

A Report on Charlotte's Urban Street Design Guidelines

The Citistates' Team was asked to address the following questions:

- A. Is good planning and implementation in a rapidly growing urban area sound fiscal policy (“good business”)? If so, why? (Page 3)
- B. Will the USDG help to support and implement the Centers and Corridors growth strategy? If so, how? (Page 5)
- C. Will failing to implement these policies have negative environmental, quality of life, economic development, and/or fiscal impacts (use examples and available data)? (Page 7)
- D. What are the consequences of focusing only on site-by-site and short-term cost analyses? How should area-wide, long-term, and public-borne costs (and benefits) be included in the discussion (give specific examples)? What examples are available from other places? (Page 9)
- E. Amplify or otherwise supplement the information related to Fort Collins and any other cities that have instituted better street designs (particularly block sizes and connectivity) – has this has had an effect on growth and/or revenues and/or operations and/or housing values? (Page 11)
- F. How does a good street network support economic development and growth, not only in TOD and station areas – these street concepts will be applied throughout the City and its sphere. (Page 15)
- G. Describe any studies that show the impacts or value capture of better streets, proximity to better streets, street trees and sidewalks, walkable and traffic-calmed neighborhoods, etc. What has been quantified or otherwise described in this regard? (Page 16)

Overview

The findings in this report are necessarily somewhat theoretical; since limited studies are available on the issues of and because models cannot fully control for all variables. Accordingly, no one should expect that Charlotte would realize the quantified projections we delineate herein with exact precision. However, the purpose of this report is not to create a detailed forecast of expected impact, but rather to illustrate the differences in planning orientation in order to facilitate policy development. Regardless, sustained economic growth is the product of a variety of interrelated factors, and place has become increasingly important in that calculus.

We conclude that the Urban Street Design Guidelines (USDG) and the complementary connectivity standards of the General Development Policies (GDP) will be critical in maintaining and growing Charlotte-Mecklenburg's quality of life and fiscal health, especially in the context of the following:

- Better community planning has become in the last decade a mainstream necessity. The evidence is all over the country – in large and medium sized cities and regions.
- A changing consumer market along with competition among regions has made it necessary for local governments to rethink their public policies about land use, urban development and transportation. Quality of life is now more than ever “king of the hill;” higher quality does not come by accident or spring from unguided markets.
- Good urban planning finds the optimal mix of residential, commercial, cultural and recreational spaces, uses density as an asset, and offers a variety of live-work situations. Often meaningful transportation choices make or break the capacity to achieve the optimal mix.
- Better planned communities do not endlessly extend their water and sewer infrastructure. While some say that all this planning cost too much, the reality is “you can pay me now or pay me later.” The question is whether the upfront costs of better planning pay off? A longer look at results shows that these costs are investments that pay off – for developers, buyers, and local governments.

A. Good Planning is Good Business


Urban development now becoming more mainstream features a mix of land uses, walkable streets, and street networks that offer multiple connections between neighborhoods and regional centers. These attributes translate into increased property values, if not right away, certainly in the longer run. Mark Muro and Robert Puentes of the Brookings Institution note that these developments may enhance regions' tax bases, create wealth through housing appreciation, and boost property tax collections. In that sense, better planning may well create substantial value by enhancing the real estate market.

The investment assumption is different in communities with better planning. According to Christopher Leinberger (of the Arcadia Development Company) in a paper for the Brookings Institution, the investment cycle for conventional income-oriented (as compared to value-based) development peaks around year seven. Absent continued investment, the development begins to decline. This has become a common occurrence in post-WWII suburbia, and has created what Leinberger calls a "throwaway built environment." The phenomena he has underscored reflects built-in obsolescence of isolated, disconnected development projects. First- and second-ring suburban areas around the country are suffering huge tax base reversals because of this dynamic. Much of the new development patterns of suburban Charlotte reflects these same development patterns.

A more comprehensive urban planning approach, on the other hand, generally creates and sustains value in excess of conventional developments, although their short-term performance may not be as successful in comparison. This can be due, in part, to the quality (and thus increased investment needs) of better urban design and infrastructure, the amount of open space provided in the overall development, or the higher costs of financing. However, what may be reduced in the short-term is made up for in the mid- and long-term.

Leinberger tracked longer-term results and asserts that better-planned places all over the country yield higher mid- and long-term returns and last longer because they usually focus on giving people more ways to get around the community, particularly by being able to walk around mixed use places. Thus, the whole quality of place is enhanced. And that quality endures. In other words, when a family buys a home in one of these neighborhoods, they are not just buying a house; they are buying, in a sense, the entire neighborhood. And, therefore, they are willing to pay a premium.

Increased real estate values of course make a tremendous difference in the potential for public revenues. People voluntarily pay more for better community design – both



through residential purchases and resulting property taxes. For example, research conducted at George Washington University and now well accepted by scholars estimated the incremental gain per unit attributable to better neighborhood design at the Kentlands, a carefully planned new community built in Maryland about 15 years ago. This analysis showed that housing units in the Kentlands commanded an 11.7 percent market premium, all other factors held constant. This premium existed in both new and resale markets.

According to data from the Charlotte Regional Realtor Association (www.carolinahome.com), a total of 43,389 new and resale residences were sold in Mecklenberg County during 2006, at an average sales price of \$220,657. If the 11.7 percent premium outlined above were applied to only 25 percent of the number of residences sold, the impact would have been an increase of \$280 million in sales value. Obviously, this calculation is merely an illustration, but it does highlight the fiscal impact associated with higher values that can arise from taking a more comprehensive approach to urban planning.


B. The USDG supports and implements the Centers and Corridors Strategy

The Centers and Corridors Strategy offers an intrinsic advantage of implementation: the meshing of land use and transportation. This marriage facilitates both continuity in design and consistency in fiscal effects. Too many places define success as achieving land uses that leverage transportation investments in just one corridor, or just one corridor at a time. The Centers and Corridors Strategy opens the door to region-wide impact, creating the ability for the entire region to capture a meaningful share of growth within a system of interconnected transportation corridors. The policies of the Centers and Corridors Strategy can exploit the meshing of connectivity and mixed use nodes so that transportation investments result in real value capture. The Urban Street Design Guidelines (USDG) provide the tools to implement those policies.

Value capture from quality growth is driven not only by the essential street network but also by the fine-grained impacts of the street cross-section itself at the neighborhood level. The USDG sets forth a thoughtful process with pertinent standards for combining the mobility goals of a given street and street networks with the community's and the developer's specific desires for place making goals along those streets. The engineering community seems now to accept this notion in its newly promulgated ITE (Institute of Transportation Engineers) Recommended Practice for Context Sensitive Solutions for Major Thoroughfares, published in conjunction with the Federal Highway Administration (FHWA).

The new ITE standards represent the first comprehensive recommended practice guidelines aimed at effective place making in the transportation context. The new ITE standards support the approach taken in the Design Guidelines in three respects: process, connectivity analysis and urban design context for a given street. The support of the ITE Recommended Practice for the approach taken by the USDG for the implementation of the Centers and Corridors Strategy is critical as specific networks and streets are implemented in the face of growing congestion and the inevitable engineering questions about the utility and safety of those streets.

First, the ITE Practice calls for a definition of needs including analysis of the long range transportation objectives that respects the community vision—in this case, the Centers and Corridors Strategy. The USDG implements these initial steps by analyzing the land use and transportation interface of the vision in the context of stakeholder input. Next, the ITE Practice calls for analysis of context zones, which is paralleled by the USDG analysis of deficiencies and development of future objectives. Finally, the ITE process calls for initial design and testing, which gives rise to the detailed thoroughfare design. In this regard, the USDG completes the process by defining the street type and, ultimately, selecting a street cross-section within the context of connectivity analysis that is consistent with the General Development Policies (GDP).



Complementing the USDG, the GDP utilizes a connectivity analysis based on street segments, which ultimately form intersections. This measure of the degree of connectivity is supported by the ITE Recommended Practice. The USDG takes the connectivity measure to the next level by incorporating transit accessibility, sidewalk availability and bicycle facilitation within the calculation of the level of connectivity. Those elements are at the core of implementing the Centers and Corridors Strategy.

A high level of connectivity is critical to the ability of the transportation system to “support the desired development pattern.” The specific functional need is to expand the typical definition of “collectors” to recognize and institutionalize the ability to distribute better local origins and destinations and to accommodate transit riders, pedestrians and cyclists. Supported by the ITE Recommended Practice, the USDG embraces this expanded definition of “collector” by marrying up improved connectivity with a design context for each street type, not measured from curb to curb, but from building type to building type. Hence, the marriage of street type and desired land use through the USDG will enable the real estate markets to embrace the Centers and Corridors Strategy.

C. Failing to implement these policies will have Negative Impacts

It really boils down to “pay me now or pay me (more) later.” Muro and Puentes reviewed the best academic empirical literature on fiscal effects of growth and development for the Brookings Institution and reported that, overall, the relative cost of providing public infrastructure and delivering services can be reduced through thoughtful design and planning. The logic is straightforward; compact, less sprawling development patterns can reduce the capital and operations costs governments incur from new growth. The authors identify two related ways urban form can decrease costs:

- **Economies of scale.** Sometimes known as “density efficiency,” the marginal cost of serving additional population decreases as more residents cluster within a small geographic area.
- **Economies of geographic scope.** The marginal cost of serving each additional person decreases as each person locates more closely to existing major public facilities.

Muro and Puentes picked a year and looked at data to assess impact. Over the year 1999-2000 states and localities nationwide spent nearly \$140 billion on capital outlays for infrastructure shaped by development patterns such as elementary and secondary schools, highways, sewer lines, solid waste management, and utility systems. More than \$200 billion was spent on recurring expenditures to provide such services such as highway maintenance, police and fire protection, trash collection, and utility service. These researchers noted that:

Considering that these outlays represent almost 20 percent of the \$1.7 trillion states and localities spent during 1999-2000, realizing even modest percentage savings from more intensive growth management planning could save taxpayers billions. And such savings grow only more attractive in light of economic stagnation, weakening federal support for states and cities, and the twin challenges many states face with shrinking revenue bases and increasing mandatory spending.

Several studies reported by the authors predict that rational use of more compact development patterns from 2000 to 2025 promise the following sorts of savings for governments nationwide: 11 percent, or \$110 billion, from 25-year road-building costs; 6 percent, or \$12.6 billion, from 25-year water and sewer costs; and roughly 3 percent, or \$4 billion, for annual operations and service delivery.

According to budget data from the City of Charlotte (www.charmeck.org), the capital plan for 2007-2011 includes the following total expenditures: roadways: \$92.5 million; and water & sewer: \$214.6 million, for a combined total of \$307.1 million. If these figures are typical of a five-year pattern, then 25 years worth of spending in these areas would amount to approximately \$1.5 billion (in 2007 dollars). Given the savings rates outlined above, Charlotte might be able to reduce this expenditure by approximately \$115 million. Can Charlotte and Mecklenburg County afford not to reduce relative expenditures in the context of ever increasing budget demands?

Similarly, the annual operations costs listed for transportation (roadways) and water & sewer for fiscal 2007 are a combined \$138.4 million – a reduction of 3 percent would be an annual savings of approximately \$4.2 million. Again, these are hypothetical assessments, but the principle underlying them is sound and significant. This analysis reinforces the question whether Charlotte's fiscal success can be maintained absent more efficient investments in infrastructure resulting from the land use benefits of the USDG and the GDP's connectivity policies.

In essence, the question is one of willingness to invest: is Charlotte prepared to expend a potentially larger amount in the near-term for infrastructure that reflects current planning best practices in order to reduce costs over the longer run? An appropriate analogy may be investment in energy efficiency – while higher quality insulation costs more initially, the payback in reduced utility bills typically more than offsets the capital cost.

D. Focusing only on site-by-site misses area-wide and long-term benefits

In addition to higher property values and resulting tax base as well as reduced relative capital costs of infrastructure, regional economic growth should be considered. Some are concerned that the USDG could increase costs for the development of homes at the lot level. In some cases this might be true. But these site level costs should be viewed in the context of the overall impact on the economy. In other words, by focusing only on site-by-site costs, the effects of the ability of a coherent area-wide growth pattern to leverage better economic growth will not be reached in the inquiry.

Alfred Marshall (1890) was the first modern economist to theorize about the positive economic effects of spatial concentration of economic activity on economic growth. His insights into economic geography lay relatively dormant for nearly a century before they found new voice in the 1990s in what has come to be known as the “New Growth” theory of economics. The core insight of New Growth theory is that technology and innovation are not merely accidental external stimulants to growth. Rather, they are integral to the process, shaped most importantly by factors that promote greater interaction among human beings.

More recently, Richard Florida has explored the concentration of skilled and educated workers in desirable locations and how these communities of society’s most creative types have propelled certain cities in the United States to the forefront of innovation and technology. He has found that no longer are these workers attracted to the location of firms, as much the firms have become concentrated in locations where this skilled and educated labor force has chosen to settle. These locations tend to be urban areas with a larger component of their workforce employed in “creative” professions, such as scientists, engineers, researchers, writers, artists, teachers, etc.

Florida observed that for these populations to create economic growth, creative individuals must interact socially, have access to cultural activities, exchange ideas, switch jobs easily, and create businesses. Mixed use urban forms with rapid transportation linkages make these activities easier, as opposed to disconnected environments that require a person to drive to meet every need or to come into contact with other people. By the same token, the quality of the built environment contributes to the overall aesthetic quality of a place, a key underlying element in the relative appeal to those whose value proposition is based on creativity. In this context, analyzing the implementation of the USDG at the development project level risks ignoring the factors that determine Metropolitan Charlotte’s ability to continue to attract the best and the brightest. , an approach that could well prove to be penny wise and pound foolish in the modern economy

In summary, the following area-wide benefits should provide the appropriate framework for analysis of the USDG:

- **The first payoff is in the value of properties themselves.** Those values turn out to be higher on average, after discounting for other variables, in communities resulting from intensive and aggressive urban planning than in communities operating under more conventional regimes.
- **The second payoff lies in lower relative public sector costs.** Both capital expenditures on infrastructure and annual operations and maintenance tend to be lower in terms of relative costs due to increased efficiencies. Conversely, there are rising costs associated with further damage to the natural environment due to inefficiencies. More comprehensive planning for connected mixed use development has significant capacity for reducing negative impacts, and hence saving more public and private resources.
- **The final payoff lies in the spurred growth of the local economy itself.** The data that model comparisons across communities show a significant difference – a gain in personal income growth for communities where a more intensive planning process has taken hold (as demonstrated in Citistates’ earlier report), with more mixed use and connected urban design and higher quality development as the goal. Hence, the substance and tone of Charlotte-Mecklenburg’s Centers and Corridors orientation toward planning would seem to push the region into the winners’ column assuming the analysis is undertaken at the regional level, not the site-by-site level.

E. Case Studies

Fort Collins, Colorado

Concerned about unbridled growth, Fort Collins established a new vision for growth via transit corridors. The "Structure Plan," a mandatory implementation of urban development standards developed in 1999, identified key corridors for quality growth. The fundamental implementation was based on required pedestrian-scale designs at the site level and better connectivity through the implementation of maximum block lengths and specific traffic-shed patterns in new developments -- all providing better access for the community. Fort Collins claims a successful experience with comprehensive connectivity reform.

The connectivity reforms were married with a mixed use strategy, a combination considered aggressive at the time. Fort Collins sought to bring back the idea of authentic neighborhoods with two policy tools: (1) a required minimum mix of housing types for each neighborhood; and (2) the requirement that a minimum number of housing units be located within three-quarters of a mile from a "neighborhood center" or "neighborhood commercial district." Like Charlotte, the Fort Collins region was (and remains) under major growth pressures. The Fort Collins approach appears to be similar to Policy 2.b of the GDP Phase II Guiding Principles (facilitate the incremental development of well-designed and well-connected mixed use development in appropriate locations).

Outcomes:

- Although some in the development community raised concerns that the initiative would shut down growth (a predictable early reaction), Fort Collins has realized robust and continued growth.
- Fort Collins' growth management efforts have evolved into an aggressive redevelopment and in-fill program to round out its efforts.
- The efficacy of Fort Collins' focus on regional place making as a tool for growth management can be measured in part by its placing in the top 20 this year in the annual Best Place in America for Business and Careers published by Forbes.
- The early implementation experience of Fort Collins provided the impetus for many other reform efforts across the country.

Portland, Oregon

In 1998, Portland began updating the city's code to comply with metropolitan area's Functional Plan, which established street connectivity standards for residential and mixed-use areas. The Portland Transportation System Plan (TSP), adopted in 2002, maintains that street connectivity improves arterial streets system capacity, enhances mode choice, improves emergency response times, reduces traffic volumes on other streets by spreading traffic over a denser network, and results in slower traffic speeds because of the increased number of intersections.

The purpose of the connectivity requirements is to "ensure provision of efficient access to as many lots as possible, and enhance direct movement by pedestrians, bicycles, and motor vehicles between destinations." Rather than establishing a specific maximum for the spacing of through streets, the code suggests that "through streets should generally be provided no more than 530 feet apart, and pedestrian connections should generally be provided no more than 330 feet apart." The ordinance provides a large degree of flexibility for the planning staff, and thus staff can consider features such as steep slopes, ravines, railroads or freeways, existing lot patterns, and environmental protection areas in determining necessary connections.

Outcomes:

- Since 2003, when the connectivity requirements were adopted, Portland was ranked fifth in the nation in business climate rankings of U.S. technology hubs in 2006, and it was named the 10th best market for office buyers in 2007.

Raleigh, North Carolina

In the early 1990's, the Raleigh city council adopted a strategic plan that included the goal of finding incentives to encourage street connectivity, and sparked a research program and public discussion spanning several years. The city's analytic efforts focused on public benefits and costs in four areas (1) travel efficiency and mode choice; (2) fire response and service costs, (3) water and residential trash collection costs, and (4) environmental costs.

As part of the study, the Raleigh Transportation Department created a travel demand forecasting model to simulate alternative travel scenarios that varied street densities, connections, and block lengths. The simulation study provided evidence that new connectivity standards would create a street pattern that was more efficient in dispersing traffic, provided more mode and route choices, would not be overly

expensive to the development community, and would create street patterns comparable to those found in older well-known and established neighborhoods. The new rules were adopted into the city's zoning and subdivision codes in 1993.

Outcomes:

- The standards have been in place over 10 years, and the city has had some success in achieving interconnectivity in new subdivisions as well as in those infill projects where opportunities are available for increasing connectivity.
- With a few notable organized oppositions, the vast majority of street connections happen without political upheaval, and the program in general results in substantially more connective streets now.
- This year, Raleigh received the number two ranking in Forbes' Best Places in America for Business and Careers.


Orlando, Florida

In 1999, Orlando adopted an incentive-based approach to encourage connectivity and context-sensitive street designs. The policy provides a discount on impact fees if a developer meets or exceeds a connectivity index value of 1.4, with an allowance for topographic or other constraints. The city's land development code requires several basic, but generally unquantified, elements of connectivity. For example, street stubs to adjacent developable property and connections to existing adjacent streets are required. Cul-de-sacs may not serve more than 30 single-family houses or be longer than 700 feet in other residential areas, and the minimum width of local residential streets is 24 feet. Additionally, traffic calming techniques such as street design with curves, medians, textured pavement, changes in alignment, short lengths and other special designs are required.

The Growth Management Plan, amended in 2002, requires the city to ensure connectivity of roadways, bikeways, and pedestrian systems in existing and new residential neighborhoods and between neighborhoods. In new residential developments, the plan encourages a maximum stub spacing of 660 feet.

Outcomes:

- Residents of Orlando view connectivity favorably, and the area boasts several high profile, high-connectivity communities (Disney's Celebration and Baldwin Park, for example).

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- The chief planner for Orlando feels that the success of these neighborhoods and their high property values encourages a broader group of developers to build in Orlando, even with the more stringent connectivity and street design requirements

F. Good Street Networks support Economic Development and Growth

Although we found no studies that directly correlate good street networks and economic development (as confirmed by Professor Susan Handy of the University of California at Davis, well known for her expertise on travel behavior), a very limited number of studies do support indirectly that street networks that provide lots of interconnectivity support the development of mixed use neighborhoods and visa versa. See, for example, studies that conclude that a more grid-like street pattern reduce VMTs, such as those by McNally and Ryan (1993), Rabiega and Howe (1994), and Stone, Foster and Johnson (1992). In the context of a more balanced regional transportation system, both in terms of mode choice and connectivity, this leads to land uses that could generate a more sustainable growth pattern. But we are unaware of studies that have confirmed this quantitatively.

One of the other indirect factors that supports the conclusion that better street networks results in sustainable economic development is that just building more highway capacity may make congestion worse and, thus, negatively impact economic development. This conclusion is based on empirical studies concluding that simply expanding highway supply induces additional travel demand resulting in greater rates of congestion (Handy and Huang, 1997; Noland, 1998).

Raymond Unwin's seminal work, *Town Planning in Practice* (1909) recognized that

Roads are primarily highways for traffic. They serve also a secondary purpose in affording sites for buildings... For roads in a town to satisfy properly their primary function of highways, they must be so designed as to provide generally for easy access from any point in the town to any other.... A general scheme of roads may be based on various theoretical figures; the most common is that representing a trellis...[and those] forming an irregular radiating system...more nearly representing a spiders web.

Unwin's description of the classic regional networks has been the basis for the great cities of the world such as Paris, places that have retained real estate values for generations. The point is simple: disconnected, dendrite-like roadway systems breakdown because of their inability to provide options of movement once the system becomes congested. Whereas, true networks, providing optional means of travel with connected street types that complement adjacent land uses, provide both mobility and effective access throughout the network. Thus, new development throughout the region can be sustained, whether in a center, corridor or wedge.

G. Studies regarding impacts of Better Streets

There is virtually no data available on the quantifiable impacts of better streets. But many studies have provided some contextual support that better streets are beneficial.

Improved Safety

- Streets that are designed and operated to enable safe access for all users (pedestrians, bicyclists, motorists, and bus riders) reduce crashes through safety improvements. Pedestrians are less safe when there are high traffic speeds, more miles of wide arterial streets, poor lighting, and poorly located bus stops and crosswalks (Transportation Research Board/Institute of Medicine, 2005).
- A 2004 study by the Federal Highway Administration found that designing for pedestrian travel by installing raised medians and redesigning intersections and sidewalks reduced pedestrian risk by 28%. The study also showed that pedestrian crashes are more than twice as likely in places without sidewalks; streets with sidewalks on both sides are the least hazardous (www.completestreets.org).

Health Benefits

- Physical inactivity causes numerous physical and mental health problems, is responsible for an estimated 200,000 deaths per year, and contributes to the obesity epidemic. The Centers for Disease Control determined that creating and improving places to be active can result in a 25 percent increase in the percentage of people who exercise at least three times a week (www.activelivingresearch.com).
- One study found that 43 percent of people with safe places to walk within 10 minutes of home met recommended activity levels, while just 27 percent of those without safe places to walk were active enough (American Journal of Public Health, 2003).
- People who live in neighborhoods with a mix of shops and businesses within easy walking distance have a 35 percent lower risk of obesity (American Journal of Preventive Medicine, 2004).



Ease Transportation Woes

- Streets that provide travel choices can give people the option to avoid traffic jams, and increase the overall capacity of the transportation network. In Portland, Oregon, for example, better street design has resulted in a 74 percent increase in bicycle commuting in the 1990's (www.completestreets.org).

Good for Air Quality

- Poor air quality in urban areas has been linked to increases in asthma and other illnesses. An analysis showed that if each resident of an American community of 100,000 replaced one car trip with one bike trip just once a month, it would cut carbon dioxide emissions by 3,764 tons per year in the community (www.completestreets.org).

Makes Fiscal Sense

- Integrating sidewalks, bike lanes, transit amenities, and safe crossings into the initial design of a project spares the expense of retrofits later (www.completestreets.org).

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