Infrastructure, Implementation, and the Coming Demand for New Urbanism

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Introduction

The lack of available data regarding New Urbanist infrastructure is an impediment to NextGen practitioners' communication with conventional developers. The Charter of the Congress for the New Urbanism advocates neighborhoods diverse in use and population; communities designed for the pedestrian and transit as well as the car; cities and towns shaped by physically defined and universally accessible public spaces and community institutions; and urban places framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice[1]. For development projects across the country to reflect the principles advocated by the Charter on a widespread basis, the efforts of enlightened developers and homebuilders who view building New Urbanism as "doing the right thing" will not be enough. NextGen must strategize how to best bring its collective forces to bear outside the circle of New Urbanist developers.

The above Charter principles exist as conceptual planning and design guidelines for the development of compact, walkable, sustainable places. However, the Charter does not address implementation of projects. Consider the following:

1. Experts predict 100 million new Americans by 2037 and 34 million new housing units by 2030[2]
2. The top ten homebuilders in America account for 25% of all new homes built each year[3]

Then factor in predictions of a major undersupply of Smart Growth/New Urban housing[4] over the next twenty years, and a compelling case for the need to address conventional housing developers and the conventional development process is apparent. Furthermore, since the development strategies of the top ten homebuilders in America are inextricably tied to the financial bottom line, NextGen must address the conventional housing industry on their terms and using their vocabulary. The Charter principles alone are not a compelling case for New Urbanism.

Given the above predictions regarding the coming demand for New Urbanism relative to high production homebuilders, NextGen's focus should turn to infrastructure and implementation in light of the Charter principles. What questions need to be asked and answered in order to effect change in the conventional residential construction industry? How important is infrastructure and infrastructure cost as a component of the development equation? How do NextGen practitioners 1) ensure that the new development needed to satisfy the coming demand for New Urbanism fits the concepts advocated by the Charter; 2) communicate the details of New Urbanist infrastructure and implementation with conventional developers effectively; and 3) provide a business case for compact, walkable development?

Environmental Protection Agency (EPA) White Papers

In an attempt to answer some of the above questions, the EPA has been commissioning white papers and sponsoring various research projects in an effort to produce a business case for Smart Growth development. One piece of the EPA effort is a study by Morris Beacon Design to compare

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[1] *Charter of the Congress for the New Urbanism*, CNU, 2001.
[2] EPA White Paper: *Where Will Everybody Live?* Arthur C. "Chris" Nelson, Virginia Tech. 2007.
[3] BuilderOnline/Handley Wood, LLC.
[4] Nelson, op. cit.

infrastructure cost for Conventional Suburban Development (CSD) and New Urbanism, or Traditional Neighborhood Development (TND). The work product is based on a working EPA project with the findings to be published later in 2007 in a forthcoming EPA publication with the draft title "Making the Case: Smart Growth for Production Builder and Developers".
The infrastructure case study project uses five planning and design scenarios for the 750 acre "Belle Hall" site in South Carolina in order to quantify and compare the impact of specific infrastructure decisions (street patterns, street pavement width, density, single-family lot size, driveway configuration, etc.) on the total infrastructure cost. In order to provide as close to an "apples to apples" TND/CSD comparison as possible, several input assumptions including total residential units and commercial/industrial building area were held constant for specific TND and CSD scenarios, allowing the effect of the scenario's *configuration* on infrastructure cost to be compared.

It is important to note that the most sustainable infrastructure solution is reuse of what has already been built. Infill development and reuse of underutilized buildings provides the lowest infrastructure construction and long-term infrastructure maintenance costs, and as importantly, redevelopment projects do not cause a loss of natural resources. This paper is not meant to state otherwise. However, the EPA's "business case for developers" is primarily aimed at conventional high production homebuilders, most of whom build greenfield projects. The business case presents reasons why these homebuilders should consider greenfield TND as an alternative.

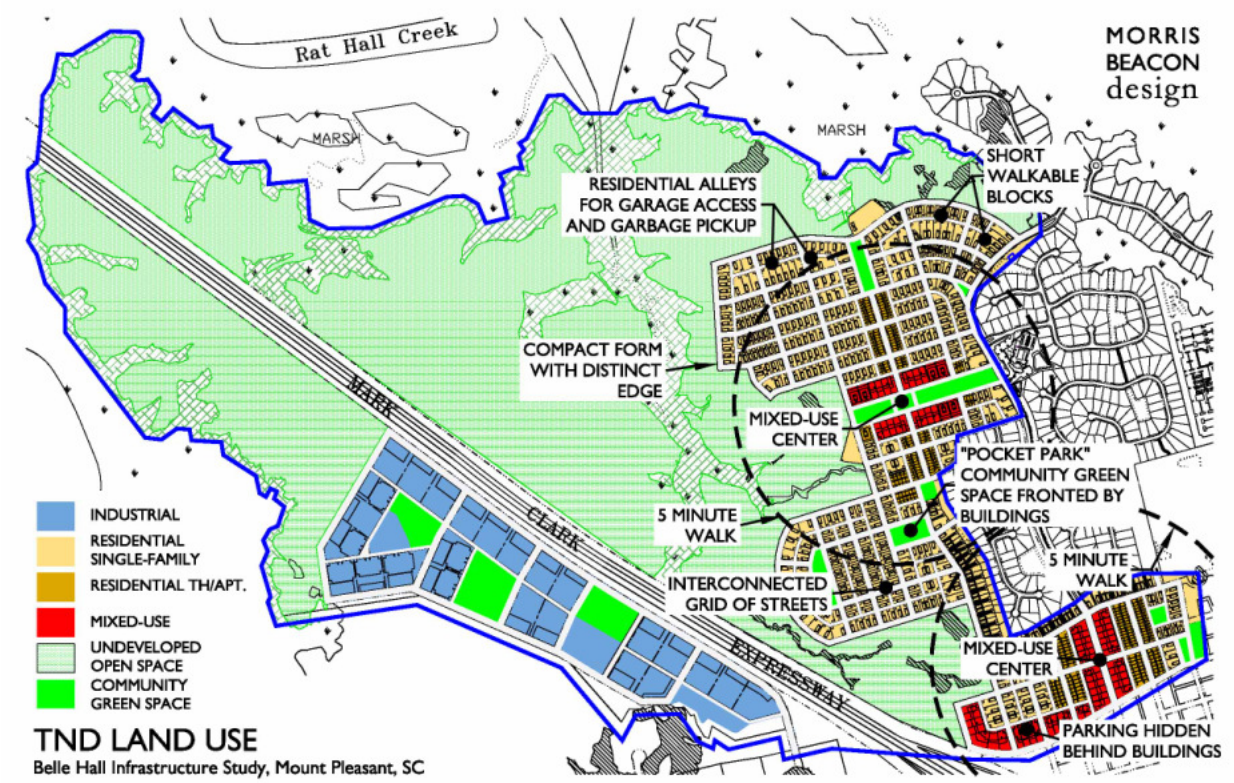

Figure 1 - TND Scenario A

Infrastructure Cost: Results

There are many unknowns in the development community when it comes to TND infrastructure cost. Does the TND interconnected grid of streets cost more than a CSD dendritic system due to the greater total length of streets in the system, with the higher cost offset by less pavement required for the narrower TND street cross sections? How does residential density affect

infrastructure cost? Is the cost of TND alleys offset by the cost of CSD driveways? How do TND on-street parking and shared parking strategies affect infrastructure cost?

The fact is, many of these unknowns are true to some degree but exist as one of many variables in a much larger system of interrelated components driving the total infrastructure cost. Examining the outputs of the EPA infrastructure cost study began to shed some light on the relationships between infrastructure components and their relative effect on the bottom line. Full results and detailed analysis will be released as part of the forthcoming EPA publication.

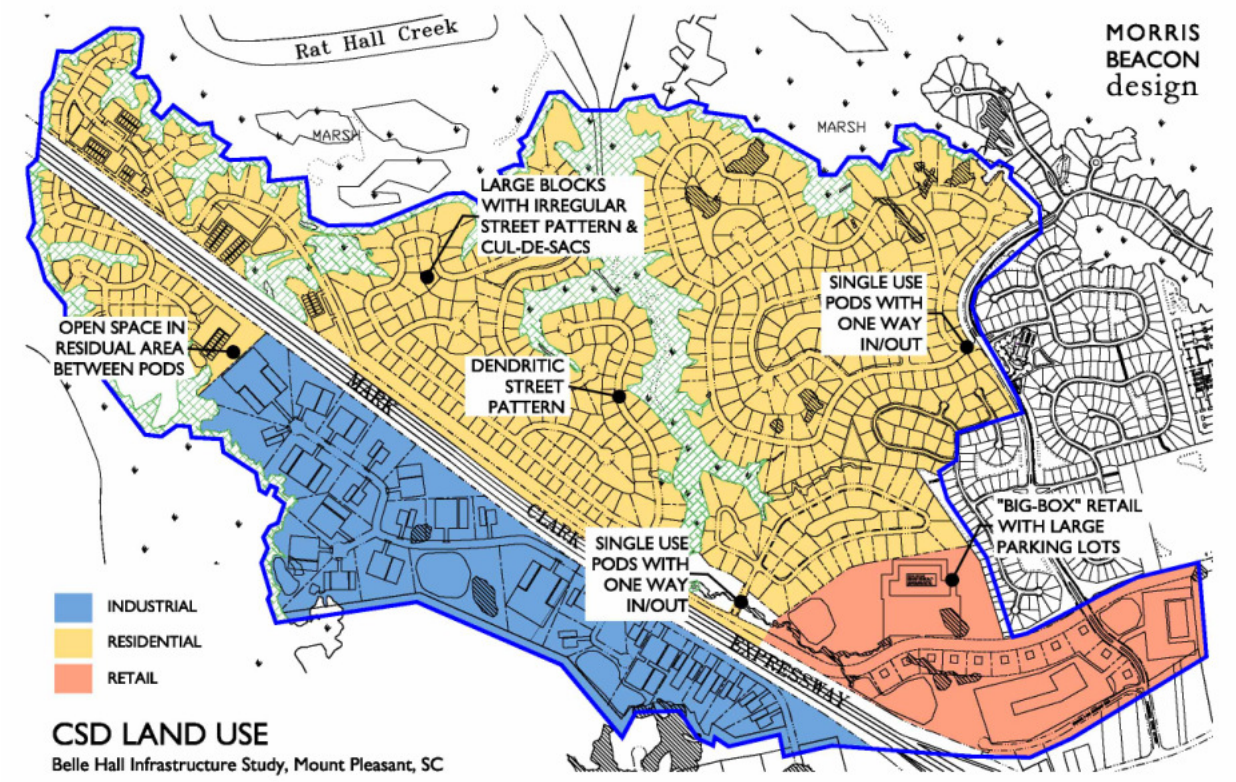

Figure 2 - CSD Scenario B

Phasing & Risk Management

The infrastructure cost breakdowns for each of the development scenarios is certainly helpful to evaluate the impact of various planning and design decisions on cost; however, it does not necessarily address developers' implementation strategy. In addition to evaluation of the overall infrastructure cost, development phasing and risk management is a crucial component of the CSD/TND infrastructure comparison. Due to the compact nature of TND development and the inherent mix of uses, far less land and infrastructure is required to bring all products to market in a single phase[5]. This translates into less carrying cost and shorter risk horizon per phase. If adjustments to the residential product mix are necessary due to a changing market, adjustments can be made incrementally. Due to the pod-like segregation of residential product types and sprawling infrastructure, CSD development patterns are far less flexible and require greater initial investment and risk.

[5] TND Scenario A = 34 acres, large-lot CSD Scenario B = 228 acres.

Next Steps for NextGen?

Given the assumption that the results of the EPA infrastructure study will support high production homebuilders' adoption of development patterns that coincide with the core Charter principles, what are the next steps? How is the business case for Smart Growth best communicated to homebuilders, and what key questions remain? For example, even though infrastructure cost may be reduced as an unknown risk for homebuilders as a result of the EPA study, the development process itself is not set up to permit and implement TND development projects as the path of least resistance. Are fundamental changes to the system required? Are the individuals who administer the system impeding TND projects, or is the problem the system itself?

In addition to homebuilders, who else impacts project implementation? One often hears about the power of traffic engineers, town and city planners, public works officials, and fire chiefs to shape development projects, but what about less obvious untapped sources of power? Local newspaper reporters? Financial appraisers and lenders? Environmentalists? Celebrities? The general public? Children and their teachers? What is the most effective way to reach out to each group?

And regarding the growing national network of Next Gen practitioners, what is the role of the Next Generation as an organization? Will the CNU be the best organization around which to rally, now and in the future?

Conclusion

The infrastructure study commissioned by the EPA begins to quantify the nuts and bolts of infrastructure cost and sheds light on a crucial piece of the development equation for conventional homebuilders. In order to effect widespread implementation of projects that appropriately reflect the core development principles advocated by the Charter of the CNU, NextGen practitioners must understand CSD and TND infrastructure, infrastructure's effect on sustainability and on quality of place, and the relative effect of each infrastructure component on total cost. Once these concepts are understood, it is incumbent upon each and every one of us to examine both how we can effect change within our discipline, and how the role of the various networks under the CNU umbrella can speed the process. TND infrastructure holds the power to shape places with immediate value to developers and lasting value to the community, but only if projects are efficiently and skillfully implemented.

Notes:

1. Special thanks to Dover Kohl & Partners for generously providing Belle Hall project site information including the initial CSD & TND scenario plans, and to William Gietema, Arcadia Development Company, for providing valuable developer review and feedback.
2. Infrastructure case study methodology, results, and all other work product are based on a "working" project commissioned by the EPA. Findings will be published later in the year in a forthcoming EPA publication. The project is still in progress and all facts and figures presented in this essay do not bind the EPA to findings that are not yet complete.

APPENDIX A

CONCEPTS

Conventional Suburban Development (CSD)

CSD is characterized by a strict separation of land uses with relatively little street connectivity, requiring travel by car between destinations. CSD development usually reflects the following characteristics[1]:

- Dispersed form with no distinct edge, disturbing the majority of the site's buildable land;
- Single-use pods, containing one kind of lot and building type in each;
- One way in and out of each pod;
- Garage doors and garbage pickup facing the street;
- Large blocks with irregular shapes and cul-de-sacs;
- Open space in the residual "left-over" land between pods and around regulated wetlands; and
- Strip shopping centers with big box retail and large parking lots between buildings and the street.

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Smart Growth & Traditional Neighborhood Development (TND)

TND, which is also referred to as New Urbanism, utilizes many planning and urban design techniques modeled after well-loved traditional towns established hundreds of years ago, before the advent of the automobile. New Urbanism and TND take advantage of Smart Growth regional development principles by implementing specific urban design techniques including:

- Compact form with a distinct edge yielding large contiguous preserved open space;
- Mixing of land uses;
- Complete neighborhoods proportioned generally according to 5 minutes walking distance;
- Grid network of interconnected streets with short, walkable blocks and multiple route choices;
- Alleys with garage access and rear garbage pickup;
- On street parking & shared parking strategies to reduce parking lot size; and
- Community parks, squares, and open spaces faced by the fronts of buildings and located within walking distance of residential homes.

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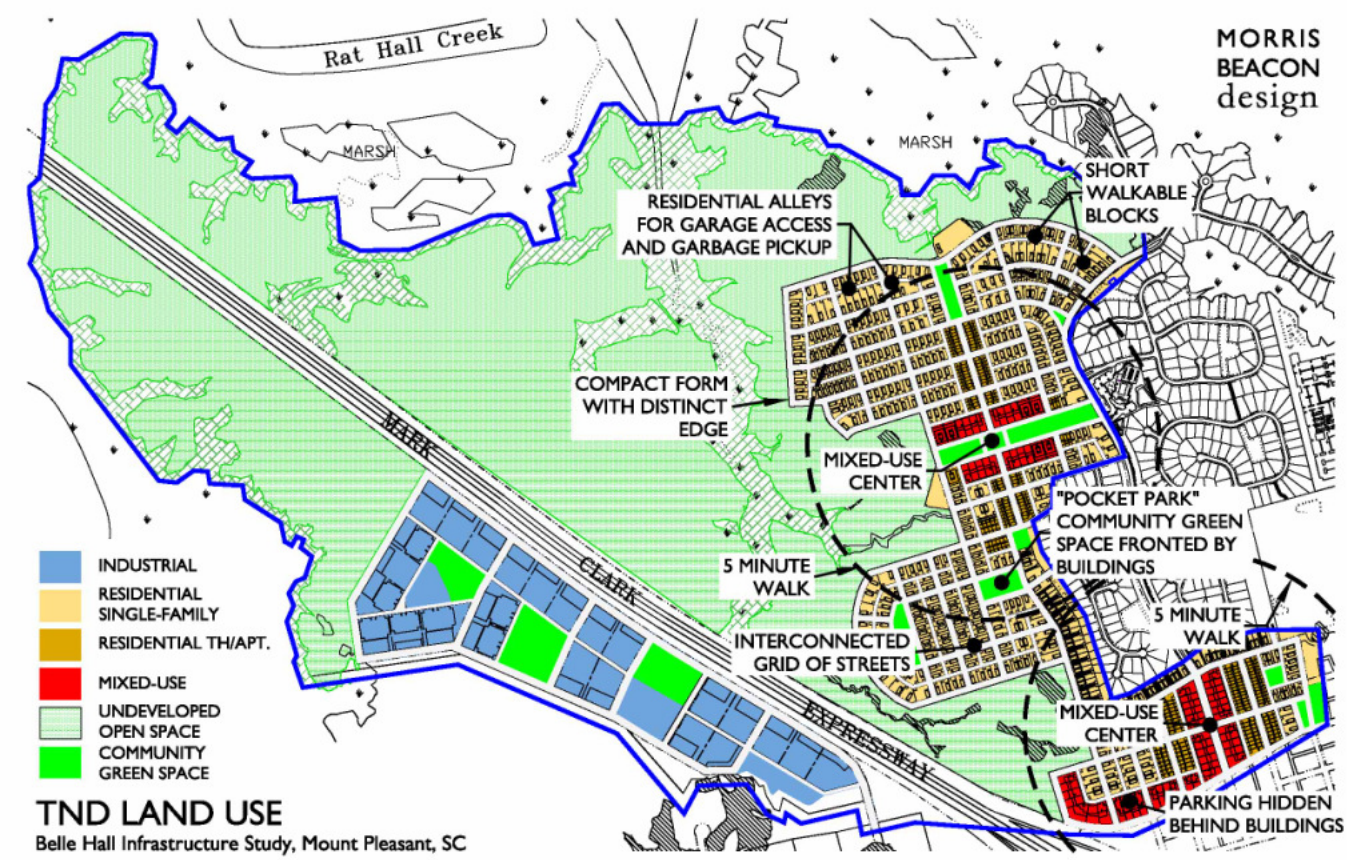
[1] CSD & TND characteristics adapted from *The Belle Hall Study, Mount Pleasant, SC*, Dover Kohl & Partners. Images courtesy of Dover Kohl & Partners.

APPENDIX B

CASE STUDY SCENARIOS

Scenario A:



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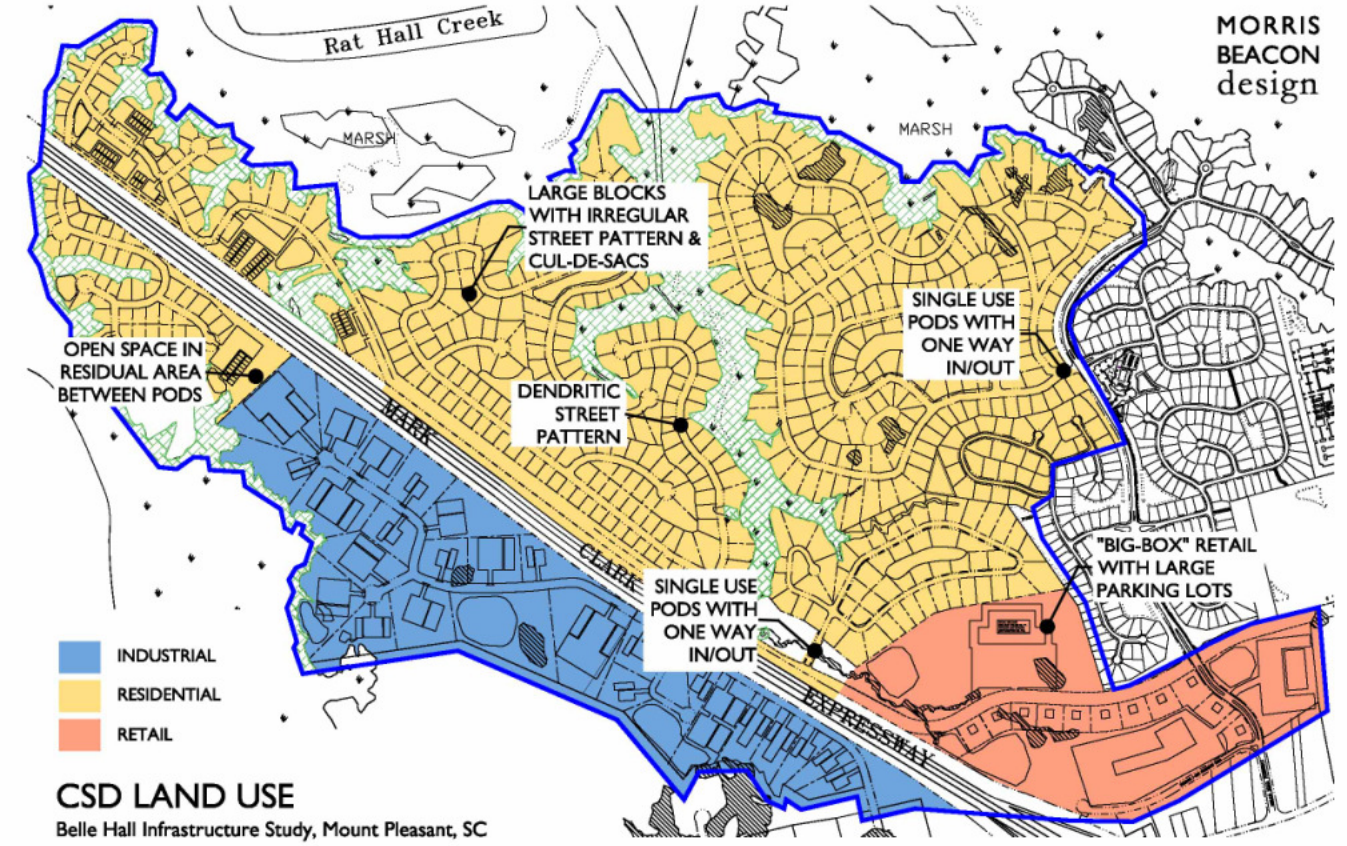

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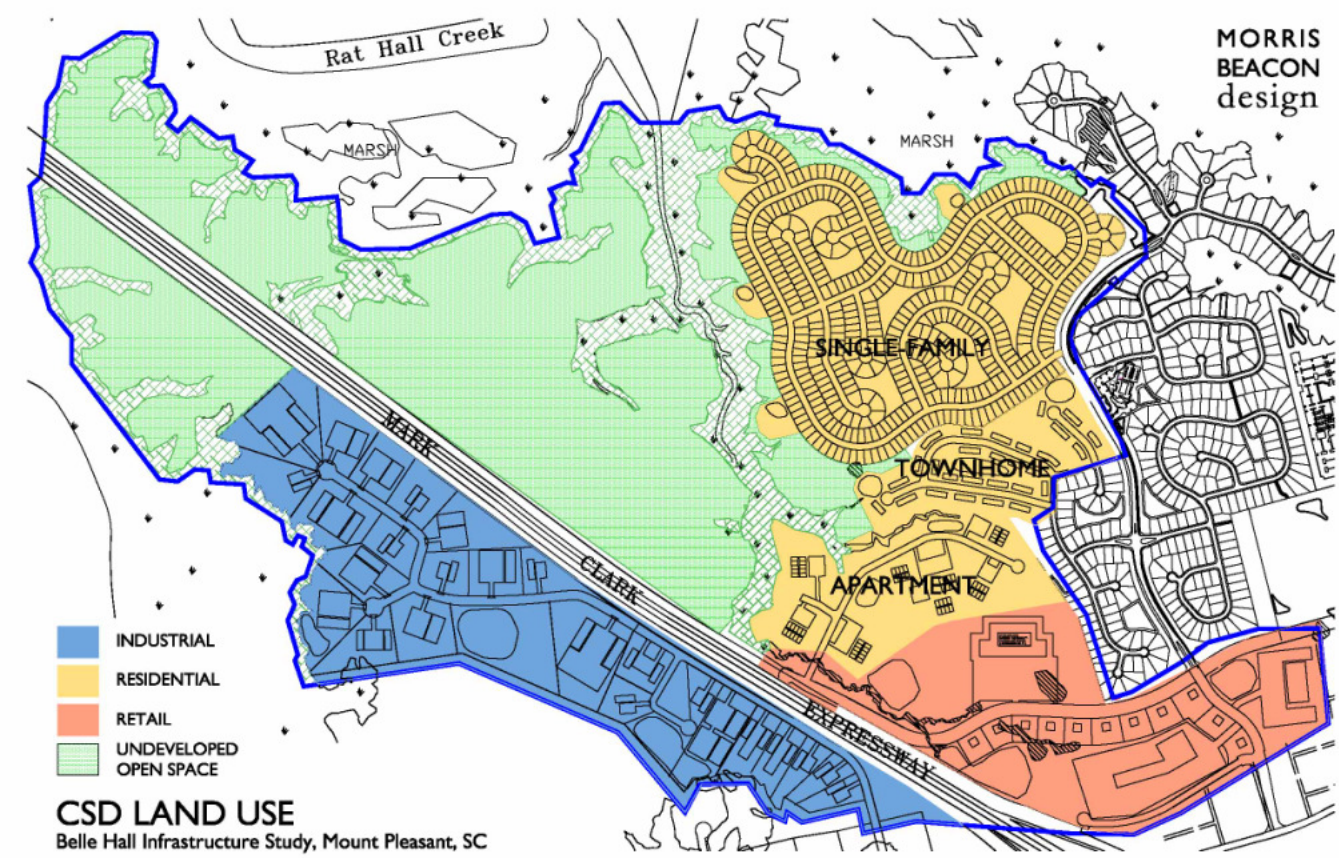

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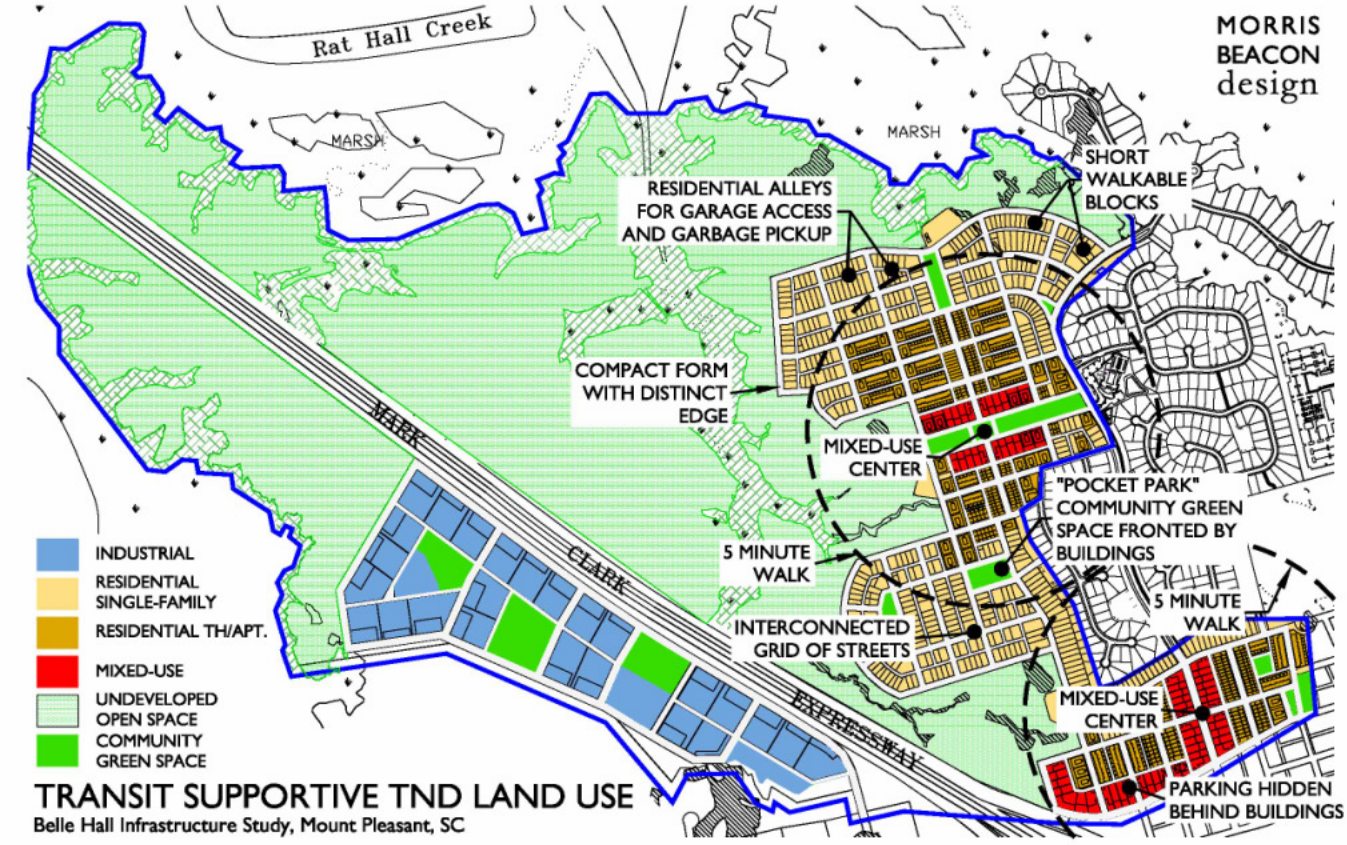
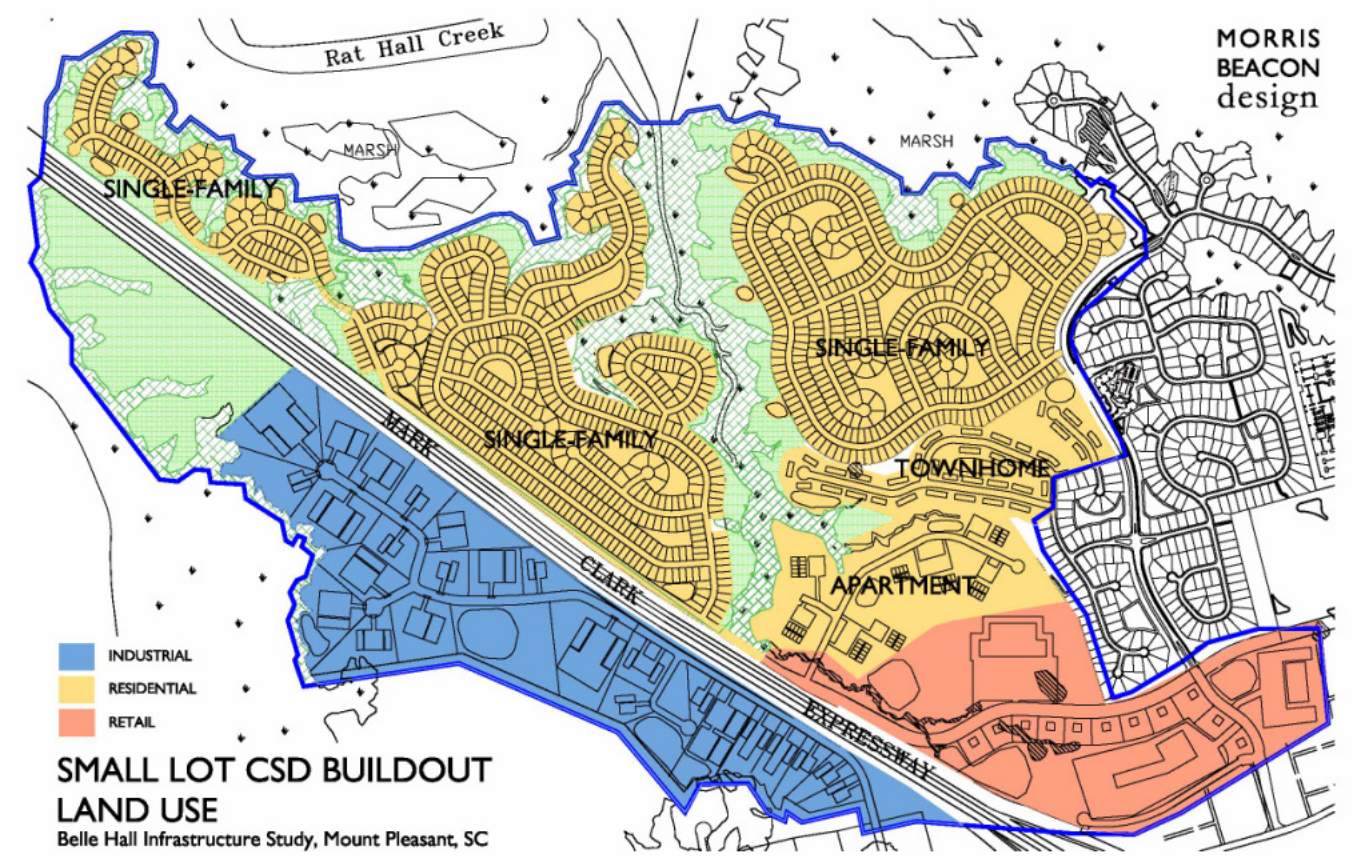


Scenario E: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TOWNHOME
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CLARK
EXPRESSWAY
MORRIS
BEACON
design
INDUSTRIAL
RESIDENTIAL
RETAIL
SMALL LOT CSD BUILDOUT
LAND USE
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