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Introduction

A US supreme court justice once famously remarked that he could not define pornography, but that he knew it when he saw it. A similar remark might be made about urban design. We all know that some cities and towns are better designed than others, but we might have difficulty describing what exactly goes into good design. Similarly sized towns might have very different designs but be equally well designed. With the difficulty of accurately describing good design in mind, a few principles of design are offered here.

1. Access. Good design offers access to jobs, services, open spaces, and other amenities.
2. Health and Safety. Good design limits citizen exposure to health risk due to accident, stress, life style, violence or pollution.
3. Aesthetics. Good design in this dimension is harder to characterize, but generally accepted principles might include lack of uniformity, but consistency of style, harmony with landscape, and homage to the cultural and architectural values of preceding generations.

It is clear that each of these three concepts of design has something in common with the others, while at the same time having several of its own dimensions. So achieving good design--even when divorced from differences in individual tastes and preferences, is still a complex n-dimensional maximization problem. Yet if we accept and limit ourselves to these three simple principles, casual observation tells us that late 20th century urban environments are, in general, headed away from good design. Design of urban environments is in decline, yet urban areas continue to attract an ever larger percentage of the world's population. This note explores

phenomenon of the decline of urban design from the perspective of an economist. Economic principles are used to offer a few observations on factors driving this undesirable result. Gaps that appear not to be explained by economics are also explored.

Market Failure

A perfectly competitive market is characterized by large numbers of buyers and sellers of a uniform product, where prices are known by all participants, where there are no economies of scale, and where costs of buying and selling are low. Economics tells us that if this situation exists, then markets provide socially optimal solutions. Since we have stated that markets appear to be offering sub-optimal solutions, which of the desirable market conditions are lacking?

Most urban markets offer large numbers of buyers and sellers, particularly for housing. Prices of houses are also quite easy to obtain. While no two houses are exactly alike, housing options are also relatively homogenous--various econometric studies have shown that the components of housing price can be modeled with some precision.

Clearly transaction costs are one element that constitute a market failure in housing. Changing houses is costly for the individual, and so it is avoided. In large urban environments, changing employment and other aspects of the life/work cycle might combine with transaction costs to create a lack of access. For example, an individual might purchase a home close to her place of work. Several years later, a job change might move her place of work somewhere else in the city. The net present value of the increased commuting costs over her expected time with the new job

might be lower than the transaction costs of moving to a similar house in a new neighborhood. Doubling the number of workers in the household (as when both partners in the household work outside the home) doubles the probability of life cycle induced commuting. The presence of school-aged children in the home also increases the psychic transaction costs associated with a move.

Other transaction cost market failures might be found in greenfields development versus brownfields development. Consider the costs of land acquisition. In greenfields housing development, a single developer may be able to choose from several holders of large blocks of land. In brownfields development, a developer wishing to obtain a large block of land will likely need to deal with many individual sellers, some of whom inevitably refuse to voluntarily sell at market prices. Why do they refuse to sell? As the number of tracts the developer holds increases, the remaining landholders are no longer numerous, giving them monopsony power.

Salvage value and Salvage Cost

Redevelopment is also costly because the developer must pay to remove existing infrastructure (even though it may still have some economic value) before producing the new infrastructure. Thus the economic gains associated with the redevelopment must offset the costs of both obtaining and removing the old development. Redevelopment has some cost advantages in terms of availability of ancillary infrastructure such as roads, power lines, and sewers, but in greenfields development, much of this ancillary infrastructure is often financed by state and local governments.

Risk and Uncertainty

Risk and uncertainty clearly play important roles in fostering production of bad design. Risk refers to occurrences with known probability, for example It floods every five years. Uncertainty refers to occurrences with unknown probability, for example, The Dow-Jones Industrial Average will hit 9000 next month. With these definitions in hand, the example of the transferred employee discussed above can now be expanded. Risk and uncertainty may work in opposite directions in motivating a move by the transferred employee. The case of uncertainty is perhaps most obvious. The employee faces certain costs associated with moving, but uncertain gains because she or her partner may experience another transfer (voluntary or involuntary) soon after she moves. Also unknown are whether she will like her new neighbors or other qualities associated with the new house. As for risk, the increased commuting activity presents risk in the form of increased exposure to traffic hazards and probably a more sedentary lifestyle.

Uncertainty also plays a role in how subdivisions are structured. The developer who creates a self-contained cluster of monotonous houses is reducing access and aesthetics, and insuring a more sedentary lifestyle for those who ultimately dwell in the homes built on the lots. But that same development is perceived as reducing uncertainty for buyers of the homes. A monotonous subdivision created with a ream of association regulations reduces the likelihood that the investor will lose money as the nature of the surrounding houses change over time. By assuring that purchasers of nearby homes have very similar preferences (otherwise why would they buy a similar home) potential differences in home maintenance and additions are minimized.

Homogeneity of class translates into more stable property values, and the likelihood that individual investments in upgrading will be matched similar improvements in nearby homes. However, homogeneity does not necessarily translate into maximum property value growth.

Uncertainty is also likely quite important in homebuilder (self build or speculative) decisions to use monotonous plans. If the builder/buyer does not know where he or she may be living in a few years, a generic plan using low cost materials may be preferred over more unique plans and higher quality materials. Unique plans might be better for the first owner and contribute to a neighborhood's sense of place, but appeal to a smaller number of buyers in the future, increasing the time it takes to resell the home. The payoff period for higher quality materials (better siding, roofing, insulation) may exceed the purchaser's time horizon at a particular location.

Land Use within Subdivisions

Let us now turn to the decisions by the developer once a tract of land has been identified and purchased. The classic subdivision involves building roads and allocating all the remaining land to plots for home construction. No land is set aside for parks, playgrounds, or other kinds of open space. Clearly this is bad design according to our criteria of access, health & safety, and aesthetics. Table 1 illustrates two hypothetical developments. In the bad design, the developer might create 360 0.25 acre lots. In the good design, the developer could create 360 lots, each 0.22 acres in size. The smaller lot size (roughly 1210 square feet smaller), would still allow ample room for a large house with a two car garage. Overall long term subdivision lot values would likely be increased with ready access to ten acres of parks or open space.

Table 1
Hypothetical One Hundred Acre Development

	Bad Design	Good Design
Roads	10	10
360 Lots	90	80
Parks	0	10
Average Lot Size	.25	.22

Why do developers avoid developments with parkland or open spaces? One obvious reason may be that parkland may be less valued at the time of the development than it is after the development is established. With greenfield development, there is often ample open space near the new development. So there is little premium attached to any open space within the subdivision. With time, open spaces near the subdivision become occupied with other new developments.

A second reason developers do not plan parks could be simple cash flow issues. Even limited facilities such as trails, swings, baseball fields or basketball courts take cash to install. If cash flow is a problem, the developer will likely avoid making these investments a high priority, focusing instead on the basics such as water, sewer, and electric. At the same time, if the facilities are not installed, but only on the drawing board for development after lots are sold, then the sales value of the amenity is decreased. And there may be complaints about the quality or maintenance of the facilities and liability issues.

A final disincentive for open space may be association regulations and fees. When communal space is available and developed with some additional amenities, association fees are typically required to maintain its condition. If the communal space has been developed into capital intensive activity areas such as swimming pools, clubhouses, or golf courses, the association not only pays maintenance, but also some costs to exclude potential free riders--such as a staffed gate. A gated community reduces access not only for free riders, but for residents. To reduce staffing costs, the number of gates are minimized--usually there is only one gate. So residents have limited access to routes to the outside world. As an extreme example, I'm aware of a development where residents on the extreme edge of a gated community must travel ten miles by car visit the property on the other side of their back yard lot line.

Association fees also have the socially undesirable effect of reducing equity. Amenities are overprovided within the association--capacity is built to handle peak loads, resulting in underutilization most of the time. Meanwhile, association members are reluctant to approve property taxes to finance similar amenities outside the development, contributing to underprovision of amenities elsewhere in the jurisdiction.

Agglomeration Effects

In services, agglomeration effects are strong. Consumers can use cheap transportation to go to a single destination with substantial selection. The developer who can build the biggest mall wins a share of retail customers disproportionate to the mall's size advantage over its nearest competitor. Large shopping complexes require large tracts of land--difficult to assemble in areas that have

previously been built up. So large shopping complexes tend to be greenfields development. Core urban shopping complexes in redevelopment zones suffer from the problems listed above with respect to housing. As greenfield shopping complexes are developed along the urban periphery, access is reduced. Shops in more densely populated areas reduce their inventories, or close up entirely, and urban consumers are increasingly faced with the necessity of traveling by car to shop. Uncertainty plays a role here, too. In times past, consumers could reasonably expect the central business district to maintain its status as the area's premier retail area. With the current pattern of leapfrog peripheral development, home buyers cannot be sure of the next big shopping area's location.

Economies of Scale

The global economy has intensified firms' abilities to capture economies of scale in production of goods. To obtain maximum efficiency, the modern plant has been reconfigured considerably as compared to its predecessors. Two major differences are square footage and the number of stories. Square footage has increased while today's plant is typically a one-story building, rather than the multi-story complex of former times. Efficiency has been gained by moving more product through the plant; a one-story configuration aids product flow considerably. Modern plants also require large loading docks for semi-trucks, and, of course, parking lots to accommodate a workforce that commonly travels up to fifty miles to work on the plant floor. So many modern plants require huge tracts of land; for reasons discussed above, the tendency is to build these on greenfields.

Conclusions

This paper has shown that the process of urban development exhibits many characteristics of market failure. So from an economist's perspective there is ample argument for government intervention to achieve a socially preferable result. Some basic solutions to consider would include the following.

1. Pay-as-you go greenfields development as the standard. Subsidizing development that reduces access, safety and health, or aesthetics must be offset by substantial gains in economic efficiency to justify more subsidies. A general rule should be that new housing developments on greenfields ought to pay large development fees to offset the negative consequences of sprawl on the rest of society. Most studies have shown that most recent housing developments use more tax base than they add to local jurisdictions--this should be reversed.

2. Regulated greenfields development. Particularly within the context of new subdivisions, regulations should encourage a healthy balance of open space and access to other amenities in new subdivisions. Building codes should encourage use of quality materials and design, recognizing the social value of future aesthetic gains.

3. Subsidized redevelopment and brownfields development. The public's willingness to pay for better access, safety and health, and aesthetics needs to be better accounted for in establishing norms for subsidies to reinvigorate previously developed areas. Similarly, redevelopment likely provides cost savings in the form of less road construction and use. When we take these factors

into account we are likely undersubsidizing redevelopment. Subsidies might take simple forms such as government acceptance of liabilities associated with brownfields contamination, assistance in assembly of land, or assistance in demolition to make redevelopment more competitive with greenfields development.