city finances, contributing to budget pressures like those that motivated its acceptance in the first place.

As costs rise, cities struggling with development seek out more growth to keep up with lagging revenues. Boomtowns used to prosperity, especially those with boosters who embrace and promote growth as the community's reason for being, are especially vulnerable to making losing development decisions that cannot generate enough revenues to offset the costs of new demand for public services such as schools, police, fire, roads, and sewers. The inherent structural problems—whether it's inadequate tax base or inefficiencies in service delivery born of sprawl—can not be fixed easily, despite the hopes that the next big expansion will produce enough tax revenues to do it.

Dispersal & the Center City

To the surprise of many armchair urban theorists, several other factors closely associated with suburban sprawl seem to have no impact on city population growth rates or urban decline and distress. If sprawl has some role in the decline of cities, that influence is not being exerted through:

- unlimited outward extension of new development;
- leapfrog development; and
- low-density residential and nonresidential development.

However, if urban depopulation is a self-replicating and re-enforcing process, it changes over time: initially being attributable to problems (real or perceived) in the city but rapidly evolving into a chicken-egg scenario… at one point, people left the city for whatever reason, but as time goes by and more depart, others depart somewhat because sprawl has established a place to go and that's where "people like us" now live.

An interesting Brookings Institute study examined whether effects of sprawl were deemed negative beyond the realm of city devotees. In fact, many effects of sprawl are widely perceived as benefits, if not to society as a whole then at least to individuals trading one set of circumstances for another. For example, people perceive larger lot sizes as a benefit free of any offsetting societal costs. Moreover, less dense areas are widely thought to experience lower crime rates. These findings hint at the challenges that lie ahead vis-à-vis the public debate surrounding the desirability of various growth patterns. Development Patterns & Costs in the Erie-Niagara Region

In the Erie-Niagara region, issues associated with development patterns are already understood by the general public on both an intuitive and a practical basis. Suburbanites struggle with congestion, separation, and a loss of sense of community. As they go about their day, they recognize that most shopping centers and strip malls are ugly and development's appetite for land leaves less for agriculture and open spaces. Meanwhile downtown's denizens mourn the diffusion of residents, businesses and investment dollars even as they enjoy providing the amenities that lend the region its character, including cultural facilities and other

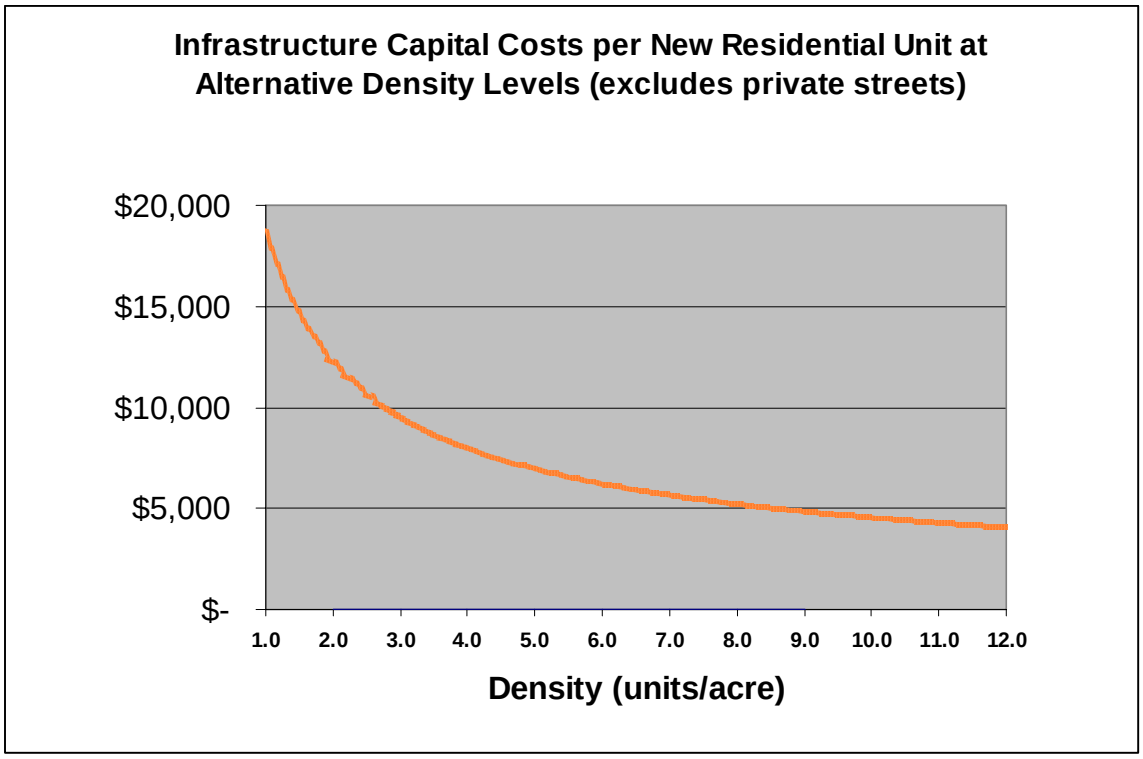
things to see and do. Translating these dynamics into dollars—whether paid out in taxes or time—is needed to help people tackle sprawl-related issues with their heads as well as their hearts.

The three scenarios for regional growth, reinvestment and development prepared for review by the Steering Committee—a 1980-2000 Trend Scenario, a Strategic Investment Scenario, and a Reinvestment Scenario describe three possible futures for the region based by quantify regional distribution of households, the overall density of development, and the relative dispersal or concentration of development. The projected amount of regional growth is held constant, but regional distribution and density factors varied by scenario. As a result, the acreage required to accommodate growth differs for each scenario.

Each scenario assumed that the density of new households would be highest in inner city and mid-century suburban communities and lower in rural areas, with the highest densities assigned for the Reinvestment Scenario and the lowest for the 1980-2000 Trend Scenario.

	80-2000 Trend Scenario			Strategic Investment Scenario			Reinvestment Scenario		
	HH #	Density Factor (HH/acre)	Land Need (acres)	HH #	Density Factor (HH/acre)	Land Need (acres)	HH #	Density Factor (HH/acre)	Land Need (acres)
Developed Area									
Erie County	12,235	4	3,059	21,106	6	3,518	37,155	6	6,193
Niagara County	2,203	4	551	7035	6	1,173	4,690	6	782
Subtotal	14,438		3,610	28,141		4,690	41,845		6,974
Developing Area									
Erie County	14,057	2	7,029	11,733	4	2,933	4,965	4	1,241
Niagara County	9,006	2	4,503	3,911	4	978	3,259	4	815
Subtotal	23,063		11,532	15,644		3,911	8,224		2,056
Rural Area									
Erie County	13,914	0.5	27,828	11,076	1	11,076	6,307	2	3,154
Niagara County	7,137	0.5	14,274	3,692	1	3,692	2,177	2	1,089
Subtotal	21,051		42,102	14,768		14,768	8,484		4,242
TOTAL	**58,552**		**57,243**	**58,553**		**23,369**	**58,553**		**13,272**

The chart below shows a trendline relating total infrastructure capital costs associated with new residential units and density. The chart becomes less reliable at the extremes. At lower densities, development practices favor septic systems, wells, and other site-specific infrastructure options. Similarly, at the high end, infrastructure costs can vary immensely based on proximity.



The chart below compares expected infrastructure costs associated with the three development scenarios, expressed in millions of current dollars:

Expected Infrastructure Costs by Scenario

	80-2000 Trend Scenario			Strategic Investment Scenario			Reinvestment Scenario		
	HH #	Density Factor (HH/acre)	Infra-structure costs ($millions)	HH #	Density Factor (HH/acre)	Infra-structure costs ($millions)	HH #	Density Factor (HH/acre)	Infra-structure costs ($millions)
Developed Area									
Erie County	12,235	4	28	21,106	6	25	37,155	6	43
Niagara County	2,203	4	5	7,035	6	8	4,690	6	5
Subtotal	14,438		32	28,141		33	41,845		49
Developing Area									
Erie County	14,057	2	74	11,733	4	26	4,965	4	11
Niagara County	9,006	2	47	3,911	4	9	3,259	4	7
Subtotal	23,063		121	15,644		35	8,224		19
Rural Area									
Erie County	13,914	0.5	501	11,076	1	199	6,307	2	33
Niagara County	7,137	0.5	257	3,692	1	66	2,177	2	11
Subtotal	21,051		758	14,768		266	8,484		45
TOTAL	**58,681**		**911**	**58,681**		**334**	**58,681**		**112**

Source: Economic Stewardship, Inc., The HOK Planning Group

For all three scenarios, the savings available to the regional economy thanks to prudent location decisions increases with every household's decision to choose an infill development or redevelopment opportunity. However, in the areas where these opportunities are typically found, the infrastructure costs associated with new development shifts from building new to refurbishing dated or outmoded installations, from sewer pipes

on the brink of failure to resurfacing streets where urban pioneers agitate for improvements. At higher densities associated with urban infill opportunities, the infrastructure cost per new unit used in the calculations above stands at less than $5,000 per unit; at this point the per unit infrastructure costs associated with new and infill development begin to overlap for single family and small multi-family dwelling units.

As the chart reveals, expected infrastructure costs associated with the Strategic Investment and Reinvestment Scenarios pale in comparison to the Trend Scenario. The approximately $800 million in capital costs—not to mention potential ongoing operating costs savings—available to the regional economy if it can exert discipline in its development patterns is an extraordinary resource available to Erie and Niagara counties