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PART TWO

LIVING PROCESSES

With structure-preserving transformations established as the foundation of all living process, we may now go on to a more elaborate and detailed account.

In the present way of thinking about architecture, one is supposed to design a building completely, occasionally even plan a whole neighborhood, and then use the description (the design, with its plans and drawings) as a specification from which to build. But the essential idea of Book 2 is that it is precisely in this way that architecture has gone wrong, and that it is because of this that living structure rarely appears in contemporary buildings. Instead of using plans, designs, and so on, I shall argue that we MUST *instead use generative processes. Generative processes tell us what to* DO, *what* ACTIONS *to take, step by step, to make buildings and building designs unfold beautifully, rather than detailed drawings which tell us what the* END*-result is supposed to be.*

This idea, obvious to biologists, is not yet obvious to architects nor to most people in our society overwhelmed by 20th-century ideas of architecture. It is therefore helpful to read the following eloquent and simple passage explaining the difference between descriptive process and generative process. The passage comes from Professor Lewis Wolpert's PRINCIPLES OF DEVELOPMENT *(New York: Oxford University Press, 1997), page 21.*

THE EMBRYO CONTAINS A GENERATIVE RATHER THAN A DESCRIPTIVE PROGRAM

All the information for embryonic development is contained within a fertilized egg. So how is this information interpreted to give rise to an embryo? One possibility is that the structure of the organism is somehow encoded as a descriptive program in the genome. Does the DNA contain a full description of the organism to which it will give rise? The answer is no. The genome contains instead a program of instructions for making the organism — a generative program — in which the cytoplasmic constituents of eggs and cells are essential players along with the genes like the DNA coding for the sequence of amino acids in a protein.

A descriptive program, like a blueprint or a plan, describes an object in some detail, whereas a generative program describes how to make an object. For the same object the programs are very different. Consider origami, the art of paper folding. By folding a piece of paper in various directions, it is quite easy to make a paper hat or a bird from a single sheet. To describe in any detail the final form of the paper with the complex relationships between its parts is really very difficult, and not of much help in explaining how to achieve it. Much more useful and easier to formulate are instructions on how to fold the paper. The reason for this is that simple instructions about folding have complex spatial consequences. In development, gene action similarly sets in motion a sequence of events that can bring about profound changes in the embryo. One can thus think of the genetic information in the fertilized egg as equivalent to the folding instructions in origami: both contain a generative program for making a particular structure.

Lewis Wolpert

Essentially the same thing can be said about the way — the ONLY *way, I believe — that it is possible to generate buildings or communities that have life. Living structure in buildings can only be* GENERATED. *It cannot be created by brute force from designs. It can only come from a generative program — hence from a generative process existing in the production process of society — so that the building — its conception, plan, design, detailed layout, structural design, and material detail are all unfolded, step by step in* TIME.

The generative processes I am speaking about start from the structure-preserving processes I have described in chapters 1–5. But they will be described in the next chapters, as part of a detailed society-wide system, in such a way that we may contemplate a complete system of living processes that could be responsible for the construction of the built world all over the Earth.

It is as if — we might say — we are to create a complete genetic system for the production of living structure in our built world.

I believe such a system of living processes can be described precisely, can be made practical, and can be implemented. If it can be done, implementing such a system on a world-wide scale could represent one of the greatest transformations of the Earth in modern history.

So we come to the core of Book 2. In the next chapters I try to specify not only what I mean by living process in technical detail, but also what characteristics are operationally necessary to any process which is a "living" process — in other words, what is necessary to ANY *and* EVERY *process which is capable of generating living structure.*

The practical crux of unfolding, the essence of every living process (what is sometimes described as "emergence" by physicists and biologists) is that it is above all a GEOMETRIC *process. That is surprising, and not widely understood. The unfolding is geometrical in its* ESSENCE. *Although there are many side features to living process, it is fundamentally the unfolding of coherent* GEOMETRIC *form, even when it appears loose and "organic."*

Further, the geometrical form of a living world and its unfolding are guided above all, by processes and transnformations which create the fifteen properties. These properties have been described at length in Book 1, and I have indicated in chapter 2 of this book why these fifteen properties will necessarily come into being as a result of any life-creating process.

That is the core of what follows in the next twelve chapters.

CHAPTER SIX

GENERATED STRUCTURE

WITH SPECIAL ATTENTION TO THE DIFFERENCE BETWEEN GENERATED AND FABRICATED STRUCTURE AND THE HUGE ECONOMIC COST TO OUR SOCIETY OF THE FABRICATED STRUCTURES WHICH ARE CREATED BY CONTEMPORARY ARCHITECTURE

1 / COMPLEXITY

In this chapter, I shall begin to express, operationally and concretely, what real complexity is when we encounter it in a part of the built environment that has life.

Ostensibly, we are surrounded by complexity. The modern city is immensely complex. Buildings are complex. Ecosystems, and the biosphere are still more complex. Computers and computer networks, and software, are all enormously complex. It would be natural to expect, therefore, that we must have a theory of complexity, that we have an effective and sensible way of thinking about the best way to *create* complexity. Faced with the need, growing every day, to create successful complex structures all around us, one would expect that we have at least asked ourselves *how*, in general, a complex structure may become well-formed. We should long ago have asked ourselves this most basic question: *Is the way that we view design, planning, and construction — in all the spheres mentioned, ecosystems, buildings, communities, objects, computers and computer software — the right way to produce sufficient complexity, and does what we are doing have a chance of success?*

And the answer is, that there is a fundamental law about the creation of complexity, which is visible and obvious to everyone — yet this law is, to all intents and purposes, ignored in 99% of the daily fabrication processes of society. The law states simply this: ALL *the well-ordered complex systems we know in the world, all those anyway that we view as highly successful, are* GENERATED *structures, not fabricated structures.*

The human brain, that most complex neural network, like other neural networks, is generated, not assembled or fabricated. The forests of the Amazon are generated, not fabricated. The tiger, beautiful creature, is generated, not fabricated. The sunset over the western ocean with its stormy clouds, that too is generated not fabricated. When we make a fire that really burns, we generate its structure, by placing a few logs, strategically, to create currents of air, radiation between glowing embers, so that the structure of the fire then creates itself. When we cook a souffle, we generate the souffle by initiating transformations among eggs, butter, sugar, and so on: we do not try to build it, like an inept bunch of chopped vegetables, that someone likes to call a salad. Music, possibly most among all things, is generated, even when stimulated by a score: and it may be generated by a more elusive combination of chords and rhythms that "get something going." All this, is true of buildings, too, and of our communities.

2 / THE GEOMETRY OF COMPLEXITY

In broad terms, a generated structure is something that has a certain deep complexity and is created in some way that appears to be almost biological, and reaches deeper levels of subtle structure than we commonly associate with "design," or with designed objects. In a generated structure one feels intuitively, above all that the structure is more complex and more subtle than anything that could be designed or fabricated.

To get a detailed grip on the nature of this generated complexity, we need a perspective which focuses, above all, on the *geometry* of what has been generated. Further, it is a particular aspect of the geometry we are concerned with. We may identify a particular visible physical character of the environment — its "generatedness" — as the sign that it has been made by a living process.

Generated structure: Jaisalmir, Rajasthan, India. Here the wishes of the family, their comfort, and the adaptation of use to structure have been simply carried out, without fuss, all quite direct. Contrast this picture with the photograph on page 184.

For all these reasons, I devote this chapter, almost entirely, to the generated structure of *the geometry* which follows from living process.

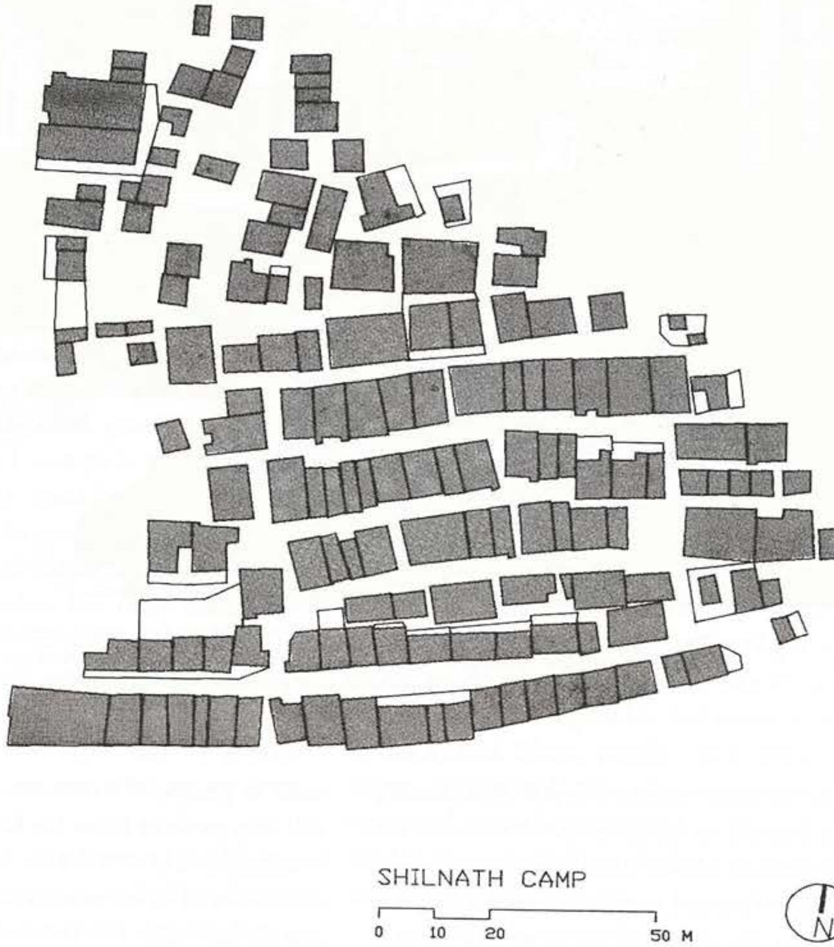
When a process creates living structure, we at once see the impact of the process in the geometry as that something that seems like "generated structure." We see it in the photograph on this page. And we see it in the plan illustrated below, on page 182. The geometry is always, when living, what we may recognize as "*Generated*." This is the adjective which best captures what we are looking for, and that will become the talisman of our success in trying to implement a living process. Does the process create generated structure, or doesn't it? This is a most useful practical question, in trying to decide whether a particular process is a living one.

The need to make all parts of the environment as generated structures, once established, will help guide us to see the various attributes of living process, in detail. Our search for adequate definitions of living process can then be guided and stimulated by this focus on the geometry of the results.

Once we have the geometry of complexity fixed in our minds as a target, we may then understand better the purpose of the chapters which follow, and will understand that each of the features of living process covered in subsequent chapters, is specifically intended to make the generation of living structure — in its real and necessary complexity — achievable, possible, and likely to succeed. Throughout the discussion, I shall use the concept of a generated structure, and use this term in opposition to the concept of a fabricated structure.

3 / ANALYSIS OF A FEW GENERATED STRUCTURES BY MEANS OF EXAMPLES

A



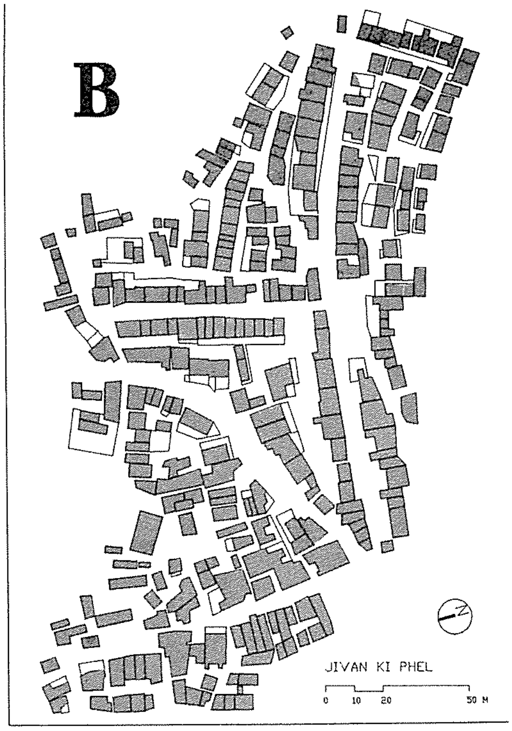
A: A generated structure: Shilnath, Indore, India.

On pages 181–85 there are seven plans of settlements in India. Three of them (A, B, C) are generated structures. Four of them (D, E, F, G) are fabricated structures.[1]

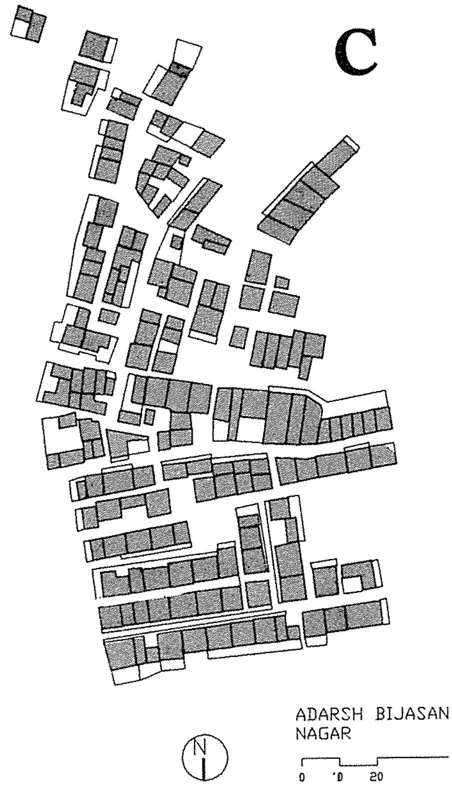
What is it about A, B and C that is different? I should like to suggest, first of all, that most of us share an immediate perception that A–C are more *interesting* than D–G: more complex, more difficult to describe, richer, and somehow more important.

We may feel this in many ways. One person may feel that A–C are more interesting simply as works of art, more interesting to look at, would hold the attention better artistically, if (as plans) they were hung on a wall. D–G are boring, too simple, one stops looking at them after a few moments.

At a slightly more sophisticated level, looking carefully at the plans as plans *of human settlements*, we can see immediately, that A–C are bet-



B: A generated structure: Jivan Ki Phel, Indore, India.



C: A generated structure: Adarsh Bijasan Nagar, Indore, India.

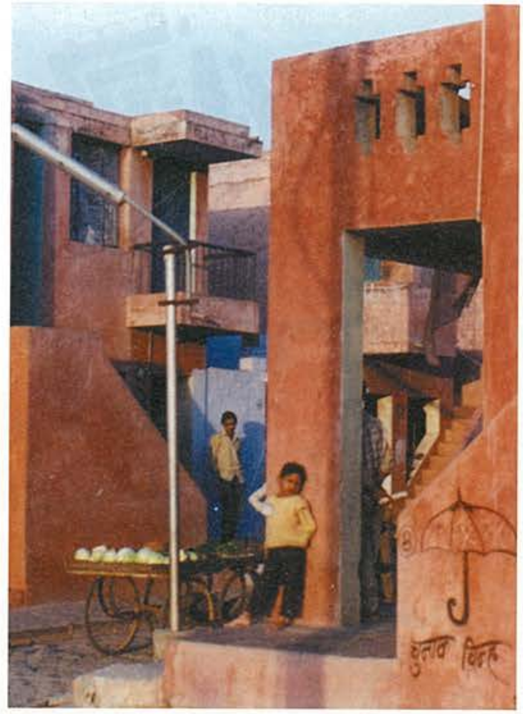
ter places to live than D–G. The houses are more differentiated; spaces are more satisfying; the experience of being there is richer, each house is unique in shape and position; there are more, and denser, patterns of significant relationships between houses and spaces. With D–G the experience of the actual place will be more sterile, it is less rewarding to be there. Altogether as human, social, and emotional environments, they are less satisfying than A–C.

At least intuitively it is clear, then, that there is something more interesting, more important about A–C than about D–G. The difference hints at something interesting. But what does it mean, what is responsible for the difference we see, and what is the meaning of the difference we see? What is it that makes them profound, what distinguishes them?

My purpose in bringing this out is to ask what the difference is between the two *classes* of objects. What is it about the two classes, *precisely*, that makes the generated structures more interesting and more important?

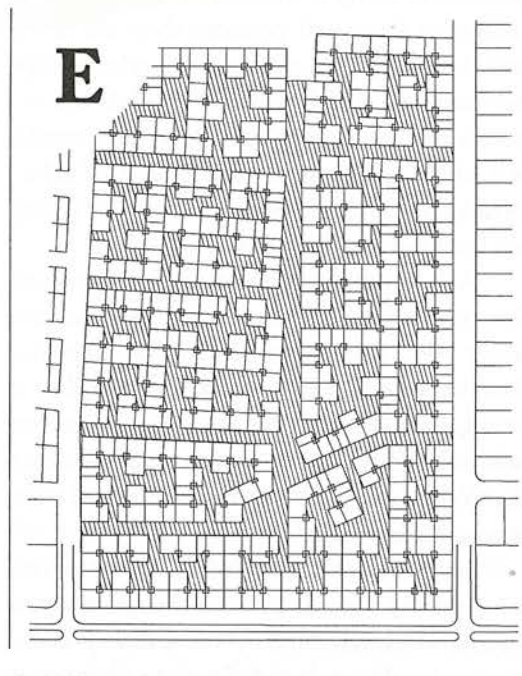
The concept of "generated" is not quite as straightforward as it seems if one merely looks at the geometry of the plan. For example, architects have thought for two or three decades now, that, in various ways they can simulate the beauty and living character of generated structures and achieve results of greater variety and beauty by doing so. The plan F was made by Rajinder Puri, visibly in an attempt to reproduce the variety of space, the variety of house sizes, and the overall more dynamic character of the generated examples. Yet it still lacks the essential quality of generated structures, and must be firmly placed in the fabricated camp. Its arrangement is created by design, and seems better only in appearance. The essence of its fabricated character is untouched.

D: A fabricated structure: designed by B. V. Doshi, Vastu Shilpa, and built in Indore around 1989.

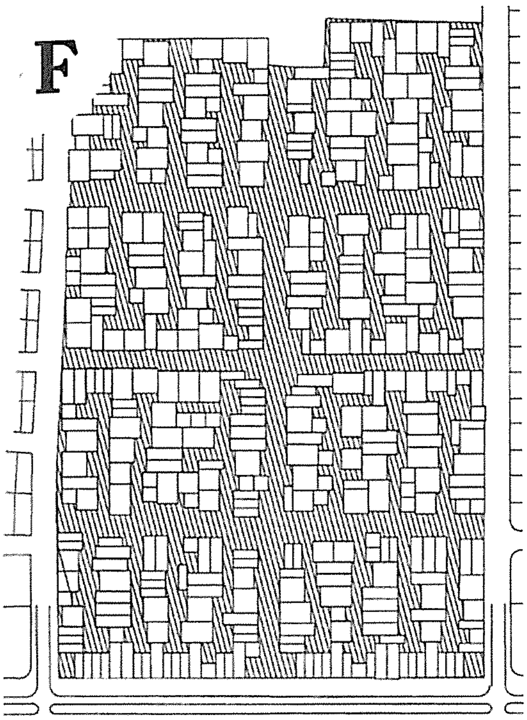


The houses built as part of plan D. Although there was a sincere effort to involve families in decisions, it is plain that this is not a generated structure, and the family input has not deeply led to emergence of living structure. Contrast this with the photograph on page 181.

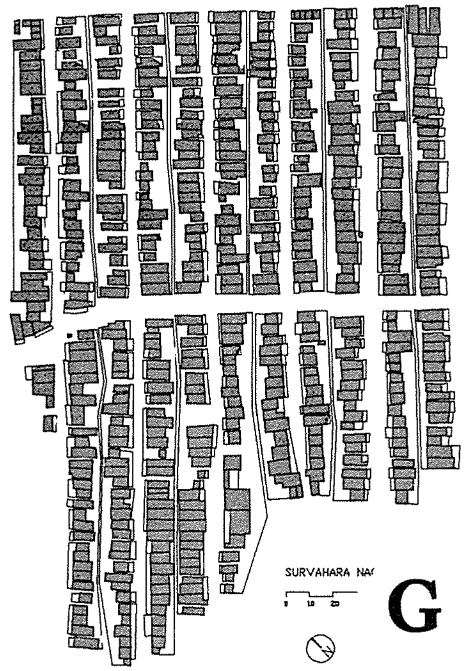
The Plan D was made by my old friend Balkrishna Doshi. In this case the whole idea of the plan is to create a living character by allowing families to make their own house for themselves, plainly a positive ideal, and one which has laid important steps as a precedent. But here, too, the plan itself, its ins and outs, are mechanical — I do not want to say contrived, since they are plainly made with good intent, and with the purpose of making a better living environment. This project was built as drawn, in 1989, and did achieve an important measure of success, as living structure, because of the individually designed house layouts allowed within the rigid structure of the plan. Yet the most important variables which should have been under control of the families, are fixed. The families' contributions are hardly more than minor cosmetic variations within a rigid shell. So this plan, too, lacks the *essence* of living structure, and is not a generated structure. It, too, must be placed in the fabricated camp.



E: A fabricated structure: designed by Carlos Barquin, a theoretical study for Indore, India.



F: Planned settlement by Rajinder Puri, making an effort to create the appearance of a generated structure, but within the framework of a fabricated structure.



G: A fabricated structure: government-designed public housing, Indore, India. The project has had some modest changes over time, which are visible in the in-and-out character of individual dwellings. However, as a whole, the community remains a fabricated structure.

At first sight Plan G looks more generated, and less fabricated than D, or E, or F. And indeed it has more of the character of a generated structure, within the framework of a fabricated one. It is an actual place, made by architects and inspired by a government program of public housing. However, it seems generated only because the houses are all slightly different, house fronts wobble, and the street has minor jigs in it. The variation is a little more real, a little more genuine, than that in plan F, for example. But, although there is an aspect of this plan G that is truly generated, again what is allowed to vary is only a very small proportion of what matters. The core of the plan, most of what one experiences in the actual place, is a lack of living structure at intermediate levels of scale, shows that in its essential quality this plan is still independent of human reality in the houses and in the social groupings: The plan is still a fabricated one.

4 / STRUCTURES THAT HAVE UNFOLDED IN TIME

In the generated structures A–C we have a strong sense that they unfolded over time. We have a feeling, an intuitive certainty that the plans could only have been generated over time. On the other hand, in D–F it is very clear that the design was created at one moment in time as an *arrangement.* Of course, in a certain sense, D, E and F, too, were created in time. Although the time scale may have been shorter, they still happened in time. The design did not appear all at once in one nanosecond. It may even have taken months at the drawing board to create them. Yet in D–F this length of time is not significant. We know that A–C happened in time in some *meaningful* way, and in a way which mattered, and which gave them their deep essential structure. In D–F, the role of time is insignificant, trivial. Time did not affect the structure, or contribute to its design.

We shall, in the next half-dozen pages, try to understand just what exactly this is, this "meaningful" way.

5 / HOW TO COUNT MISTAKES

When we examine an object, we may see that each element in the object (part, line, edge, position, color, size) represents a decision. In very rough terms, we may say that each line represents a different decision. We may also say that each line has created space on either side of it and near it, and therefore typically represents some four or five decisions about space (through size, convexity, adjacency, organization).

In addition, we must be conscious that larger elements, too (streets, house groups, courtyards, party walls, paths, blocks) — not only the smallest elements — must be included among the elements considered, and decisions about size, shape, and position of these larger elements, too, must be counted, since these also may be either flawed (with mistakes) or well-adapted. In the Shilnath plan (A) there are 150 house lots. Each house lot, as shown on this plan, has possibly four or five lines associated with it, making a total of say, 700 elements or decisions at the lowest level of scale. In addition, we may guess that there are potentially half as many again larger-level elements at a wide variety of different scales. Thus there are about 1000 elements in all, in the Shilnath plan.

Each element has the possibility of being wrong. By that I mean that the element as placed, sized, and oriented, may be *well-adapted* to its neighbors, to the space around it, to the conditions which exist, and to the conditions arising from the structure of the surrounding elements — or it may be *badly adapted* to the neighbors, conditions, space, trees, arising from surrounding elements.

We are going to count the number of possible mistakes, and try to estimate how mnay of these mistakes have been avoided, and how many have been committed, in different types of plan. It is here, that we shall see the vast superiority of generated plans. They avoid mistakes. A fabricated plan cannot avoid mistakes, and in all fabricated plans, the overwhelming majority of possible mistakes, are actually committed.

6 / THE SIGNIFICANCE OF GENERATED STRUCTURE

The significance of generated structure lies in the concept of mistakes. Fabricated plans *always* have many mistakes — not just a few mistakes but tens of thousands, even millions of mistakes. It is the mistake-ridden character of the plans which marks them as fabricated — and that comes from the way they are actually generated, or made, in time. Generated plans have *few* mistakes.

In order to describe what it is that actually happens in time in the case of a generated structure, I shall draw attention to the vital point. Let us consider D, one of the fabricated designs, and compare it with the more organic design of C. We can see that at any given place in C, many small things work. The house has a nice street outside: The house across is in a good relation to it; the space opens out to a place where children can play. The house has a front which is recognizable. Each place has its own uniqueness.

A dramatic way of expressing this idea is to say that by comparison in the fabricated scheme E (which has about 400 houses), each element has the potential for a number of mistakes. Let us make a wild guess and say that the drawing E contains 400 houses, hence about 1600 elements (lines). I shall say (and argue) that in a mechanical scheme like E, each line has roughly five mistakes associated with it. By that I mean that the line was drawn on a drawing board, without any opportunity for the line to be modified, or adjusted, according to realistic perception of actual difficulties and opportunities on the place itself. I claim that in a professional planning/design/development process, this failure of adaptation is inevitable, and that at the time of its creation no process was put in place to remove these mistakes.

By contrast, in C (Shilnath), I argue that each line represents a decision that was put down, one at a time, over a history extended in time, and that each decision was made by people associated with the place, the house, the immediate conditions. As a result of this relatively slower unfolding process, and as a result of the decentralization of the decision-process in different people's hands and in the hands of people intimately associated with the needs of the situation, I shall say, further, that at the time the line is put down, each of the five possible mistakes (that existed in E) is here corrected, by adaptation, and that as a result of the process which allows each line to be considered carefully, and adjusted, these five possible mistakes are eliminated.

The upshot of this comparison suggests that the plan E must inevitably have some 8,000 mistakes in it. There was, in the procedure used to generate this plan, no way to avoid it. Any process which statically determines these elements (lines, edges, and positions) merely by drawing-board planning, cannot avoid having some 8,000 mistakes.

C, on the other hand, has very few mistakes in it — or perhaps, by the same kind of count, at most a few hundred. Thus, the effect of allowing C to grow in time, and to grow gradually, to unfold gradually, is that most of the possible mistakes in it are eliminated, while a designed and planned object such as D will have on the order of 10^4 mistakes in the site plan alone.

That is the enormous difference between a generated thing, and a designed and fabricated thing. In a fabricated/designed thing, it is virtually certain that it will have a huge number of mistakes, reducing the value of the environment, and reducing its ability to support people's daily lives in an efficient and adequate fashion.

7 / A THOUSAND TRILLION POSSIBLE MISTAKES IN A HUMAN EMBRYO

If an embryo were shaped by fabrication, and not generated, the number of mistakes would be unbelievably large.

The human embryo is created by 50 doublings of the cells. Starting with a single cell (the fertilized egg), after 50 doublings, the embryo has 2^{50} cells. During this doubling process that occurs 50 times, each cell has the opportunity to adapt itself, and to remove possible mistakes by position, adaptation, pushing and pulling. The total number of opportunities for correction, then, in the growing embryo, is $(1+2+2^2+2^3+....2^{50}) = 2^{51}$. Reversing the argument, we may express this by saying that the assembly of embryo cells, if not given the chance for adaptation and if instead made by design or fabrication, would typically have 2^{51} mistakes — a truly enormous number, roughly 10^{15}, or a thousand trillion possible mistakes. That is what would happen if an embryo were designed and built, not generated. If an embryo were built from a blueprint of a design, not generated by an adaptive process, there would inevitably be one thousand trillion mistakes. Because of its history as a generated structure, there are virtually none.

8 / ONE MILLION POSSIBLE MISTAKES IN A COMMUNITY

The number of potential mistakes avoided in the settlement of houses in Shilnath is certainly far less than those avoided in the human embryo. But the principle is the same. In any site plan for a few hundred houses, like the examples D and E and F, there will inevitably be on the order of ten thousand mistakes.

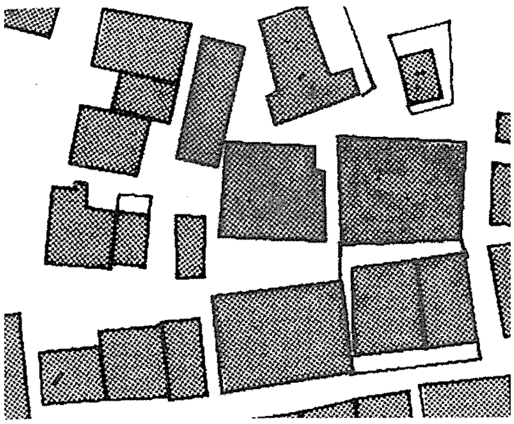
I have estimated, above, that the possible mistakes in a plan for 150 houses, will be about 1000. That is for the site plan alone, only for the *boundaries* of the buildings. In addition, in the type of planned architecture typical of public housing, or development tracts, we have the further possibility of similar huge numbers of errors in each individual house. As we see in the calculation on pages 192, each house, itself, then contains the possibility of some additional 5,000 mistakes per house. If there are 150 houses in a small community, we then have the possibility of approximately (1,000 (for the siteplan) plus 150 times 5,000 (for the houses)) or some one million total possible mistakes in the project as a whole — an egregiously large number. Unfortunately this is not fanciful, but a fact about the way we design and build our houses today.

If we have responsibility for such a plan, or for building such a community, we can only avoid the huge number of inevitable mistakes, by finding some way to make the thing a generated structure, not a fabricated one. This requires deep — very, very deep — changes in procedure.

9 / THE COMPLEXITY THAT WAS GENERATED IN SHILNATH

The primary way in which complexity of structure reveals itself, is in the internal density of significant relationships which exist. When adaptation occurs successfully, and each line or element created is created in such a way as to avoid its possible mistakes, it does this by creating meaningful relationships in every direction.

Let us once again look at Shilnath, and examine the particular part of it which is shown below in the detailed plan (page 189) blown up to a large scale. Please look at the one small house which is freestanding in the middle of the space shown on the left. This house performs several functions at the same time. First, it is placed in such a way as to close the space to the right. Thus, it makes that space somewhat more private, creates a natural boundary to it, yet leaves it half open to movement and view. We should be aware that this subtle "closing while yet leaving open"



A detail of the settlement at Shilnath. Here we see the profound complexity of overlapping relationships that is typical in every generated structure.

is a human practical matter that concerns the feelings of the people living there, their daily experience, and is something that was plainly done by them to satisfy the way they conduct themselves socially, and emotionally, in their normal daily lives.

Looking again at the small house, with reference now to the long axis it creates, we also see that it is placed to have a relationship with the long house that is above it (on the drawing) and with which it is nearly coaxial. This creates a sense of cooperation and connectedness between these two long houses, and it makes the face of one house face directly to the other. The specific deliberateness with which this is done tells us that once again, it has practical human reasons. Further, the connectedness between the two houses is embodied in the beautifully shaped squarish open space between the two. Again, we see that the makers of these two houses placed their buildings to shape a comfortable space of a certain dimension, which is comfortable for play, conversation, and other things.

We know, too, that the small house, being surrounded by the street, has the capacity to function as a fulcrum at a time of festival, since it allow processions, or dancing, to move around and around the house, without stopping, a common way that people move during marriage festivals and other more informal celebrations. Furthermore, our small house also has an important relationship with the narrow path below it (in the drawing). Also it forms a square space just below it, at the opening to that path. And then, finally, the house also forms an important part of the space on the left (in the drawing), where it helps to shape the end of that space by narrowing it down and forming and endpoint. In this regard the front of our freestanding house also has a significant relation with the fronts of three or four houses to its left (above the forementioned space), by forming a wall, or a facade, or edge of the space, when taken together with these houses.

Our small house thus enters into at least seven meaningful relationships, overlapping and connected. Each of these relationships is embodied as a center, and these seven centers are strong and living ones. Further, the relationships are motivated by practical daily-life concerns, which come from people's most ordinary strivings and needs and wishes. They are not esoteric artistic efforts to create nice space, as a western artist might attempt: Rather they are very mundane, sensible, and practical expressions of real thoughts, feelings, emotions, actions, games, commerce, and neighborly behavior. They are above all down to earth.

Every one of the 150 houses in the Shilnath community enters, in a similar fashion, into multiple overlapping relationships with other houses and other spaces. The subtlety of these relationships, and the connective tissue which they form, is a large part of the life in any living structure. Each of these relationships takes the form of a living center. Since the one example I have been discussing alone creates some seven vitally important living centers, as a result of the extreme carefulness of placing and position, size, and shape, we may surmise that the community as a whole probably contains some 7 x 150 or about a thousand overlapping living centers. This is the true complexity typical of any living structure, and as in this instance, such complexity can only be created when the structure is a generated one.

10 / IN INDIVIDUAL BUILDINGS, TOO, WE MAY ASK WHAT IS THE NATURE OF A "MISTAKE?"

The complexity which I have described in Shilnath and the other generated settlements can be seen, almost without change, in individual buildings, and in objects, too.

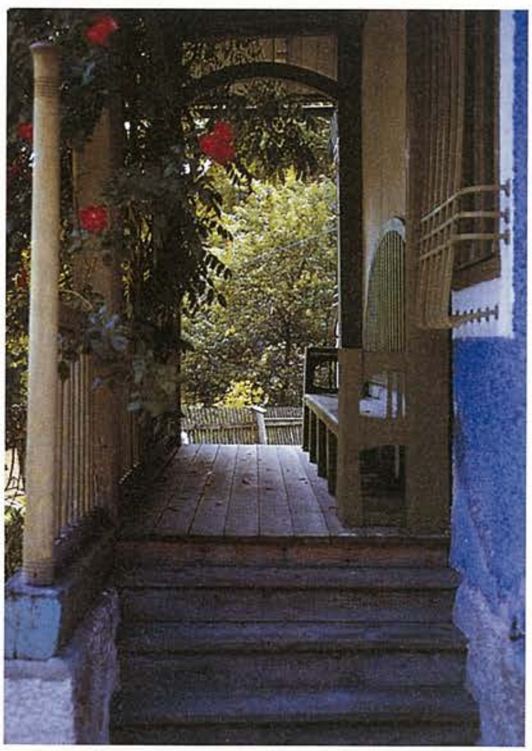
In each case, we have a structure in which the edges, spaces, positions, colors, either have — or do not have — the levels of subtle adaptation that I have described.

They have thousands of potential mistakes; and, when fabricated, most of these mistakes do actually occur *in fact*. If generated, there is a chance that these mistakes do not occur, and the object, or building, is harmonious in its existence in the world, and in relation to the things around it.

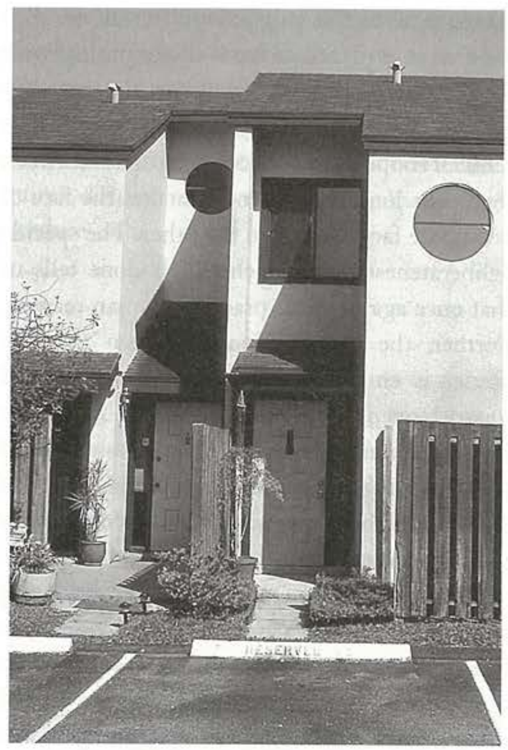
Whether the mistakes are successfully avoided, depends on the adequacy and subtlety, of the generating process. In particular, it is essential — absolutely essential — that the adaptation, and the avoiding of mistakes, occurs at several levels of scale, as I described earlier. If this does work, then the adaptation is capable of real, subtle fine tuning. If the adaptation occurs only at one level — what I might call, well-meaning tinkering — this will not work out very well.

Let us consider the kinds of things which are, in my definition, "mistakes."

A window sill may be just right to put thing on — or it may be too small. A window may look at a favorite tree, or it may be placed to look at a wall. The bath maybe built so that one hardly has place to put the soap; or it may be built with a comfortable shelf where soap and shampoo can be without falling off. The light in a room may



Few mistakes: Generated structure of the front part of a house which HAS been generated



Many mistakes: Fabricated structure of the front part of a house in a housing tract which has NOT been generated be placed to create a comfortable atmosphere at night, small pools of light in just the right places, or it may be merely a light fixture wherever the builder put it. The garage can be a box, barely big enough, or it can have a shelf, or bench, with tools, with a small but adequate window above the work surface. A stair post is either just in the place where your hand comes down as you walk down the stair or not. A paving which warms your feet or your body, because it is colored or terracotta to be absorbent and therefore gets warmed by the sun, works. It is well-adapted to need because of specific small, features that it has.

Each of these things, once again, depends on adjustment, attention to position, dimension, comfort, and adequacy. If missing, they are mistakes of adaptation — adaptations that were not achieved.

Look at the steps of the blue porch, on the left-hand page. It is full of subtle adaptations: the seat up on the right, the railing on the left, the 'wrong' top riser, the boards on the deck, the arched opening framing the trees beyond, and the special choice of paint color giving the trees their special luster. Each one of these is coupled with a careful adaptation that makes life more worthwhile, more practical, without disturbing the harmonious character of the place. But in the porch in the right-hand picture, from a Fort Lauderdale housing tract, the adaptations are missing. Instead of sizes chosen to work right, dimensions are based on cheap cuts made on a 4 x 8 foot sheet of plywood. Windows are standard and cannot be fitted to frame a view or to be just the right size for the feeling of a room or of a view. The height of the ugly slot in the front is done without careful regard for a person entering a house, or, of course, for the concern and special nature of any one particular human being who is to love or cherish this place. The lack of adaptation in the one building, and the fullness and subtlety of adaptation in the other, are clear.

In the next section, we shall see just how many of these adaptations, and how many mistakes, are typical in an ordinary house. The number is surprising. And in the foregoing argument, it is vital to understand that the beautiful blue porch is not good because it is archaic. Some people might respond to the example by saying, "Well, this beautiful porch is all very well, but it is nostalgic, just something from the past." The point, of course, is not that the porch is ancient or archaic, but simply that it is *better*. It has the deeper adaptation, to its use, to its surroundings, and to its internal orgamization — and is *therefore better*.

Above all the blue porch avoids the two-thousand mistakes which are potentially present in such a porch, and for this very concrete reason is a better, more deeply adapted structure. The battle cry of modern architects, throughout much of the 20th century, which branded such things as nostalgic, irrelevant, not modern, and so forth, was really little more than a wild attempt to justify the huge mistakes modern buildings (and developers and architects) were making daily, by claiming that things which did not make these mistakes were "bad" and "nostalgic."

In fact, of course, the number of mistakes or its contrary — depth of adaptation — has nothing to do with style. In the 20th century, for instance, one of the classes of artifacts which frequently had very good adaptation, were the motorbikes made and adapted by bikers for themselves. Here there was nothing nostalgic at all — merely a community of people with good access to machine tools, welding torches, and a strong desire to make their bikes good for themselves. Long-haul truckers had a similar (not quite so intense) love affair with the cabs of their long-haul rigs, which they also frequently tuned to their own needs, and where once again people managed frequently to reach a relatively mistake-free environment. No nostalgia there!

Nearly all the beautiful and living structures described in Book 1 are, on close examination, generated structures which have precisely this many-level adaptation and overcoming of possible mistakes deep in their fabric, because they were made by processes which *generated* — not fabricated — the structure.

11 / THE FIVE-THOUSAND POSSIBLE MISTAKES IN A TYPICAL HOUSE

H many possible mistakes are there in a typical house?

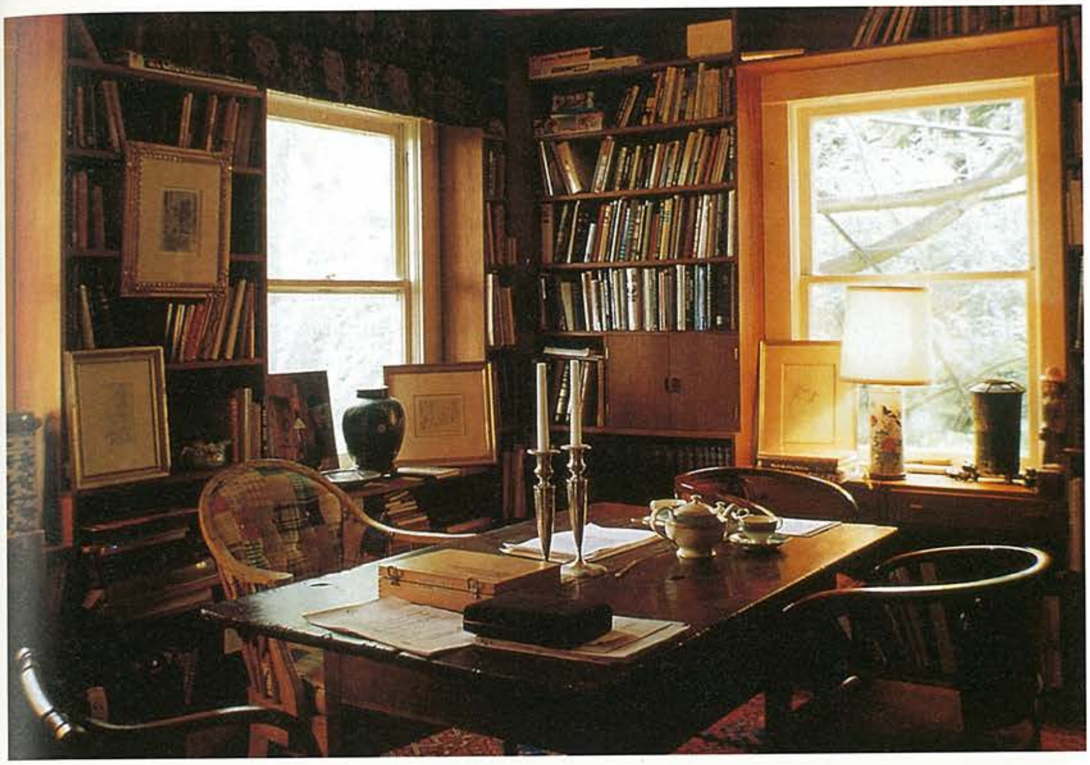
In order to estimate the number of potential mistakes which can occur in a typical house, it is helpful to consider the fact that a typical house nowadays has about 2000 man-hours of labor in it. During an hour, decisions of dimension and position are being made by a carpenter several times an hour; thus, we have a likely guess that the house contains some 5,000 decision points — each one, again, capable of being done right, or being a mistake, or being done right.

It is fair to say that if any one of these decisions is made blindly, according to design information in a construction blueprint, it is virtually certain that this decision will be a mistake since there is — in general — no way that luck could manage to make the decision come out right. The mistake will be avoided, and the "right" thing done, only if the decision has attention, thought, and mental effort.

Consider the number of physical pieces of material in a typical house: steps, sills, walls, baseboards, floorboards, tiles, shelves, doors, windows . . . A reasonable guess is that there are likely to be a few hundred really important pieces of material of this kind. With each piece there are decisions about position, length, breadth, height, relation to the next thing, extension, connection — again half a dozen or a dozen. All in all, by this method, too, we arrive at a likely number of about 5,000 decisions that can potentially be wrongly placed, and will, inevitably be wrongly placed if they are not given special attention while the house is being made.

It must be said emphatically that this by no means requires an increase in construction cost. The valuable *decision time* need not be done by a highly paid worker — it can be done by family members themselves, provided what they decide can then be built without extra effort or material cost, and the only thing the construction worker or craftsman must do then is to cut, nail, and place material correctly, according to the wishes of the client. This does of course require new forms of contract which provide new relation-

Generated structure: here the wishes of the family, their comfort, and the adaptation of use to structure have been simply carried out, without fuss, all quite direct. Contrast this with the photograph on page 184. Note: this picture is not about "Isn't poverty wonderful." It is about the fact that even with very simple means, people can make themselves comfortable when permitted to do so.



A room (my own library) in which a very large number of adaptive decisions (about 1000) were made, in a relatively short time, and at very low cost. Nevertheless it is a truly generated structure, because every decision, no matter how small, was made in such a way that the resulting relationships became meaningful.

ships between client, craft and labor, and new forms of cost control which can achieve these things in a practical legal framework. The topic is taken up more fully in Book 3.

An example of such a process, where low-cost decisions having a direct bearing on the comfort and harmony of a room, were made in a short space of time (about one week) is presented elsewhere (pages 387–90). An example of its results are shown in the photograph above.

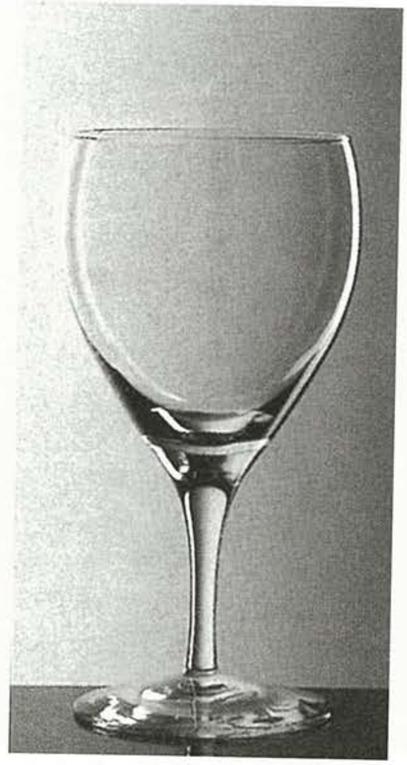
It is also necessary to recognize that the generated character of elements, in a house or anywhere, goes down to the smallest details. Consider, for example, the Japanese tea bowl and the wine glass, shown on the next page.

The concept of mistakes does not only apply to what is functional in the obvious way. A mistake, is ultimately a geometrical problem, which bears on what we call function, and the concept of practical function is only the tip of the iceberg. This matter is fully discussed in Book 1, chapter 11. So, in a small object which appears in the house, within its structure, even within an inch or two, there are also mistakes possible, or harmonies achievable. Let us examine the wine glass and the tea bowl. We may imagine, in each case, that as the object unfolded, centers were latent, and these centers, at the next step were embellished or not, opportunities created by latent centers pressed forward, or left dangling.

In the wine glass we see a number of mistakes. The top of the glass edge of the bowl — not very comfortable for the lips — could have been made rounder; as a boundary, then, it would have had a certain fatness or juiciness, which has not been pursued. The stem of the glass, where it meets the base, is flaccid, and this junction, as a center could have been more beautifully shaped.

But in the Japanese tea bowl, we see such centers have been taken to the fullest, and each latent center, at the time of its making and con-

A famous Japanese tea bowl which, in spite of its appearance of having been "designed," is actually a generated structure — hence its beauty.



A "fabricated" object — a glass made in the Royal Dutch Glassworks, well-designed (perhaps), but utterly dead as an object — because it has no generated structure.

ceiving, pressed home to become a structure of beauty. Of course, when we talk about such intense attention to small details, this is not something that could be carried out in every part of the house, in every domestic utensil, every stair rail. But here, too, thousands upon thousands of mistakes can be made — and *are* made daily in such common objects as the wine glass. They add to the sum-total lack of harmony in the evolving whole. But when taken seriously, even if it is only here and there, in one object such as the tea bowl, or in one special window, the house will gain enormously.

The bowl, in regard to its shape, its glazes, its decoration, the form of the emblem drawn on its surface — all of them are *generated.* At every level the bowl is a generated structure, through and through. By comparison, the wine glass shown above next to the tea bowl, and made by Royal Dutch Glassworks, is stiff and lifeless. It is *not* a generated structure. This is reflected in the fact that the wine glass has not been thought through for comfort. For example the stem is thin, one feels that it is necessary to pick the glass up by the stem — yet this is awkward. The bowl of the glass is not comfortably shaped for the hand. The Japanese tea bowl, on the other hand, is very comfortable to hold. It is made for two hands. the cup is raised from the table, so that one's fingers fit underneath easily. And the slight, yet extraordinarily subtle curve of the bowl is designed to be comfortable and comforting as the hands go round it.

Let us ask why the tea bowl is so much more "generated" than the crystal wine glass? Why is the glass stiff and lifeless — harsh — while the cup is unified and harmonious — orderly, yet soft? We do see, of course, that the tea bowl is replete with the fifteen properties, as explained already in Book 1, chapter 5. But why does this geometrical quality, as it appears in the tea bowl, come necessarily from the history of this object unfolding in time?

Let me ask this more clearly. In the tea bowl, we see many centers, strong centers, levels of scale, massive boundaries, good shape, deep interlock, and so on. All the fifteen properties are there. And they are largely missing from the wine glass. But what does this have to do with time? What was it that made this structure of centers achievable in the tea bowl?

The answer is complex, and lies at the core of the transformations I shall discuss in chapter 7, but in a nutshell the answer is this: If you want to get a system of centers to appear in that cup or glass, you must introduce them in a certain order, the placing of each depending on infinitesimal subtleties in the structure and geometry, as they have appeared up to that moment. This is what the loose term "unfolding" means. And further, you can only get this structure by allowing the profound and multiple structure of centers to appear in a certain order, so that you get each bit of the structure by unfolding it — *from* the previous state. Thus the importance of time, is not merely that you have a chance of tinkering and adapting. It also allows you to get each next layer of structure from the previously established layers of structure. Complex, generated structure *cannot be arrived at in any other way.* One structure is established. The next structure is then made to appear within that structure, and *from* that structure. Each stage develops from the previous stage, each one creating the conditions from which the next can be created, and from which it flows. It is in this process that the fifteen properties, and their enormous density, can be achieved. *That is the secret of the whole thing.*

Journey to the Center of The Brain: The Neuroscience of Holistic Urbanism

Introduction

For well over one hundred years, planners, architects, and urban designers have been severely confronted by what to lay people is obvious. Despite observational insights and often compelling narratives by the spectrum of thinkers and researchers, newly built contemporary fabric sorely lacks an actual aesthetic aesthetic dimension. The vast glossary of Modernist problem-solving jargon—from "walkability," to "resilience," to "15-minute city;" from "smart traffic" and "highrise agriculture," to "inclusive connectivity" and "predictive policing through AI"—illustrates how much contemporary problem-solving lacks a fundamental understanding of urbanism, let alone humanity. [1]

Indeed, as the voluminous codes and standards indicate, society has no faith in Modernists' ability to create built environments. Architectural and urban practice today simply offer a continual flow of "patches" intended to repair the fundamentally inoperable Modernist system. But with 40%-65% of emissions and energy related to the production and operation of Modernist structures and systems, we clearly need a better paradigm. But what can it be?

The increasing traumatic contributions of mechanization, industrialization, and automation in the built environment were barely touched upon in the book, *The Art of Classical Planning*.[2] It was not until after its writing that the author began to understand the full spectrum of disruption caused by introducing technologies into cities. But the challenges of understanding aesthetic experience, urban sprawl, traffic design, and the apparent necessity of manual building craftsmanship prompted the founding of the Classic Panning Laboratory, the CPLab.

In the last years the CPLab has focused mostly on neuroaesthetics. Indeed, we can reach out to neuroscience for clues to understanding humanity and its needs. Neuroaesthetics are central to the holistic understanding of the built environment because

1. When you stand in the street most of what you see are buildings.
2. That makes the aesthetic experience—beauty—essential to understanding human response
3. Beauty is inseparable from the philosophical triad of truth, goodness and beauty, the unity of which defines the term holism and is arguably a description of the universe.

But understanding the human response to the built environment and how architecture impacts us will not be satisfied wholly by either cellular brain function or phenomenology alone. Indeed, attempts by some neuroscientists to understand the forms of the built environment or various compelling ideas floated by phenomenologists together seem to imitate the fable of the blind men describing an elephant.

Another paradigm of understanding human response to environment is obviously necessary and the CPLab has started applying the holistic traditional architectural literacy—"everything has three parts, everything comes in three sizes, there are only three ways to connect rooms, etc."—as a framework for understanding the results we get in the lab. In recent engagement with researchers and literature, the CPLab has so far identified four notable areas of necessary neuroscientific research that may help more coherently frame the urban discourse:

1. Aesthetic Experience
2. Memory and Place
3. The Hand-Eye-Brain Nexus
4. Perception of Movement

Areas of Research Considered

The Art of Classical Planning related that the pleasure-based neuroaesthetic experience of beauty, the key to built-environment success, is best understood in terms of the perception of multiple fractal geometries. Indeed, the eight proportional systems of the classical method engender a sense of beauty that arguably reflects the embodied cognition of the evolutionary aesthetics of the landscape of Homo sapiens' emergence, the African savannah.

To further serve neuroaesthetic understanding, the CPLab sequenced what happens in the brain when we walk down the street, identifying the saccadic visual perception cycles that underpin urban experience, about 4 scans every step.[3] This research indicated that faces and buildings are processed at about 40 to 80 ms.

Research also determined that traditional buildings register medium-to-high on the visual beauty scale. Indeed, traditional buildings structures are identified as such, whereas the brain does not identify Modernist structures as buildings at all. They confound the brain, stressing individuals, while traditional aesthetics tend to measurably reduce observer stress. Consequently, the CPLab is currently researching a beauty scale as a neuroaesthetic measure of both individual and urban well-being.

In the course of our studies we realized that neuroscience is also shedding light on other vital areas of urban experience. One is that memory is locational. The urban consequence is that both personal and civic memory reside in the unique—not "iconic"—designs of built streets, plazas, parks, and other urban design elements. Place-making is thus memory-making. People throng to memorable places to validate their own memories and to share them with others, helping create communal memory, which underpins not only religious pilgrimage and secular tourism, but which lies at the basis of any and all human interaction and culture.

We are also neuroscientifically exploring the uniqueness of the human hand. This resituates the building arts not as a set of arcane skills useful only in restoring old structures. Revealing an ecosystem that neuroexperientially serves the greater community of makers, users, viewers, their heirs and, notably, the environment around, we might discover that the low-carbon methods of manual skilled work hold keys to societal and planetary well-being. It could be that public works are a more useful path for civilization than ongoing industrialization, digitization, and AI.[4]

A fourth recent area of interest is that cars appear to be processed as living animals. Recent experiments show that vehicles are neurocepted similarly to animal threats, with subjects responding almost identically to both animal and vehicle images, 51.6% vs. 52.8%! In a manner consistent with rapid pre-attentive activation, animal-selective feature detection occurs together with the extraction of visual features such as orientation, spatial information, and motion. This kind of rapid visual processing does not require foveal vision, and images can be presented at different eccentricities without losing accuracy. They can do so while simultaneously performing other attention-demanding tasks. Most significantly, both vehicle and animal stimuli feature multiple 150 ms perception cycles. [5,6,7,8,9]

Discussion

Evidence-based observations and phenomenology confirm that neuroscience connects to urbanism at each level and by way of every system. Biophilia as well. Paraphrasing the Canadian scientist Brian Goodwin, good urbanism arrives at coherent forms and structures in an economical way because it obeys a general principle of "skillful action." It integrates materials and know-how not through arbitrary or trendy say-so, but with the goal of harmonious composition. Master urbanist Leon Krier suggests that overwhelming necessity will drive an inevitable return to traditional, holistic patterns of architecture and settlement.[10]

It could be that neuroscience has been beset by the challenges that plague so much science, namely being technology driven and organized in vertical silos. From mazes to electrodes to fMRI, eye tracking, and AI, the actual technologies seem to have driven as much of the scope of neuroscientific research as plain intellectual curiosity. This leads to a critique of the research being akin to seeking the lost key under the streetlamp. It could even be that a laudable yearning for rigor limits cross pollination among specialists.

That is why understanding urban neuroscience is a key to a humanistic future. We urge urban neuroscience to illuminate ways that link us with the places we love, to help reconnect us at the deepest levels with our aesthetic and physical experience. Neuro-urbanism might even help open up some relief to society from the pressures of industrialization, mechanization, and digitization.

Fortunately, even if somewhat ironically, science and technology now enable us to reexamine our knowledge bases and restudy ways of doing things that in the name of progress were abandoned for nearly a century. Advanced neuroscience indicates that the simple yet resonant mandates for the design of built environments include:

1. Design streets for people before you accommodate traffic.
2. Provide an appropriate aesthetic factor in buildings.
3. Engage urban memory.
4. Engage manual skills in construction.
5. Be careful about how much technology is visually exposed.

While neuroaesthetic science in general is an attractive topic, there are is not much science that tries to connect the dots. We propose exploring the emerging neuroaesthetic facets more interconnectedly. Indeed, the lack of architectural literacy in the research may be considered to hamper it, as if one needs the right language to ponder an environment it is devoted to, like snow and ice to arctic natives. Most significantly, it might be suggested that properly structured emerging research might shed light on new understandings of brain structure, based on holistic experience rather than cell function, cranial location, or disembodied phenomena such as "humans prefer rounded forms."

People need to know "What harm is the contemporary built environment doing to my body and brain?" and "What do I need to demand from builders, designers, and government to alleviate these conditions?"

Beyond architects, urbanists, and students in the field, the general public needs to be made aware how the neural processing of cities and buildings impacts their well-being. Educational, health, hospitality, retail, and transportation entities that depend on architectural design as well as local, state, and federal leaders, must demand for their communities well-tempered neuroaesthetic environments. After all, there is no good urbanism without good architecture, and traditional and classical buildings of all cultures still make the best streets and places.

Today we live in a world where we can produce anything—with and without machines. How about creating built environments in the most ethical, humane, long-term durable, and inclusive manner?

Further Talking Points

- STATE OF THE ART:
  - Current Models of the Urban Brain
  - Phenomenological Precepts
- URBAN STRESS AND YOUR HEALTH
  - Physical Urban Stress
  - Architectural Allostatic Stress
  - Effects and Costs
- AESTHETIC EXPERIENCE
  - Proportions and Fractals
  - Neuro-ambulatory Rhythms
  - Synthesis
- MEMORY AND PLACE
  - A Sense of Place
  - Connecting Places
  - Place Making is Memory Making
- THE HAND-EYE-BRAIN NEXUS
  - The Hand
  - Craft
  - A City of Makers
  - Grand Public Works
  - Technology
- CARS ARE PERCEIVED AS LARGE ANIMALS
  - Perceptions of Animals and Their Motion
  - Optic Flow
  - Animacy
  - Discussion
  - Conclusion
- LOOKING AHEAD
  - Neuroaesthetic Urban Guidelines
  - Towards a New Model of the Human Brain?

Notes

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Public Understanding and Adoption of Ecological Placemaking Principles through Simulation and Gaming

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Abstract

Ecological placemaking refers to the study and implementation of principles related to increasing the underlying value of city agglomeration in the built environment and across society. It seeks to articulate systemic and network effects of patterns in human settlements related to economic, social, and community wellbeing.

A substantial gap exists between knowledge accumulated by researchers and practitioners versus the general public, which stymies wider policy and development implementations through various budgetary and political processes. With few exceptions, public education and outreach efforts fail to reach the wider public in a way that results in policy changes.

This paper incorporates relevant factors, including public finance, real estate markets, infrastructure, local economies, and community wellbeing into public participation simulations and games that can more effectively bridge the gap in public understanding and reinvigorate the adoption of placemaking policies. Progress and experiences with an existing prototype game implementation will be shared.

Systems are better understood by interacting with models and dialogue than lectures or promotional literature. Games and simulations are models that can help forward public education and give researchers and practitioners needed feedback from the public's lived experience. They afford the opportunity to iteratively hear from a plurality of voices and adapt to a growing collective understanding.

Future implementations will afford human interaction and integration of artificial intelligence-mediated urban patterns and ontologies. Simulations allow society to test future scenarios before pouring them into concrete. Ecological placemaking can achieve the same gains in effectiveness as simulations have provided in other fields.

Keywords: placemaking, public engagement, ontologies, systems, network science, simulation and gaming, artificial intelligence.

Public Understanding and Adoption of Ecological Placemaking Principles through Simulation and Gaming

Ecological placemaking expresses the confluence of ecology, places, and the process of making them. Ecology often relates to environmentalism but more formally comes from biology as studying an organism and its relation to its environment. Placemaking is the process of deepening connections between people and the important places in their lives (Moreira, 2021; Project for Public Spaces, 2007).

In our context, ecological placemaking is the study and application of the natural and built environment focused on humans and ancillary species, primarily in urban environments. Those species include pets, wildlife, food sources, and landscaping components, among others. Our built environment includes the physical structures and the social and economic systems underpinning them.

Ecological placemaking as a subject is vast and not fully encapsulated in any one discipline. An interdisciplinary approach requires input from multiple disciplines, professions, and disparate stakeholders. Many of the individual components have a deep body of literature and professional practice supporting them. Given that no one can stay abreast of all the related disciplines, we expect and routinely find wide gaps between what we collectively know as professionals, academia, policymakers, and the general public.

Further complicating the process of translating theory into practice, many processes involved in human development are political. Mismatching time preferences between stakeholders means that while a researcher may expound on a concept that influences thinking for decades or longer, corporations are often yoked to quarterly results and politicians to election cycles. An average citizen may only observe those issues as passing daily news. The time preference and structural incentives may be opaque from one stakeholder to the next.

Nevertheless, many researchers and professionals devote considerable time communicating principles to the wider public through writing, media, and other outreach efforts. An awareness of ideas may not result in better implementations in the built environment due to the overarching complexity of ecological placemaking. Still, we try.

The purpose of this paper is to outline the scope of ecological placemaking, the problem of translating theory to practice and its consequences, a possible process through interactive, iterative experiences connecting professionals and the public, a prototype implementation, extending applications with newer branches of science and technology, and a brief exploration of future implementations.

Section 1: Ecological Placemaking Principles

In this first section, we outline the scope of ecological placemaking and discuss related foundations and historical context. An interdisciplinary approach draws connections rather than delineations, as is typically common in research and among professions. Contrasts and points of view help us establish the concept's nature.

A foundational contrast between origin stories of two fields – 1) epidemiology and geospatial information science and 2) network science. The former trace their roots to the cholera map of John Snow (Snow, 1854). He was a British doctor who traced a cholera outbreak back to a water pump and used a map to document his findings and justify remediation.

Network science traces its roots to graph theory of mathematics and the Königsberg bridge problem: whether there was a way to cross all seven bridges without crossing the same path twice.

More fundamentally, the contrast is whether we model data as a table, list, or collection of unrelated items or as a network (i.e., graph) of interrelated items. Most data models are lists. Many early urban professionals viewed cities as a collection of items. Such views were what led researchers such as Christopher Alexander to declare that cities are not trees (i.e., the mathematical structure) (1965) and Brian JL Berry to state that cities were systems of systems (1964).

While we can usually represent the same data as a table or a network, the fundamental difference is whether the relationships between items are important. In tables, relationships are usually represented as attributes, while in networks, relationships are primary and essential to the underlying structure. Both models have their uses, but the exclusion of one entirely can give inadequate modeling results.

Ontologies help us define the scope of a concept. They typically consist of entities and relations between them, as with networks. They specify what is part of a field and what is not. They can be as simple as a hand-drawn diagram or as complete as a system of logic implemented in software. Relevant examples of ontologies include one for Open Street Map tags (Codescu et al., 2014) or CityGML, which "defines a conceptual model and exchange format for the representation, storage, and exchange of virtual 3D city models" (Gröger & Plümer, 2012; Open Geospatial Consortium, n.d.; Zhu et al., 2008).

Typically, physical objects or people are the entities in an ontology. Systems of systems or networks of networks imply that we can construct meta-networks or bigraphs (aka bipartite graphs) connecting elements of different kinds. Figure 1 below shows the relations between red (top) elements and blue (bottom) elements. We would expect to see relations within element groups as well. Such a network could model more abstract concepts such as wellbeing or psychographics used to study community dynamics. While we can represent systems as networks, they have the additional characteristics of inputs, processes, and outputs.

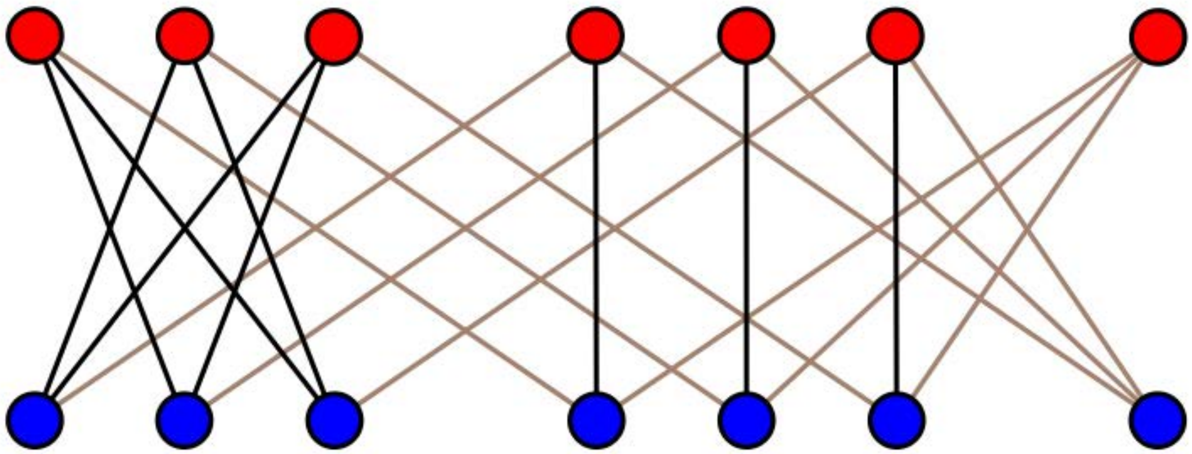

Figure 1: Bipartite Graph

Michael Batty recently explored the boundary problem limiting systems theory research by drawing arbitrary and artificial borders around systems to close them (Batty, 2023). He explains that closed systems may be easier to study, but their tradeoff is that virtually no system within the limits of human measurement is entirely closed. Treating them otherwise overstates our confidence in the results. A multiple-network approach can better represent open systems to the degree that they can be adequately specified.

Christopher Alexander's Pattern Language (Alexander et al., 1977) specified a type of ontology of building patterns. Each pattern listed the related patterns and can be represented as a network or ontology, though the exact relationship between each pattern was not included. Creating connections more descriptive than "is related to" gives us more information to model.

An example of how physical objects relate between themselves and people is an article on The Social Life Project site describing the phenomenology of ice cream stands and how they relate to coffee shops and bookstores and enable social life (Kent & Madden, 2023).

Earlier urban researchers found that people often represent their places as networks of connected places (Lynch, 1960). Such cognitive understanding helps explain why subway maps are typically not drawn to scale but drawn by connections. Those maps enable wayfinding, which helps us with placemaking by layering possible experiences.

Building on the insight that the map is not the territory, each profession might draw a different cognitive map of a city according to their different points of view and emphasis (Horowitz, 2013). Trained as both a city planner and a civil engineer, Charles Marohn has written extensively about the differences between the value hierarchy of traffic engineering and the communities they serve regarding streets (Marohn, 2016). An engineer prioritizes speed, volume, safety, and cost. When surveyed, residents value safety, cost, volume, and speed.

Similar conflicts arise between many different urban-related professions. While in architecture school, the author was instructed to add more value to his sketch. Coming from a real estate background, he wondered how to add more economic value to a drawing. The instructor meant the art-specific terminology to make the sketch darker with harder pencil applications.

Systems theory implies that changing the natural or built environment will change the experience for many stakeholders in multifaceted and unpredictable ways. Public engagement with professionals can reduce unintended consequences, though engagement efforts are often inadequate for reasons we will address next.

To complete the circle, we can say that ecologies are systems we can represent using ontologies as networks. Deepening connections to places involves the qualities of individual places and the connections between them. We experience places uniquely, and interventions need wide input for better outcomes.

Section 2: The Knowledge Gap and its Consequences

Here, we discuss the gap between experts and the public, group discussion and decision-making, and implications for policy and development.

Whether we walk, ride a bike, take public transit, or drive, parking impacts urban land use and quality of life for residents. Parking requirements affect nearly all land uses from urban cores to the rural scale. What experts know about parking is that we maximize its value to the city and commuters alike when we price on-street parking at the level such that, on average, one in six parking spots is available (Shoup, 2011).

Charging more means more people will find alternative modes of transportation, leaving spots unused and generating less income. Charging less means more drivers will spend more time congesting the roads looking for parking and then occupy spots longer. When this has not been applied where it could, it is likely that some stakeholder somewhere is unaware of it and pushes against change, or some stakeholder benefits more from the current inefficiency.

This example of a knowledge gap between experts and the public is one of many. There are many in every field touching human settlements. Moreover, this gap is two-way. Siloed experts may lack insight into the places they make prescriptions for that residents hold (Day & Parnell, 2002).

Considering economics alone, various perspectives exist beyond classical (Keynesian) or neoclassical economics. Other approaches include modern monetary theory, behavioral, institutional, Marxist, Austrian, feminist, complexity, cooperative, and ecological economic approaches (Fischer et al., 2017).

Beyond filling in missing perspectives, when we consider sociology and psychology, we find that whether people are more helpful or empathetic citizens can be traced back to their involvement with building a place. One study of 6 and 10-year-olds found that their relative helpfulness was largely explained by whether they were allowed to be involved by older siblings growing up (Alcalá et al., 2018). Inclusion and involvement led to helpfulness. It stands to reason that public engagement would see similar effects.

Public participation spans a spectrum of effort and cost. Easier approaches include polls or surveys. More expensive approaches include temporary installations or charrettes (Lennertz & Lutzenhiser, 2014). As the difficulty and quality of feedback improve, the quantity of people who can be involved decreases—assuming that a one-on-one conversation is near the highest quality communication, moving to a town hall meeting or charrette introduces limitations of time and space. Not every voice will get equal time. Retired citizens frequently overrepresent meetings. The loudest voice usually gets more time. Conversations outside of formal meetings may have the biggest impact on a city council vote. Sound bites rule the day regardless of whether they make sense or are true.

The author previously reviewed that in one example of a redevelopment plan charrette facilitated by a nationally known development firm, the reported attendance and participation of the city of Richardson, Texas, meant that between 4-8 people provided more than 50% of the input for a plan affecting the 110,000 residents (Burns, 2017). That is far below a statistically significant sample size.

Conducting such events allows a city to proceed with a plan and claim that the residents were allowed to participate. This level of participation is unlikely to leave many residents feeling included in the process.

Online and mobile applications open up additional venues for contribution. Online forums, Q&A sites, and social media afford additional opportunities, though aside from a handful of social media sites, most activity is not local in scope.

The question then is how to balance communication between experts, the public, and their representatives with accomplishing meaningful progress. Referencing our previous systems approach, the development of the process becomes as important as the outcomes it produces. Political “winning” accomplishes little if the time is spent passing laws against the majority opinion and then reversing some or all of the effort in courts.

Passing laws abolishing parking minimums may be an ideal goal from a planning and development perspective, but without adequate public engagement, it risks reversion through protracted legal battles. Engaging residents at the beginning might appear slower, but avoiding the pushback of constant legal battles would likely be faster and more cost-effective.

The implication for policy and development is that while it is expensive to talk to people, it is more expensive not to.

Section 3: Simulation and Gaming for Public Education

This section discusses a medium-fidelity public participation process previously detailed with the most current updates (Burns, 2017).

The primary goal of public participation is to engage with the public as a better process and, hopefully, to obtain better outcomes. The cost and effort tend to scale with the quality and quantity of feedback and communication between experts and the public. Interactive digital experiences have the potential to scale across a larger population, assuming access is widely available through online or mobile applications. Such experiences can often be designated simulations or games depending on the accuracy of the mapping onto real life.

There have been some attempts made at engaging the public through games and simulations including Legos (Poon, 2015), Minecraft (Elmerghany & Paulus, 2017), hybrid physical and spreadsheet simulations (Mechlin, 2017), eye tracking preference measuring (Noland et al., 2017), digital city games like SimCity (Devisch, 2008), physical city games (*Magnate*, n.d.), and public participation games (Tan, 2014).

Games and simulations allow participants to learn the system designed for the experience. For example, playing SimCity teaches about zoning, infrastructure planning, and some market forces. UrbanPlan by the Urban Land Institute teaches balancing financing considerations with city and resident interests using a city block and a spreadsheet.

The experiences span a spectrum of fidelity in the various approaches in finance, architecture, real estate development, and community organizing, and sometimes touch on policy considerations.

Because an abstracted experience cannot cover all the relevant factors involved in developing the built environment, it is worth reviewing more of the factors. The only limits of digital experiences are the available data, computational power, and imagination.

Factors often overlooked by these experiences are the public financing process, interest rates, infrastructure costs, market demand, social issues, policy and zoning issues, spatial issues, parking, aesthetics, walkability, quality of life, and wellbeing.

Games often intentionally exclude such factors because they would make the game unplayable and overly complex (Robertson, 2013). Thus, designing future experiences requires asking what experiences we want to simulate. What expert-to-public systems do we want to teach or explore? Any simulated experience may run into the issue that residents may find that certain elements do not accurately model the built environment enough. Those conversations are valuable feedback. It is not uncommon for things to work differently than most people realize. Cities cannot fill potholes and provide other essential services with subsistence property taxes, yet many expect that.

Games and simulations also can provide space to test the effects of policy and development decisions. If we adequately model dynamics, residents and policymakers could see the effects of possible outcomes before making hard-fought changes.

For instance, a perennial question in city management is allocating limited resources. From experts in criminal justice, we know that adequately treating crime hotspots can reduce their maintenance requirements low enough to free up police resources for other areas (Kleiman, 2009). Spreading resources evenly across the city is less effective.

A simulation could help all stakeholders learn whether the same applies to walkability or other infrastructure improvements. Stakeholders could explore whether a serial urban acupuncture hotspot improvement approach (Lerner, 2014) worked better than more equitable resource allocation over time.

Downtown core revitalization or a few specific prioritized 15-minute neighborhoods might gain more support if more stakeholders could see the possibilities through an interactive experience.

We propose that additional factors often overlooked by simulations can be introduced. Building on our bipartite graph model, we might introduce intangible factors such as wellbeing, quality of life, or sustainability as meta-factors that affect underlying factors like the housing market or civic finance.

In developing a simple system to engage and inform the public, we would do well to keep in mind that performance psychology has found that people can attend to up to three inputs while under stress (Lohrenz, 2021). It would be easy to overwhelm users, so designers must carefully consider which elements to model, develop the underlying dynamics, and set up the user controls.

With current computational capabilities, we can customize simulations to user preferences. A resident who valued parks and schools more highly might interact differently than a user who preferred more coffee shops and bookstores. System design would afford the integration of existing or the development of new data models related to psychographics.

Section 4 - Prototype Game Implementation

This author began developing a city-building game as part of his dissertation. The main limitations in prior gaming attempts seemed to be a lack of an underlying economy, a disconnect between any economy and design decisions, and missing an overarching goal beyond completing infill or maximizing population or revenue. None appeared to address policy issues or incremental development. Addressing these issues would create a more complete ecological placemaking experience.

We developed a game map scaled to suburban proportions with an eye toward suburban retrofitting (Dunham-Jones & Williamson, 2011). Part of the initial goal was to introduce policy considerations and set the overall goal of building a thriving neighborhood.

Criteria for progress were set to managing city health and community health while playing as city residents with attributes as an investor, builder, designer, or advocate. Developments would require resources, including money, plans, materials, and promotions (i.e., marketing).

We subdivided city health into infrastructure conditions, city reserves, and property values. Community health depended on population, social cohesion, and inventory diversity, meaning housing and retail (see Figure 2).

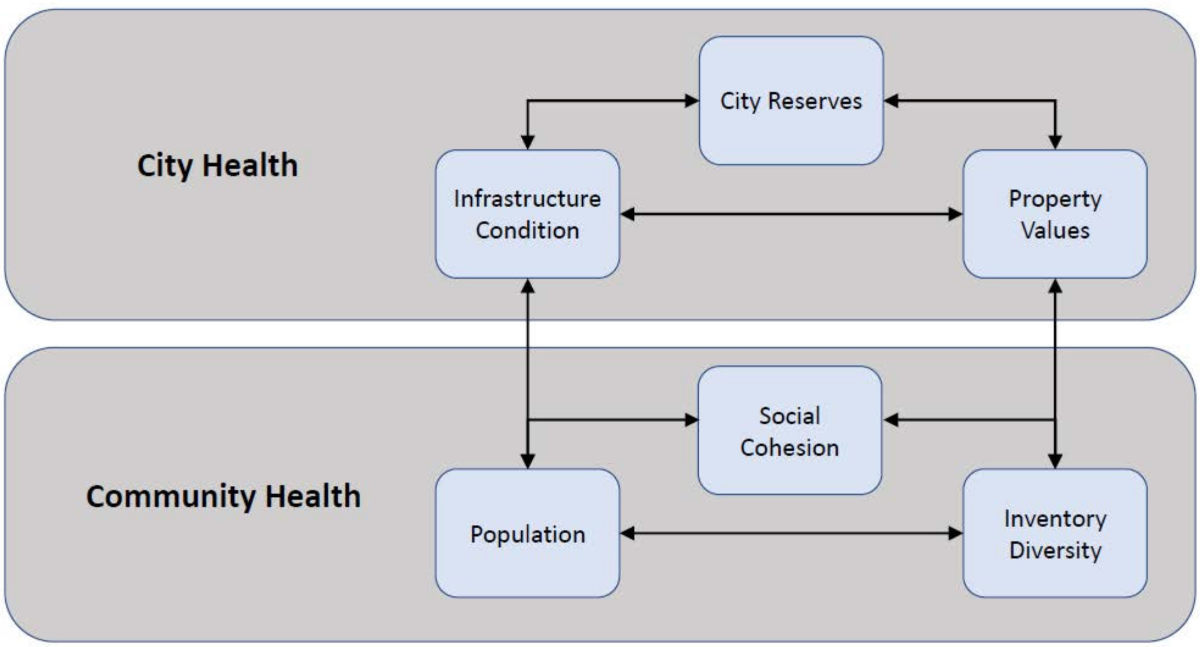

Figure 2: Game System Mechanics

We divided the health scale into thriving, surviving, or struggling sections. We won the game when both the city and community reached thriving. The game could be lost if any factor fell to the bottom of struggling. Resource allocation decisions, market variables, and policy decisions affected the health and what players could do.

Inventory pieces were 3D printed to allow a variety of building options. Missing Middle Housing (Parolek, 2020) building types ranging from accessory dwelling units to fourplexes were available, as well as single-family homes and apartment blocks. See Figures 3-4.

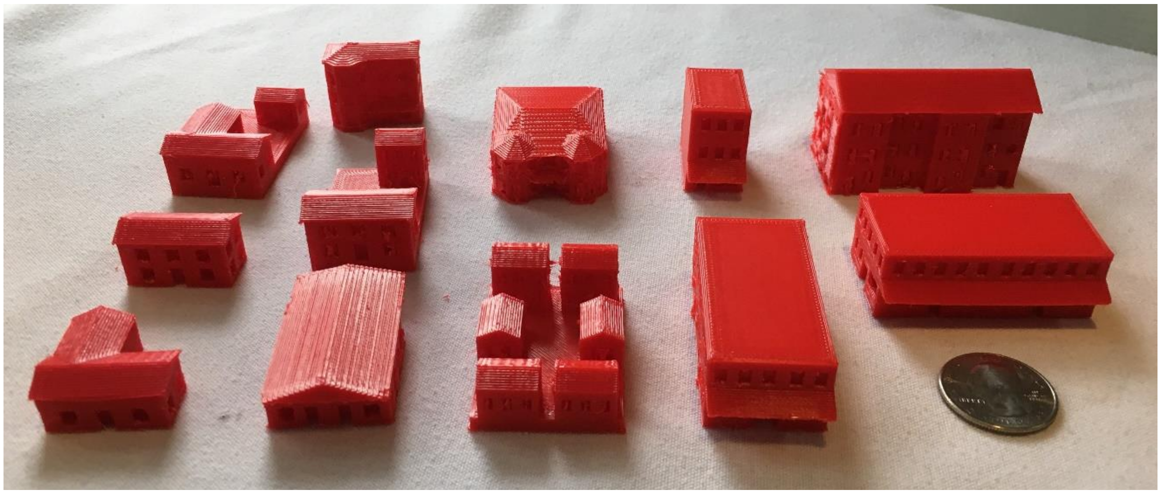

Figure 3: Game Building Types

Figure 4: Pieces on Board

Playtesting found that computing transactions slowed gameplay considerably, with perhaps half of the game completed in a four-hour session (Figure 5). Those experiences resulted in several conversations that revealed additional considerations, such as the impact of bond financing on city health.

Figure 5: Playtesting

Several playtesting sessions concluded that a better experience might involve a mobile application that tracked transactions and the overall economy.

Since the time of those experiences, we paused development during the pandemic when board games with large groups of people were not feasible. More recently, Magnate: The First City is a published board game that addressed the transaction complexity problem by simplifying it with a current market rate multiplier modified through gameplay.

A further consideration was that part of the game’s intention was the in-person experience a board game could provide and the conversations it would spark. A digital game might provide a more accurate experience at the cost of conversations. Conversely, it might be able to reach a wider audience in a digital form. Given recent developments in artificial intelligence for generative design, it would be worth considering.

Section 5 - Artificial Intelligence in Placemaking

While computation and urban design are not new (Negroponte, 1970), recent advances in computational power and algorithms have led to a proliferation of generative design efforts in text and imaging. Some of these efforts may be helpful to communication and feedback efforts between experts and the public. Some architects are already using their design capabilities (Schumacher, 2023).

The author worked in Midjourney to prompt an image generation with a Google Street View and the prompt, “photorealistic, urban redevelopment, improvement project, complete streets, trees, benches, walkable, bike-friendly, better block, family-friendly, pedestrians --ar 16:9 --iw 2”. The result is interesting but not ready for production (Figure 6). The reader will notice that while the generated image is visually appealing, it does not quite match the building footprint, neglects any bike improvements, and appears ambiguous about whether paved areas are for cars, bikes, or pedestrians (aside from the apparently random striping).

https://www.google.com/maps/@45.3598677,-122.6042606,3a,75y,264.85h,90.22t/data=!3m7!1e1!3m5!1skQwOmAus8wY39WByz94ZYQ!2e0!6shttps:%2F%2Fstreetviewpixels-pa.googleapis.com%2Fv1%2Fthumbnail%3Fpanoid%3DkQwOmAus8wY39WByz94ZYQ%26cb_client%3Dsearch.revgeo_and_fetch.gps%26w%3D96%26h%3D64%26yaw%3D277.37146%26pitch%3D0%26thumbfov%3D100!7i16384!8i8192?entry=ttu

Figure 6: Oregon City Main Street Before and After

Other possibilities for recent AI applications are developing concept images or conducting content summaries or sentiment analysis from public comments. Some cities or public processes tally comments for or against, and few can disambiguate concerns that may not fall into one of those categories or contain caveats.

Before mainstreaming generative design, pattern analysis through machine learning algorithms was the cutting edge and used for pattern recognition, anomaly detection, or prediction. The use cases for these approaches in cities are still emerging.

Eye tracking and virtual reality experiences have been available for some time, though few built environment applications have emerged past architectural and engineering design development. As equipment costs continue to decrease, this approach might become more feasible for public participation and placemaking applications.

The promise of smart cities was that cities could become more efficient and provide better service through sensor-enabled mass data collection. While scaling such solutions, the author reminded readers of the need to consider local context, policy, and financing solutions (Burns, 2022). Certainly, sensors could enable advances in parking management. Video cameras are already available to track customer movement, shopping behavior, and eye tracking (Sturari et al., 2016).

The caveat to recent advances in artificial intelligence is that large language models lack grounding in ontologies or underlying system dynamics. They remix words in a human-understandable way, but they generally do not add to the outer limits of the existing literature. They are also limited to digital literature references and presumably cannot have phenomenological experience or understanding, which is necessary for placemaking.

Section 6 - Toward Future Implementations

Here, we review some results from artificial intelligence generative design applications.

Considering a future game application, the author experimented with Midjourney, an image generation application, in September 2023 (Figures 7). The aesthetics of the game would likely be pixel art. See the included prompts.

isometric clean pixel art image coastal fourplex craftsman style

isometric clean pixel art image fourplex Cambridge style

isometric clean pixel art image fourplex craftsman style wooded

Figure 7: Midjourney Generated Images

In addition to game assets, we can generate placemaking examples as follows (Figures 8) with the caveat that it does not do redesign well:

relaxing urban park, bench, bird, near pond, pedestrians strolling

variation of prior image 1

Figure 8: Midjourney Placemaking

Further opportunities exist for the code development portion of the game development process. While ChatGPT would not be able to work out the underlying game mechanics, if prompted, it should be able to suggest appropriate code to establish interactivity. Unity is a game engine appropriate for multi-platform development, including virtual reality applications.

Developers have had mixed results getting usable code. The current state suggests ChatGPT 3 may work with sufficient coding background. Without it, the recommendation is to use ChatGPT 4. Prompt the model to explain where the code should go and the results obtained for debugging purposes.

While current AI does not appear to be able to create games from scratch, there is an opportunity to reduce development time for art and code.

Beyond games, AI appears to be able to generate places with adequate prompting and could be useful in facilitating communication between experts and the public.

Conclusion

To enhance public understanding and adoption of ecological placemaking principles, we recommend further exploring simulation and gaming applications. The relevant fields' contexts were reviewed, including ontologies, network science, and systems theory. We explored the knowledge gap between experts and the public. We reviewed various experiences across the fidelity spectrum along with a specific author-developed game. We reviewed some applications of artificial intelligence and some examples.

Better ecological placemaking outcomes are likely possible by leveraging the best human experience and emerging technology. Computation may simultaneously allow for both scaling and mass hyper-local contextualization. This developing communication dynamic hopes to give greater voice and inclusion to residents to promote city, community, and planetary wellbeing.

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The Final Undoing of the "Law of Supply and Demand"

Why is housing so unaffordable no matter how much new housing we build

By UBC Professor of Urban Design Patrick M. Condon.

Figure 1.

***Behold Vancouver**, where since 1960 we have more than tripled the number of housing units within city limits.*

From 384,000 population in 1961 to 662,000 in 2021
From 109,000 housing units in 1961 to 315,000 in 2021
Housing units tripled all through infill or change of land use.

Figure 2..

*In 1960 the city was already "built out," with no undesignated or unoccupied parcels. Thus, this tripling was all "**infill**" densification or changes in land use from industrial to residential use. This was an unreservedly good thing – in all but one respect. **This giant surge of new housing supply did not lead to more affordable housing** as we all hoped. Somehow, confoundingly, the reverse happened.*

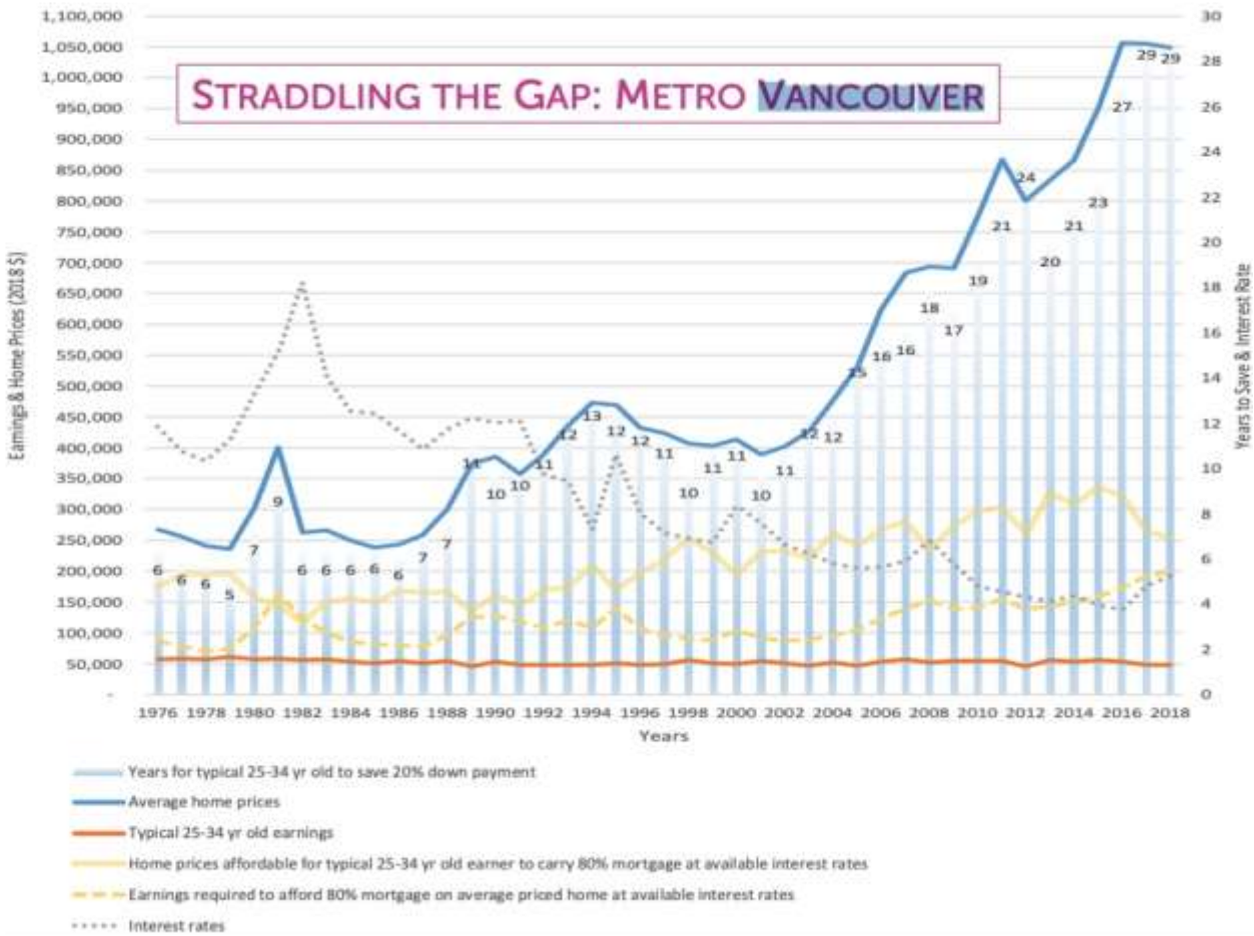


Figure 3.

***During this period, Vancouver housing prices quadrupled**, rising faster and further than in any other North American center city.*

Currently Vancouver home prices are North America's highest, and the third most expensive globally (behind only Hong Kong and Sydney).

The brown line on the chart above shows Vancouver area wages have stayed stubbornly flat (inflation adjusted) while the blue line shows housing prices (also inflation adjusted) have climbed by 400 percent. ***"Real Estate Fundamental" would tell us that a region's housing prices rises should rise and fall with average area incomes. In Vancouver, average wages and home prices have separated wildly. Why?***

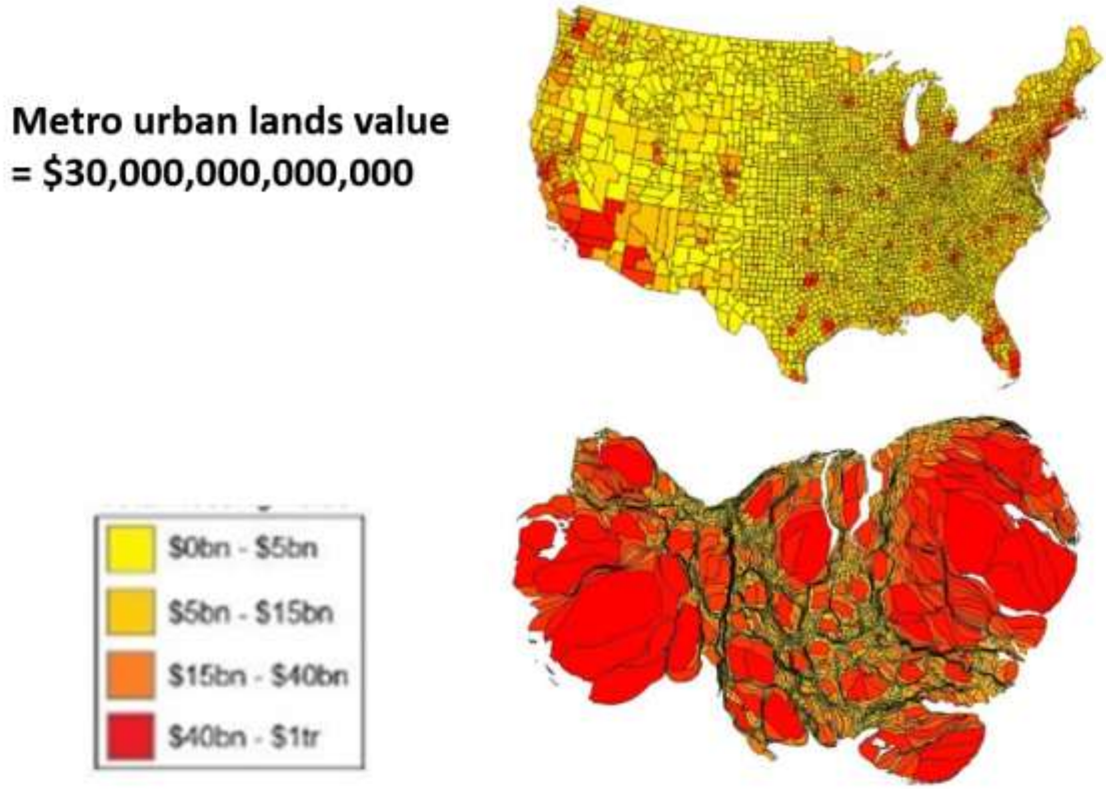


Figure 4.

Part of the explanation is that average wages and home prices are now separating everywhere in most of the developed world. And it does not seem to matter how rapidly new supply is added. Prices keep rising.

So this problem can't be cause by imbalances in " supply and demand" for housing; something else is going on.

In the USA this "something else" is reflected in the ***fantastic increase in the value of - not urban buildings - but in the value of the land under those buildings.***

And the overwhelming bulk of that new value is confined to less than 5% of the nation's land area – in major coastsl cities as these two maps show (the first showing land values geographically correct by US county and the second map altered to give a clear idea of just how much cash value is in the form of urban land).

Rural land is now effectively worthless, while access to a share ofurban land is unaffordable to all but the well off.

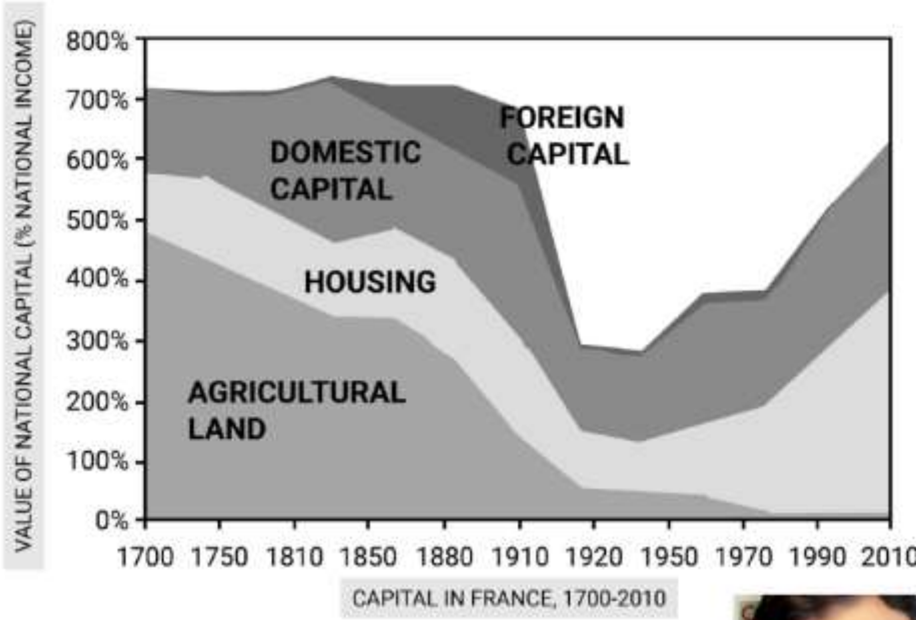


Figure 5.

*Why is urban land more expensive now than in past decades? Thomas Piketty's book**, Capital in the 21st Century** provides a clue to the mystery. He says that this increase in land price is not new. It's a reversion to the norm. He was the first economist to compile financial data dating back to the 1700s. His breakthrough insight was, as the chart above shows, **"wealth" (privately held assets like real estate) has always been far greater than "income" (wages) except for a relatively brief period between WWI and 1980.** After 1980 that disparity began to shoot back up to the norm.*

***The big change shown above is that most of that new wealth was in "housing" (replacing agricultural land)** or, really, in urban land value since 70 percent of average home value is now the value of the dirt below (up from 3 percent in 1930).*

The chart above shows France's wealth to wages gap, but this trend is worldwide

*This shift really matters because it means **that wealth now comes from the appreciating value of wealth itself - not from income – and especially from the increasing value of urban land.** We have gone back to an inequitable financial situation, the likes of which we have not seen since the turn of the 20th century "Gilded Era," and urban land is the main instrument of that inequality.*

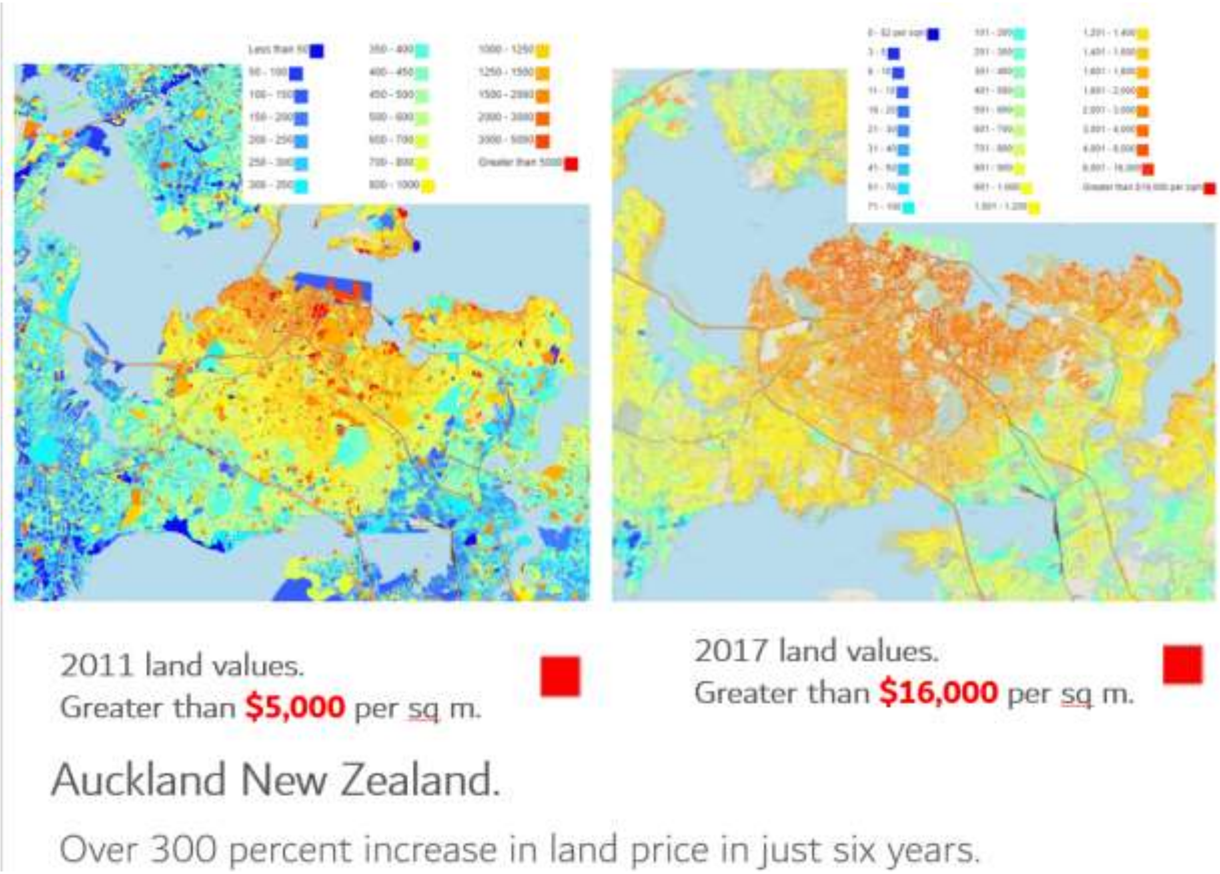


Figure 6.

This crazy increase in land price is happening worldwide. In Auckland New Zealand urban land ***prices jumped by over 300 percent in just six years!***

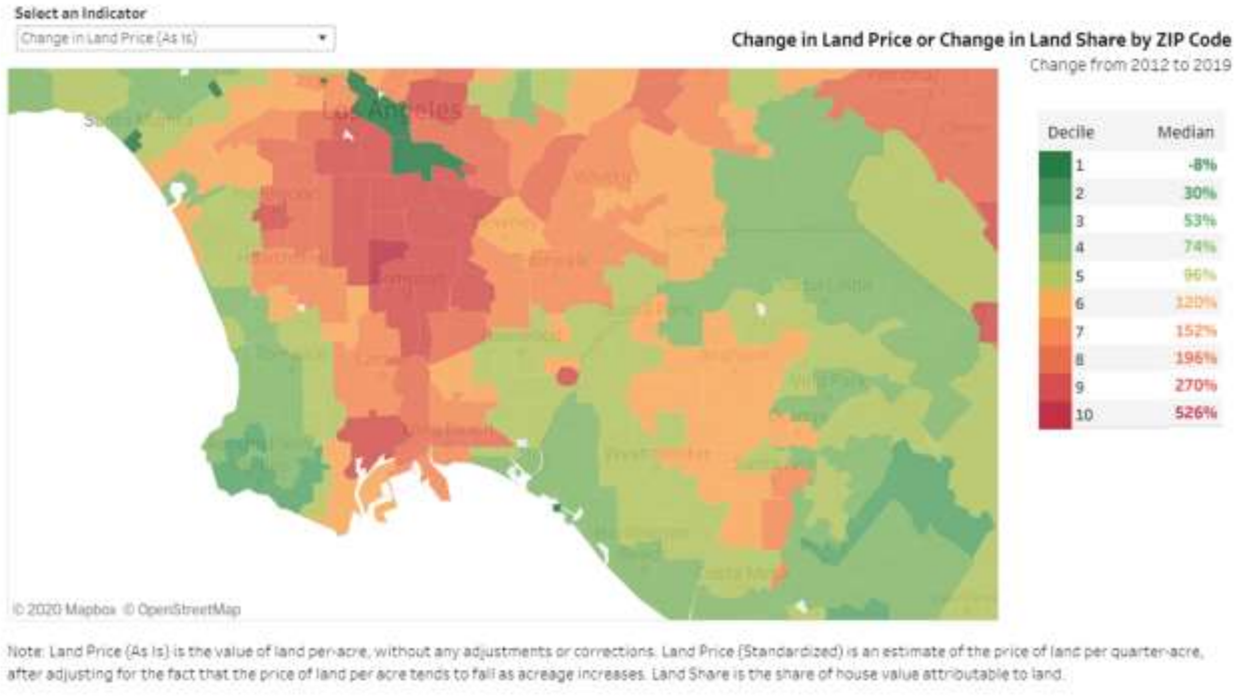


Figure 7.

Or in Los Angeles where land values (separated from building values) have ***increased*** *in many areas by* ***over 500 percent*** *in just seven years.*

Tragically those hardest hit areas in the LA basin are mostly districts where middle- and working-class wage earners live – or try to.

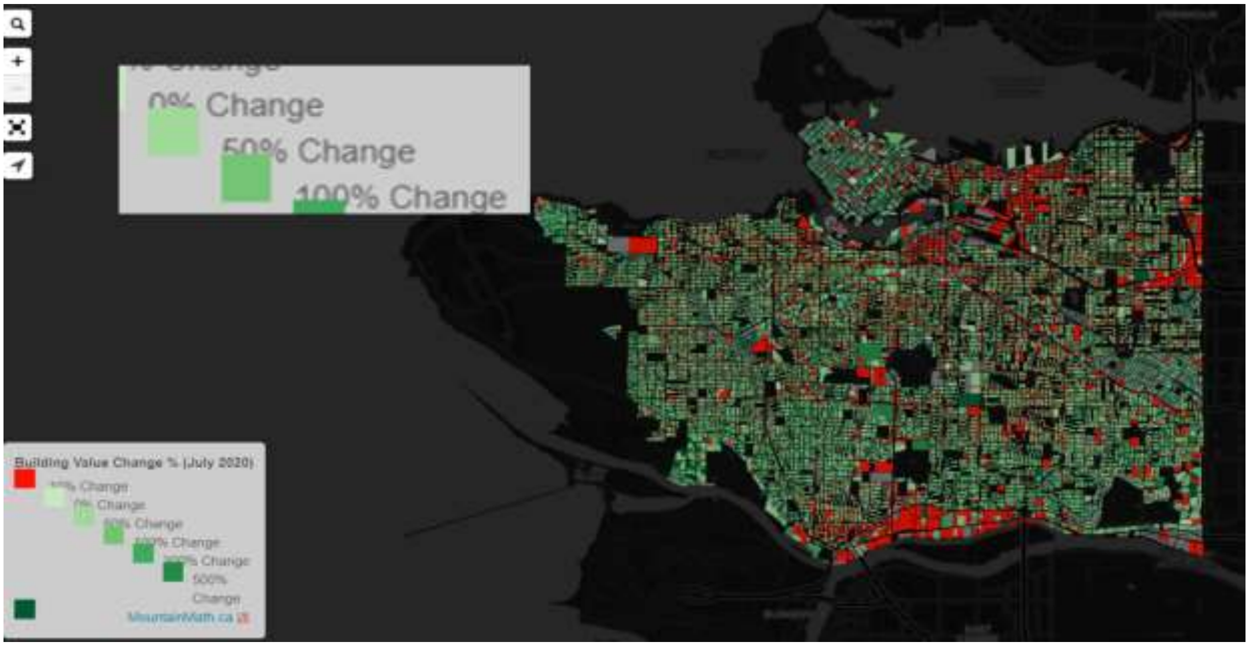


Figure 8.

And Vancouver, by many measures, leads the land price inflation pack. Over the past 15 years, as shown in the map above, the value of the ***buildings*** *in the city rose modestly or even* ***decreased****…. (image from mountainmath.ca)*

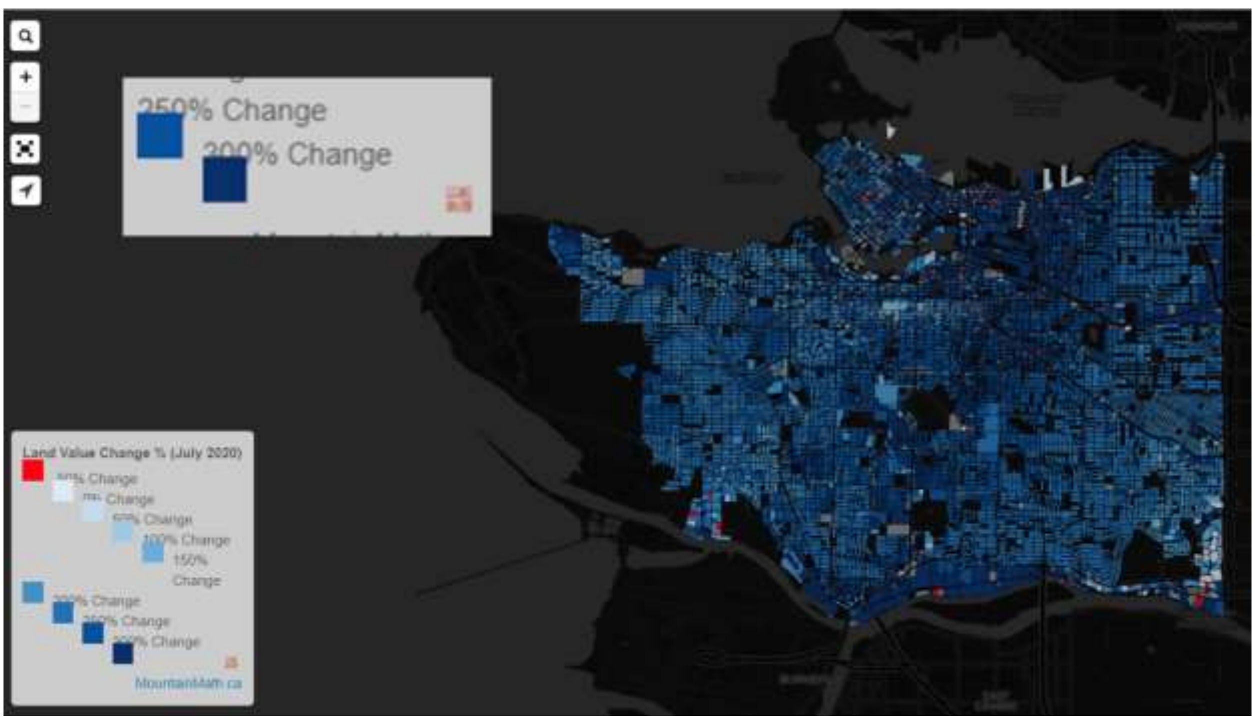


Figure 9

…. while this one shows that, during the same period, the land portion of assessed value ***increased*** *by* ***300 percent*** *- or more. (image mountainmath.ca)*

Figure 10.

*Zooming in closer we can see that many individual plots of land, especially along the Broadway corridor where the new Vancouver subway is under construction**, increased by over 1,000 percent** in the same 15 years, while building value actually declined. (image mountainmath.ca)*

Figure 11.

Many people think that crazy inflating land prices don't matter much because if land costs a lot you just add more density to the parcel to cut the "land share component" of the dwelling unit cost. But if this were true, parcels with bigger buildings on them should show a stronger relative value for the building. But the above two examples show this is not true. ***As density goes up so too does the land value share of total parcel value.***

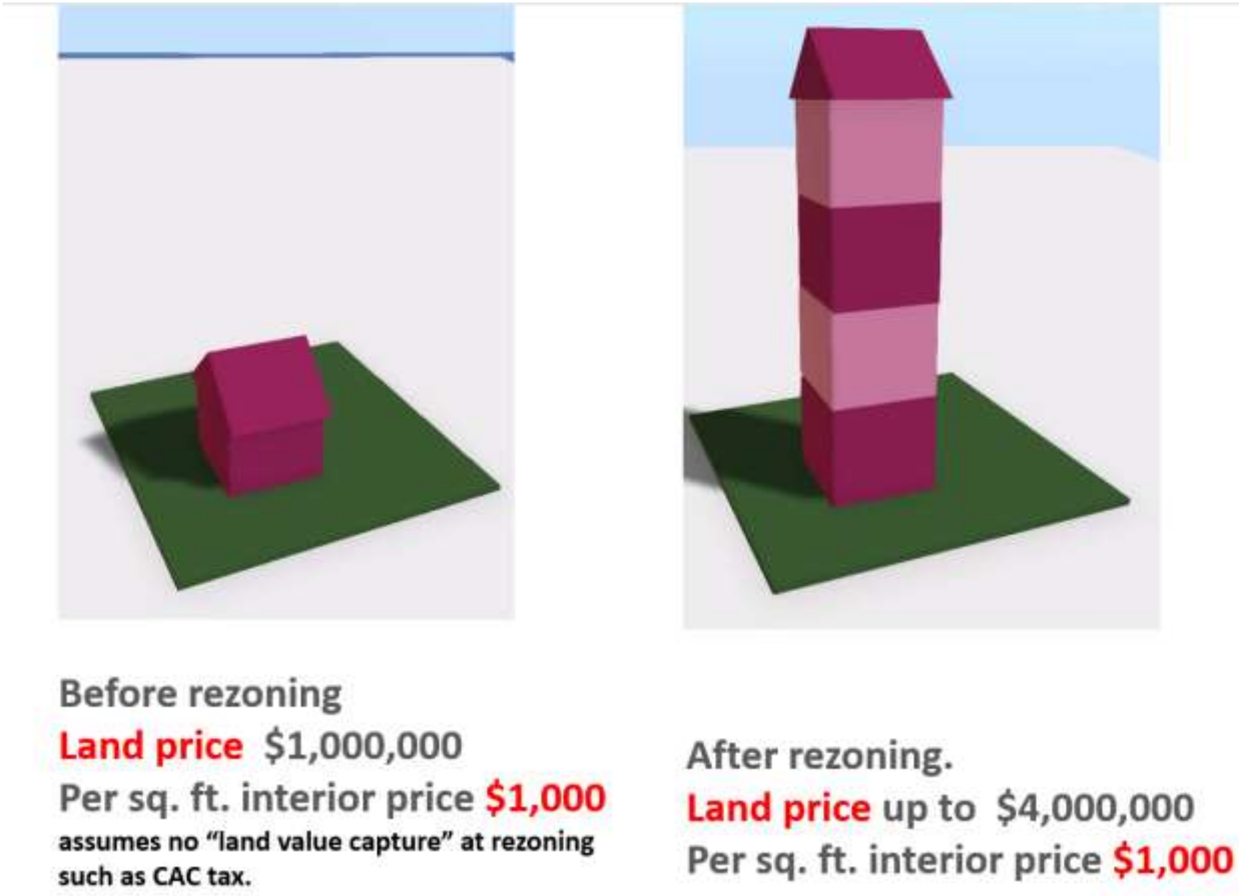


Figure 12.

In simple terms it works like this: Housing is priced by its market value per interior square foot. Let's set that value at $1,000 per sq. When the city decides to allow higher density buildings in the hopes of getting more affordable housing, what most often happens is ***that the asking price of the land immediately inflates****, such that all the additional value of the new density allowance is* ***captured by the land owner****. Smart developers know this and many make most of their money by being the land owners during the rezoning process. In the end, no benefit accrues to the eventual buyer or renter.*

'Alarming' land prices spook city – and condo developers

Some newly completed condos are selling for less than the pre-sale price paid during construction

By Frank O'Brien | November 30, 2017, 9:11am

Vancouver developer and architect Michael Geller warns that land has been selling at such high prices that some condo developers – and new condo buyers – fear they won't be able to profit on the final product.

"I am seeing land sales now in excess of $500 a [square] foot buildable in the City Vancouver and these are not in any way special sites," Geller said.

"I am seeing land sales now in excess of $500 a [square] foot buildable in the City Vancouver and these are not in any way special sites," Geller said.

Figure 13.

Some very good developers are also alarmed by these shocking increases in land price. With urban land so costly, they find ***it impossible to put out an affordable housing product****.*

Figure 14.

But that doesn't fully explain why our tripling of the number of allowable units in the city did not eventually lead to a drop in home prices.

And in Vancouver the production of housing units has exceeded household formation for more than a decade. So, the so-called "law of supply and demand" should have kicked in at some point, lowering the cost of developable land.

Why didn't this happen?

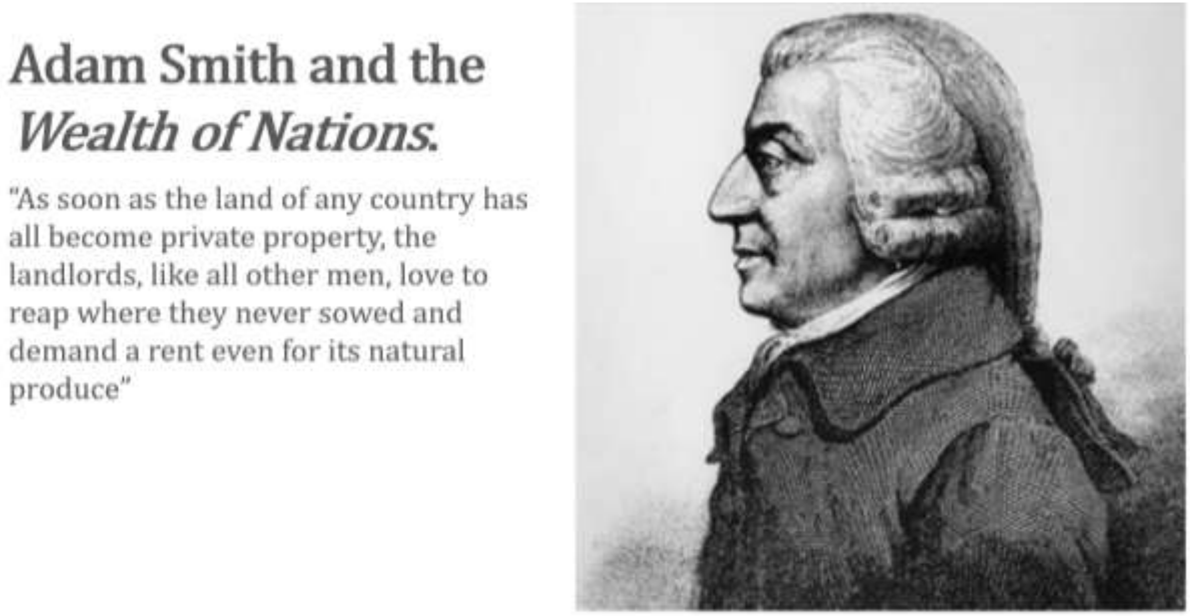


Figure 15.

To answer that question, we have to think about how urban land is different than "commodities" like steel or blueberries.

It was good old Adam Smith who first noted that land was not a commodity, it was one of the three "factors of production" along with capital (a factory or a tractor) and labor (a farm worker or a barista). Land is always necessary to production but makes no direct contribution. He pointed out ***that land owners (or "landlords") are essentially parasitic, drawing off value from capital and labor without doing any of the work to deserve it.***

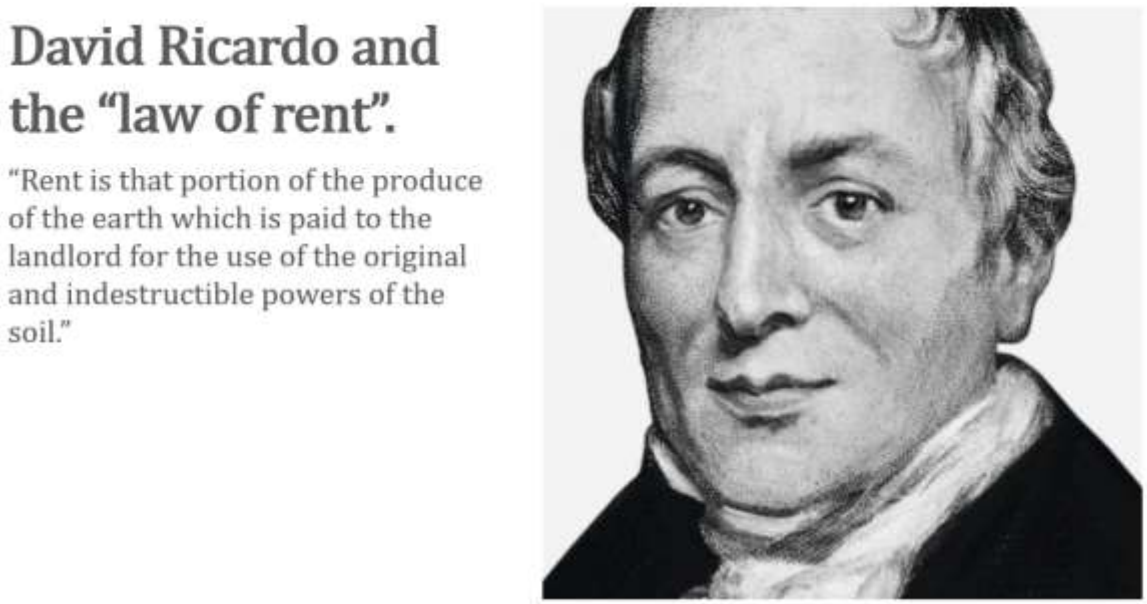


Figure 16.

Not too many decades later, British economist David Ricardo clarified Smith's point with his "Law of Rent."

Basically, his law of rent says, in effect, that a landlord will demand in rent the difference in yield value between productive land and completely unproductive land.

What that means is that all of the value of the soils production (or in modern terms the value of a prime urban location) ***will go, not to the entrepreneur or worker, but to the landlord*** *(land owner).*

This law and Smith's three factors of production are still fundamental tenets of classical economics as taught to this day.

Henry George and a tax on “Rent”

Labour and Capital are productive. Urban land is not. *Progress and Poverty.*

“How can a man be said to have a country when he has not right of a square inch of it.”

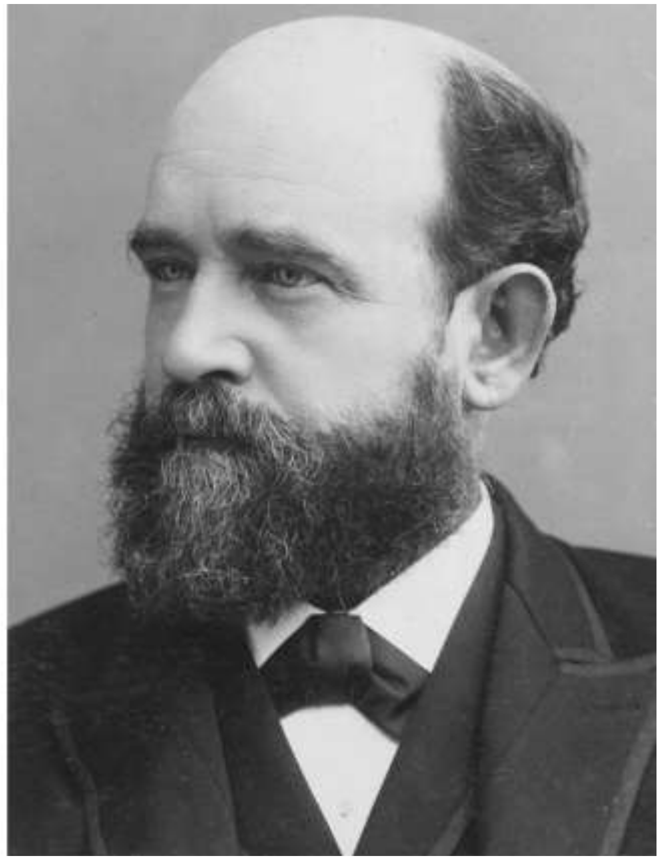


Figure 17.

Closer to home, and closer to our time, Henry George, the Progressive Era economist, clarified how this all applied to the late 1800’s – by which time cities were economically more important than rural areas.

*He became world famous for explaining how as cities mature**, more and more of the value** produced collaboratively by wage earners (labor) and entrepreneurs (capital) **eventually gets absorbed in the higher and higher price of urban land.***

*As this process unfolds the **regional economy becomes destabilized** by the ever more absurd price of urban land, while the poorest of the poor end up with no urban land to claim; in other words, homeless.*

Figure 18.

Today’s out of control land prices are again a burning topic among economists, including Nobel Prize winning economist Joseph Stiglitz, who also concludes that ***urban land has an innate capacity to absorb far too much of the wealth generated by labor and capital*** *into the price of urban land – land which, again, contributed nothing to the wealth generated by capital and labor.*

Figure 18. Digression between hourly wages and productivity gains. At the end of the 60s you see that productivity and wages, previously growing in tandem, split, with all future gains going to capital. Information Bureau of Labor Statistics. Image Wikipedia Commons.

Figure 19.

But why is it all so much worse now than it was in the 20th century?

Part of he answer seems to be that as global productivity per wage earner increases, those increases have flowed toward the **owners** of capital, with wage earners getting no real benefit from their increased productivity.

With this glut of capital in the hands of those who already have wealth, they must invest it in something, and **urban land has been a very safe bet**. This form of globe wide, and highly speculative "asset inflation" eventually bids up the price of urban land way beyond its utility value for housing or industry, **exerting an ever more crushing burden on both entrepreneurs and wage earners**. So here we are.

There are other indicators of how we have moved from a "wage-based economy" to an "asset-based economy;" but the above indicator is fairly typical of this trend.

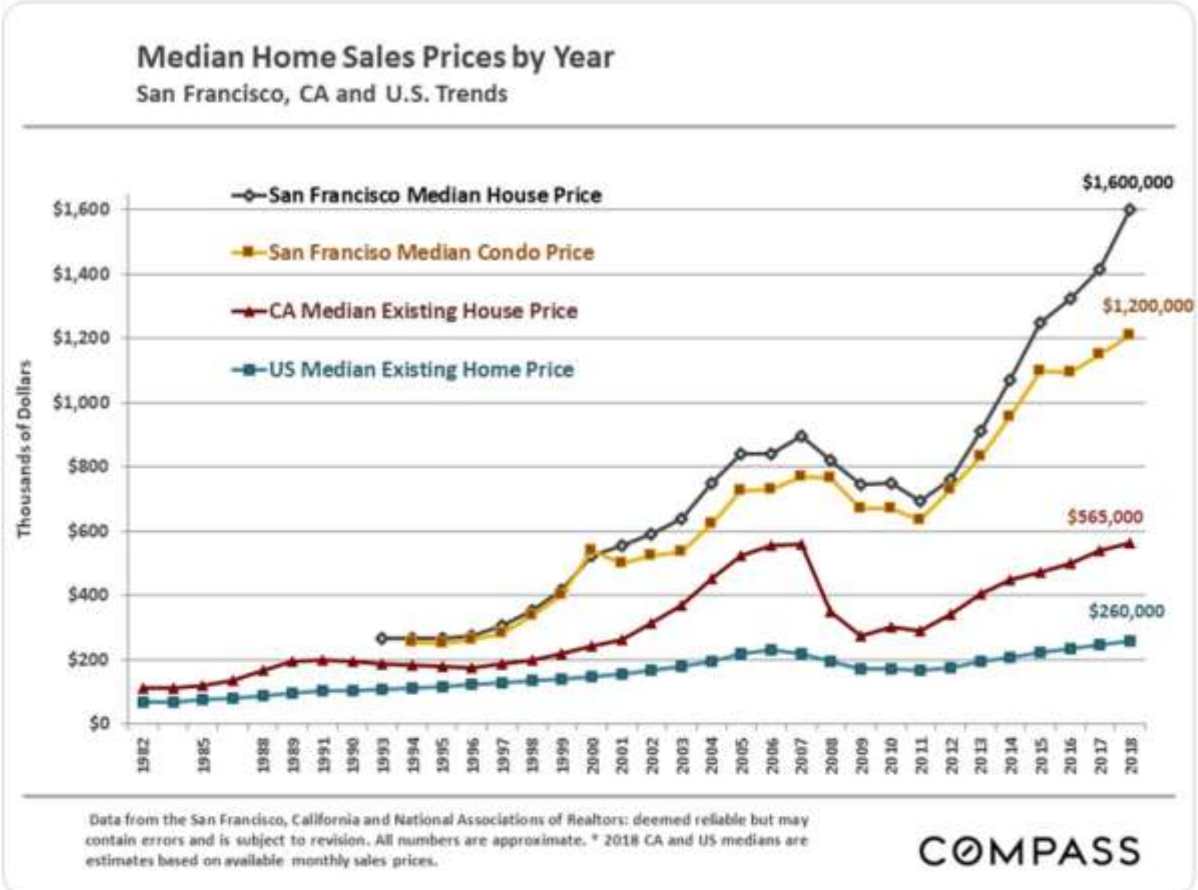


Figure 20.

All of which helps explain why certain cities are seeing outrageously inflated home and land price increases. ***San Francisco and Vancouver are extreme examples*** *of this phenomenon. Also New York, Miami, Toronto, Sydney, Christchurch, London. On and on.*

Figure 38. The Holy-Hof in Hernals, Vienna, public housing project constructed by Rudolf Perco in 1928-1929.

Figure 21.

So, if adding density can't make housing cheaper what, if anything, can be done about this?

One city that solved this problem 100 years ago is Vienna*. During their own extreme housing crisis, they adjusted their municipal tax structure to fall heavily on landlords. They then took the money gained from this source and used it to buy land for non-market housing.*

They worked with their non-profit housing providers to build affordable housing - supplying land on a competitive basis to community groups anxious to create affordable communities.

Figure 40 Hundertwasser housing complex. Corner of Kegelgasse / Löwengasse of the Hundertwasserhaus in Vienna's 3rd district, Landstrasse. The residential complex of the municipality of Vienna with 50 residential units was built as an eco-house from 1983 to 1985. It was designed by the artist Friedensreich Hundertwasser, in collaboration with architect Josef Krawina and Peter Pelikan.. Image © Bwag/Wikimedia

Figure 22.

*The results are striking. Now **more than half of all housing in Vienna is non-market housing -** permanently affordable to citizens making average wages and below. Rents in Vienna are about half what they are in other equivalent European cities.*

*Those citizens who wish to own their own homes also pay less in Vienna than elsewhere, since the strength of the non-market housing sector **exerts downward pressure on all land values throughout the city.***

Figure 23.

*In the past Vancouver found a way to build far more non-market housing than most people realize. Most prominently in the False Creek South (top photo) and Champlain Heights (middle photo). Neighbourhoods. Actually, non-market co-op type housing projects are located in every part of the city (map, bottom), and collectively along with social housing of all types, makes up 15% of all housing units in the city. **If Vancouver had continued to build non-market housing after the 80s, and at the same rate as in that decade, non-market housing would constitute about 30% of the total by now.***

Figure 24.

*A contemporary example of a zoning policy that lowers land price residuals to the benefit of non-market housing providers is the new, **City of Cambridge Massachusetts, "Affordable Housing Overlay" policy.***

This city-wide alternative development path allows non market developers to be granted double current zoned density, on any parcel in the city, but only to developers who agree to supply 100 percent affordable housing units, whose rents are permanently pegged to average household incomes in the region.

*This approach puts downward pressure on the land price "**residual**" value of potential development parcels, making them affordable to the non-profits who would be the preponderant site developers under this policy.*

This last point is key.

*If Cambridge just allowed a doubling of allowed density city wide, without this affordability demand**, it would not work** - for all the reasons discussed above**. Land prices would rise to the market price per "buildable" sq. ft., pushing eventual rents out of reach for average income earners.***

*Non-profits could not get their projects to "pencil out" at these inflated land prices. **Doubling allowable density without the demand for affordability streams public benefit to private hands and effectively excludes nonprofit developers from the land market.***

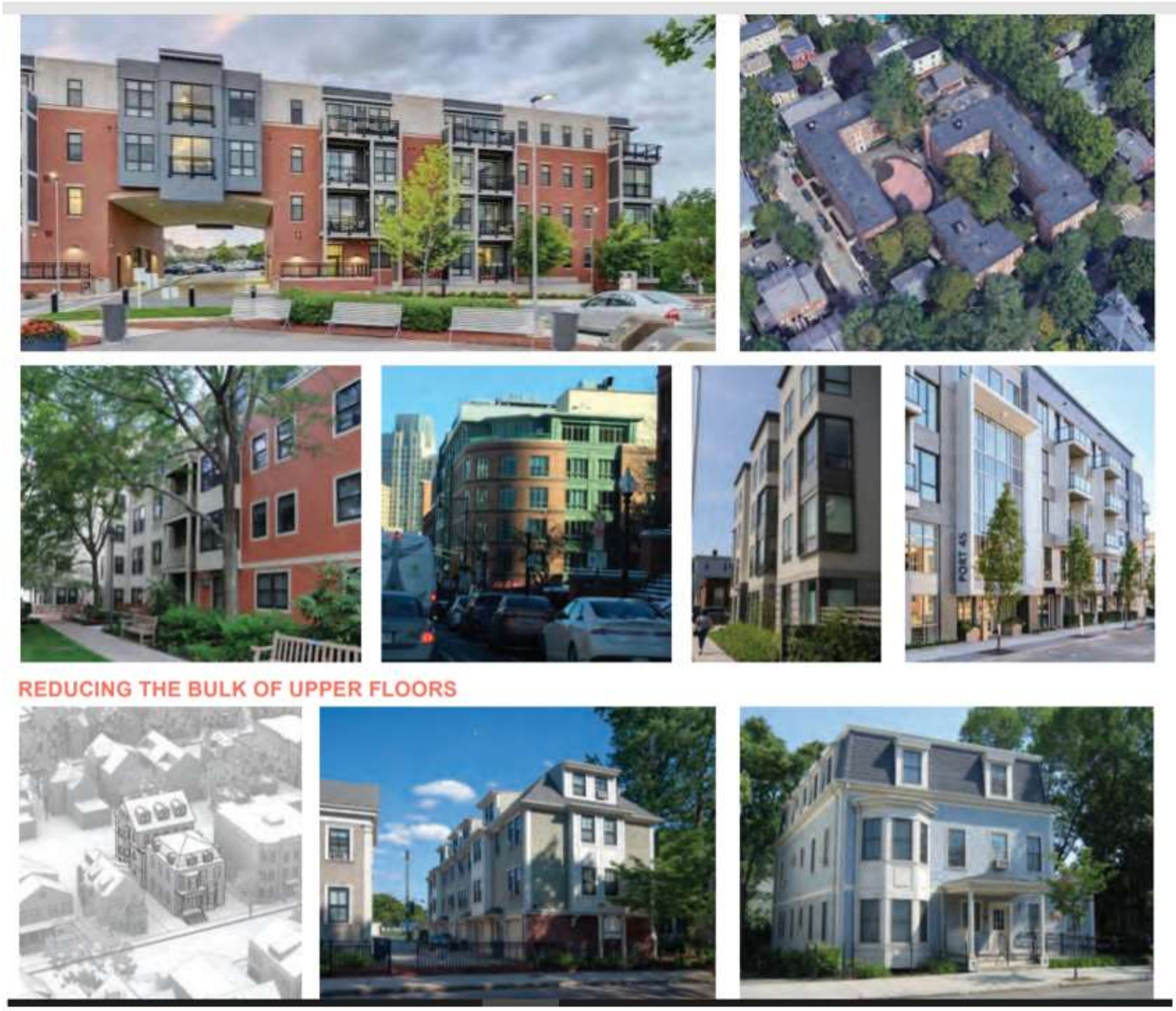


Figure 25.

The grass roots politics of development should never be ignored.

Cambridge's elected and appointed officials were very careful to consult with neighborhood groups about this plan. Neighborhood owners' concerns were respected in the forms chosen for the new buildings.

These historically precedented Cambridge building types were eventually seen as positive additions to the typically very high-quality of Cambridge neighborhoods.

Good systems thinking – thinking that includes quantitative and qualitative understanding – was key to their political success.

The Ecology of Urban Centers and Corridors: Access and Proximity

DRAFT (10/2/23)

Written by Kathy Galvin of Galvin Architects & Chris Sinclair of Renaissance Planning (as noted) with visualizations by Kathy Galvin (hand drawings) and Chase Kea of Renaissance (computer generated.)

Abstract Summary (Kathy Galvin)

Definition of Ecology- *the spatial and temporal interrelationships between organisms and their environments inclusive of the physical, chemical, and biotic factors (such as climate, soil, and living things) that determine their form and survival.* (Merriam-Webster, with modifications)

Definition of Urban Ecology- *the spatial and temporal interrelationships between organisms in urban environments as well as the overall ecological sustainability of cities.* (Nature Portfolio-with modifications) *Urban ecology reveals the systemic interaction and relationship between environmental frameworks, transportation networks and economic systems that shape our built environment from the scale of the region to the scale of the municipality down to the scale of the block.*

Metropolitan areas in America and the Western World have recognizable and similar development patterns, inclusive of corridors and a hierarchy of centers. Unlike their European counterparts however, most metropolitan corridors in the United States are engineered for high-speed inter-regional and job automobile access. The negative impacts of this auto-centricity (i.e., environmental to human health impacts) are well-documented, and efforts to build more sustainable models of urban development are neither rare nor new. Then why do we continue to sprawl at the expense of our agricultural and forested lands? This exploration will first touch upon what's at stake if we fail to change course and ignore the legacy of past efforts to replace sprawl with other more sustainable models of urban growth. It will then focus on a new growth model built upon time-tested principles of high access and proximity within an urban ecology of new walk-able centers (both on greenfield sites like Poundbury and Deseret Ranch, FL and gray field sites like Jacksonville, FL) linked by a network of high efficiency transit corridors.

1. Rationale for Change (Kathy Galvin)

How we move, shapes how and where we live and what we value dictates what we consume and throw away. REDUCE, REUSE, RECYCLE no longer just applies to the "stuff" we accumulate but the land we squander. The time for what Al Gore called a "Global Marshall Plan "(1) for the planet is long overdue; one that solves our systemic economic, social, and environmental problems at once, in all their mind-numbing complexity. That complexity is best summed up by the word ecology. (2) Urban ecology reveals the systemic interaction and relationship between environmental frameworks, transportation networks and economic systems that shape our built environment from the scale of the region to the municipality to the block. That's where the Art (3) and Technique (4) of Placemaking (5) come in.

Executing any art form (or science) requires technique. If the Art of Placemaking is the way we shape public space to celebrate our physical, cultural, and social identities, then the Technique of Placemaking is Urban Design. (6) As an integrative and holistic discipline, Urban Design establishes the frameworks and procedures required to shape development into the urban forms of neighborhoods, cities, and towns. It does so by respecting precedent and operating at multiple geographic scales across both natural and urban ecological systems.

1. Earth in the Balance: Ecology and the Human Spirit by Al Gore, 1992
2. Ecology-a branch of science concerned with the interrelationship of organisms and their environments: the totality or pattern of relations between organisms and their environment. (Merriam-Webster Dictionary)
3. Art- The quality, production, expression of what is beautiful, appealing, more than ordinary significance. (Dictionary.com)
4. Technique - The basic method for making or doing something, such as an artistic work or scientific procedure; Skill or command in a particular activity. (Free Dictionary)
5. Placemaking - The process by which we shape public space to maximize shared value and celebrate the physical, cultural, and social identities that use and change them. (Project for Public Spaces website)
6. Urban Design -The process of patterning urban forms into neighborhoods, cities, towns, or other municipalities. (Law Insider Dictionary) The collaborative and multi-disciplinary art of making places and the act of establishing frameworks and procedures to shape development outcomes over time. (Urban Design Group website)

When we fail to see this connection between the way we move and the way we shape the built environment, we disrupt the balance between our natural and urban ecologies with serious consequences to human and planetary health and safety. Nor do these impacts fall evenly across geography and race. Fatality rates especially among pedestrians and cyclists due to unsafe motorist behaviors have hit a 20-year high. (1) Even though non-whites were 35% of the population in 2016, they represented 46 % of pedestrian deaths. (2) The most dangerous streets occur in the southern half of United State where "low-density sprawling land uses and high-speed, multi-lane arterial highways" became the norm after 1960. (3) Coincidently this region has seen the greatest declines in physical activity and increases in metabolic disease like diabetes and childhood obesity over the last 40+ years. (4) The mortality rate for African Americans with diabetes in Virginia is twice that of Whites (5) Finally, 27% of greenhouse gas emissions which are directly tied to climate change and costly extreme weather patterns are now caused by the transportation sector. That's more than electric power plants. (6)

1. NHTSA website, 3/2/22 and the National Highway Traffic Safety Administration data released on 1/9/23.
2. Dangerous by Design, 2016 by the AARP, ASLA and Nelson Nygaard, 2016
3. Dangerous by Design, 2022, Smart Growth America.
4. State of Obesity, Robert Wood Johnson Foundation and CDC "Adult Obesity Prevalence Maps" website, 2022.
5. MAPP2Health, District 10 , December 2016
6. Environmental Protection Agency EPA website (2020.)

When we fail to see this connection between the way we move and the way we shape the built environment, we also consign our urban centers to what economists refer to as an "doom-loop of decline" in the wake of the COVID 19 pandemic and subsequent changes to the way we shop, work, and play. This phenomenon appears particularly pronounced in the US and the UK Large retailers in the U.K. like Marks and Spencer for instance have disappeared from city centers, along with overextended restaurant chains, bank and even pubs. (1) This post pandemic trend has been exacerbated by the "sprawling" low density suburbs and lack of high efficiency public transit not just characteristic of American cities, but also of UK cities relative to the continent. In fact, there appears to be a correlation between productivity and greater access as measured by the availability of affordable housing and public transportation. According to the Financial Times, 40 percent of Britain's population in cities can reach the city center by public transport in 30 minutes, whereas 67 percent in mainland European cities can. Narrowing the productivity gap between the UK and the Europe will require investments in public transportation, repopulating city centers, (which like American cities emptied out into the suburbs during the 20th century) and designing & building urban environments that attract and retain talent. In short, "Better cities lead to greater retention of skills." (2)

1. "British towns are stuck in a doom-loop of decline," by Ben Marlow for The Telegraph, 8/11/2023 https://www.msn.com/en-us/news/technology/british-towns-are-stuck-in-a-doom-loop-of-decline/ar-AA1f8eZp?ocid=socialshare&cvid=5ceb66fa12ef4fd490786d7c4586cd84&ei=168
2. "How sprawling suburbs are stunting productivity in UK cities," by Peter Foster for the Urban Planning Division of the Financial Times, 1/20/22, https://www.ft.com/content/a45e028d-4b81-4bef-9546-970838ab963a

On the other hand, when we do meet the ecological needs of both nature and humanity and respect the role art (1) and culture (2) play in shaping our worldview, we not only sustain the well-being of ourselves and our planet we share our communal values and “sense of place” across time and space. This is the rationale behind ***Placemaking.*** (3) The Art of Placemaking shapes space in ways that meet our everyday needs while celebrating our unique cultural and social identities. It enables the “***more coherent, and more whole”*** (4) urban forms of neighborhoods, cities, and towns instead of the single-purpose, isolated landscapes of subdivision, strip mall and cul de sac. Urban Design embodies the techniques required to achieve these desired results. Successful Placemaking therefore entails both engineering backed by data analysis and scientific methods, and art born out of the cultural and geographic context.

Urban places of varying size and scale practice the Art of Placemaking when they maintain the balance between natural and urban ecologies by incorporating sustainable modes of transportation, and principles of equitable development and inclusive community engagement. They are also distinguished by their mixed-use centers, variety of housing choice, and networks of interconnected streets that provide access to jobs, services, and amenities either on foot or efficient public transportation. They may also be distinguished by the health of their residents because the increased physical activity enabled by a community designed for active living is highly correlated with lower rates of heart disease, stroke, type 2 diabetes, and some cancers. (5)

1. Art- The quality, production, expression of what is beautiful, appealing, more than ordinary significance. (Dictionary.com)
2. Culture-The customary beliefs, social forms, and material traits of a racial, religious, or social group and its capacity for learning and transmitting knowledge to succeeding generations; the enlightenment acquired by intellectual and aesthetic training. (Merriam-Webster Dictionary)
3. Placemaking - The process by which we shape public space to maximize shared value and celebrate the physical, cultural, and social identities that use and change them. (Project for Public Spaces website)
4. Christopher Alexander in <u>The Timeless Way to Build.</u>
5. CDC “Vital Signs” Fact Sheet

2. Theories and Precedents of Places in Balance (Kathy Galvin)

a. Functional and spatial dynamics of metropolitan centers and corridors.
a. Role of urban centers and other place types along corridors.

Great urban places can be found in all cultures, sizes, countries, and eras, yet they all have one thing in common: they’re memorable, functional, and beloved by their residents. By virtue of their diversity, compactness, and capacity to innovate, they also play an ongoing and critical role in solving today’s chronic problems from pandemics to climate change, regardless of when they were built. For instance, Forest Hills Gardens in Queens, NY was developed in 1914 as a commuter rail suburb of New York City. (1) Milwaukee’s Westlawn Gardens Public Housing was redeveloped in 2013 into a walkable neighborhood with resident participation but no resident displacement. (2) The Pineapple Arts District and West Settlers Neighborhood in Delray Beach, FL were successfully revitalized twenty years ago in partnership with longstanding residents. (3) The old Naval Training Center in Orlando was redeveloped into Baldwin Park, a walkable neighborhood with its own mixed-use center beginning in 2006 (4.) These urban places continue to function as originally intended and inspire the development and redevelopment of new great urban places.

1. Frederick Law Olmstead Jr. in 1914
2. Torti Gallas & Partners in 2103
3. Delray Beach

4. Baldwin Park https://www.orlando.gov/Our-Government/Records-and-Documents/Plans-Studies/Baldwin-Park

Great theorists, observers, and practitioners shape the way we think about urban places. Walter Christaller's "Central Place Theory" which modeled the optimum economic relationships between urban places of different scales in Southern Germany in the 19th century, still informs regional economic planning today. (1) By the mid-20th century Jane Jacobs not only led the charge against urban renewal but identified the four key ingredients of a successful American city namely: a mixture of land uses, short walkable blocks, a variety of building types, and different kinds of people in large numbers. (2) In the late-20th century Peter Calthorpe identified the three co-occurring densities essential for viable transit-oriented development (TODs) within the context of a well-functioning transit system: housing, street intersection and employment. (3) Finally, in the 21st century Jan Gehl gaged the condition of cities today by monitoring how well they maintained a balance between three key functions: meeting places, marketplaces, and traffic spaces. (4)

1. "Central Place Theory" by Walter Christaller
2. The Death and Life of Great American Cities by Jane Jacobs
3. The Urban Index and the Regional City by Peter Calthorpe
4. New City Spaces by Jen Gehl and Lars Gemzoe

3. Holistic Model that Leverages Centers & Corridors (Kathy Galvin)

a. Influence of 20–25-minute commute times on travel decisions and the need for one mile station spacing to ensure optimal transit operating speeds.
b. Geographic and analytical criteria at the regional scale that set the stage for successful TODs that can compete with the SOV and successful multimodal corridors that facilitate alternatives to the SOV.

Geography provides the context for effective Placemaking at all scales ranging from the region (macroscopic), the municipality (mesoscopic) and the block (microscopic), while three "systems" (1) shape the built environment at all scales. Those systems are 1) the Environmental Framework 2) the Transportation Network, and 3) the Economic System. How and where these systems interact with one another determines how and where human communities settle on the land. The planning, design and construction of these settlement patterns (referred to as Place Types) addresses a whole host of issues from density to urban form and land use and creates a feedback loop that in turn impacts the functioning of our environmental, transportation and economic systems.

1. System- a regularly interacting or interdependent group of items forming a unified whole. (Merriam-Webster Dictionary)

4. TOD Typologies & Network Requirements (Kathy Galvin)

a. Design criteria critical for successful TODs at the Place Type scale that enable high quality, urban environments at the pedestrian scale that are essential for facilitating well-functioning economic and transportation systems at the regional scale.
b. Urban design standards required by corridors and thoroughfare networks at all scales, that work "hand in glove" with Place Types to sustain regional transit and other modes.

How do we physically make Places today that are as memorable, functional, and beloved as the Places we used to make years ago? First, like music, a place is composed. Instead of combining notes to form a song, blocks, lots, and streets add up to shape a place. Second, if music is passed down from one generation to the next in an oral tradition, then that musical record of daily life (a.k.a. folk music) need not be written down to be remembered. That same organic process of cultural transmission and remembrance used to happen with Placemaking, when people moved by foot or animal drawn wagon within compact villages, towns, and cities.

By the 18th century, like the growing complexity of musical composition that required a written score and a full orchestra, so too did the growing complexity of urbanization require new rules about building form and placement. But just as folk music continued to inspire orchestral works in the 19th century, so too did the visible built legacy continue to inspire Placemaking. With the heavy footprint of industrial specialization and automobile use on our landscapes in the 20th century however, the old rules were forgotten or rendered obsolete. New rules about land use, building form and placement were written and packaged into zoning ordinances that segregated living spaces from working spaces and accommodated the spatial mobility and storage needs of the car above all other modes of transportation.

These wholesale shifts in the way we move and live have decimated our natural systems and ruined our health, but remnants of the organic built legacy of Placemaking remain. To reset the balance between urban places, culture, and nature we need a new way of occupying the earth: one inspired by the lighter footprint of the past but informed by our capacity and need for technological and social progress. To investigate, evaluate and create that new way, we need drawings to "help people to work out intricate relationships between parts." (1) Those parts in turn, are derived from a set of strategies gleaned from our legacy of great Placemaking.

Those strategies include asking the same questions that Peter Calthorpe asked to introduce organizational structure to our growth patterns and diversify our mobility diet. "What can I walk to within a ¼ mile of my residence or within ½ mile of the transit station?" Taking a few more pages from Calthorpe and Jane Jacobs, make sure there's a high frequency of intersections within a neighborhood, with clearly marked crosswalks, and that block lengths are no greater than 600.' Use mid-block alleys to limit curb cuts and conflict points with cars and transition between areas of high and low intensity of development. Vary lot sizes within any given block to diversity uses and price-points. Face both sides of a street with richly detailed building frontages, inclusive of windows, doors, awnings, storefronts, stoops, and porches to activate street life. Learn from the research of Jan Gehl, by making sidewalks at least 7' wide for two people walking abreast, and lining streets with trees to make walking and taking the bus more pleasant, social, and healthy than driving a car.

1. The Pattern Book- Christopher Alexander

5. **Case Study from Deseret Ranch in Central Florida, U.S.A.**. (As excerpted from the **Orange County FL, Long-Term Master Plan** authored by Chris Sinclair with written modifications by Kathy Galvin and visualizations by Kathy Galvin & Chase Kea.)

Ag Reserves' Deseret Ranch at 300,000 acres, is Central Florida's largest undeveloped property. Strategically located between the Orlando metro area and cities stretching north and south in Brevard County and the Space Coast, the Ranch offers a unique opportunity to plan a large portion of the region in a manner that balances its natural, cultural, and urban systems. Despite the region's efforts, urban sprawl continues because of siloed planning practices. The Orange County Ranch Sector Plan prepared by

Renaissance Planning, Prime Consultant, departs from those siloed planning practices by adopting an integrated approach, that focuses on the dynamic relationships within and among the larger environmental, urban and cultural systems (inclusive of the dynamics of transportation, economics and land development.)

INTEGRATED PLANNING PROCESS

The Long-Term Master Plan for the Orange County Ranch Sector Plan presents Central Florida with a unique opportunity to cultivate a sustainable balance among its environmental, cultural, and urban systems. The Planning Area (i.e., “the Ranch”) is essentially a blank canvass, a large undeveloped property that is not in the “middle of nowhere” but crossed by inter-regional multimodal transportation networks and utilities and surrounded by high-tech companies and neighborhoods in Orange County to the west and in Brevard County to the east. The Planning Area, in other words, is poised to attract high-tech businesses that can diversify the region’s economy. The development of “Medical City” just to the west of the Ranch for instance, provides a glimpse of the economic development possibilities in this region, however the integrated planning and design approach advocated by this Plan assumes that this Planning Area can absorb much of the region’s growth in a compact urban footprint, thereby reducing urban sprawl pressures elsewhere in the region.

ACTIVITIES AND FORM

The activities of commerce and everyday life have a major influence over urban form. Businesses locate where access to customers, suppliers, and employees is optimized while residential households seek locations where travel to and from work, shop, recreation, etc., is the quickest and easiest. Without intentional design interventions, these activities occur over space, forcing trade-offs in location and travel decisions. The resulting “sprawling” patterns are recognizable in nearly every American metro area. In contrast, this alternative model focuses on how to optimally orchestrate those decisions within an integrated planning process. It begins by articulating the bottom-up dynamics responsible for urban form, then builds responsive conceptual design models at differing scales that can guide development.

TRADED CLUSTER ECONOMIC ACTIVITY PATTERNS AND FORM

National and global economic activities drive the demand for metropolitan development and sustainability, while traded cluster industries are the primary drivers of those demands. They generate income by selling goods and services to other regions or “importing” customers from other regions. Tourism, for example, attracts people from around the world who spend money in Central Florida. Traded cluster agglomerations occur as similar businesses work to provide the best access to customers, suppliers, and employees. As a result, even though they are competitors, Universal Studios and Disney World for example, mutually benefit from proximity to each other.

With few exceptions, traded industries locate along major inter-regional transportation facilities to optimize access to markets. Employment data from Central Florida confirm this relationship, with nearly 85% of all traded cluster jobs located within 3 miles of an expressway. The strong relationship between the inter-regional transportation network and economic development is the primary reason for the designation and development of Florida’s Strategic Intermodal System (SIS) by the Florida Department of Transportation (FDOT). While inter-regional transportation facilities are a precondition for traded cluster economic activity, demand drives where traded cluster businesses will locate. Demand is influenced by several factors, such as the unique catalyzing location decisions made by the federal government (Kennedy Space Center) or big business (Disney World). More often, demand is generated by the magnitude of traded cluster activity in metropolitan areas close to one another. The Central Florida and Tampa Bay regions are stretching toward each other along the I-4 corridor, and much of the development is in the form of distribution and warehousing companies that utilize access to both metro areas. The distance between Central and South Florida has inhibited economic development along Florida's Turnpike.

Because of the benefits of agglomeration (proximity among similar industries), differing traded cluster industries are organized in differing quadrants of Central Florida. The agglomeration area for hospitality and tourism is highest in the southwest quadrant of the region (Figure 4.2) because of Disney World, Universal Studios, Sea World, and other attractions. The agglomeration area for business and financial services is highest around downtown Orlando (Figure 4-2). The transportation and logistics agglomeration area surrounds Orlando International Airport and stretches along the I-4 corridor (Figure 4-2). Aerospace, communications, and information technology industry (collectively referred to as the high-tech area) is located in the southeast quadrant of the Orlando metro area around UCF and also around Melbourne and Cocoa. (Figure 4-2).

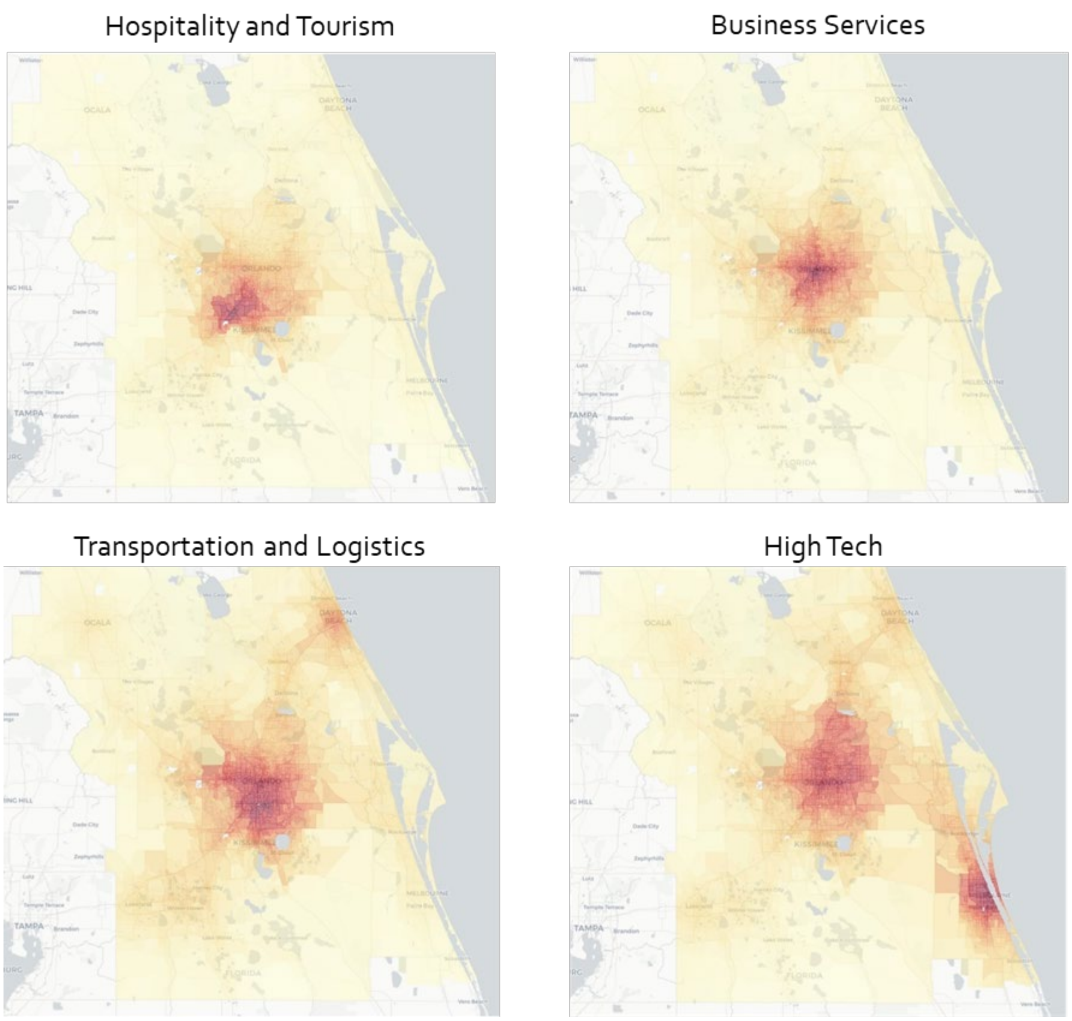


Figure 4-2 – Central Florida Traded Cluster Agglomeration Access Areas (Maps by Renaissance Planning)

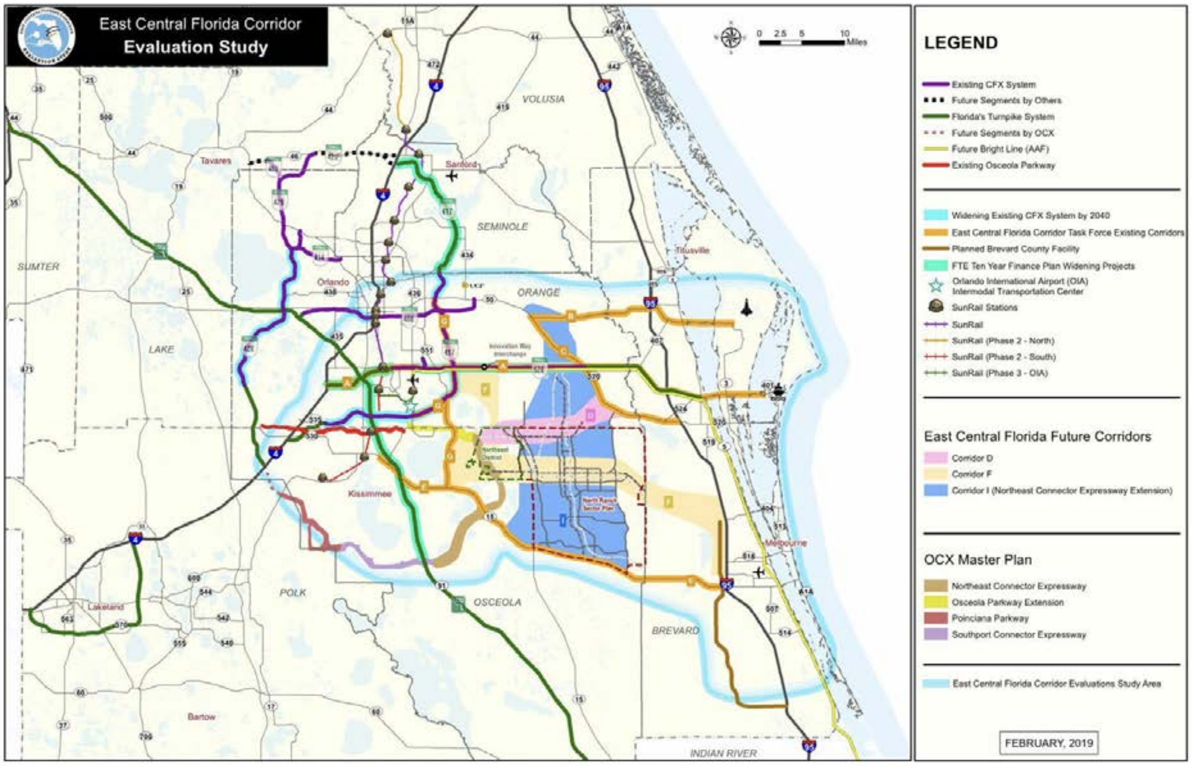


Figure 4-3 - Regional Transportation Network Projects and Studies (Maps by Renaissance Planning)

Agglomeration creates demand for high-tech business sites in the southeast quadrant of the region, as evidenced by the rapid development of Medical City. The demand prompted the formation of the East Central Florida Governor's Task Force in November 2013. The task force, which included 13 members representing public, private, and civic organizations, was charged with "evaluating and developing consensus recommendations on future transportation corridors serving established and emerging economic activity centers in portions of Brevard, Orange, and Osceola Counties." Task Force recommendations have since been incorporated into the Central Florida Expressway (CFX) Master Plan and FDOT's East Central Florida Corridor Evaluation Study (Figure 4-3).

1. Future Conditions Data Report, FDOT, March 2020
2. East Central Florida Corridor Task Force presentation

DAILY ACCESSIBILITY PATTERNS AND FORM

The Planning Area's inter-regional transportation network, coupled with the demands of high-tech industries, make it an attractive place for high-tech business locations. As high-tech businesses move into or adjacent to the planning area, they will create demand for new neighborhoods and local retail and services. The daily accessibility needs of those new residents will influence the form of growth. The planning challenge is to ensure that growth is compact and respectful of natural systems.

Consistent with long-standing national trends, Central Floridians on average commute 20 minutes and 8 miles to work each day. The 40 minutes spent traveling to and from work makes up the majority of a person's daily travel time budget (which is around 60 minutes a day). Most would prefer to live close to work but extenuating factors influence the decision, most importantly higher housing costs near job centers that prompt many to trade off the cost of housing with longer commute times – the "drive-till-you-qualify" phenomenon. The longer commute distances create pressure to build higher-speed roads, a pressure that has influenced urban development patterns and networks since the 1970s and contributes to urban sprawl.

Daily accessibility patterns create spatially important commute sheds, areas where high percentages of work trips both begin and end. A commute shed can extend over 10 to 20 square miles depending on its location within the metropolitan area. Network design and development intensities within the commute shed also influence its size, shape, and functionality. Interconnected networks improve the functionality of commute sheds (trips are completed within a reasonable amount of time). Higher-intensity development patterns increase the influence of proximity on access and within a commute shed.

New commute sheds form as the urban footprint grows. For example, when new neighborhoods are built beyond 8 miles from the Central Business District and travel times to work put strains on outlying commuters, businesses begin locating in new centers along inter-regional routes radiating from the CBD. Maitland Center and Altamonte Springs exemplify this pattern. The new job centers create new commute sheds. In most regions, including the Orlando metropolitan area, a beltway is constructed to connect new centers. The new outlying commute sheds will rely more on speed for access than the original, centrally located commute shed. Nevertheless, the functionality of those commute sheds can be optimized with interconnected networks and organized development patterns.

3. Replica travel data collected in May 2021

DESIGN MODELS

The relationships between traded cluster economic, daily accessibility activity patterns and urban form guided the development of this Sector Plan. Activity patterns were translated into nested design models focusing on differing scales. This macroscopic (regional) model considers how both economic and accessibility patterns influence the locations of a metropolitan area's major centers and corridors and the development between the centers and corridor configurations (known as "wedges.") Its major corridors surround an inter-regional transportation network where traded cluster businesses prefer to locate. Centers along those corridors are the focal points for the commute sheds detailed in the mesoscopic design model. Place types which provide more localized design guidance at the microscopic, or local, level, also provide a range of urban experiences for various residential and job markets.

MACROSCOPIC DESIGN MODEL (THE METROPOLITAN AREA)

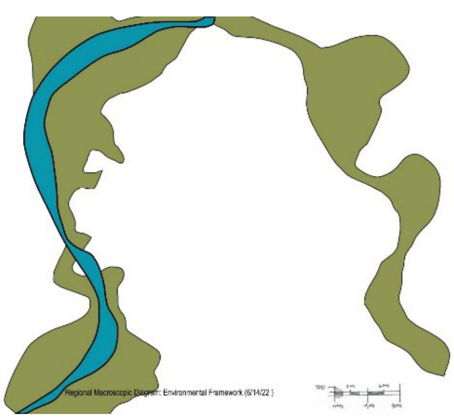
Figure 4-4 presents a schematic of the macroscopic design model. Its structure reflects the economic and daily accessibility patterns described above. The model has three levels, the first being protection of natural habitats, the edges of which serve as urban growth boundaries. Level two is the transportation network, which includes a hierarchy of streets and transit. At the highest level in the network are inter-regional transportation corridors (metropolitan corridors), outlined in blue, that provide high-speed access both within the metropolitan area and to other regions and markets. Most of the traded cluster businesses and jobs will be located along the corridors. Premium transit and TOD support high development densities and maintain high-speed travel along those corridors. The metropolitan corridors include an expressway, a major arterial, and premium transit to ensure adequate capacity for high intensity development. The intensity of the interconnected streets network is highest in the area in and around the Central Business District (downtown) and in centers spaced throughout the metropolitan area. Level three presents place types, all revolving around the Central Business District located at the crossing of the inter-regional metropolitan corridors. Satellite employment centers are located approximately 8 miles from the CBD along the inter-regional corridors. Smaller centers are spaced along radial routes.

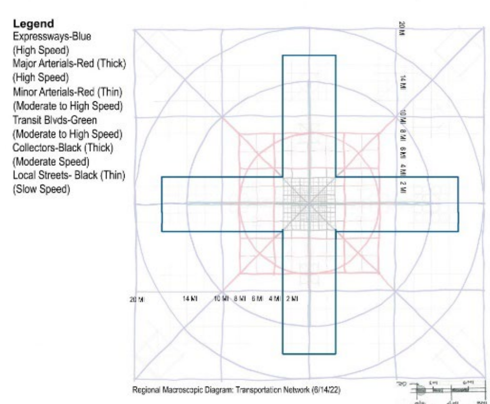
MESOSCOPIC DESIGN MODEL (COMMUTE SHEDS)

A hierarchy of overlapping commute sheds knits together the metropolitan area (Figure 4-5). Commute sheds form as households locate for the most favorable daily access to work. Because of the length of work trips (around 8 miles on average), commute sheds cover a relatively large geographic area (from 8 to 16 square miles). Smaller travel sheds enhancing household access to non-work destinations (shops, schools, medical facilities, parks, etc.) form within and among commute sheds.

Commute sheds are organized by neighborhoods and locally oriented retail and services, surrounding traded industry jobs clustered along inter-regional corridors. The high percentage of travel between the neighborhoods and jobs creates spatial cohesion in each commute shed, but trips destined to other commute sheds create overlaps, particularly among two adjacent sheds. New commute sheds form when the metropolitan urban footprint extends beyond a reasonable travel time to jobs within the commute shed (5 to 8 miles). In Central Florida, as in many other modern metropolitan areas in the U.S., new centers are built when new neighborhoods are built over 8 miles from the CBD. Maitland Center and Altamonte are examples of new centers along the I-4 corridor – the new centers create new commute sheds, providing timely access to those living beyond a reasonable travel time to the CBD.

Differing combinations of proximity and speed are used to access destinations within commute sheds. The two are inversely related: Increasing proximity decreases distances between buildings, thereby reducing trip lengths. But as buildings get further apart, more speed is needed to complete trips in the same amount of time. Accessibility can be improved either by increasing proximity or increasing speed. The geographic extents of commute sheds vary by their locations within the metropolitan area (i.e., the commute sheds surrounding the CBD are relatively compact compared to others) and by the design and intensity of networks and development within the commute shed. Higher-intensity development can support the influence of proximity in commute sheds, resulting in more-compact urban form without sacrificing access.





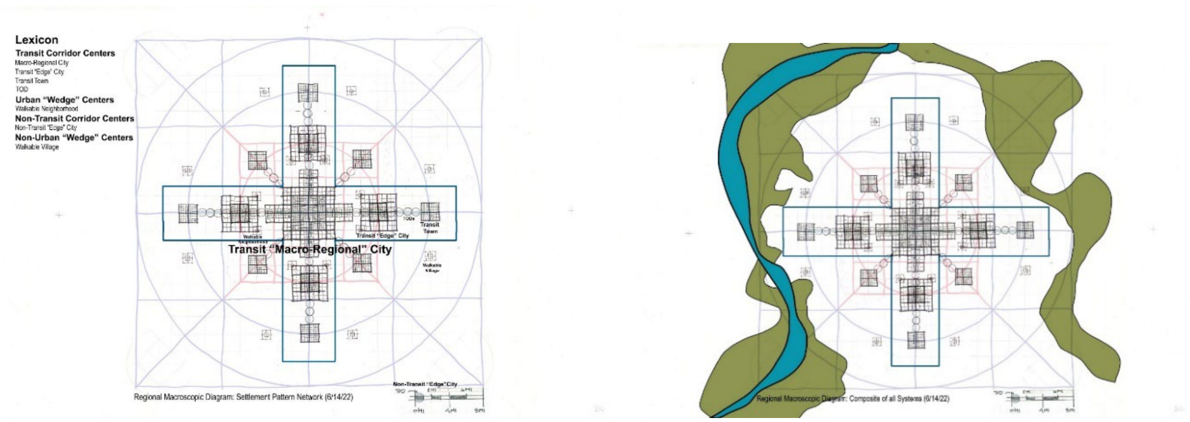


Figure 4-4 - Macroscopic Design Model (visualizations by Kathy Galvin)

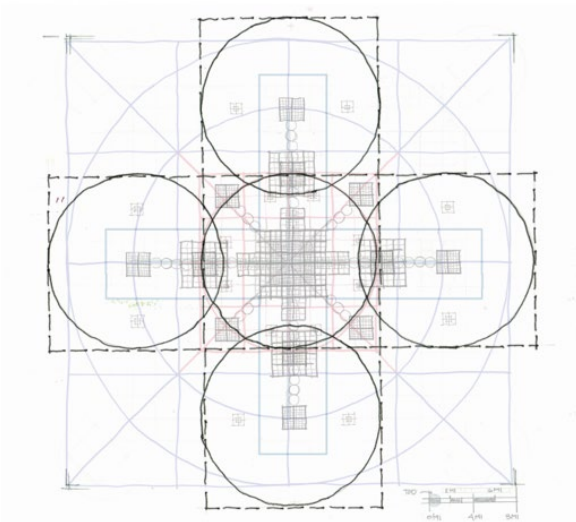


Figure 4-5 - Commute Shed Pattern and Structure (visualizations by Kathy Galvin)

MICROSCOPIC DESIGN MODELS (PLACE TYPES)

The microscopic model scales to finer geographic levels of detail, focusing on the community and neighborhood planning levels. The community level nests within commute sheds and covers approximately 2 to 4 square miles. Development is organized around community level centers (urban community centers in the urban corridors, community centers in the wedge areas). The neighborhood level nests within the community level, covering 1 to 2 square miles. Each area is centered on a neighborhood level center.

The microscopic models include an array of place types that provide design details for the differing contexts in the macroscopic (metropolitan) and mesoscopic (commute shed) models. The models focus on the design of sub-areas within the macroscopic model. They reflect the place types identified in Orange County's Vision 2050 initiative and provide details on network design and the size and orientation of buildings. The Transect is used to organize networks and buildings across the place type. Macro design models were developed into illustrative site plans for several key locations (Figure 4-6).

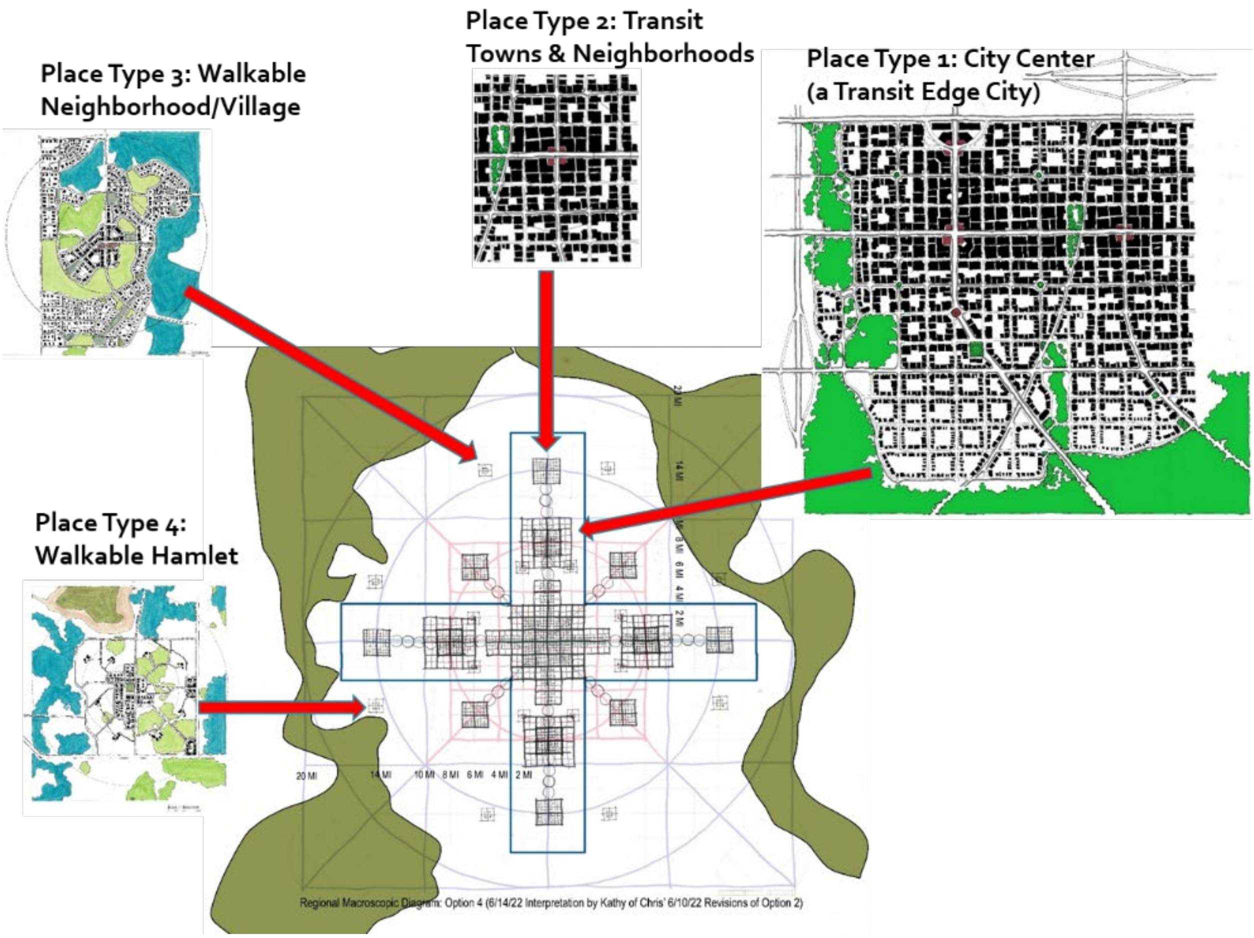


Figure 4-6 - Macroscopic Design and Place Types (visualizations by Kathy Galvin)

APPLYING THE MODEL in the REGIONAL CONTEXT

Figure 4-7 overlays the macroscopic model described above over the Orlando metropolitan area to illustrate emergent metropolitan form resulting from bottom-up and top-down forces. This pattern emerged because of the right combination of preconditions. Vacant land surrounded downtown Orlando in the 1950s, yet the area was crossed by inter-regional roads and rail lines. Traded cluster activity, initially citrus production followed by aerospace and hospitality, created the impetus for growth. Traded cluster and accessibility activity patterns (bottom-up forces) guided the development of networks and development. Early development had a compact form, but the singular focus on automobiles and speed beginning in the 1970s gave way to suburban networks and form. The suburban patterns continue today, with growth sprawling as appendages from the original compact core around downtown Orlando. Efforts such as Vision 2050 are now attempting to impose urban form and multimodal transportation networks on existing suburban areas, a daunting task because of the permanence of networks and private land ownership and a political resistance to change.

Figure 4-7 also illustrates how this model overlays the proposed Orange County Ranch Planning Area and the approved North Ranch Master Plan in Osceola County. As with Orlando in the 1950s, preconditions are right for growth in the area. Most of the land is used for agriculture, creating a blank canvas, but it is not in the “middle of nowhere” or at the “end of the line” – the property is crossed by inter-regional transportation facilities and is proximate to high-tech businesses.

The model illustrates how the planning area can become a distinguishable metropolitan area, not a sprawling appendage to Orlando, with compact urban centers and corridors and interconnected multimodal networks. Despite its uniqueness, the traded cluster jobs located in the area increase the economic diversity of the region. The environmental framework plan protects major ecosystems, including the Econlockhatchee and St. Johns River basins. The land preserved along the Econlockhatchee River ecosystem serves the dual purpose of maintaining regional ecological connectivity and distinguishing the two metropolitan areas. Commute patterns orient inward, not outward, to mitigate potential traffic impacts to the Orlando metropolitan area. Non-transportation infrastructure and services, independent of those in the Orlando metropolitan area, serve residents and businesses. Transportation, infrastructure, and services are sized to accommodate residents and businesses at densities above those in the existing Orlando metropolitan area, helping to ease urban sprawl pressures and impacts elsewhere in Central Florida.

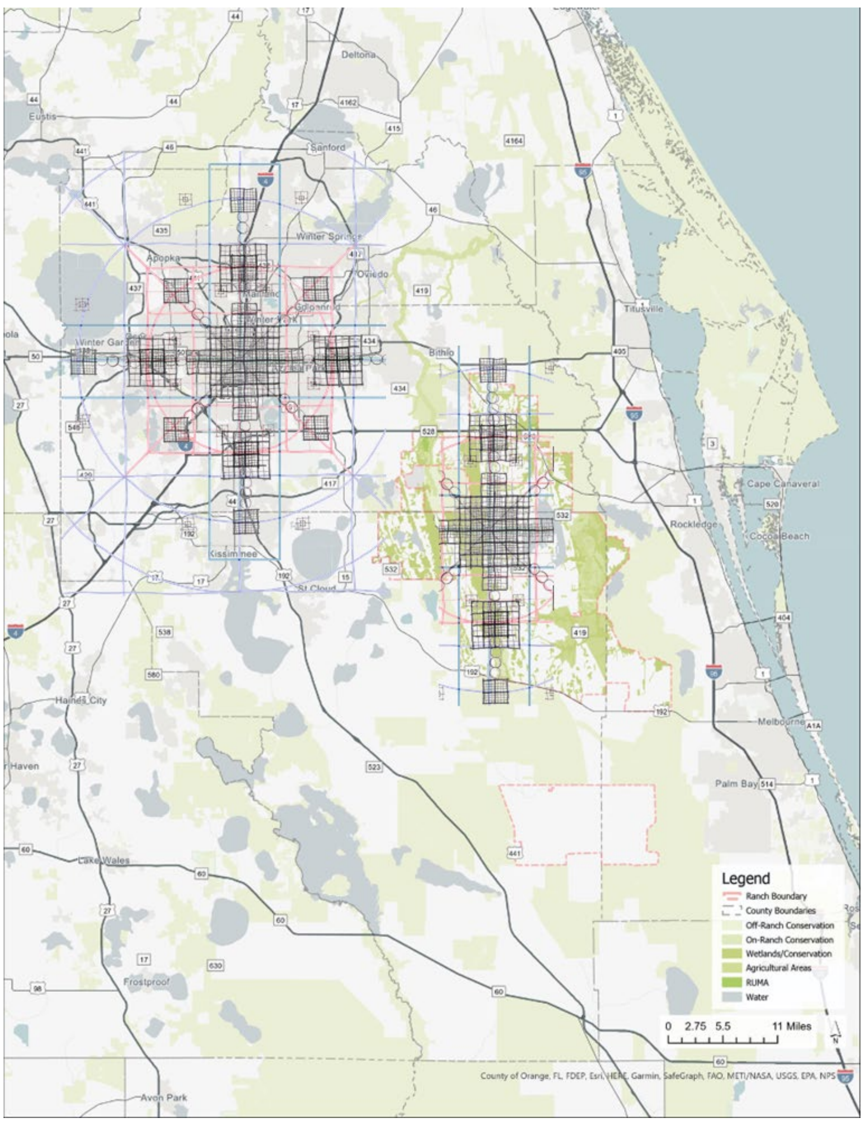


Figure 4-7 - Metropolitan Design Model Overlays in Central Florida (diagrams by Kathy Galvin)

FRAMEWORK MAP

The Framework Map (Figure 4-8) illustrates the key urban form feature of Central Florida's Planning Area Mixed Use District (MUD). The map is organized by higher-level centers, corridors, wedges, and commute sheds. The array of place types listed below are generally located within the larger structure.

The Framework Map was developed in layers, beginning with the environmental framework (Figure 4-9) designed to protect natural habitats of regional significance within the Planning Area and provide landscape and ecological connectivity across the region. The proposed transportation network (Figure 4-10) will transform existing inter-regional roads, such as SR 528, into multimodal corridors that form the macrolevel structure of urban corridors and wedges (Figure 4-11). Details of network design are provided in Chapter 5. Place types are organized within the macrolevel structure (Figure 4-12), with metropolitan and urban centers and traditional fabric neighborhoods placed in the urban corridors, and community and neighborhood centers and a mix of neighborhood types placed within the wedges in between centers and corridors. Place type details are provided below. Finally, this Orange County Plan is also aligned with the Osceola County North Ranch Master Plan that lies to the south. Figure 4-13 illustrates the full extent and organization of the two Master Plans.

MACROSCOPIC FORM

Figure 4-11 illustrates the macrolevel structure of the Planning Area MUD, depicting its centers, corridors, and wedges. Three multimodal corridors cross the planning area:

- East-west corridor enveloping SR 528 and the Brightline passenger rail line.
- North-south corridor including portions of SR 520 and the Corridor I expressway included in the CFX Master Plan.
- East-west corridor just north of the Orange/Osceola County line including the extension of the Osceola Parkway to SR 520.

Premium transit routes run parallel to the expressways on exclusive rights of way in each corridor. Transit stations spaced about 1 mile apart, on average, are the focal points for TOD within half-mile-diameter transit station areas. Station areas are part of differing center types along the corridors, ranging from metropolitan to urban centers. The premium transit alignments are spaced from 1 to 2 miles from expressways to protect half-mile pedestrian sheds around stations. Arterials are located around 1 mile to the opposite side of the premium transit. Highway-oriented retail and services are located at expressway interchanges and around major arterial intersections. High-intensity traditional fabric neighborhoods stretch between the centers on street grids that maintain connectivity along the length of the corridor.

The plan's Central Business District, referred to as the city center, is a metropolitan center (regional center in Vision 2050) located at the intersection of SR 528 and Corridor I corridors. It is envisioned to become jobs-oriented, with the highest development intensities in the MUD. The city center will be one of the few locations in Central Florida to have multimodal inter-regional access via expressways and a possible Brightline station.

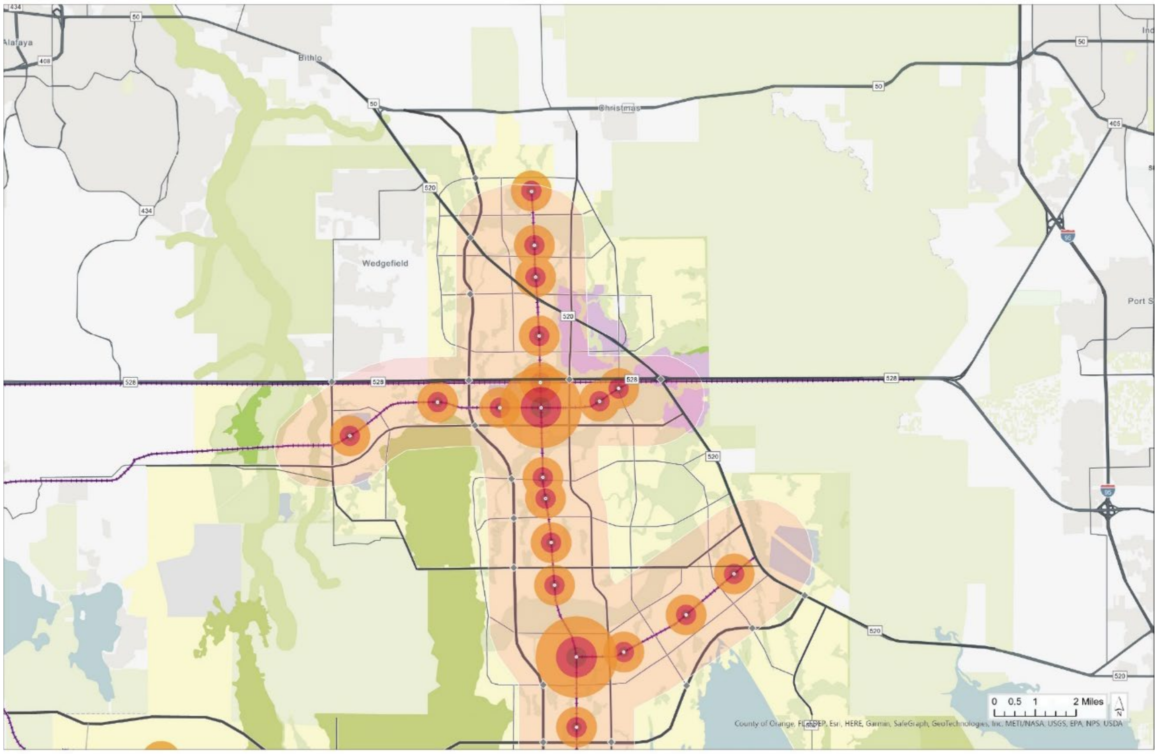


Figure 4-8: Framework Map (visualizations by Chase Kea)

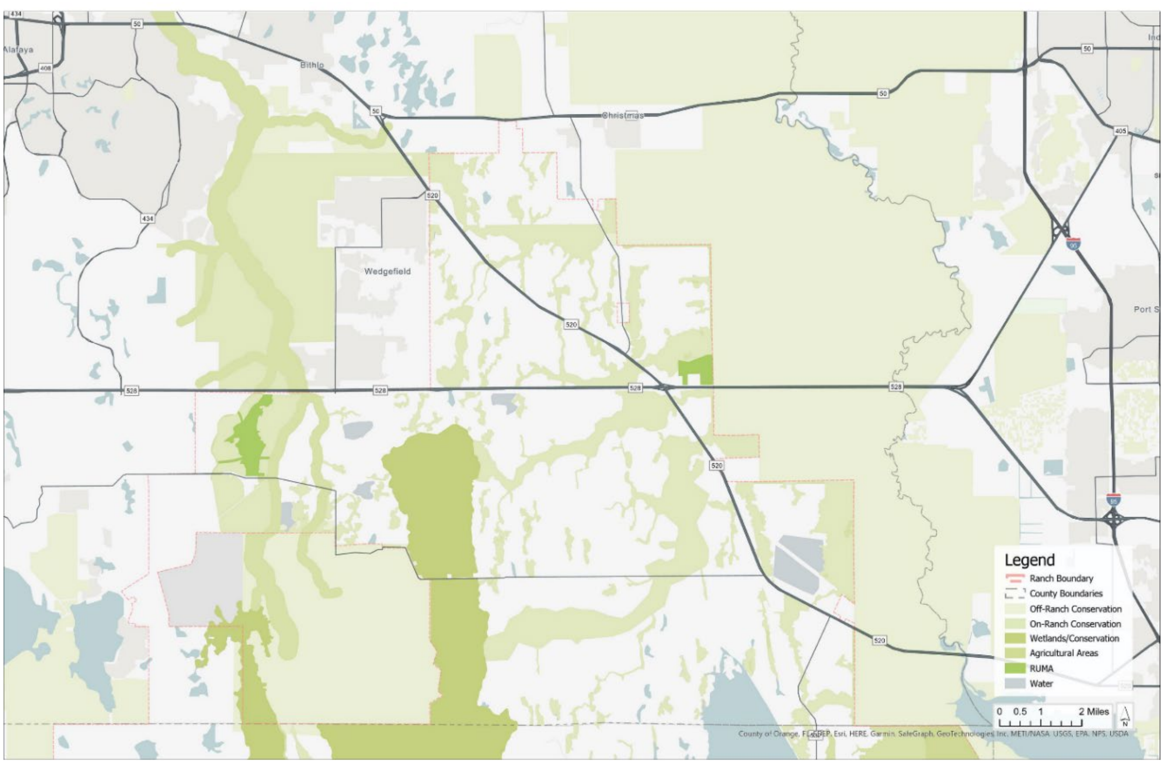


Figure 4-9 - Framework Map Environmental Layer (visualizations by Chase Kea)

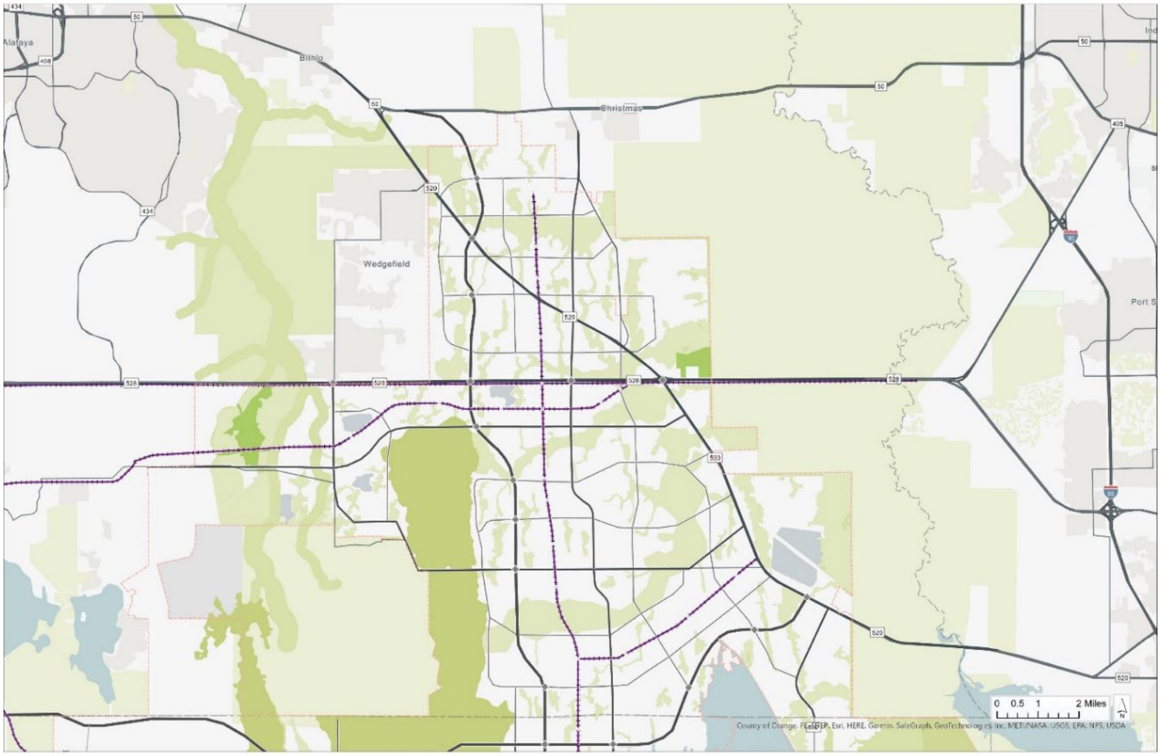


Figure 4-10 - Framework Map Transportation Network (visualizations by Chase Kea)

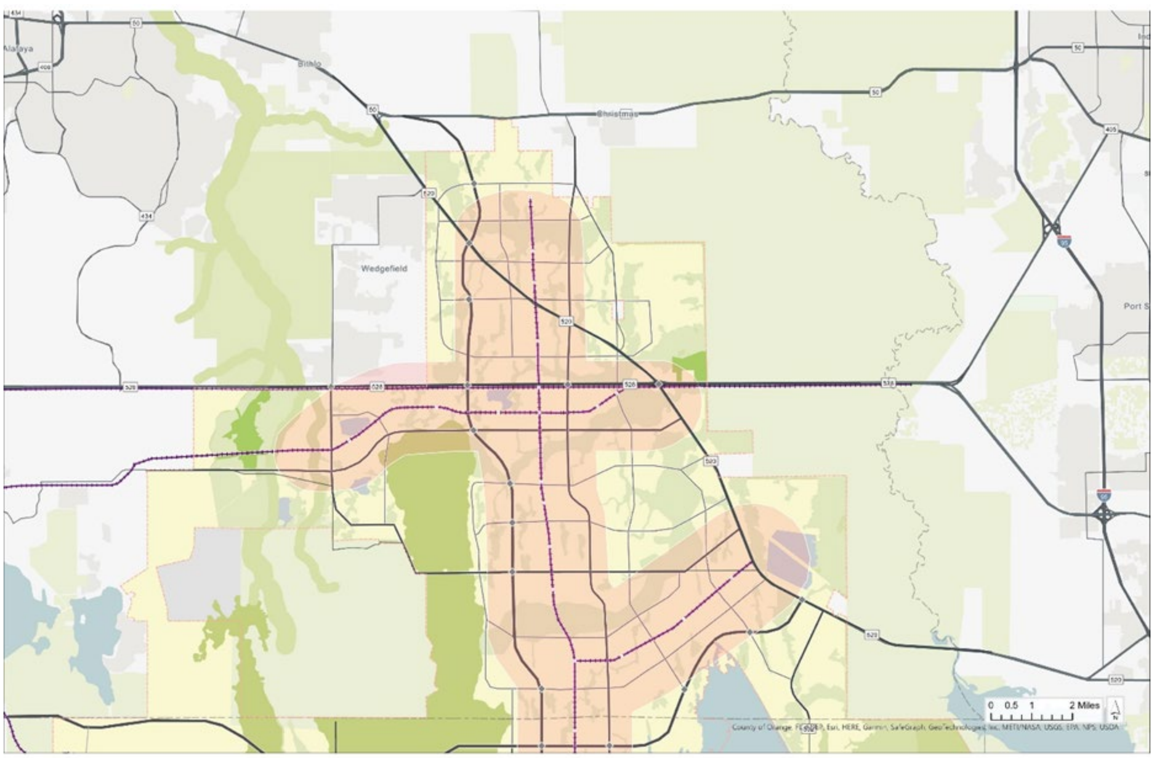


Figure 4-11 - Framework Map Urban Corridors and Wedges (visualizations by Chase Kea)

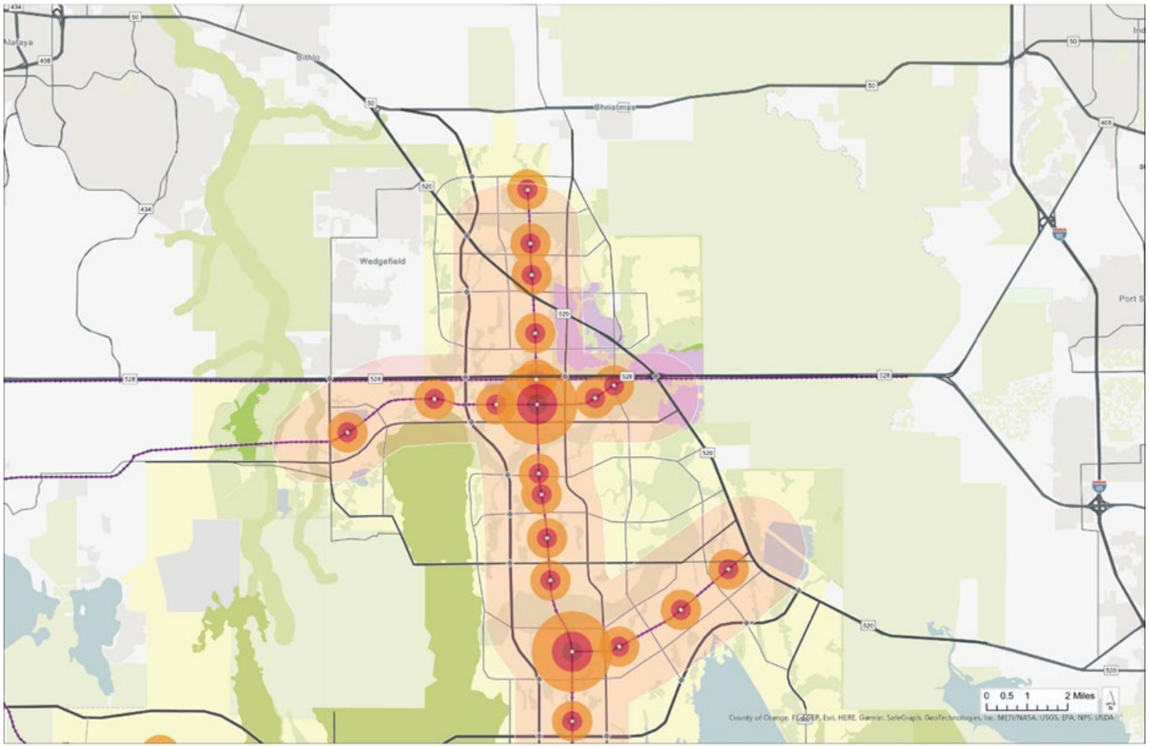


Figure 4-12 - Framework Map Place Types (visualizations by Chase Kea)

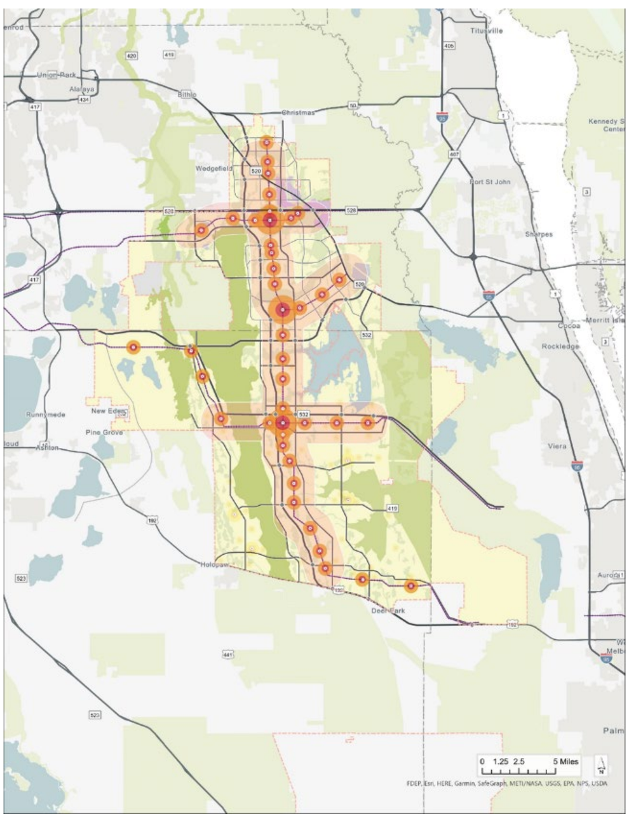


Figure 4-13 – Orange County & North Ranch (Osceola County) Master Plans (visualizations by Chase Kea)

A second metropolitan (regional) center is located at the intersection of the Osceola Parkway extension and Corridor I. It is also envisioned to be jobs-rich but will not have the same overall intensity as the city centers. An employment-oriented special district will be located along SR 520 north of SR 528. It is designed for a mix of lower-intensity research manufacturing and distribution businesses. Lower-intensity residentially oriented neighborhoods, clustered around community and neighborhood centers, will develop in the wedge areas lying outside the major centers and corridors, connected by a grid of streets and multiuse trails. Neighborhood networks will converge on the centers, each having a mix of retail, service, recreational, and civic uses. Details for the wedge place types are provided below.

MESOSCOPIC ORGANIZATION (COMMUTE SHEDS)

The Framework Plan is divided into three commute sheds (Figure 4-11). The first extends from the city center north to the environmental corridor about 4 miles north of SR 528, 4 miles south to the existing water pipeline road, and east and west to the edges of the MUD. The second commute shed lies south of the first, and the third lies to the north.

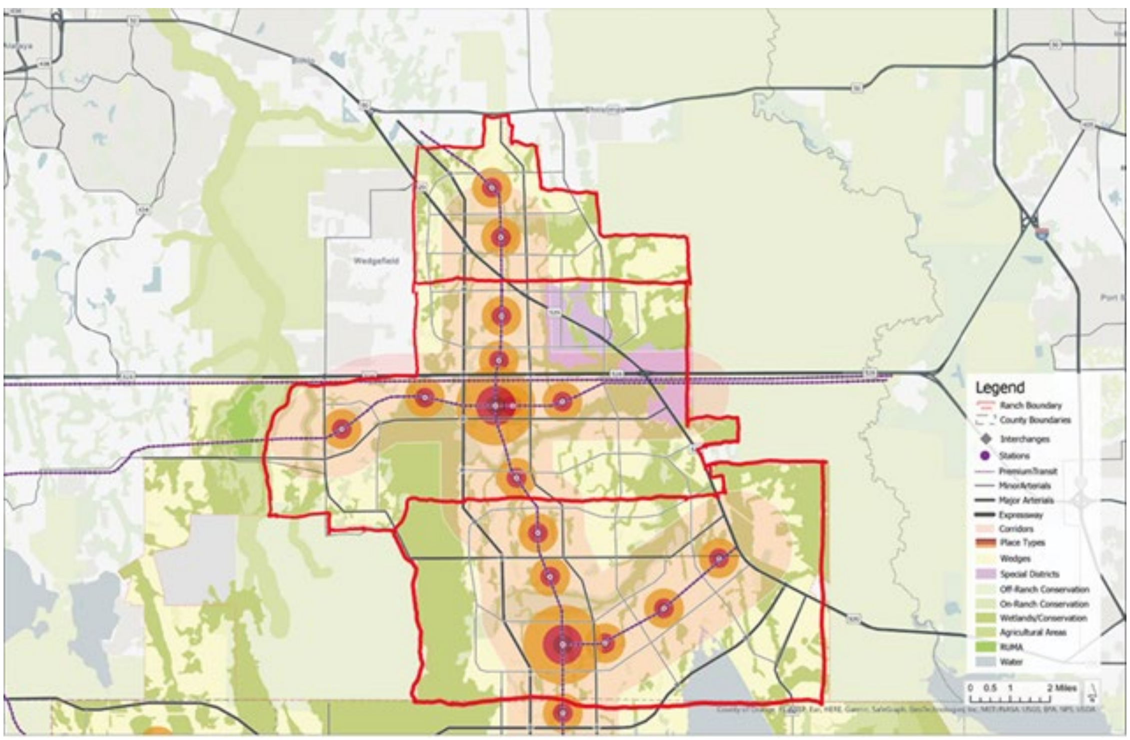


Figure 4-11 – Commute Sheds (visualizations by Chase Kea)

PLACE TYPES and CENTERS

METROPOLITAN CENTER

Metropolitan centers (defined as Regional Center in the Osceola County Vision Plan 2050) are located at the intersections of urban corridors and cover from 1 to 2 square miles. The key design features of metropolitan centers are illustrated in Figure 4-12. The center is flanked by an expressway on one side and a major arterial on the other, with premium transit operating on dedicated right of way in the middle. Development is oriented around premium transit stations, and metropolitan centers may have multiple stations. The highest development intensities (over 10 stories) occur within a quarter mile of transit stations. Densities drop in the second quarter-mile ring (four to 10 stories) surrounding the station, and even further beyond a half-mile. Interconnected street grids extend throughout, with blocks averaging 500 feet in each direction. The streets are designed to promote walking and biking.

Because of their inter-regional access, metropolitan centers will be the target locations for traded cluster businesses. They will include both Class A and Class B office space and will include high-rise residential buildings. Street-level entertainment and retail will occur throughout to promote street activity. Metropolitan centers will be the primary locations for regionally oriented civic uses, such as theaters and museums. They could include urban college campuses.

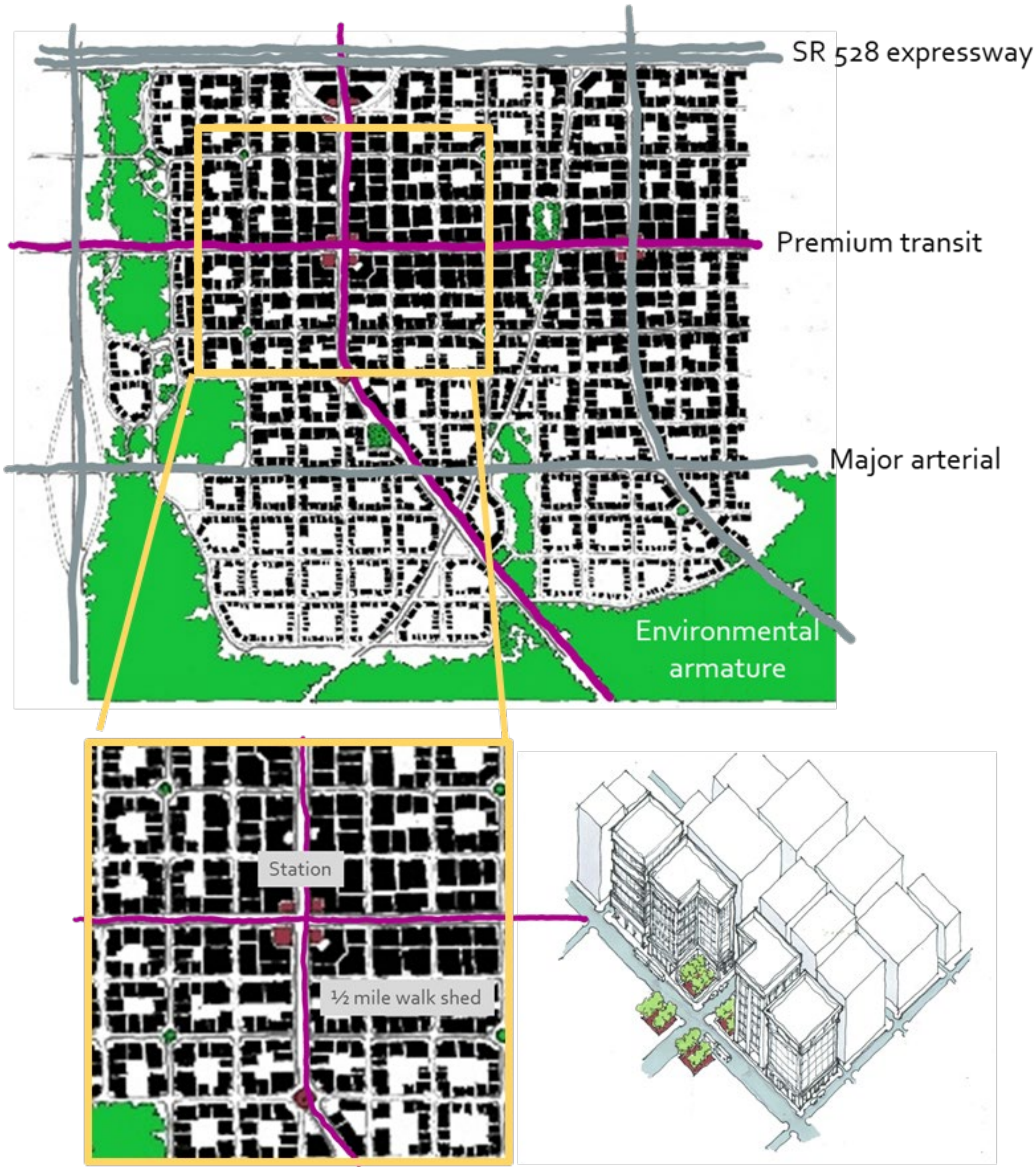


Figure 4-12. Metropolitan Center Design Features (visualizations by Kathy Galvin)

URBAN COMMUNITY CENTER

Urban community centers are located between the metropolitan centers along the urban corridors. They will be organized as transit-oriented development (TOD), like the metropolitan centers, but will have lower overall intensities (4 to 6 stories) and a higher residential mix. Development will orient around premium transit stations, with highest intensities at the premium transit station, and lower intensities in the second quarter-mile ring. The mix of residential buildings will increase with distance from the stations. The centers are intended to provide "everyday" retail, services, and entertainment (i.e., grocery stores, day care, small restaurants, etc.) for residents within the center and in adjacent neighborhoods. Urban centers will have a tight street grid, blocks of no more than 500 feet in length and width. Street grids will extend beyond the center into adjacent neighborhoods to maintain connectivity. Streets will be designed for biking and pedestrian comfort and safety. Street environments and uses within the first quarter mile ring will promote activity. Urban centers will have a mix of parks and open spaces, with smaller places near the stations and larger recreational areas near the edges.

COMMUNITY CENTER

Community centers will be destination focal points for neighborhoods in the wedge areas lying outside urban corridors. They will be organized as half-mile pedestrian sheds, with the highest development intensities (2- to 4-story buildings) at the center, gradually dropping toward the adjacent neighborhoods. Like urban community centers, they are intended to provide "everyday" retail, services, and entertainment (i.e., grocery stores, day care, restaurants, etc.) for residents within the center and in adjacent neighborhoods. Community centers will have lower development intensities than their urban counterparts. They will be in a quadrant adjacent to a major street intersection, with the focal point, or main street, at least a quarter mile from major streets to protect the pedestrian orientation and flow of the center. They will also be designed to support low-intensity transit and shuttle service and have street grids with blocks no larger than 500 feet in length and width. The street grids will extend into adjacent neighborhoods to provide easy access. They will have a variety of parks, open spaces, and recreational areas.

NEIGHBORHOOD CENTER

Centers are intended to be focal points, destinations for surrounding neighborhoods. Most will be vibrant and active places and designed for commerce and exchange. Neighborhood centers are intended to be the heart of the community, a place where residents and visitors are encouraged to congregate. Neighborhood centers will have at least one outdoor public space for this purpose, designed for pedestrians. Centers will be within a 5- to 10-minute walking distance of many residents, although they need not be in the geographical center of the neighborhood. Centers will vary in size, use, and intensity depending on the size and density of the surrounding residential uses.

Neighborhoods create a different context, one that fosters stability, safety, and sense of community. They are typically organized by half-mile-radius pedestrian walksheds, with nearby neighborhood centers providing a local place to gather. All neighborhoods are anticipated to be within a range of 800 to 1,200 units. Higher-density, traditional fabric neighborhoods will have a minimum of eight dwelling units per acre and will be located within urban corridors adjacent to metropolitan and urban community centers. Suburban mixed fabric neighborhoods, with a density of five dwelling units per acre, are in the wedge areas, adjacent to urban corridors and major roads. Lower-density suburban fabric neighborhoods will lie between suburban mixed fabric neighborhoods and the edges of the Planning Area.

Neighborhoods allow for a variety of home types, from single-family on large lots to townhomes and apartments. A 2- to 4-mile framework of major and minor arterials, thoroughfares, and boulevards will provide access into major centers and interconnect neighborhoods. Networks of local streets will provide access to smaller centers and interconnect adjacent neighborhoods. The network will include streets for cars, small-scale transit vehicles and shuttles, and multiuse walking and biking paths.

FRAMEWORK MAP AND PLACE TYPES (visualizations by Chase Kea)

Figures 4-13 through 4-16 illustrate the relationships between the generalized form presented by the Framework Map and the more detailed design features presented in this section. Figure 4-13 presents the location of the city center, a metropolitan center place type, and the more detailed form of the center. Figure 4-14 illustrates the form of a TOD structured urban center located along a premium transit alignment and within an urban corridor. Figure 4-15 presents the form of a community center and a surrounding suburban mixed fabric neighborhood located in a wedge area of the Framework Map. Figure 4-16 presents conservation-oriented form of a suburban framework place type.

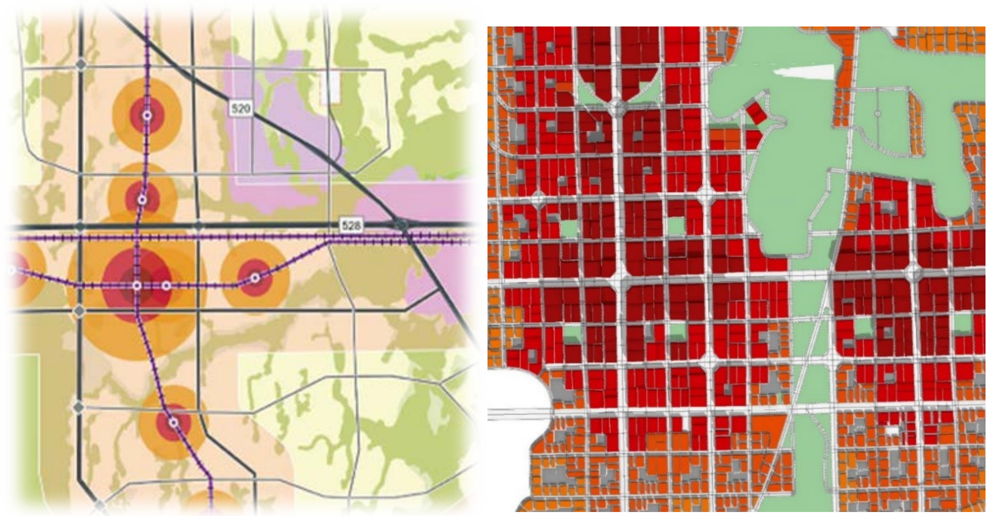


Figure 4-13 - Metropolitan Center Form (computer generated visualizations by Chase Kea)

Figure 4-14 - Urban Community Center Form -TOD (computer generated visualizations by Chase Kea)

Figure 4-15 - Suburban Walkable Neighborhood (computer generated visualizations by Chase Kea)

Figure 4-16 - Suburban Conservation/Walkable Hamlet (computer generated visualizations by Chase Kea)

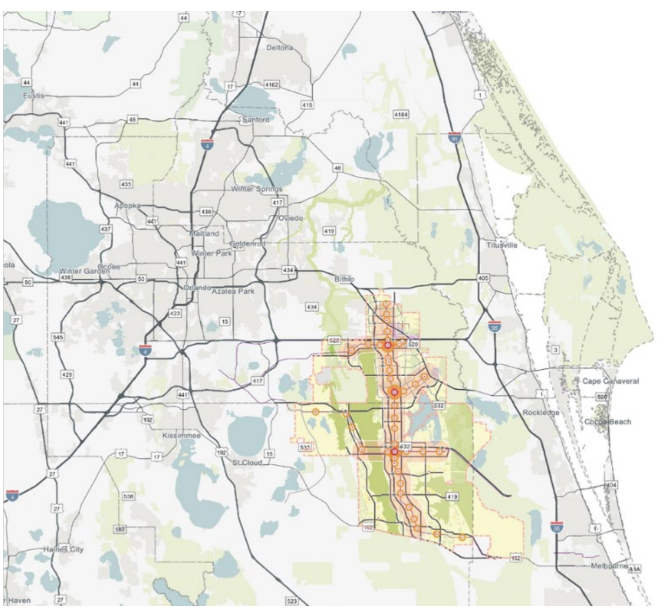


Figure 4-17 – Master Plans in Regional Context (computer generated visualizations by Chase Kea)

6. Conclusion: A Possible Antidote to Sprawling Development in the United States & the United Kingdom (by Kathy Galvin)

Central Florida has provided us with a regional case study on how to grow sustainably and practically in the face of intense population growth pressure with increasingly constrained land resources due to climate change. Despite this region's desire for a better balance between its natural and urban systems, urban sprawl, and the highway construction it necessitates, continue unabated, impacting natural systems and fragmenting communities. Planning practices, rules, and regulations in turn reflect a prevailing reductionist perspective where complex systems are only understood and guided by reducing them into individual parts and then optimizing each part. This siloed approach gave us failed planning practices in the past such as "urban renewal" in the 1960's and will continue to throw systems out of balance in the future, ultimately impacting the overall health of the planet and the human community.

A holistic systems-level perspective in contrast, strives to find the right balance among subsystems by prioritizing the relationships among system elements and then using those relationships to guide public policy and decision-making. Ultimately, a more holistic planning approach leverages these relationships and activity patterns to form a functional, livable compact urban metropolitan area that synergizes a region's economic goals and takes advantage of existing inter-regional transportation ports and facilities either on or adjacent to the property. It enhances existing transportation networks with multimodal facilities that can accommodate higher development intensities without compromising quality of life, which in turn can ease urban sprawl pressures elsewhere in the region.

This Holistic Model in short, can support economic development and accommodate the region's growth while steadfastly protecting its natural systems and providing human habitats with a "sense of place." Notably, this Model is applicable to infill and redevelopment sites at station areas (known as gray-field sites) along corridors determined to be ripe for premium transit. In closing, because this Model strives for an urban ecology in balance internally and externally, it aligns with the ethos of Poundbury itself.

End of the Ecology of Urban Centers and Corridors- DRAFT (10/2/23)

The Ecology of Urban Centers and Corridors: Access and Proximity

DRAFT (10/2/23)

Written by Kathy Galvin of Galvin Architects & Chris Sinclair of Renaissance Planning (as noted) with visualizations by Kathy Galvin (hand drawings) and Chase Kea of Renaissance (computer generated.)

Abstract Summary (Kathy Galvin)

Definition of Ecology- *the spatial and temporal interrelationships between organisms and their environments inclusive of the physical, chemical, and biotic factors (such as climate, soil, and living things) that determine their form and survival.* (Merriam-Webster, with modifications)

Definition of Urban Ecology- *the spatial and temporal interrelationships between organisms in urban environments as well as the overall ecological sustainability of cities.* (Nature Portfolio-with modifications) *Urban ecology reveals the systemic interaction and relationship between environmental frameworks, transportation networks and economic systems that shape our built environment from the scale of the region to the scale of the municipality down to the scale of the block.*

Metropolitan areas in America and the Western World have recognizable and similar development patterns, inclusive of corridors and a hierarchy of centers. Unlike their European counterparts however, most metropolitan corridors in the United States are engineered for high-speed inter-regional and job automobile access. The negative impacts of this auto-centricity (i.e., environmental to human health impacts) are well-documented, and efforts to build more sustainable models of urban development are neither rare nor new. Then why do we continue to sprawl at the expense of our agricultural and forested lands? This exploration will first touch upon what's at stake if we fail to change course and ignore the legacy of past efforts to replace sprawl with other more sustainable models of urban growth. It will then focus on a new growth model built upon time-tested principles of high access and proximity within an urban ecology of new walk-able centers (both on greenfield sites like Poundbury and Deseret Ranch, FL and gray field sites like Jacksonville, FL) linked by a network of high efficiency transit corridors.

1. Rationale for Change (Kathy Galvin)

How we move, shapes how and where we live and what we value dictates what we consume and throw away. REDUCE, REUSE, RECYCLE no longer just applies to the "stuff" we accumulate but the land we squander. The time for what Al Gore called a "Global Marshall Plan "(1) for the planet is long overdue; one that solves our systemic economic, social, and environmental problems at once, in all their mind-numbing complexity. That complexity is best summed up by the word ecology. (2) Urban ecology reveals the systemic interaction and relationship between environmental frameworks, transportation networks and economic systems that shape our built environment from the scale of the region to the municipality to the block. That's where the Art (3) and Technique (4) of Placemaking (5) come in.

Executing any art form (or science) requires technique. If the Art of Placemaking is the way we shape public space to celebrate our physical, cultural, and social identities, then the Technique of Placemaking is Urban Design. (6) As an integrative and holistic discipline, Urban Design establishes the frameworks and procedures required to shape development into the urban forms of neighborhoods, cities, and towns. It does so by respecting precedent and operating at multiple geographic scales across both natural and urban ecological systems.

1. Earth in the Balance: Ecology and the Human Spirit by Al Gore, 1992
2. Ecology-a branch of science concerned with the interrelationship of organisms and their environments: the totality or pattern of relations between organisms and their environment. (Merriam-Webster Dictionary)
3. Art- The quality, production, expression of what is beautiful, appealing, more than ordinary significance. (Dictionary.com)
4. Technique - The basic method for making or doing something, such as an artistic work or scientific procedure; Skill or command in a particular activity. (Free Dictionary)
5. Placemaking - The process by which we shape public space to maximize shared value and celebrate the physical, cultural, and social identities that use and change them. (Project for Public Spaces website)
6. Urban Design -The process of patterning urban forms into neighborhoods, cities, towns, or other municipalities. (Law Insider Dictionary) The collaborative and multi-disciplinary art of making places and the act of establishing frameworks and procedures to shape development outcomes over time. (Urban Design Group website)

When we fail to see this connection between the way we move and the way we shape the built environment, we disrupt the balance between our natural and urban ecologies with serious consequences to human and planetary health and safety. Nor do these impacts fall evenly across geography and race. Fatality rates especially among pedestrians and cyclists due to unsafe motorist behaviors have hit a 20-year high. (1) Even though non-whites were 35% of the population in 2016, they represented 46 % of pedestrian deaths. (2) The most dangerous streets occur in the southern half of United State where "low-density sprawling land uses and high-speed, multi-lane arterial highways" became the norm after 1960. (3) Coincidently this region has seen the greatest declines in physical activity and increases in metabolic disease like diabetes and childhood obesity over the last 40+ years. (4) The mortality rate for African Americans with diabetes in Virginia is twice that of Whites (5) Finally, 27% of greenhouse gas emissions which are directly tied to climate change and costly extreme weather patterns are now caused by the transportation sector. That's more than electric power plants. (6)

1. NHTSA website, 3/2/22 and the National Highway Traffic Safety Administration data released on 1/9/23.
2. Dangerous by Design, 2016 by the AARP, ASLA and Nelson Nygaard, 2016
3. Dangerous by Design, 2022, Smart Growth America.
4. State of Obesity, Robert Wood Johnson Foundation and CDC "Adult Obesity Prevalence Maps" website, 2022.
5. MAPP2Health, District 10 , December 2016
6. Environmental Protection Agency EPA website (2020.)

When we fail to see this connection between the way we move and the way we shape the built environment, we also consign our urban centers to what economists refer to as an "doom-loop of decline" in the wake of the COVID 19 pandemic and subsequent changes to the way we shop, work, and play. This phenomenon appears particularly pronounced in the US and the UK Large retailers in the U.K. like Marks and Spencer for instance have disappeared from city centers, along with overextended restaurant chains, bank and even pubs. (1) This post pandemic trend has been exacerbated by the "sprawling" low density suburbs and lack of high efficiency public transit not just characteristic of American cities, but also of UK cities relative to the continent. In fact, there appears to be a correlation between productivity and greater access as measured by the availability of affordable housing and public transportation. According to the Financial Times, 40 percent of Britain's population in cities can reach the city center by public transport in 30 minutes, whereas 67 percent in mainland European cities can. Narrowing the productivity gap between the UK and the Europe will require investments in public transportation, repopulating city centers, (which like American cities emptied out into the suburbs during the 20th century) and designing & building urban environments that attract and retain talent. In short, "Better cities lead to greater retention of skills." (2)

1. "British towns are stuck in a doom-loop of decline," by Ben Marlow for The Telegraph, 8/11/2023 https://www.msn.com/en-us/news/technology/british-towns-are-stuck-in-a-doom-loop-of-decline/ar-AA1f8eZp?ocid=socialshare&cvid=5ceb66fa12ef4fd490786d7c4586cd84&ei=168
2. "How sprawling suburbs are stunting productivity in UK cities," by Peter Foster for the Urban Planning Division of the Financial Times, 1/20/22, https://www.ft.com/content/a45e028d-4b81-4bef-9546-970838ab963a

On the other hand, when we do meet the ecological needs of both nature and humanity and respect the role art (1) and culture (2) play in shaping our worldview, we not only sustain the well-being of ourselves and our planet we share our communal values and “sense of place” across time and space. This is the rationale behind ***Placemaking.*** (3) The Art of Placemaking shapes space in ways that meet our everyday needs while celebrating our unique cultural and social identities. It enables the “***more coherent, and more whole”*** (4) urban forms of neighborhoods, cities, and towns instead of the single-purpose, isolated landscapes of subdivision, strip mall and cul de sac. Urban Design embodies the techniques required to achieve these desired results. Successful Placemaking therefore entails both engineering backed by data analysis and scientific methods, and art born out of the cultural and geographic context.

Urban places of varying size and scale practice the Art of Placemaking when they maintain the balance between natural and urban ecologies by incorporating sustainable modes of transportation, and principles of equitable development and inclusive community engagement. They are also distinguished by their mixed-use centers, variety of housing choice, and networks of interconnected streets that provide access to jobs, services, and amenities either on foot or efficient public transportation. They may also be distinguished by the health of their residents because the increased physical activity enabled by a community designed for active living is highly correlated with lower rates of heart disease, stroke, type 2 diabetes, and some cancers. (5)

1. Art- The quality, production, expression of what is beautiful, appealing, more than ordinary significance. (Dictionary.com)
2. Culture-The customary beliefs, social forms, and material traits of a racial, religious, or social group and its capacity for learning and transmitting knowledge to succeeding generations; the enlightenment acquired by intellectual and aesthetic training. (Merriam-Webster Dictionary)
3. Placemaking - The process by which we shape public space to maximize shared value and celebrate the physical, cultural, and social identities that use and change them. (Project for Public Spaces website)
4. Christopher Alexander in <u>The Timeless Way to Build.</u>
5. CDC “Vital Signs” Fact Sheet

2. Theories and Precedents of Places in Balance (Kathy Galvin)

a. Functional and spatial dynamics of metropolitan centers and corridors.
a. Role of urban centers and other place types along corridors.

Great urban places can be found in all cultures, sizes, countries, and eras, yet they all have one thing in common: they’re memorable, functional, and beloved by their residents. By virtue of their diversity, compactness, and capacity to innovate, they also play an ongoing and critical role in solving today’s chronic problems from pandemics to climate change, regardless of when they were built. For instance, Forest Hills Gardens in Queens, NY was developed in 1914 as a commuter rail suburb of New York City. (1) Milwaukee’s Westlawn Gardens Public Housing was redeveloped in 2013 into a walkable neighborhood with resident participation but no resident displacement. (2) The Pineapple Arts District and West Settlers Neighborhood in Delray Beach, FL were successfully revitalized twenty years ago in partnership with longstanding residents. (3) The old Naval Training Center in Orlando was redeveloped into Baldwin Park, a walkable neighborhood with its own mixed-use center beginning in 2006 (4.) These urban places continue to function as originally intended and inspire the development and redevelopment of new great urban places.

1. Frederick Law Olmstead Jr. in 1914
2. Torti Gallas & Partners in 2103
3. Delray Beach

4. Baldwin Park https://www.orlando.gov/Our-Government/Records-and-Documents/Plans-Studies/Baldwin-Park

Great theorists, observers, and practitioners shape the way we think about urban places. Walter Christaller's "Central Place Theory" which modeled the optimum economic relationships between urban places of different scales in Southern Germany in the 19th century, still informs regional economic planning today. (1) By the mid-20th century Jane Jacobs not only led the charge against urban renewal but identified the four key ingredients of a successful American city namely: a mixture of land uses, short walkable blocks, a variety of building types, and different kinds of people in large numbers. (2) In the late-20th century Peter Calthorpe identified the three co-occurring densities essential for viable transit-oriented development (TODs) within the context of a well-functioning transit system: housing, street intersection and employment. (3) Finally, in the 21st century Jan Gehl gaged the condition of cities today by monitoring how well they maintained a balance between three key functions: meeting places, marketplaces, and traffic spaces. (4)

1. "Central Place Theory" by Walter Christaller
2. The Death and Life of Great American Cities by Jane Jacobs
3. The Urban Index and the Regional City by Peter Calthorpe
4. New City Spaces by Jen Gehl and Lars Gemzoe

3. Holistic Model that Leverages Centers & Corridors (Kathy Galvin)

a. Influence of 20–25-minute commute times on travel decisions and the need for one mile station spacing to ensure optimal transit operating speeds.
b. Geographic and analytical criteria at the regional scale that set the stage for successful TODs that can compete with the SOV and successful multimodal corridors that facilitate alternatives to the SOV.

Geography provides the context for effective Placemaking at all scales ranging from the region (macroscopic), the municipality (mesoscopic) and the block (microscopic), while three "systems" (1) shape the built environment at all scales. Those systems are 1) the Environmental Framework 2) the Transportation Network, and 3) the Economic System. How and where these systems interact with one another determines how and where human communities settle on the land. The planning, design and construction of these settlement patterns (referred to as Place Types) addresses a whole host of issues from density to urban form and land use and creates a feedback loop that in turn impacts the functioning of our environmental, transportation and economic systems.

1. System- a regularly interacting or interdependent group of items forming a unified whole. (Merriam-Webster Dictionary)

4. TOD Typologies & Network Requirements (Kathy Galvin)

a. Design criteria critical for successful TODs at the Place Type scale that enable high quality, urban environments at the pedestrian scale that are essential for facilitating well-functioning economic and transportation systems at the regional scale.
b. Urban design standards required by corridors and thoroughfare networks at all scales, that work "hand in glove" with Place Types to sustain regional transit and other modes.

How do we physically make Places today that are as memorable, functional, and beloved as the Places we used to make years ago? First, like music, a place is composed. Instead of combining notes to form a song, blocks, lots, and streets add up to shape a place. Second, if music is passed down from one generation to the next in an oral tradition, then that musical record of daily life (a.k.a. folk music) need not be written down to be remembered. That same organic process of cultural transmission and remembrance used to happen with Placemaking, when people moved by foot or animal drawn wagon within compact villages, towns, and cities.

By the 18th century, like the growing complexity of musical composition that required a written score and a full orchestra, so too did the growing complexity of urbanization require new rules about building form and placement. But just as folk music continued to inspire orchestral works in the 19th century, so too did the visible built legacy continue to inspire Placemaking. With the heavy footprint of industrial specialization and automobile use on our landscapes in the 20th century however, the old rules were forgotten or rendered obsolete. New rules about land use, building form and placement were written and packaged into zoning ordinances that segregated living spaces from working spaces and accommodated the spatial mobility and storage needs of the car above all other modes of transportation.

These wholesale shifts in the way we move and live have decimated our natural systems and ruined our health, but remnants of the organic built legacy of Placemaking remain. To reset the balance between urban places, culture, and nature we need a new way of occupying the earth: one inspired by the lighter footprint of the past but informed by our capacity and need for technological and social progress. To investigate, evaluate and create that new way, we need drawings to "help people to work out intricate relationships between parts." (1) Those parts in turn, are derived from a set of strategies gleaned from our legacy of great Placemaking.

Those strategies include asking the same questions that Peter Calthorpe asked to introduce organizational structure to our growth patterns and diversify our mobility diet. "What can I walk to within a ¼ mile of my residence or within ½ mile of the transit station?" Taking a few more pages from Calthorpe and Jane Jacobs, make sure there's a high frequency of intersections within a neighborhood, with clearly marked crosswalks, and that block lengths are no greater than 600.' Use mid-block alleys to limit curb cuts and conflict points with cars and transition between areas of high and low intensity of development. Vary lot sizes within any given block to diversity uses and price-points. Face both sides of a street with richly detailed building frontages, inclusive of windows, doors, awnings, storefronts, stoops, and porches to activate street life. Learn from the research of Jan Gehl, by making sidewalks at least 7' wide for two people walking abreast, and lining streets with trees to make walking and taking the bus more pleasant, social, and healthy than driving a car.

1. <u>The Pattern Book-</u> Christopher Alexander

5. **Case Study from Deseret Ranch in Central Florida, U.S.A.**. (As excerpted from the **Orange County FL, Long-Term Master Plan** authored by Chris Sinclair with written modifications by Kathy Galvin and visualizations by Kathy Galvin & Chase Kea.)

Ag Reserves' Deseret Ranch at 300,000 acres, is Central Florida's largest undeveloped property. Strategically located between the Orlando metro area and cities stretching north and south in Brevard County and the Space Coast, the Ranch offers a unique opportunity to plan a large portion of the region in a manner that balances its natural, cultural, and urban systems. Despite the region's efforts, urban sprawl continues because of siloed planning practices. The Orange County Ranch Sector Plan prepared by

Renaissance Planning, Prime Consultant, departs from those siloed planning practices by adopting an integrated approach, that focuses on the dynamic relationships within and among the larger environmental, urban and cultural systems (inclusive of the dynamics of transportation, economics and land development.)

INTEGRATED PLANNING PROCESS

The Long-Term Master Plan for the Orange County Ranch Sector Plan presents Central Florida with a unique opportunity to cultivate a sustainable balance among its environmental, cultural, and urban systems. The Planning Area (i.e., "the Ranch") is essentially a blank canvass, a large undeveloped property that is not in the "middle of nowhere" but crossed by inter-regional multimodal transportation networks and utilities and surrounded by high-tech companies and neighborhoods in Orange County to the west and in Brevard County to the east. The Planning Area, in other words, is poised to attract high-tech businesses that can diversify the region's economy. The development of "Medical City" just to the west of the Ranch for instance, provides a glimpse of the economic development possibilities in this region, however the integrated planning and design approach advocated by this Plan assumes that this Planning Area can absorb much of the region's growth in a compact urban footprint, thereby reducing urban sprawl pressures elsewhere in the region.

ACTIVITIES AND FORM

The activities of commerce and everyday life have a major influence over urban form. Businesses locate where access to customers, suppliers, and employees is optimized while residential households seek locations where travel to and from work, shop, recreation, etc., is the quickest and easiest. Without intentional design interventions, these activities occur over space, forcing trade-offs in location and travel decisions. The resulting "sprawling" patterns are recognizable in nearly every American metro area. In contrast, this alternative model focuses on how to optimally orchestrate those decisions within an integrated planning process. It begins by articulating the bottom-up dynamics responsible for urban form, then builds responsive conceptual design models at differing scales that can guide development.

TRADED CLUSTER ECONOMIC ACTIVITY PATTERNS AND FORM

National and global economic activities drive the demand for metropolitan development and sustainability, while traded cluster industries are the primary drivers of those demands. They generate income by selling goods and services to other regions or "importing" customers from other regions. Tourism, for example, attracts people from around the world who spend money in Central Florida. Traded cluster agglomerations occur as similar businesses work to provide the best access to customers, suppliers, and employees. As a result, even though they are competitors, Universal Studios and Disney World for example, mutually benefit from proximity to each other.

With few exceptions, traded industries locate along major inter-regional transportation facilities to optimize access to markets. Employment data from Central Florida confirm this relationship, with nearly 85% of all traded cluster jobs located within 3 miles of an expressway. The strong relationship between the inter-regional transportation network and economic development is the primary reason for the designation and development of Florida's Strategic Intermodal System (SIS) by the Florida Department of Transportation (FDOT). While inter-regional transportation facilities are a precondition for traded cluster economic activity, demand drives where traded cluster businesses will locate. Demand is influenced by several factors, such as the unique catalyzing location decisions made by the federal government (Kennedy Space Center) or big business (Disney World). More often, demand is generated by the magnitude of traded cluster activity in metropolitan areas close to one another. The Central Florida and Tampa Bay regions are stretching toward each other along the I-4 corridor, and much of the development is in the form of distribution and warehousing companies that utilize access to both metro areas. The distance between Central and South Florida has inhibited economic development along Florida's Turnpike.

Because of the benefits of agglomeration (proximity among similar industries), differing traded cluster industries are organized in differing quadrants of Central Florida. The agglomeration area for hospitality and tourism is highest in the southwest quadrant of the region (Figure 4.2) because of Disney World, Universal Studios, Sea World, and other attractions. The agglomeration area for business and financial services is highest around downtown Orlando (Figure 4-2). The transportation and logistics agglomeration area surrounds Orlando International Airport and stretches along the I-4 corridor (Figure 4-2). Aerospace, communications, and information technology industry (collectively referred to as the high-tech area) is located in the southeast quadrant of the Orlando metro area around UCF and also around Melbourne and Cocoa. (Figure 4-2).

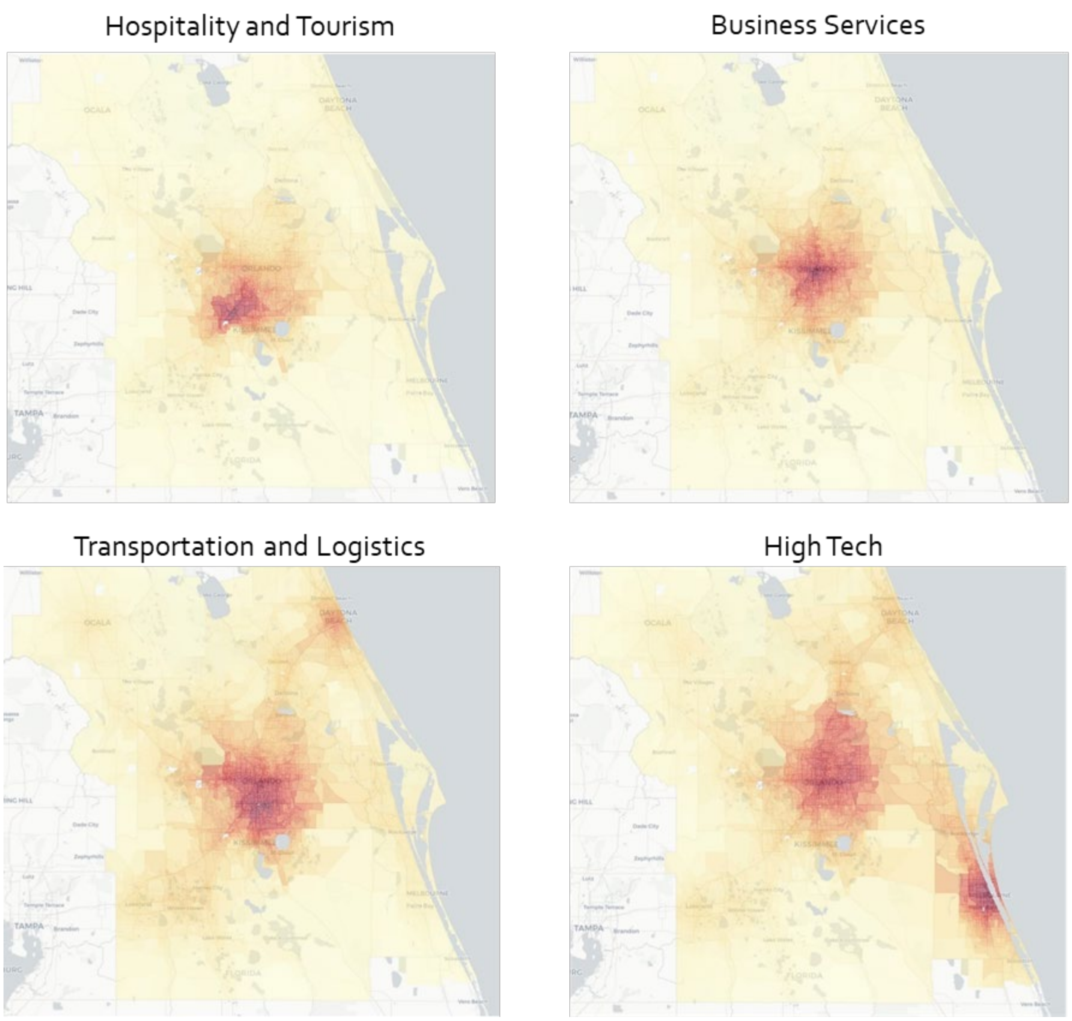


Figure 4-2 – Central Florida Traded Cluster Agglomeration Access Areas (Maps by Renaissance Planning)

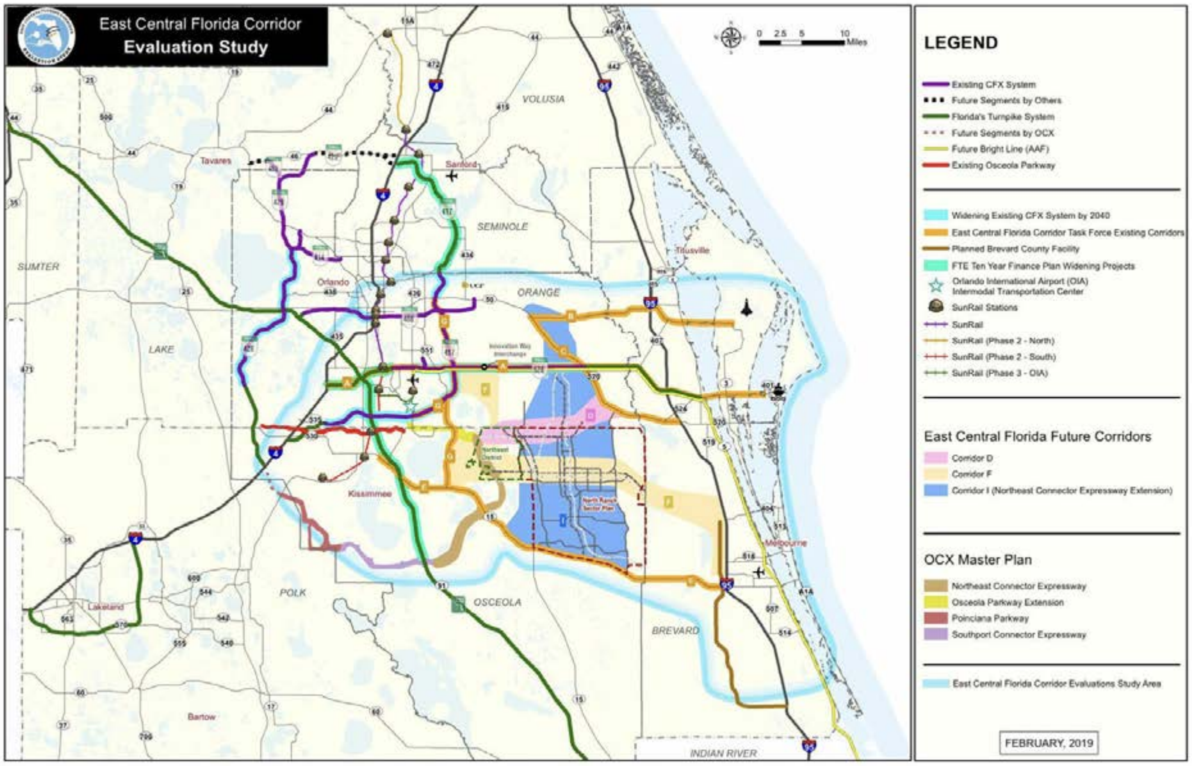


Figure 4-3 - Regional Transportation Network Projects and Studies (Maps by Renaissance Planning)

Agglomeration creates demand for high-tech business sites in the southeast quadrant of the region, as evidenced by the rapid development of Medical City. The demand prompted the formation of the East Central Florida Governor's Task Force in November 2013. The task force, which included 13 members representing public, private, and civic organizations, was charged with "evaluating and developing consensus recommendations on future transportation corridors serving established and emerging economic activity centers in portions of Brevard, Orange, and Osceola Counties." Task Force recommendations have since been incorporated into the Central Florida Expressway (CFX) Master Plan and FDOT's East Central Florida Corridor Evaluation Study (Figure 4-3).

1. Future Conditions Data Report, FDOT, March 2020
2. East Central Florida Corridor Task Force presentation

DAILY ACCESSIBILITY PATTERNS AND FORM

The Planning Area's inter-regional transportation network, coupled with the demands of high-tech industries, make it an attractive place for high-tech business locations. As high-tech businesses move into or adjacent to the planning area, they will create demand for new neighborhoods and local retail and services. The daily accessibility needs of those new residents will influence the form of growth. The planning challenge is to ensure that growth is compact and respectful of natural systems.

Consistent with long-standing national trends, Central Floridians on average commute 20 minutes and 8 miles to work each day. The 40 minutes spent traveling to and from work makes up the majority of a person's daily travel time budget (which is around 60 minutes a day). Most would prefer to live close to work but extenuating factors influence the decision, most importantly higher housing costs near job centers that prompt many to trade off the cost of housing with longer commute times – the "drive-till-you-qualify" phenomenon. The longer commute distances create pressure to build higher-speed roads, a pressure that has influenced urban development patterns and networks since the 1970s and contributes to urban sprawl.

Daily accessibility patterns create spatially important commute sheds, areas where high percentages of work trips both begin and end. A commute shed can extend over 10 to 20 square miles depending on its location within the metropolitan area. Network design and development intensities within the commute shed also influence its size, shape, and functionality. Interconnected networks improve the functionality of commute sheds (trips are completed within a reasonable amount of time). Higher-intensity development patterns increase the influence of proximity on access and within a commute shed.

New commute sheds form as the urban footprint grows. For example, when new neighborhoods are built beyond 8 miles from the Central Business District and travel times to work put strains on outlying commuters, businesses begin locating in new centers along inter-regional routes radiating from the CBD. Maitland Center and Altamonte Springs exemplify this pattern. The new job centers create new commute sheds. In most regions, including the Orlando metropolitan area, a beltway is constructed to connect new centers. The new outlying commute sheds will rely more on speed for access than the original, centrally located commute shed. Nevertheless, the functionality of those commute sheds can be optimized with interconnected networks and organized development patterns.

3. Replica travel data collected in May 2021

DESIGN MODELS

The relationships between traded cluster economic, daily accessibility activity patterns and urban form guided the development of this Sector Plan. Activity patterns were translated into nested design models focusing on differing scales. This macroscopic (regional) model considers how both economic and accessibility patterns influence the locations of a metropolitan area's major centers and corridors and the development between the centers and corridor configurations (known as "wedges.") Its major corridors surround an inter-regional transportation network where traded cluster businesses prefer to locate. Centers along those corridors are the focal points for the commute sheds detailed in the mesoscopic design model. Place types which provide more localized design guidance at the microscopic, or local, level, also provide a range of urban experiences for various residential and job markets.

MACROSCOPIC DESIGN MODEL (THE METROPOLITAN AREA)

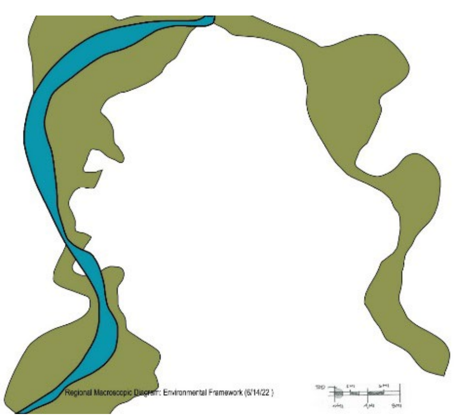
Figure 4-4 presents a schematic of the macroscopic design model. Its structure reflects the economic and daily accessibility patterns described above. The model has three levels, the first being protection of natural habitats, the edges of which serve as urban growth boundaries. Level two is the transportation network, which includes a hierarchy of streets and transit. At the highest level in the network are inter-regional transportation corridors (metropolitan corridors), outlined in blue, that provide high-speed access both within the metropolitan area and to other regions and markets. Most of the traded cluster businesses and jobs will be located along the corridors. Premium transit and TOD support high development densities and maintain high-speed travel along those corridors. The metropolitan corridors include an expressway, a major arterial, and premium transit to ensure adequate capacity for high intensity development. The intensity of the interconnected streets network is highest in the area in and around the Central Business District (downtown) and in centers spaced throughout the metropolitan area. Level three presents place types, all revolving around the Central Business District located at the crossing of the inter-regional metropolitan corridors. Satellite employment centers are located approximately 8 miles from the CBD along the inter-regional corridors. Smaller centers are spaced along radial routes.

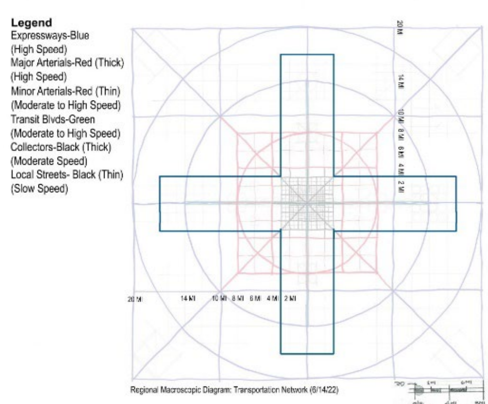
MESOSCOPIC DESIGN MODEL (COMMUTE SHEDS)

A hierarchy of overlapping commute sheds knits together the metropolitan area (Figure 4-5). Commute sheds form as households locate for the most favorable daily access to work. Because of the length of work trips (around 8 miles on average), commute sheds cover a relatively large geographic area (from 8 to 16 square miles). Smaller travel sheds enhancing household access to non-work destinations (shops, schools, medical facilities, parks, etc.) form within and among commute sheds.

Commute sheds are organized by neighborhoods and locally oriented retail and services, surrounding traded industry jobs clustered along inter-regional corridors. The high percentage of travel between the neighborhoods and jobs creates spatial cohesion in each commute shed, but trips destined to other commute sheds create overlaps, particularly among two adjacent sheds. New commute sheds form when the metropolitan urban footprint extends beyond a reasonable travel time to jobs within the commute shed (5 to 8 miles). In Central Florida, as in many other modern metropolitan areas in the U.S., new centers are built when new neighborhoods are built over 8 miles from the CBD. Maitland Center and Altamonte are examples of new centers along the I-4 corridor – the new centers create new commute sheds, providing timely access to those living beyond a reasonable travel time to the CBD.

Differing combinations of proximity and speed are used to access destinations within commute sheds. The two are inversely related: Increasing proximity decreases distances between buildings, thereby reducing trip lengths. But as buildings get further apart, more speed is needed to complete trips in the same amount of time. Accessibility can be improved either by increasing proximity or increasing speed. The geographic extents of commute sheds vary by their locations within the metropolitan area (i.e., the commute sheds surrounding the CBD are relatively compact compared to others) and by the design and intensity of networks and development within the commute shed. Higher-intensity development can support the influence of proximity in commute sheds, resulting in more-compact urban form without sacrificing access.





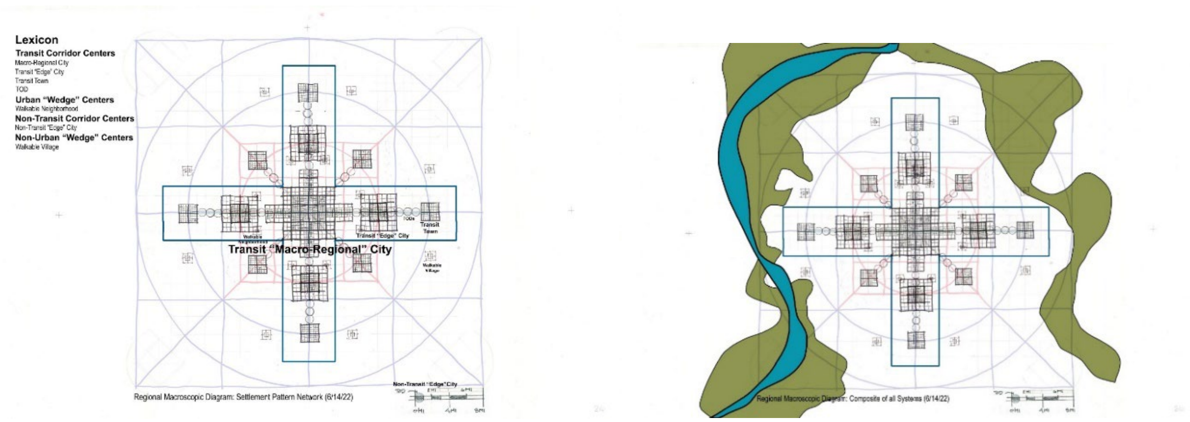


Figure 4-4 - Macroscopic Design Model (visualizations by Kathy Galvin)

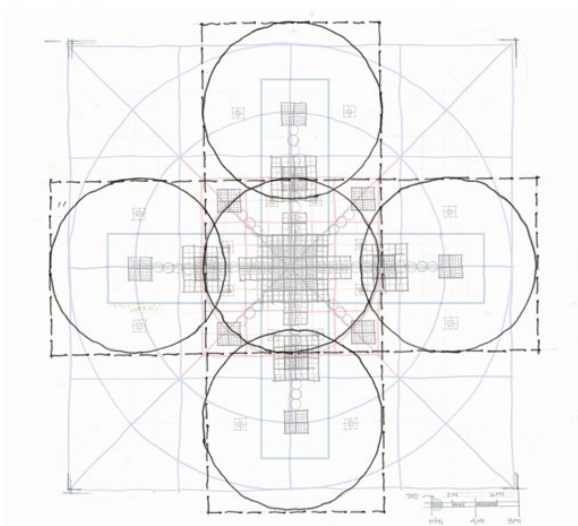


Figure 4-5 - Commute Shed Pattern and Structure (visualizations by Kathy Galvin)

MICROSCOPIC DESIGN MODELS (PLACE TYPES)

The microscopic model scales to finer geographic levels of detail, focusing on the community and neighborhood planning levels. The community level nests within commute sheds and covers approximately 2 to 4 square miles. Development is organized around community level centers (urban community centers in the urban corridors, community centers in the wedge areas). The neighborhood level nests within the community level, covering 1 to 2 square miles. Each area is centered on a neighborhood level center.

The microscopic models include an array of place types that provide design details for the differing contexts in the macroscopic (metropolitan) and mesoscopic (commute shed) models. The models focus on the design of sub-areas within the macroscopic model. They reflect the place types identified in Orange County's Vision 2050 initiative and provide details on network design and the size and orientation of buildings. The Transect is used to organize networks and buildings across the place type. Macro design models were developed into illustrative site plans for several key locations (Figure 4-6).

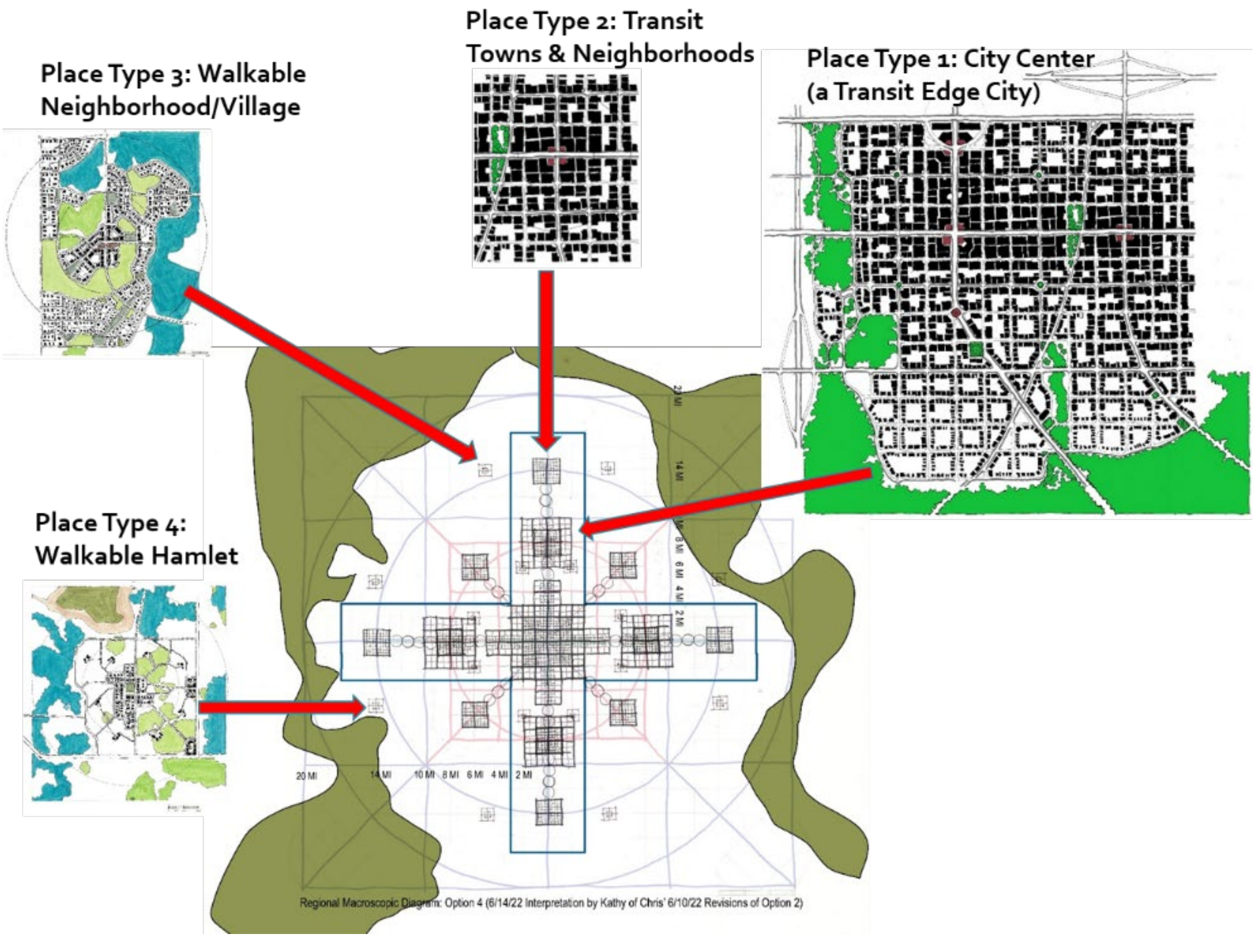


Figure 4-6 - Macroscopic Design and Place Types (visualizations by Kathy Galvin)

APPLYING THE MODEL in the REGIONAL CONTEXT

Figure 4-7 overlays the macroscopic model described above over the Orlando metropolitan area to illustrate emergent metropolitan form resulting from bottom-up and top-down forces. This pattern emerged because of the right combination of preconditions. Vacant land surrounded downtown Orlando in the 1950s, yet the area was crossed by inter-regional roads and rail lines. Traded cluster activity, initially citrus production followed by aerospace and hospitality, created the impetus for growth. Traded cluster and accessibility activity patterns (bottom-up forces) guided the development of networks and development. Early development had a compact form, but the singular focus on automobiles and speed beginning in the 1970s gave way to suburban networks and form. The suburban patterns continue today, with growth sprawling as appendages from the original compact core around downtown Orlando. Efforts such as Vision 2050 are now attempting to impose urban form and multimodal transportation networks on existing suburban areas, a daunting task because of the permanence of networks and private land ownership and a political resistance to change.

Figure 4-7 also illustrates how this model overlays the proposed Orange County Ranch Planning Area and the approved North Ranch Master Plan in Osceola County. As with Orlando in the 1950s, preconditions are right for growth in the area. Most of the land is used for agriculture, creating a blank canvas, but it is not in the “middle of nowhere” or at the “end of the line” – the property is crossed by inter-regional transportation facilities and is proximate to high-tech businesses.

The model illustrates how the planning area can become a distinguishable metropolitan area, not a sprawling appendage to Orlando, with compact urban centers and corridors and interconnected multimodal networks. Despite its uniqueness, the traded cluster jobs located in the area increase the economic diversity of the region. The environmental framework plan protects major ecosystems, including the Econlockhatchee and St. Johns River basins. The land preserved along the Econlockhatchee River ecosystem serves the dual purpose of maintaining regional ecological connectivity and distinguishing the two metropolitan areas. Commute patterns orient inward, not outward, to mitigate potential traffic impacts to the Orlando metropolitan area. Non-transportation infrastructure and services, independent of those in the Orlando metropolitan area, serve residents and businesses. Transportation, infrastructure, and services are sized to accommodate residents and businesses at densities above those in the existing Orlando metropolitan area, helping to ease urban sprawl pressures and impacts elsewhere in Central Florida.

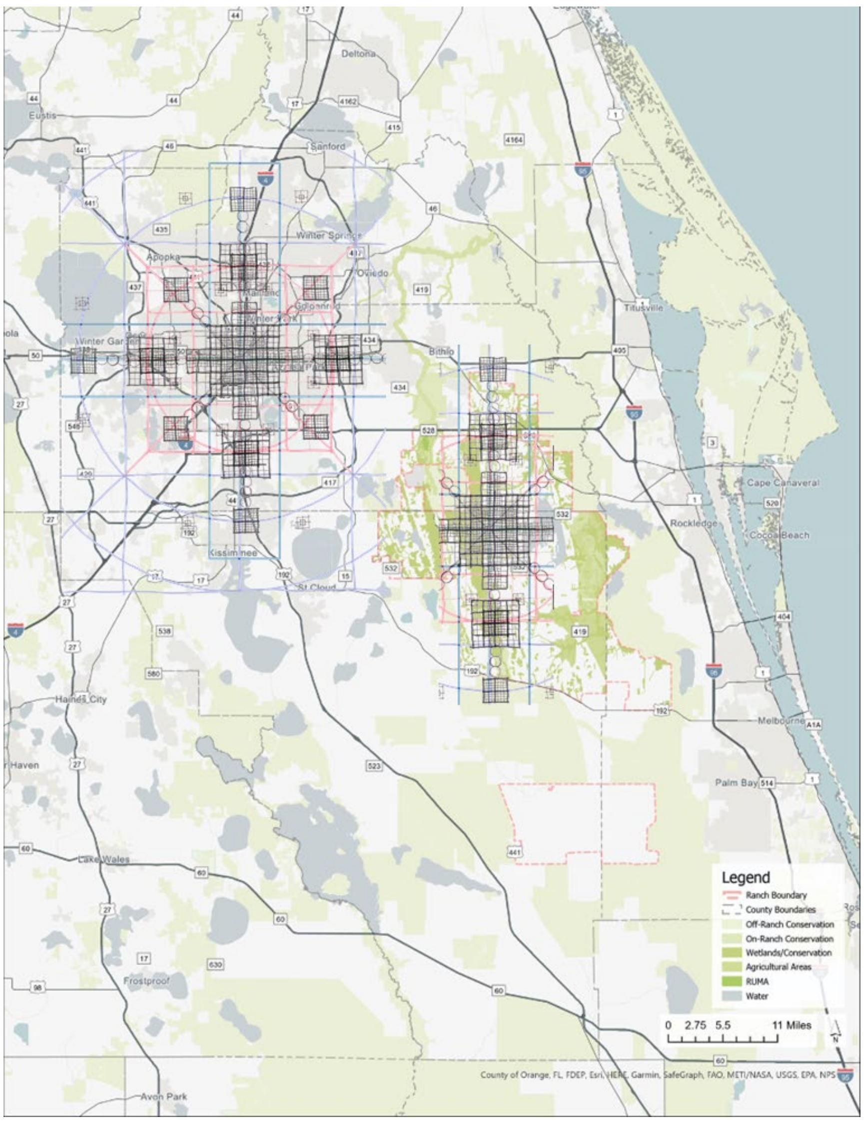


Figure 4-7 - Metropolitan Design Model Overlays in Central Florida (diagrams by Kathy Galvin)

FRAMEWORK MAP

The Framework Map (Figure 4-8) illustrates the key urban form feature of Central Florida's Planning Area Mixed Use District (MUD). The map is organized by higher-level centers, corridors, wedges, and commute sheds. The array of place types listed below are generally located within the larger structure.

The Framework Map was developed in layers, beginning with the environmental framework (Figure 4-9) designed to protect natural habitats of regional significance within the Planning Area and provide landscape and ecological connectivity across the region. The proposed transportation network (Figure 4-10) will transform existing inter-regional roads, such as SR 528, into multimodal corridors that form the macrolevel structure of urban corridors and wedges (Figure 4-11). Details of network design are provided in Chapter 5. Place types are organized within the macrolevel structure (Figure 4-12), with metropolitan and urban centers and traditional fabric neighborhoods placed in the urban corridors, and community and neighborhood centers and a mix of neighborhood types placed within the wedges in between centers and corridors. Place type details are provided below. Finally, this Orange County Plan is also aligned with the Osceola County North Ranch Master Plan that lies to the south. Figure 4-13 illustrates the full extent and organization of the two Master Plans.

MACROSCOPIC FORM

Figure 4-11 illustrates the macrolevel structure of the Planning Area MUD, depicting its centers, corridors, and wedges. Three multimodal corridors cross the planning area:

- East-west corridor enveloping SR 528 and the Brightline passenger rail line.
- North-south corridor including portions of SR 520 and the Corridor I expressway included in the CFX Master Plan.
- East-west corridor just north of the Orange/Osceola County line including the extension of the Osceola Parkway to SR 520.

Premium transit routes run parallel to the expressways on exclusive rights of way in each corridor. Transit stations spaced about 1 mile apart, on average, are the focal points for TOD within half-mile-diameter transit station areas. Station areas are part of differing center types along the corridors, ranging from metropolitan to urban centers. The premium transit alignments are spaced from 1 to 2 miles from expressways to protect half-mile pedestrian sheds around stations. Arterials are located around 1 mile to the opposite side of the premium transit. Highway-oriented retail and services are located at expressway interchanges and around major arterial intersections. High-intensity traditional fabric neighborhoods stretch between the centers on street grids that maintain connectivity along the length of the corridor.

The plan's Central Business District, referred to as the city center, is a metropolitan center (regional center in Vision 2050) located at the intersection of SR 528 and Corridor I corridors. It is envisioned to become jobs-oriented, with the highest development intensities in the MUD. The city center will be one of the few locations in Central Florida to have multimodal inter-regional access via expressways and a possible Brightline station.

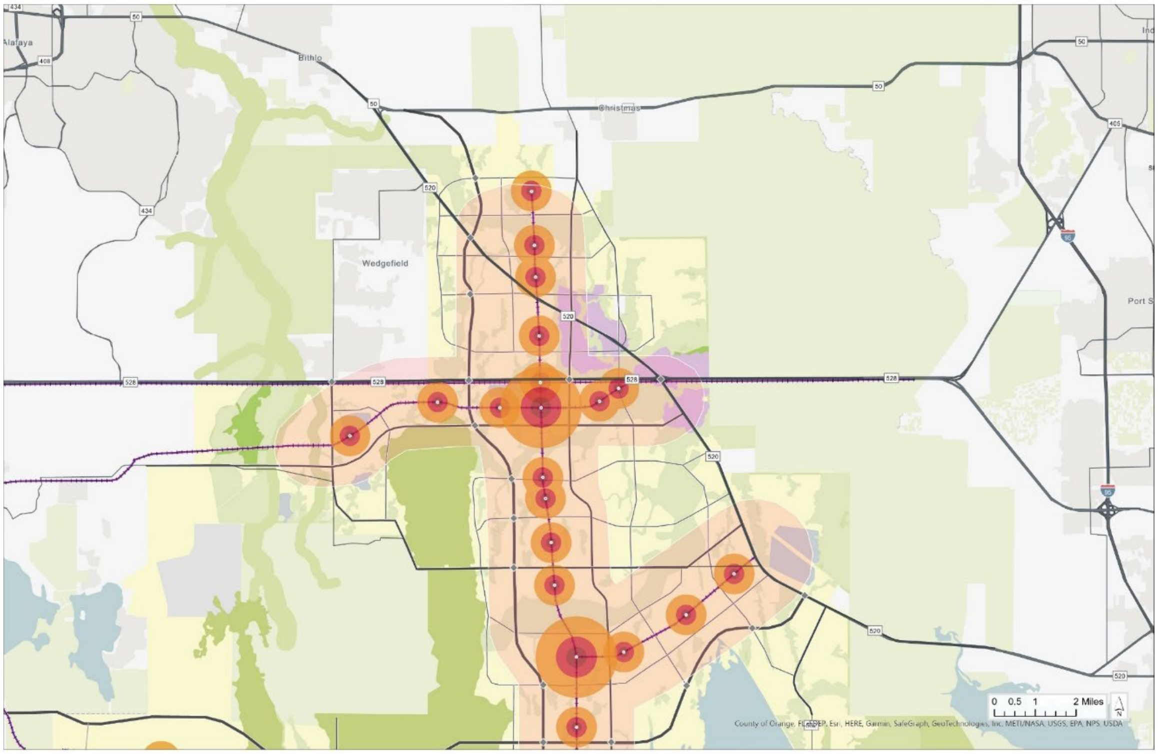


Figure 4-8: Framework Map (visualizations by Chase Kea)

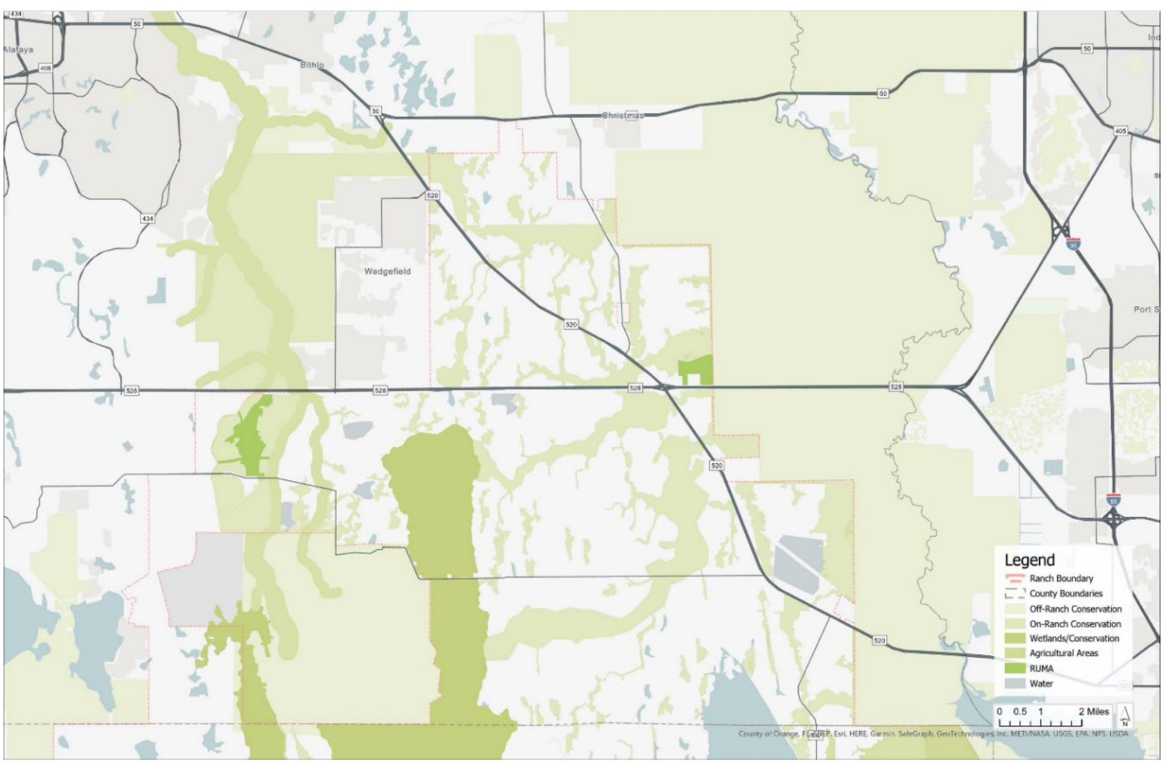


Figure 4-9 - Framework Map Environmental Layer (visualizations by Chase Kea)

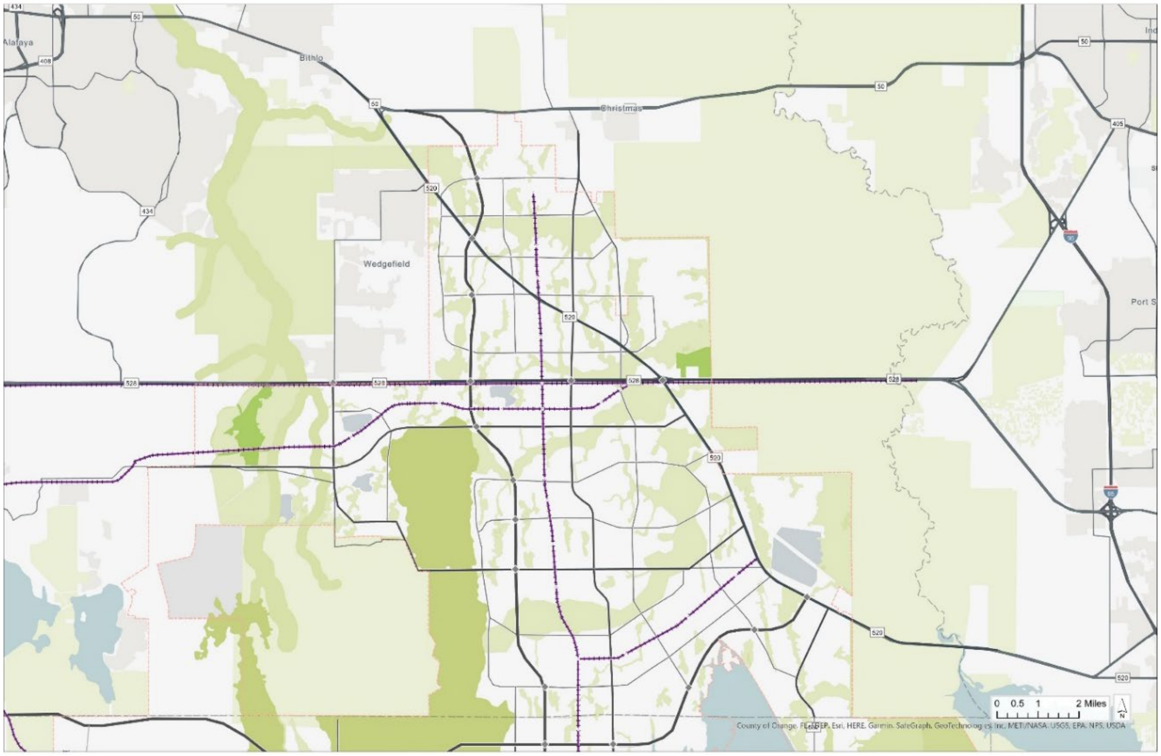


Figure 4-10 - Framework Map Transportation Network (visualizations by Chase Kea)

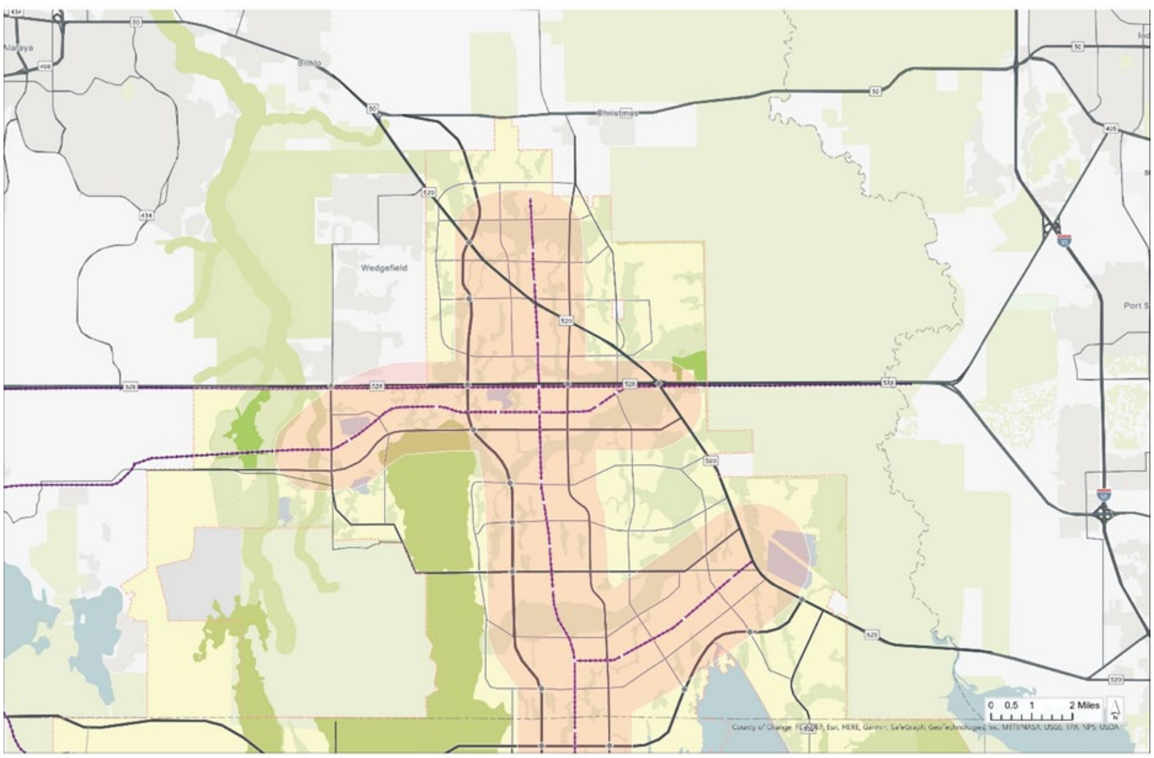


Figure 4-11 - Framework Map Urban Corridors and Wedges (visualizations by Chase Kea)

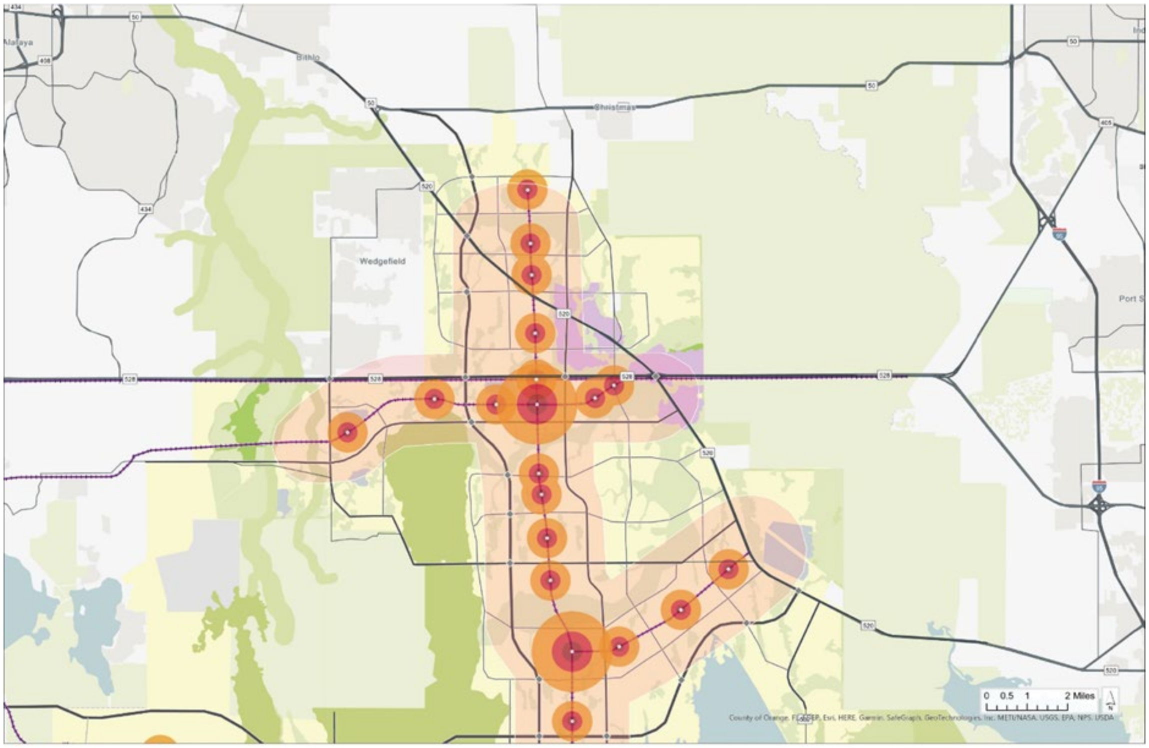


Figure 4-12 - Framework Map Place Types (visualizations by Chase Kea)

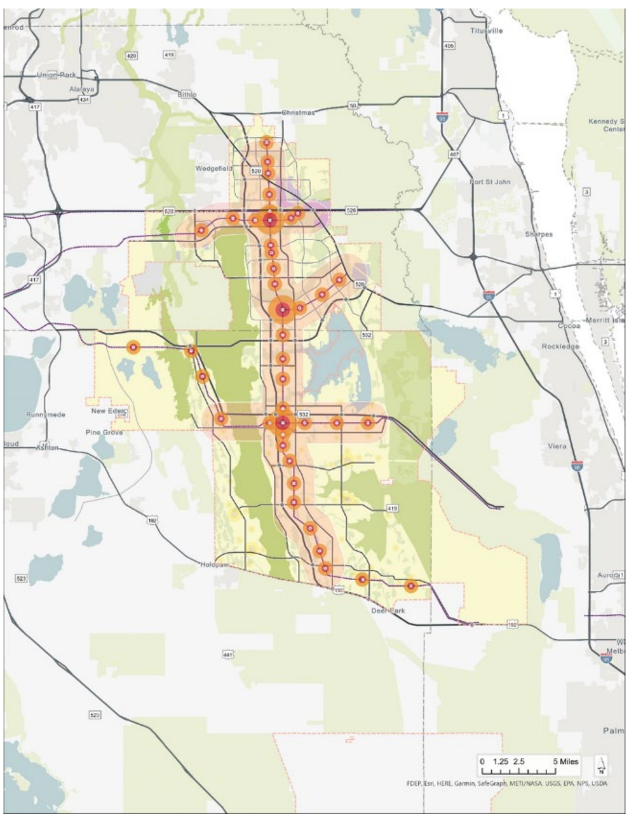


Figure 4-13 – Orange County & North Ranch (Osceola County) Master Plans (visualizations by Chase Kea)

A second metropolitan (regional) center is located at the intersection of the Osceola Parkway extension and Corridor I. It is also envisioned to be jobs-rich but will not have the same overall intensity as the city centers. An employment-oriented special district will be located along SR 520 north of SR 528. It is designed for a mix of lower-intensity research manufacturing and distribution businesses. Lower-intensity residentially oriented neighborhoods, clustered around community and neighborhood centers, will develop in the wedge areas lying outside the major centers and corridors, connected by a grid of streets and multiuse trails. Neighborhood networks will converge on the centers, each having a mix of retail, service, recreational, and civic uses. Details for the wedge place types are provided below.

MESOSCOPIC ORGANIZATION (COMMUTE SHEDS)

The Framework Plan is divided into three commute sheds (Figure 4-11). The first extends from the city center north to the environmental corridor about 4 miles north of SR 528, 4 miles south to the existing water pipeline road, and east and west to the edges of the MUD. The second commute shed lies south of the first, and the third lies to the north.

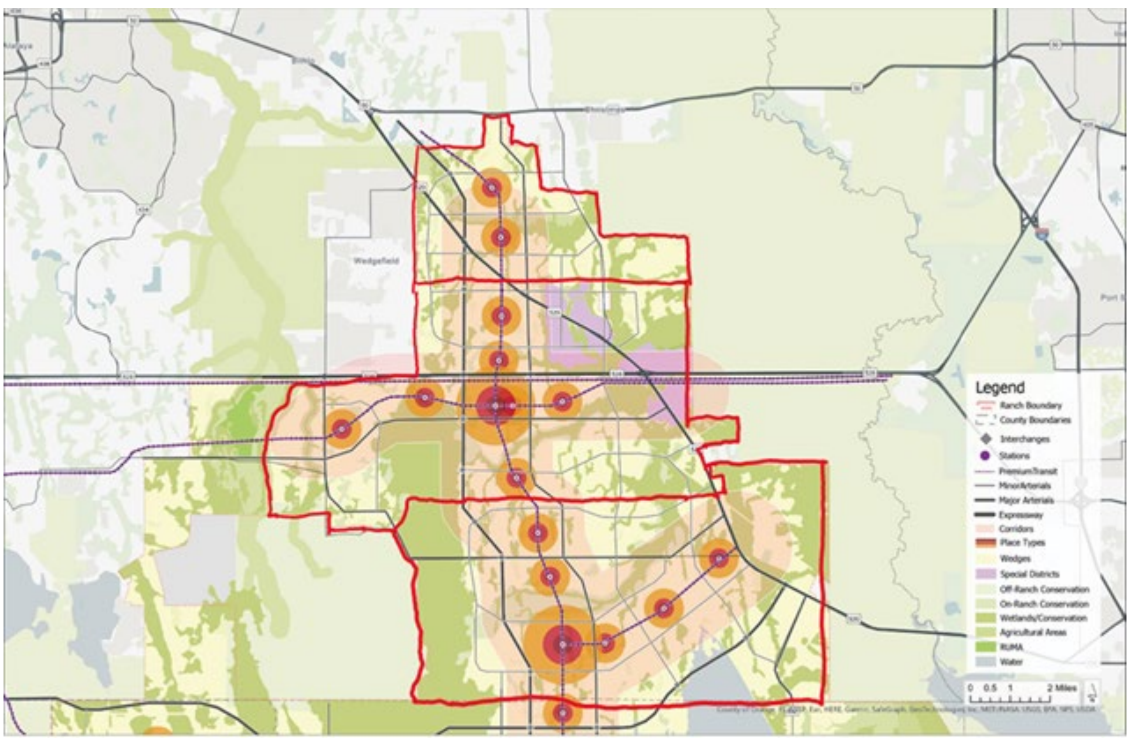


Figure 4-11 – Commute Sheds (visualizations by Chase Kea)

PLACE TYPES and CENTERS

METROPOLITAN CENTER

Metropolitan centers (defined as Regional Center in the Osceola County Vision Plan 2050) are located at the intersections of urban corridors and cover from 1 to 2 square miles. The key design features of metropolitan centers are illustrated in Figure 4-12. The center is flanked by an expressway on one side and a major arterial on the other, with premium transit operating on dedicated right of way in the middle. Development is oriented around premium transit stations, and metropolitan centers may have multiple stations. The highest development intensities (over 10 stories) occur within a quarter mile of transit stations. Densities drop in the second quarter-mile ring (four to 10 stories) surrounding the station, and even further beyond a half-mile. Interconnected street grids extend throughout, with blocks averaging 500 feet in each direction. The streets are designed to promote walking and biking.

Because of their inter-regional access, metropolitan centers will be the target locations for traded cluster businesses. They will include both Class A and Class B office space and will include high-rise residential buildings. Street-level entertainment and retail will occur throughout to promote street activity. Metropolitan centers will be the primary locations for regionally oriented civic uses, such as theaters and museums. They could include urban college campuses.

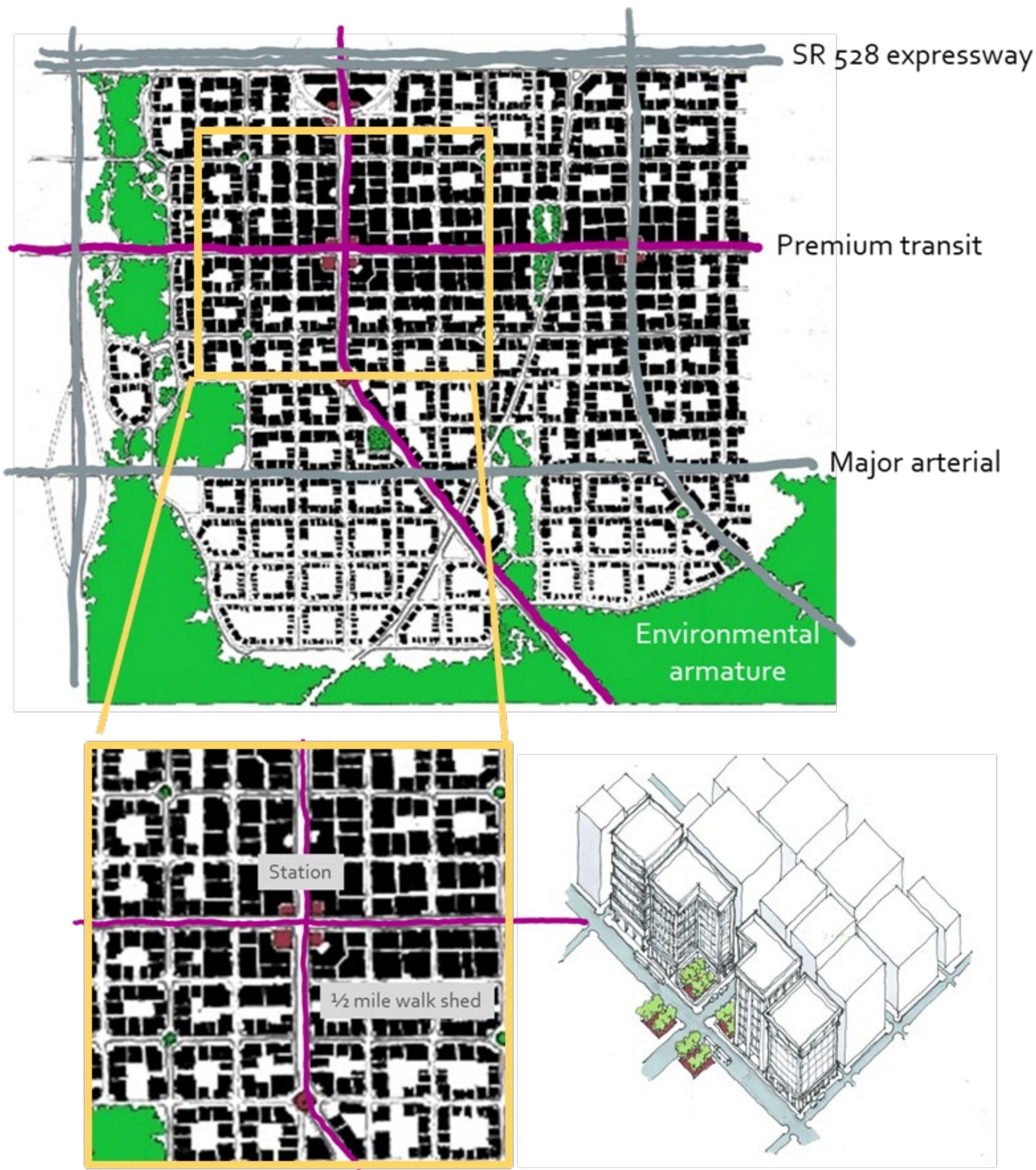


Figure 4-12. Metropolitan Center Design Features (visualizations by Kathy Galvin)

URBAN COMMUNITY CENTER

Urban community centers are located between the metropolitan centers along the urban corridors. They will be organized as transit-oriented development (TOD), like the metropolitan centers, but will have lower overall intensities (4 to 6 stories) and a higher residential mix. Development will orient around premium transit stations, with highest intensities at the premium transit station, and lower intensities in the second quarter-mile ring. The mix of residential buildings will increase with distance from the stations. The centers are intended to provide "everyday" retail, services, and entertainment (i.e., grocery stores, day care, small restaurants, etc.) for residents within the center and in adjacent neighborhoods. Urban centers will have a tight street grid, blocks of no more than 500 feet in length and width. Street grids will extend beyond the center into adjacent neighborhoods to maintain connectivity. Streets will be designed for biking and pedestrian comfort and safety. Street environments and uses within the first quarter mile ring will promote activity. Urban centers will have a mix of parks and open spaces, with smaller places near the stations and larger recreational areas near the edges.

COMMUNITY CENTER

Community centers will be destination focal points for neighborhoods in the wedge areas lying outside urban corridors. They will be organized as half-mile pedestrian sheds, with the highest development intensities (2- to 4-story buildings) at the center, gradually dropping toward the adjacent neighborhoods. Like urban community centers, they are intended to provide "everyday" retail, services, and entertainment (i.e., grocery stores, day care, restaurants, etc.) for residents within the center and in adjacent neighborhoods. Community centers will have lower development intensities than their urban counterparts. They will be in a quadrant adjacent to a major street intersection, with the focal point, or main street, at least a quarter mile from major streets to protect the pedestrian orientation and flow of the center. They will also be designed to support low-intensity transit and shuttle service and have street grids with blocks no larger than 500 feet in length and width. The street grids will extend into adjacent neighborhoods to provide easy access. They will have a variety of parks, open spaces, and recreational areas.

NEIGHBORHOOD CENTER

Centers are intended to be focal points, destinations for surrounding neighborhoods. Most will be vibrant and active places and designed for commerce and exchange. Neighborhood centers are intended to be the heart of the community, a place where residents and visitors are encouraged to congregate. Neighborhood centers will have at least one outdoor public space for this purpose, designed for pedestrians. Centers will be within a 5- to 10-minute walking distance of many residents, although they need not be in the geographical center of the neighborhood. Centers will vary in size, use, and intensity depending on the size and density of the surrounding residential uses.

Neighborhoods create a different context, one that fosters stability, safety, and sense of community. They are typically organized by half-mile-radius pedestrian walksheds, with nearby neighborhood centers providing a local place to gather. All neighborhoods are anticipated to be within a range of 800 to 1,200 units. Higher-density, traditional fabric neighborhoods will have a minimum of eight dwelling units per acre and will be located within urban corridors adjacent to metropolitan and urban community centers. Suburban mixed fabric neighborhoods, with a density of five dwelling units per acre, are in the wedge areas, adjacent to urban corridors and major roads. Lower-density suburban fabric neighborhoods will lie between suburban mixed fabric neighborhoods and the edges of the Planning Area.

Neighborhoods allow for a variety of home types, from single-family on large lots to townhomes and apartments. A 2- to 4-mile framework of major and minor arterials, thoroughfares, and boulevards will provide access into major centers and interconnect neighborhoods. Networks of local streets will provide access to smaller centers and interconnect adjacent neighborhoods. The network will include streets for cars, small-scale transit vehicles and shuttles, and multiuse walking and biking paths.

FRAMEWORK MAP AND PLACE TYPES (visualizations by Chase Kea)

Figures 4-13 through 4-16 illustrate the relationships between the generalized form presented by the Framework Map and the more detailed design features presented in this section. Figure 4-13 presents the location of the city center, a metropolitan center place type, and the more detailed form of the center. Figure 4-14 illustrates the form of a TOD structured urban center located along a premium transit alignment and within an urban corridor. Figure 4-15 presents the form of a community center and a surrounding suburban mixed fabric neighborhood located in a wedge area of the Framework Map. Figure 4-16 presents conservation-oriented form of a suburban framework place type.

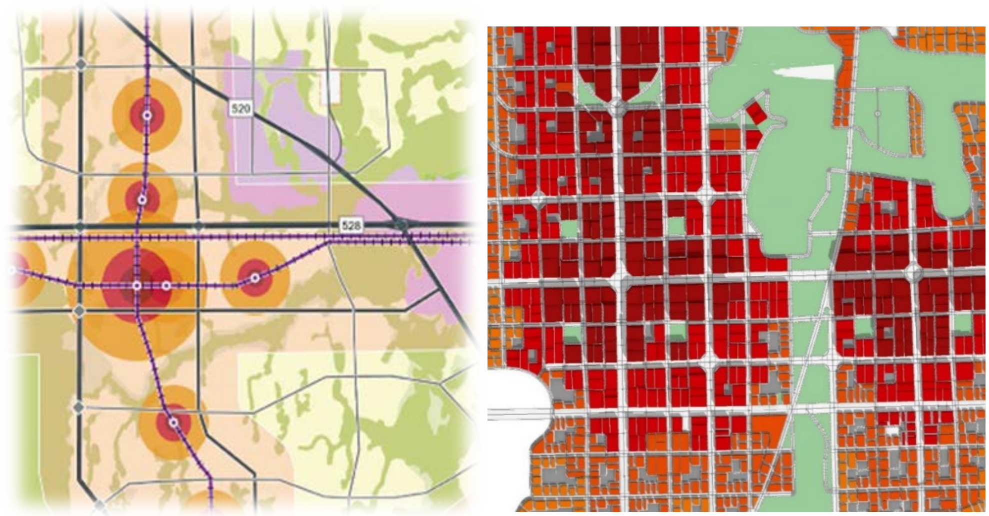


Figure 4-13 - Metropolitan Center Form (computer generated visualizations by Chase Kea)

Figure 4-14 - Urban Community Center Form -TOD (computer generated visualizations by Chase Kea)

Figure 4-15 - Suburban Walkable Neighborhood (computer generated visualizations by Chase Kea)

Figure 4-16 - Suburban Conservation/Walkable Hamlet (computer generated visualizations by Chase Kea)

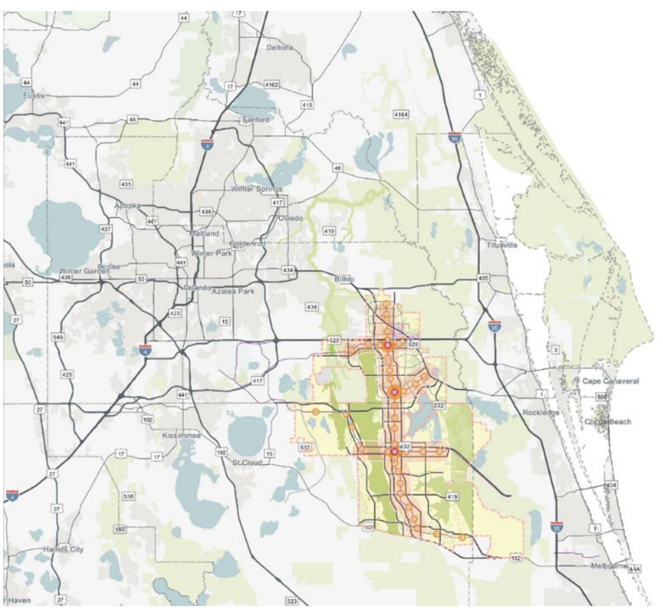


Figure 4-17 – Master Plans in Regional Context (computer generated visualizations by Chase Kea)

6. Conclusion: A Possible Antidote to Sprawling Development in the United States & the United Kingdom (by Kathy Galvin)

Central Florida has provided us with a regional case study on how to grow sustainably and practically in the face of intense population growth pressure with increasingly constrained land resources due to climate change. Despite this region's desire for a better balance between its natural and urban systems, urban sprawl, and the highway construction it necessitates, continue unabated, impacting natural systems and fragmenting communities. Planning practices, rules, and regulations in turn reflect a prevailing reductionist perspective where complex systems are only understood and guided by reducing them into individual parts and then optimizing each part. This siloed approach gave us failed planning practices in the past such as "urban renewal" in the 1960's and will continue to throw systems out of balance in the future, ultimately impacting the overall health of the planet and the human community.

A holistic systems-level perspective in contrast, strives to find the right balance among subsystems by prioritizing the relationships among system elements and then using those relationships to guide public policy and decision-making. Ultimately, a more holistic planning approach leverages these relationships and activity patterns to form a functional, livable compact urban metropolitan area that synergizes a region's economic goals and takes advantage of existing inter-regional transportation ports and facilities either on or adjacent to the property. It enhances existing transportation networks with multimodal facilities that can accommodate higher development intensities without compromising quality of life, which in turn can ease urban sprawl pressures elsewhere in the region.

This Holistic Model in short, can support economic development and accommodate the region's growth while steadfastly protecting its natural systems and providing human habitats with a "sense of place." Notably, this Model is applicable to infill and redevelopment sites at station areas (known as gray-field sites) along corridors determined to be ripe for premium transit. In closing, because this Model strives for an urban ecology in balance internally and externally, it aligns with the ethos of Poundbury itself.

End of the Ecology of Urban Centers and Corridors- DRAFT (10/2/23)

5 Minute Walking and Bicycling

Pedestrian Shed Retail Market Demand

Prepared For:
Congress for the New Urbanism

Prepared By:
Robert Gibbs

22 March 2023

Pedestrian Shed Retail Market Demand

Robert Gibbs

Cover & Left: I'on, Charleston, SC – 30,000 sf neighborhood center (DPZ, Dover Koh), Right, West Haven, TN- 150,000 sf town center (DPZ)
Images: Bob Gibbs

Overview

This study finds that 5-minute walking, biking, and electric bike pedestrian shed's households can statistically support between 3,000 to 2 million square feet (sf) of groceries, soft goods, pharmacal and restaurants. Other retail and service categories including apparel, bakeries, barbers, books, cleaners, hardware, home furnishings, medical, and sporting goods were not analyzed or included in the demand forecasts.

These estimates are based on two hypothetical models; *Limited In-Ped Shed Spending* and *Gilligan's Island.* In the Limited model, 75% to 95% of the shed's household spending will occur outside of the three sheds in other locations. The Gilligan model projects that all the shed's population retail spending occurs inside of each shed at an isolated island location.

Both models also assume there will be no retail spending from any households, workers, the internet or visitors located outside of the sheds or off island. Additionally, each ped shed population's demographics reflect the 2020 U.S. household demographic and retail spending medians.

These of course are unrealistic assumptions. The ped shed's supportable retail will vary on numerous demographic and commercial variables not available for this analysis, including spending from outside of the shed zones. For example, a large drug store Whole Foods located across the street from the ped shed boundary would capture most of its household's health-beauty and grocery spending.

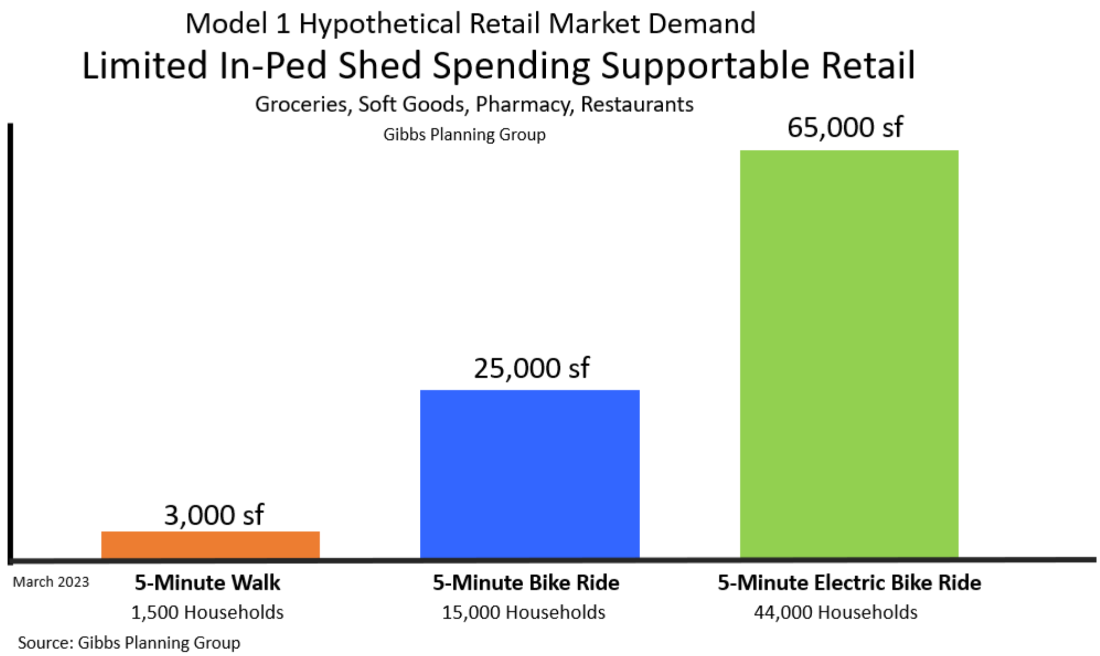
The Limited model will support more commercial than projected and Gilligan's much less.

Ped Shed Hypothetical Retail Demand Summary

Limited In-Ped Shed	**Gilligan's Island**
3,000 sf 5-Min. Walk	40,000 sf - 5-Min. Walk
15,000 sf 5-Min. Bike Ride	300,000 sf – 5 Min. Bike Ride
65,000 sf 5-Min. Electric Bike	2,000,000 sf – 5 Min. Electric Bike

Background

Gibbs Planning has been asked by the Congress for the New Urbanism to analyze the hypothetical demand for market based retail and restaurant businesses generated by households living within a 5-minute walk, bike ride and electric bike ride. These findings will be presented at an April CNU Council focusing on pedestrian sheds.



***Model 1: Limited In-Ped Spending** projected supportable grocery market, drug store, specialty retail store and restaurants based on limited in ped shed household spending. Note: 40 other retail categories not included. Source: Gibbs Planning*

Research Summary

Model 1: Limited In-Ped Shed Household Spending

The Limited model estimate assumes that the ped zones are located within regions with competitive stores and that the ped shed retailers will only capture 5% to 25% of their household 's total spending. In this scenario, 75% to 95% of the shed's population's shopping will take place in nearby commercial centers, downtowns, at work, during travel, and on Amazon and other e-commerce sites.

The model also assumes that no retail spending will occur from those outside of each shed. The analysis projects that each of the three ped sheds can support 3,000 sf – 5-minute walk, 25,000 sf 5-minute bike ride, and 65,000 sf 5-minute electric bike of retail businesses.

Model 1: 5-Minute Walk: The Model 1sheds with 1,000 households and 2,600 residents can statistically support 3,000 sf total of grocery, pharmacal, retail goods and restaurants. Combined, this retail could generate $1.2 M in total yearly sales and equate to 5 stores. This supportable retail represents 5% to 25% of the shed's total household spending for the combined 4 categories. The 5-minute walk supportable retail includes:

- 1,500 sf grocery-market
- 500 sf pharmacy
- 400 sf retail goods store
- <u>600 sf café</u>
- **3,000 sf Total**
- *Other businesses NIC*

While some of these stores are too small for a practical business, they could be considerably larger by offering best-in-class goods and services. This induced demand, combined with ped shed workers and visitors, along with those living outside of the shed is more realistic than this model.

Left, Dering Harbor Village, Shelter Island, NY - 30,000 sf: Right Siaconset Market, Nantucket, MA 1,500 sf. Overall Siaconset Hamlet commercial – 7,500 sf. (Images Bob Gibbs)

Model 1: Limited In-Ped Shed Household Spending (Cont.)

Model 1: 5-Minute Bike Ride: The Model 1 sheds 16,000 households and 41,600 residents can statistically support 25,000 sf of groceries, pharmacal, specialty retail goods and restaurants equating to 5 to 8 businesses. Overall, the 5-minute stores could generate up to $700,000 yearly sales.

- 15,000 sf grocery store
- 4,000 sf pharmacy
- 2,000 sf retail goods
- 4,000 sf restaurants
- **25,000 sf Total**
- *Other businesses NIC*

Model 1: 5-Minute Electric Bike Ride: The Model 1 sheds 44,700 households and 116,200 residents could support up to 65,000 total sf $1.7 million in sales of groceries, pharmacy, specialty retail and restaurants. Overall, the shed's retail could equate to 15 to 20 stores and restaurants. The electric bike Limited electric bike shed can support:

- 35,000 sf grocery
- 11,000 sf pharmacy
- 7,000 sf of retail stores
- 12,000 sf of restaurants
- **65,000 sf Total**
- *Other businesses NIC*

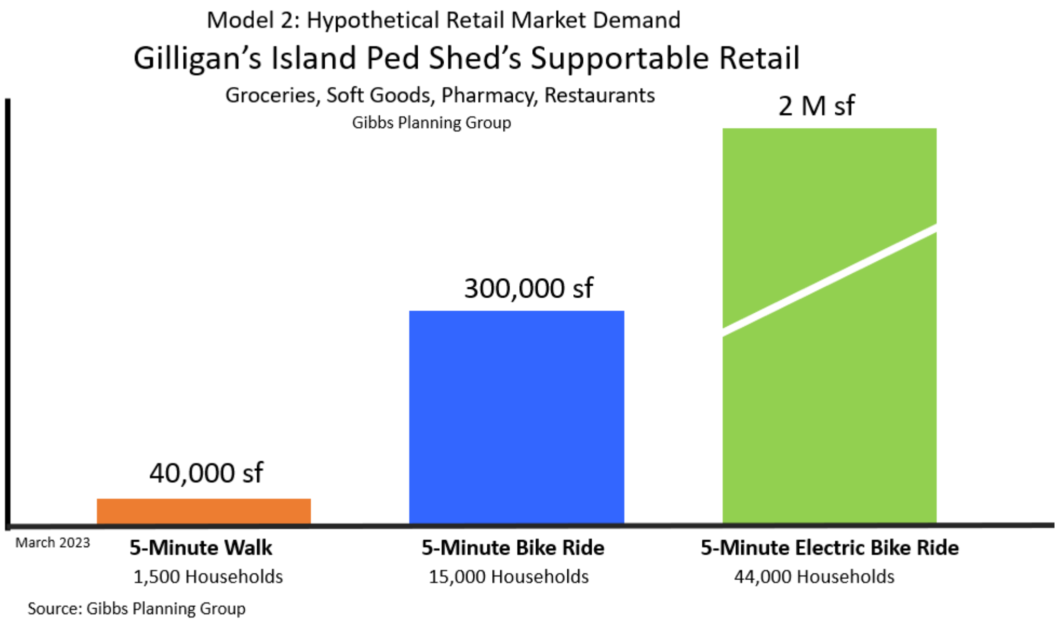
Model 1: Limited In-Shed Spending Supportable Retail Summary

Businesses Type	*5-Min. Walking* 1,000 Households	*5 – Minute Bike Ride* 15,000 Households	*5-Min. Elec. Bike Ride* 44,000 Households	*Total Spending* per Household /yr.
Grocery w/ Liquor	1,500 sf	15,000 sf	35,000 sf	$5000 yr
Pharmacy	500 sf	4,000 sf	11,000 sf	$1000 yr
Retail Goods	400 sf	2,000 sf	7,000 sf	$2,000 yr
Restaurants	600 sf	4,000 sf	12,000 sf	$2,200 yr
Total	**3,000 sf**	**25,000 sf**	**65,000 sf**	**$10,000 Total**

Source: Gibbs Planning

Model 2: Gilligan's Island
A second model assumes that three ped sheds are located on Gilligan's Island, with no access to the mainland or internet service. At the isolated location, its residents will only shop at the island's businesses. They will not dine or purchase goods on Amazon, at work, while on vacation or any stores outside of the shed. Additionally, the island will not receive any visitors.

The island stores would support 40,000 sf to 2,000,000 sf of retail and restaurant space, generating up to $60 M of retail spending depending on the ped shed size.



Model 2: *Projected supportable grocery market, drug store, specialty retail store and restaurants based on 100% in ped shed household spending if located on an isolated island. Source: Gibbs Planning*

This unrealistic model highlights each shed's actual overall household retail spending in all locations yearly. The model can be calibrated to reflect the development group's projections of the population's spending at a given store or commercial center.

Model 2: 5-Minute Walk: This island's walkable shed's 1,000 households and 2,600 residents can statistically support 40,000 sf of retail generating $10 M in total sales. This represents 100% of the shed's total household spending for the combined 4 categories.

The island's supportable retail includes a 10,000 sf grocery-market, 15,000 sf pharmacy, 8,000 sf retail goods store and a 7,000 sf of restaurants totaling 10 to 15 stores and restaurants and other businesses not studied.

Model 2: 5-Minute Bike Ride: This island's bike ride sheds 16,000 households and 41,600 residents can support up to 300,000 sf of retail and restaurants equating to 50 to 80 businesses. The shed can support 4 to 5 grocery stores (150,000 sf), 2 to 5 drug stores (25,000 sf), 5-8 specialty retail stores (12,000 sf) retail goods store and 110,000 sf of restaurants equating to 80 to 100 businesses.

Overall, the island's 5-minute bike ride supportable stores can generate up to $75 M in sales.

Model 2: Gilligan's Island (Cont.)

Model 2: 5-Minute Electric Bike Ride: This Island sheds 44,700 households and 116,200 residents could support up to 2,000,000 total sf of retail, generating $500 million in sales. The shed can support 440,000 sf of groceries, 75,000 sf of pharmacies, 350,000 sf of retail goods and 1.2 M of restaurants. If developed, the electric bike's island shed's retail would equate to 3 large cities or 6 small cities, or 20 small towns or 30 shopping centers or 2 regional shopping malls or 8 planned mixed-use town centers.

Model 2: Gilligan's Island Supportable Retail Summary

Businesses Type	***5-Min. Walking*** *1,000 Households*	***5 – Minute Bike Ride*** *15,000 Households*	***5-Min. Elec. Bike Ride*** *44,000 Households*	***Total Spending*** *per Household /yr.*
Grocery w/ Liquor	10,000 sf	150,000 sf	440,000 sf	$5000 yr
Pharmacy	15,000 sf	25,000 sf	75,000 sf	$1000 yr
Retail Goods	8,000 sf	12,000 sf	350,000 sf	$2,000 yr
Restaurants	7,000 sf	110,000 sf	1,200,000 sf	$2,200 yr
Total	**40,000 sf**	**300,000 sf**	**2,000,000 sf**	**$10,000 Total**

Source: Gibbs Planning

Study Assumptions

For the purposes of this study, supportable retail is defined as businesses that produce sales high enough to earn market rates of return on capital, pay livable-market wages, overhead, rents, inventory, promotions, profits, etc. Retail Industry standards are for total occupancy costs (insurance, utilities, CAM, rent) to average 10% of total store sales. The typical shopping center landlord receives $100 rent from the sale of a $1,000 sofa. 2022 commercial construction costs require $30/sf year minimum rent plus CAM and taxes.

Retail real estate and store operations are all about the money

Retail Business Economics

The average 2022 minimum required store and restaurant sales are $350 sf/yr. or $1,000 per day sales for 1,000 sf stores, open 7 days weekly.

- U.S. Supermarket's average $550 sf/yr
- Whole Foods-$1,200 sf/yr - Trader Joe - $1,800 sf/yr
- Apple stores average $5,000 sf/yr; New York's Apple store - $65,000 sf/yr
- Resort retailers average $1,500 sf/yr
- The Grove, CA lifestyle center produces $4,000 sf and has more visitors than Disney Land

My research has found that local retailers average $100-$150 sf/ except for Seaside, Palm Beach, Nantucket, Fifth Ave, and Beverly Hills stores. The Seaside resort entertains 4 million yearly visitors and is reported to have sales several times over industry averages.

Stores generating under $150 sf generally cannot pay their owners a living wage or operating expenses. U.S regional malls average $350 sf and Taubman Malls average $1,800 sf/yr., among the highest in the U.S.

This ped shed study is based on the following conservative store sales averages:

- $250 sf/yr sales for soft goods
- $500 sf/yr for groceries
- $600 sf/yr pharmacies
- $400 sf/yr for restaurants.

Left: Third Street, Naples – 100,000 sf retail & restaurants; Right: King Street, Charleston, SC 1.5 M sf retail & restaurants. (Images Bob Gibbs)

Retail Business Economics (Cont.)
I estimate that many new urban based commercial centers, including some of the most acclaimed, underperform industry standards and do not produce market rate sales, rents, or market rate capital returns. In many cases, the new urban commercial model has been economically unsuccessful, frequently resulting in financial defaults and large amounts of vacant storefronts.

Shopping centers that average under $150 sf are considered distressed. The Americana, Avalon, Birkdale, the Grove, Santa Row, Seaside, Rosemary Beach and Village of Rochester town centers are reported to significantly outperform U.S. upscale mall $500 sf averages.

Failing stores with limited hours, service, goods, etc. are detrimental to mixed-use communities. They lower the resident's quality of life, safety, property values, etc. Profitable stores are necessary for complete neighborhoods and communities. Subsidizing store sales should not be considered on new mixed-use or city center locations. The finding of this study is only theoretical and does not reflect industry standards or GPG's mythologies and analysis process.

Study Assumptions

1. 5 Minute Walking Ped Shed: 0.25 miles, 1,000 households - dwellings, 2,600 population
2. 5-Minute Bike Ride Ped Shed: 2.0 miles, 16,000 households - dwellings, 41,600 population
3. 5-Minute Electric Bike Ped Shed: 1.66 miles, 44,700 households-dwellings, 116,200 population
4. Average U.S. Sales: Grocery-$500 sf, Pharmacy $600 sf, Retail Goods - $350 sf, Restaurants - $400 sf
5. Median U.S. household spends $13,700 year on groceries, pharmacies, retail goods and restaurants
6. Median household spending: Groceries - $5,000 yr, Pharmacies - $1,000 yr, Retail Goods - $2,000 yr, Restaurants - $2,300 yr. (U.S. Census)
7. Additional store types were not considered, and they could increase the overall supportable shed size.
8. While some of these stores are too small for a practical business, they could be considerably larger by offering best-in-class goods and services.
9. An induced demand, combined with ped shed workers and visitors, along with those living outside of the shed is expected for all demand models

Study Assumptions (Cont.)

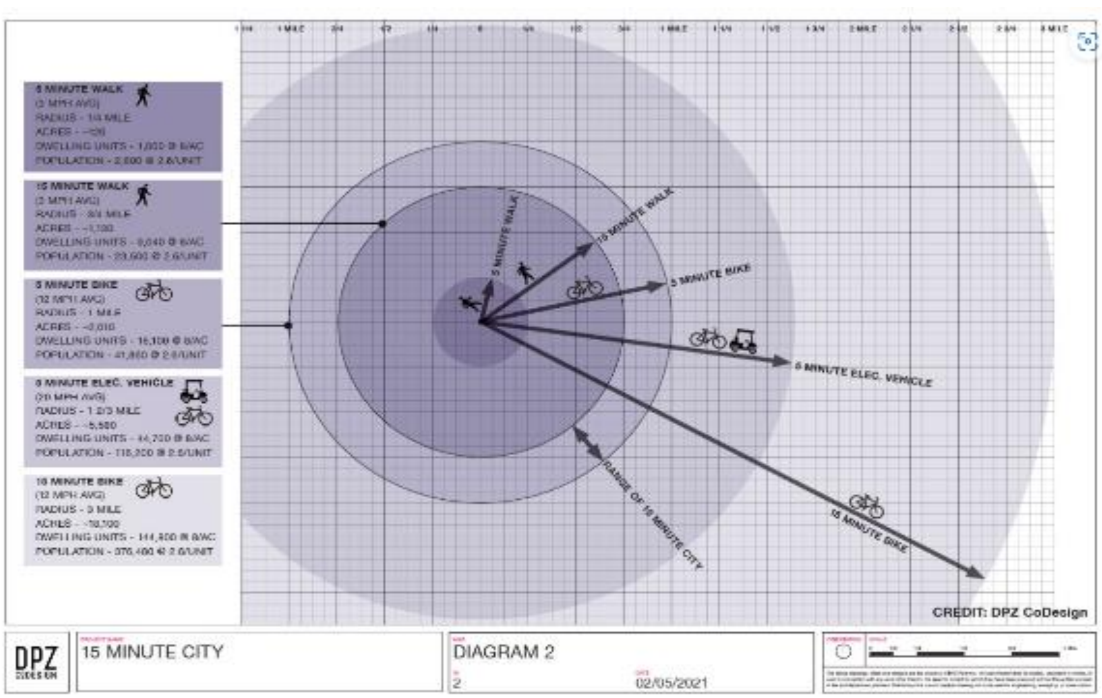
10. Store sales will be generated only by those located within the subject ped zones or island
11. All spending by households, workers, visitors outside of the ped zone will occur outside of the ped zone
12. No e-commerce sales are factored in this analysis
13. All businesses will operate per industry best practices, including design, hours, customer service, marketing, operations, etc.
14. Competitive, city business districts and shopping centers exist within the ped shed market areas
15. Both models assume there will be no in ped shed spending-sales from households, workers, or visitors outside of the shed. Also, it assumes each ped shed population's demographics reflect the 2020 U.S. medians. Other assumptions are outlined below.

Study Household Demographic Profiles Assumptions

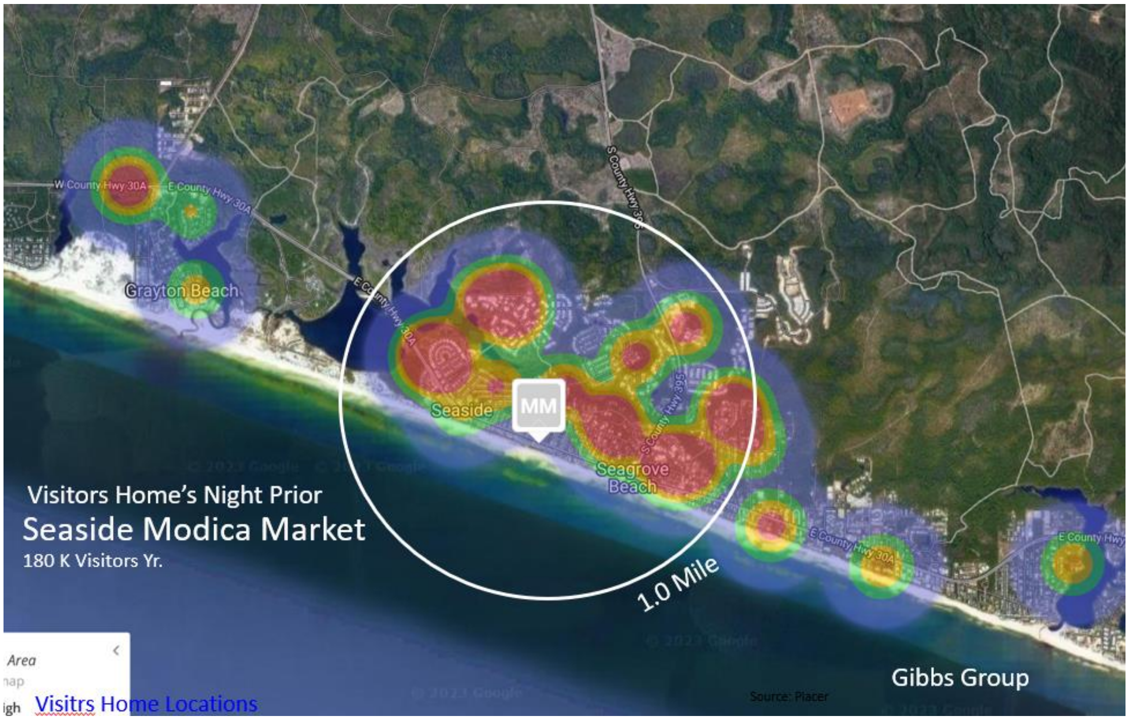
The retail spending patterns outlined by this study are based on the 2020 median U.S. demographics published by the U.S. Census Bureau.

- 70,000 median annual household (HH) income
- $38,000 Per capita annual income
- $15,200 HH retail spending/yr.
- 11% HH living in poverty
- 2.6 persons per HH
- 60% persons employed
- 35% B.A degree or higher
- 10% HH no medical insurance
- 60% White
- 14% Black
- 7% Native – Hawaiian
- 6% Asian
- 19 % Hispanic or Latin
- 17% aged 65 +
- 22% under age 18

Pedestrian Shed Metrics – DPZ

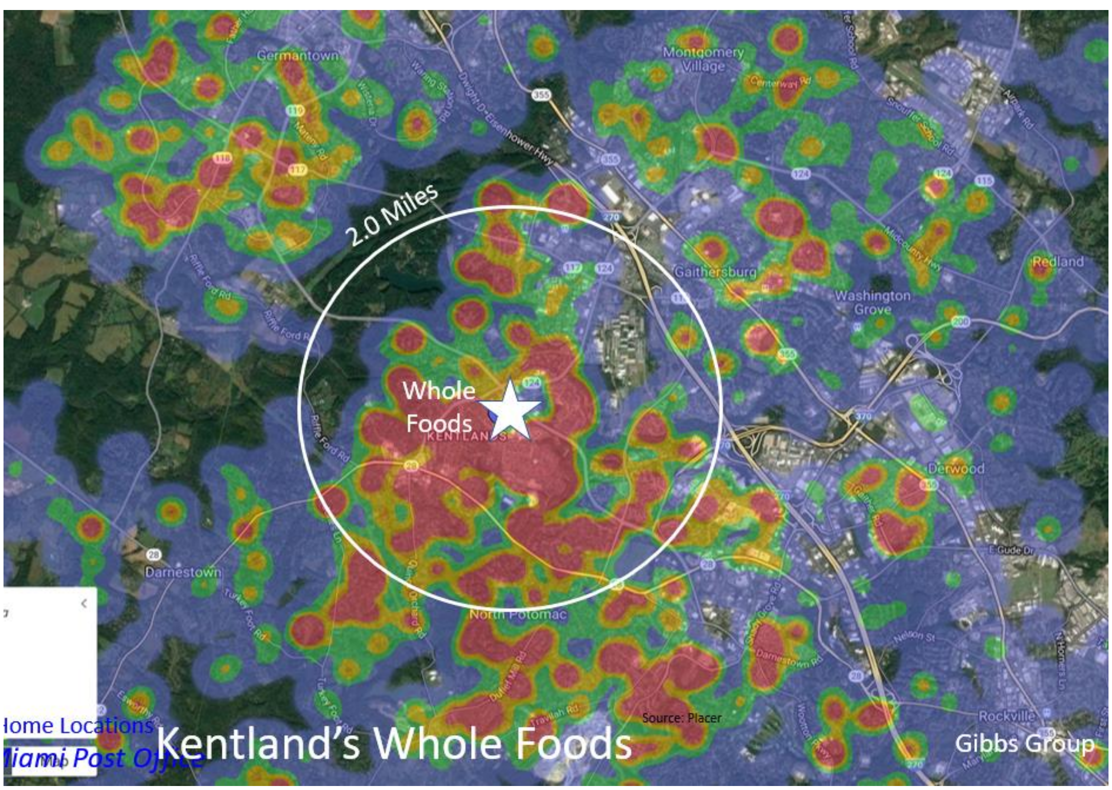


Appendix



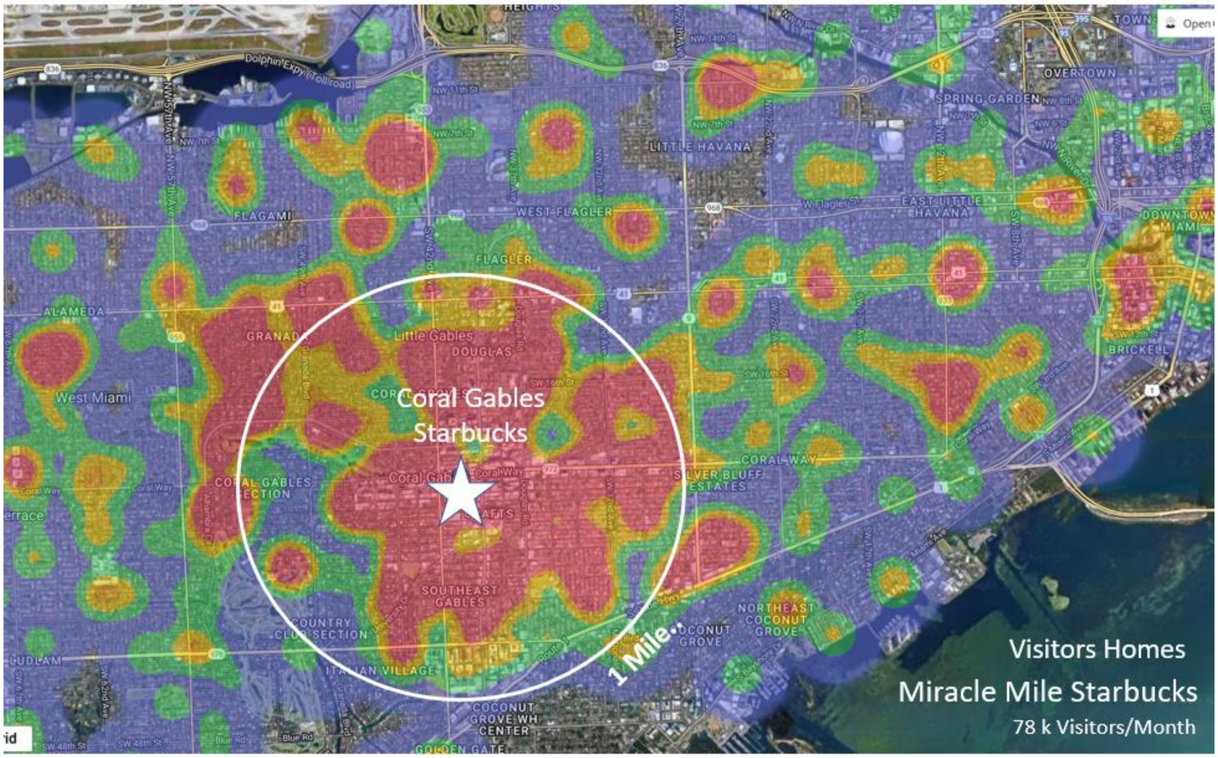
Modica Market, Seaside Shoppers visited destinations before and after their Modica trip. Gibbs Planning

Kentland's Whole Foods



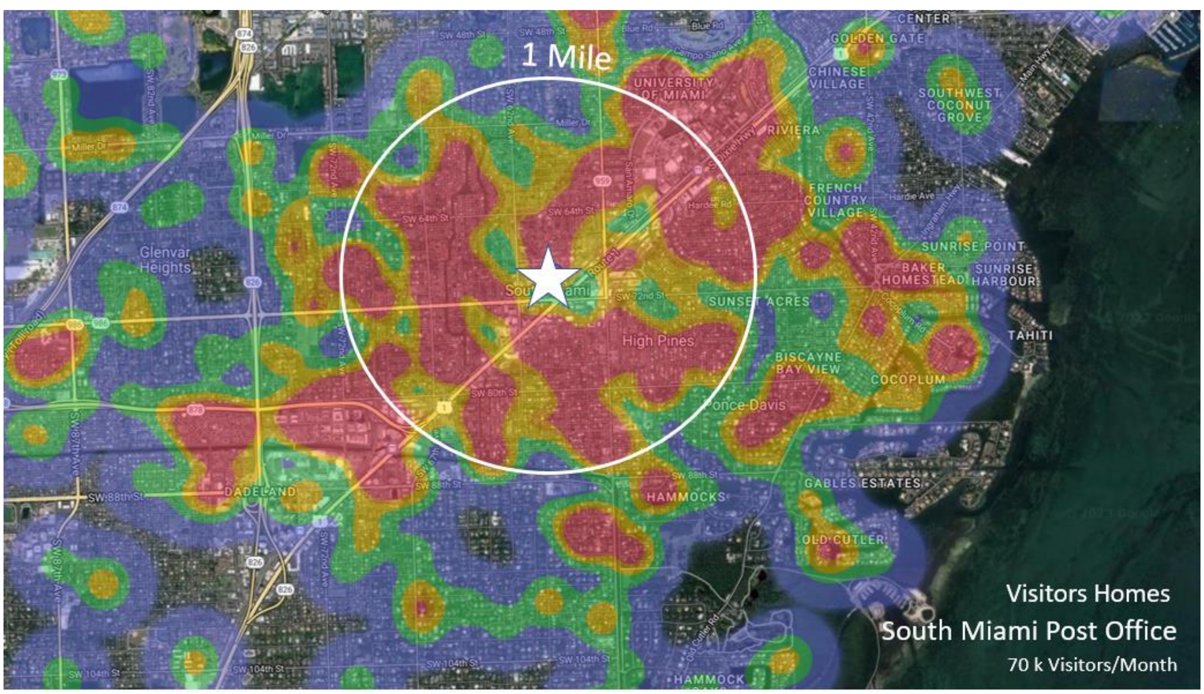
Home locations of Kentland's Whole Foods Market-Gibbs Planning

Starbucks - Miracle Mile Coral Gables, FL



Home locations of Starbucks, Coral Gables, FL 78,000 visitors / month – Gibbs Planning

South Miami Post Office



Home locations of South Miami, FL Post Office visitors – 70,000 visitors / month – Gibbs Planning

Retail Center Typologies – Conventional to Urbanism – Robert Gibbs

ICSC- Conventional Name	***Traditional - New Urban Name***	***Description***	***Trade Area***	***Examples***
Party Store	Corner Store	**1,200 – 2,500 sf** Baked Goods, Beer-Wine, Prepared Foods, Snacks, Staples,	0.5 Miles 500 -1,000 Households – No households with gas station	Modica Market, Seaside
Convenience Center	Neighborhood Center	**10,000 – 30,000 sf** Bakery, Bank, Café, Carry-out, Coffee, Deli, Pharmacy, Real Estate, Financial, Florist, Food Market, Ice Cream, Medical.	1.0 – 2.0 Miles 1,000 – 2,000 Households	I'on, SC, Quarton, Birmingham, MI, Hampstead, AL, Shelter Island, NY,
Neighborhood Center	Village	**60,000 – 100,000 sf** Above, Apparel, Bikes, Gifts, Hardware, Pharmacy, Restaurants, Supermarket (30,000-60,000 sf)	2.0 - 3.0 Miles 4,000 – 8,000 Households	Baldwin Park, FL, Fresh Fields, SC, Middleton Hills, WI, Southern Village, NC, Westhaven, TN
Community Center	Community Center	**150,000 – 300,000 sf** All Jr. – Full Anchors: Discount Dept. Stores, Hobby, Home Improvement, Office, Sporting Goods –	3.0- 5.0 Miles 10,000 – 20,000 Households	Butler Plaza North, Gainesville, FL
Small Town Center	Lg. Village – Small Town	**30,000 – 60,000 sf**	3.0 – 5.0 Miles	Charleston Place, SC, Lake Forest, IL, Palmer Park, NJ, Suburban Sq. PA
Lifestyle Center, Open Air Center	Large Town	**150,000-400,000 sf** Cinemas, Entertainment, Fashion, Gifts, Home, Food & Beverage:	4.0-6.0 Miles 30,000 – 60,000 Households	Butler TC, FL, East & Southampton, NY, Highland Park, TX, Nantucket, MA, Palmer Park, NJ, Victoria Gardens, CA, Village of Rochester, MI, Waterside Shops, FL
Town Center	City	**250,000 – 400,000 sf** Lifestyle Center plus 2 + Civic Hotels, Office, Residential	6.0 + Miles 80,000 = 100,000 + Households	Americana, CA, Avalon, GA, Belmar, CO, Birkdale, Village, NC, Coral Gables, Country Club Village, KS, Easton, OH, King St. Charleston, Mizner Park, FL, Santana Row, CA
Regional Mall	Metro Center	**700,000 – 1,000,000 sf** Neighborhood, Town Center and 2 + Department Stores	10 Miles + 150,000 + Households	Bal Harbour, FL, Bellevue Mall, WA, Brickell Ctr.,, FL, Cherry Creek Mall, CO, Eton Ctr. Toronto, Galleria, TX, Prudential Ctr. Boston, Somerset Collection, MI
Outlet Mall	District	**500,000 – 1,000,000**	100 Miles + 1 M Households	Freeport, ME, Great Lakes Crossing, MI, Saw Grass, FL

Principles for Urban Retail Planning & Development

Robert Gibbs Wiley 2012

Chapter 1: Retail Fundamentals

Location & Image Source Unknown

In a perfect commercial economy, retail offerings would balance consumer demand for those offerings. Retailers would sell their entire inventory at the ticketed price to eager shoppers, who would return on a regular basis to purchase more merchandise.

Downtowns and shopping centers would provide the exact brands, goods, prices, and services desired and needed by their communities. Residents would have only a short walk or drive to most of their preferred stores. Many small European villages and towns come close to this ideal commercial balance, such as St. Andrews, Scotland (Figure 1-1), through strict land use regulations that limit suburban development).

However, people and commerce do not act rationally. Retailers and shopping districts are at the mercy of countless factors beyond their control. Consumer spending and behavior are influenced by numerous emotional and economic variables, resulting in drastic ebbs and flows of consumption. Busy family schedules, a lagging economy, shifts in fashion, new competition, traffic congestion, crime, and local, national, or world events can result in sharp declines in a store's performance.

People do not need to shop

While families must frequently purchase groceries and basic staples they do not need to shop for most other items on a regular basis. For any number of reasons, visits to stores or shopping centers can be postponed or avoided. In many cases, individuals can suspend clothing and home-furnishing purchases for years—or at least until their wardrobes or furniture actually wear out.

The retail and shopping center sector is the riskiest of all principal real estate sectors, among which are residential, office, and industrial uses. In confronting this reality, the retail and shopping center industry depends on fast-changing cycles of color, style, or material to compel individuals to purchase items that they do not actually need. Who knew that we could not live without the Air Jordan sneaker or the Apple iPhone?

Fashion magazines, the entertainment industry, and celebrities all help drive the purchasing cycle by creating and promoting new trends. To remain competitive and economically viable, shopping center owners and individual retailers must keep up with these changing trends by updating their built environments as well as their brands and styles. In the retail sector, image is everything.

J McLaughlin Women's Store Harbor Springs, MI Image GPG

Successful retailers and shopping centers must also pay attention to how their target demographic groups experience their stores and prefer to shop. All elements of the shopping environment, including lighting, color, merchandising, fixtures, and music, must be meticulously planned and designed to meet the expectations of customers and to increase the amount of time and money they are willing to spend in the store.

A tattered, poorly maintained, or outdated store or shopping district conveys to shoppers that whatever they purchase at that location will soon be out of style, overpriced, and of questionable quality. Even worse, the shoppers may fear that the poorly presented merchandise will make them look dowdy or even unpopular among their friends and colleagues.

However, the real estate development process and the merchandise inventory supply chain cycle do not lend themselves easily to frequent changes in trends. Shopping centers take years of planning and construction to implement.

Major shopping center renovations can only be capitalized every eight to ten years, at best. Historic downtowns usually have numerous individual properties and business owners, each with buildings requiring different levels of improvement.

General Store, Good Heart, MI Image GPG

Furthermore, municipalities are often challenged to provide the funds necessary for the maintenance and updates in the public realm that are common in leading shopping centers, which are improvements contemporary shoppers have come to expect.

Most retailers must purchase merchandise nearly a year before placing them on the shelves. This lengthy time frame requires business owners to have a combination of skill and luck. The store's buyer must have the foresight to select the exact brands, colors, styles, sizes, and price points that will be popular when offered to the shopper several seasons ahead.

For example, in order to keep up with changing color trends in the 1980s, an international retailer ordered all-white sweaters and then had them dyed in the most popular colors just before delivery.

Hamlet, Beaver Kill, NY Image GPG

Sometimes, sophisticated retailers can establish trends. En route to the Paris Shoe Show a few years ago, representatives from a New Zealand–based footwear chain noted the popularity of a shoe style worn by teenagers in the Montrose section of Los Angeles. The chain purchased a large inventory of these shoes, which became the most popular footwear in New Zealand when introduced a year later.

Recently, some moderately priced apparel stores have shortened the runway-to-store cycle from months to weeks. When the latest fashions are worn at awards shows and in music videos, the design houses for these stores quickly reproduce them as inexpensive knockoffs in limited quantities. Sold while still popular, their limited supply can cause a rush to purchase before they become unavailable.

Shopping Center Business Models

Developing and managing retail centers remains one of the most financially risky of all real estate categories. In 2006, the United States had 20.22 gross leasable area (GLA) of retail space per capita,[1] far more than any other nation in the world.

Retailers must respond to ever-changing consumer trends and demands while constantly fending off new competition. As a result, the retail industry relies upon proven methods and techniques to minimize the risk and to earn a market rate of return on their investment. This risk is more acute in mixed-use urban areas, where vacant storefronts or undesirable retailers can significantly disrupt the quality of life for surrounding residents and nearby office workers.

Most of America's shopping centers fall into one of seven proven building types: the corner store, convenience center, neighborhood center, community center, regional center, lifestyle or town center, and outlet center. The GLA of each of these center types can be increased 30 to 50 percent to create supersized centers— for example, the super neighborhood center, super community center, or super-regional mall.

Each type of center appeals to a distinct market segment and has specific tenant types, size ranges, location criteria, and site plan standards. Although there are always exceptions to these types, centers that deviate from these industry standards and sizes are often considered economically risky and thus difficult to finance or lease.

For example, a 50,000-square-foot convenience center is generally too large to support 20 to 25 small stores without the pulling power of a supermarket. On the other hand, a 50,000-square-foot supermarket-anchored neighborhood center does not have enough GLA to support the below-market rents affordable to modern supermarket operators.

Corner Store, Franklin, MI Image GPG

Party Stores (CNU-Corner Stores)

The smallest and most useful retail type of center, the corner store, ranges from 1,500 to 3,000 square feet in GLA. The store can be sited as a stand-alone structure or built into a mixed-use building, in both cases preferably on a corner facing two streets. If possible, attics and basements should be provided for additional storage requirements.

These small stores offer the beverages, food, and sundries most nearby residents, local workers, and travelers need on a regular basis. Beer, bread, cigarettes, prepared sandwiches, and snacks represent the bulk of their sales.

These stores offer convenience over selection and value. Excluding dense urban locations, corner stores require convenient, nearby parking to allow for quick in-and-out shopping. If properly managed, off-street, and on-street parking—alone or in combination—can meet the parking needs of the typical corner store.

The best locations for corner stores are on major local roads at the busiest entryway into the neighborhood. In densely populated traditional neighborhood developments (TNDs), a corner store can be economically sustainable within the neighborhood when sited on its primary street.

Bliss General Store Bliss, MI c. 1880 (John Gibbs Owner)

When located adjacent to community buildings, parks, and schools, the store can benefit from the traffic generated by these uses. Because of their small sizes, corner stores must maintain extended hours, opening early and closing late, to maximize sales and to offset fixed expenses.

Approximately 800 to 1,000 households are necessary to support the average corner store, which equals the number of households in a 160-acre TND. The number of required households can be reduced significantly if the store is located on a major road carrying 10,000 or more cars per day or if the store specializes in niche products, such as wines, package liquors, or baked goods.

Sufficient vehicular traffic allows corner stores that double as gasoline stations to be supportable without nearby residences. Moreover, while a neighborhood is being built, construction traffic can support corner stores before the critical number of occupied houses is met. However, workers in the construction trades tend to be price sensitive, often preferring inexpensive snacks, sandwiches, and beverages that may not necessarily appeal to future neighborhood residents.

Typically, between 10,000 and 30,000 square feet in GLA, the convenience center offers an array of goods and services geared to the daily needs of its surrounding neighborhood. Often including a small specialty food market or pharmacy, a convenience center houses a limited number of tenants that offer a balance of food, personal, and professional services.

Mashpee Common, MA Image Source Unknown

Convenience Centers – CNU-Neighborhood Centers

The convenience center's primary economic advantage is its close location to residences, allowing the time-pressed shopper to make a quick purchase on the way to or from home. Like corner stores, convenience center businesses do not always provide competitive prices, but focus on providing shoppers with quality goods and services that can be quickly purchased.

Given their size and proximity to residences, these centers do not need the draw of a large anchor store, such as a supermarket or hardware store.

Typical convenience center tenants include bagel stores, bakeries, banks, coffee shops, delis, dry cleaners, tailors, financial services, florists, food markets, ice cream parlors, laundry centers, packing and shipping centers, package liquors, personal services, pharmacies, and real estate offices.

Adjacent businesses support each other by attracting shoppers who prefer to make multiple store visits and purchases. For example, someone dropping off dry cleaning items on the way home from work may also wish to pick up a carry-out meal for dinner or fill a prescription at the pharmacy.

Centers with numerous businesses offering diverse goods and services increase the likelihood that those businesses will be visited more frequently than as stand-alone proprietors.

Convenience centers are usually developed as linear freestanding buildings, but they can also be in the form of an L, U, or market square. Building depth can range from 20 to 60 feet, and the average sustainable tenant space is 1,000 to 1,500 square feet of GLA. Basements, attics, or off-site storage should be provided whenever possible; they allow businesses to make bulk purchases and thus reduce expenses.

Convenience retailers can also be located on the first floor of a mixed-use building as long as they can be easily seen from the primary roadway. The storefront signage and displays that shop owners use to draw the attention of passing motorists is their principal means of advertising, so careful building placement is crucial.

These businesses also rely on customers who make quick visits for planned and impulse purchases, so nearby surface parking is essential. Parking decks or underground parking lots are impractical for nearly all locations, excluding high-density urban areas.

Surprisingly, convenience centers cannot be supported by transit stops alone. The typical commuter tends to be in too much of a hurry or simply unwilling to carry purchases to or from work.

The International Council of Shopping Centers (ICSC) defines a convenience center as follows:

A Convenience Center provides for the sale of personal services and convenience goods similar to those of a neighborhood center. It contains a minimum of three stores, with a total gross leasable area of 30,000 square feet or less. Instead of being anchored by a supermarket, a convenience center usually is anchored by some type of personal/convenience services such as a minimarket.[2]

To be economically viable, a convenience center needs about 2,000 households—the equivalent of two TND neighborhoods. These centers should be located at the common entrance or intersection between two neighborhoods, preferably on the homebound side of the roadway.

Locating a convenience center inside a neighborhood poses an economic challenge because of the smaller population and lower traffic levels unless the site is in a dense urban area. Rural centers should be located at the homebound side of primary crossroads.

In suburban locations, the average primary trade area for a convenience center is a 1- to 1.5-mile radius. An urban convenience center may have a trade area of only several blocks, while a rural center may draw shoppers from up to 5 miles away.

Urban Neighborhood Center, Storrs, CT. Image GPG

Neighborhood Centers (CNU-Community Center)

The neighborhood center is considered the core of the traditional neighborhood and a staple of the shopping center industry. Anchored with a supermarket, pharmacy, and restaurant, a neighborhood center offers the complete array of goods and services needed by households on a regular basis but not available at smaller or larger centers.

The neighborhood center's primary anchor is a full-sized supermarket, typically 45,000 to 60,000 square feet in area. This anchor is the commercial engine that supports most of the center's other, smaller businesses, so much so that when a supermarket closes, many of those businesses will immediately suffer sharp declines in sales and be forced to close or relocate.

National retailers often have opt-out clauses in their leases that allow them to leave the center if the anchor closes.

The ICSC and Urban Land Institute (ULI) define a neighborhood center as follows:

A neighborhood center provides for the sale of convenience goods (foods, drugs, and sundries) and personal services (laundry and dry cleaning, barbering, shoe repairing, etc.) for the day-to-day living needs of the immediate neighborhood. It is built around a supermarket as the principal tenant and typically contains a gross leasable area of about 60,000 square feet. In practice, it may range in size from 30,000 to 100,000 square feet.[3]

Most neighborhood centers are between 50,000 and 70,000 square feet in total area, which includes the supermarket. The center can be planned in a variety of formats, including the linear strip, L, U, double-reverse L, or market square plans. The depth of a center's inline retailers ranges from 30 to 80 feet, with most of the tenants requiring 1,200 square feet of GLA. A 20-foot-wide by 60-foot-deep module is the most commonly used store dimension. Neighborhood centers are almost always constructed on concrete slabs without basements or attics.

The supermarket and other anchors are usually rectangular in plan, with their widest elevations facing the primary parking area. For example, a 50,000-squarefoot supermarket is usually 180 feet deep and 280 feet wide. Recently, however, some supermarkets have been adopting less regularly shaped floor plans, such as Copps in Middleton Hills, Wisconsin.

To generate pedestrian traffic throughout the center, the supermarket—whatever its floor plan—should be placed as close to the middle of the neighborhood center as possible. In most cases, however, supermarket management will insist on an edge location for better visibility and to reduce shared parking.

Conventional Neighborhood Center, Farmington, MI Image GPG

Except for dense urban centers, the economics of most suburban neighborhood centers presently require surface parking with an overall blended ratio of 4.0 to 4.5 cars per 1,000 square feet of the entire center's gross building area.

Presently, supermarket anchors often require parking ratios of 4.5 to 5.0 cars per 1,000 square feet, with most of their parking located near their front entrance. Lower

parking ratios may be sustainable in suburban locations in the future as land use and consumer trends evolve.
To be economically sustainable, a neighborhood center needs 6,000 to 8,000 households within its primary trade area. In a suburban setting, the trade area is within a 1- to 2-mile radius and its residents, on average, will shop at the center once or twice a week.

In rural areas, the trade area is much larger, and it is not unusual for residents to drive over 25 miles once a week to shop at a neighborhood center. In high-density urban areas, neighborhood centers may have trade areas of less than half a mile or even a few blocks.

The center's primary anchor—the full-sized supermarket—usually pays lower rents than the inline smaller retailers. In exchange for the discounted occupancy costs, the anchor will purchase considerable media advertising to attract shoppers to the center.

Neighborhood centers have, on average, 10 to 15 smaller retailers, such as a bagel shop, bakery, bank, bike shop, card shop, restaurant, coffee shop, dollar store, dry cleaner, electronic stores, eyewear retailer, family restaurant, financial services office, florist, food market, frame shop, hardware store, home furnishings retailer, ice cream shop, jeweler, laundry center, mail center, package liquor store, personal services store, pharmacy, tanning salon, telephone store, and video rental shop. Recently, apparel, sporting goods, and shoe store chains have successfully opened stores in neighborhood centers.

Since the success of the neighborhood center depends upon the performance of the supermarket anchor, the site plan, location, and view sheds for the supermarket should be well planned.

The center will be more sustainable and less susceptible to losing market share if it is located on the homebound side of the intersection of two major crossroads. In most locations, the supermarket should be easily visible from the primary roadway.

In strong market areas, some supermarket owners will accept reduced primary-road visibility for their stores after an initial three- to five-year period. Supermarkets tend to specialize in specific market niches, such as low price, high quality, organic, or meat-oriented. This specialization can result in more than one supermarket locating and being sustainable at the same intersection.

Recently, community, regional, and lifestyle centers have started recruiting supermarkets to ensure a steady stream of shoppers and to mitigate the detrimental effects of economic downturns. In the past, well-known fashion and home furnishing retailers avoided co-tenancy with grocery stores out of fear that it would harm the quality of their brands.

Grocery customers tend to shy away from extended apparel or gift shopping because of the perishable nature of groceries. This trend is beginning to change, and fashion and home furnishing stores now recognize the benefit of regular exposure to grocery shoppers, especially those who frequent upscale grocers such as Whole Foods.

Community Center (location & image source unknown)

Community Centers

The backbone of the shopping industry, community centers are larger than neighborhood centers but include many of the same tenants. Suburban community centers are typically 250,000 to 350,000 square feet in size and draw customers from within a 4- to 6-mile radius trade area with populations of 50,000 or more.

Unlike neighborhood centers, community centers have few small businesses. Their business model calls for inline tenants that are 10,000 to 20,000 square feet in size: junior anchors that are destinations in themselves.

At times pejoratively described as "power centers" or "category killers" (power centers have at least 80 percent of their GLA developed as anchors), these large-format retailers include arts and crafts stores, booksellers, and electronics, pet supplies, office supplies, sporting goods, and toy stores.

Community centers are anchored by major discount department stores, home improvement stores, supermarkets, or restaurant clusters.

This type of center can exceed 500,000 square feet in size when more than one 100,000-squarefoot or larger anchor is included.

As a rule of thumb, the larger the store is, the lower the rent (on a square foot basis). The economics of many community centers often require low-cost construction and surface parking lots, except in affluent suburbs or high-density urban areas.

Town Center –(Large Cit)y Easton, OH Image GPG

Lifestyle Centers and Town Centers

Although most community centers are frequently developed as single-story linear buildings or L-shaped assemblages with large surface parking lots, walkable, more urban building types have proven sustainable. Main streets and vertically stacked community centers have been successfully developed in strong real estate markets.

The Washingtonian Center in Gaithersburg, Maryland, and Zona Rosa in Kansas City, Missouri, pioneered the development of community center–type retailers into a lifestyle center format that incorporated large discount retailers into a walkable urban setting.

Developers prefer to locate community centers at major road intersections, but these centers can also be economically viable at other sites so long as they are easily visible and readily accessible. Community center developers often seek locations near a regional mall, which serves as the major anchor pulling shoppers to both it and the center on a regular basis.

First constructed in the mid-1980s, lifestyle and town centers constitute the newest type of shopping center format. They were created in an effort to offer upscale fashion and home furnishings without subsidized department stores. Initially, these open-air centers were very popular with busy shoppers who sought their favorite shops. These centers are built with and without streets; however, those with streets tend to be more economically sustainable.

By definition, lifestyle centers only include retail and restaurant uses, while town centers incorporate office, residential, and civic uses as well. Nonetheless, not all developers and planners agree on the center's typologies, and the term "town center" or "towne centre" is frequently misapplied to unworthy strip centers. Recently, developers and retailers have discovered that the town center's mix of civic uses, such as libraries, can increase consumer traffic and improve overall economic performance.

With a 5- to 8-mile trade area, lifestyle centers can be sited between regional centers or between small niche markets. Surprisingly, lifestyle centers can be located nearly adjacent to regional centers.

This proximity allows the center to use the regional center as a co-anchor, at times attracting otherwise mall-destined retailers by offering significantly lower rents and occupancy costs. In some cases, leading mall retailers will move to a new lifestyle center that offers a unique and more convenient shopping experience to their customers as well as lower overall occupancy costs.

The typical lifestyle or town center retailer seeks to capitalize on 75,000 households, each earning a minimum of $75,000 per year. Some retailers prefer to target fewer households, as few as 25,000, with higher average incomes, such as $100,000 or more. The lifestyle center format, however, has also proven to work for moderately priced retailers that have a broader consumer base.

Lifestyle and town centers can be planned in many configurations, including double-sided street, town square, half block, or in the shape of a U or reverse L.

Open to the elements, both lifestyle and town centers are vulnerable to the fluctuations of climate, but not to the extent one might expect. Hot and humid climates, such as those in the Sunbelt, pose the greatest challenge to the open-air lifestyle center format, while colder temperate climates, and even snowy regions in the North, are more economically sustainable.

The shopping center industry depends on the fall and holiday seasons for most of its sales and profits, while the summer and late winter seasons are considered bonuses.

The cool fall and cold winter seasons encourage shopping for back-to-school apparel and holiday gifts, and consumers in both northern and southern regions seem to enjoy being outdoors during these periods, excluding bouts of extreme precipitation. In northern areas, cold weather likely encourages more purchases of sweaters and winter gear.

After the winter season, people in cold regions are eager to get outdoors and are inclined to shop in the warm summer season's open air rather than in an enclosed mall. In fact, during mild summers, northern shoppers rarely give up a nice day to visit an enclosed mall. In contrast, many southern regions have extremely hot, humid summers that are so unpleasant that shopping in an air-conditioned mall becomes nearly essential.

Developers of the first lifestyle centers grouped home furnishings, restaurants, and popular, moderately upscale apparel stores together in a semi-urban outdoor environment.

These centers accommodated retail stores and restaurants but did not include major department stores, partly to avoid the multi-million-dollar subsidy required by department stores and partly because of the reluctance of department stores to depart from the proven format of the enclosed regional center.

The unanchored format of the lifestyle center proved successful in the first decade of its development. The novelty of shopping in semi-urban lifestyle centers generated significant consumer traffic and sales, often at the expense of nearby regional centers or historic downtowns. Many regional malls countered with a variety of marketing and leasing measures that achieved various levels of success.

Nonetheless, an oversupply of lifestyle centers has occurred, often in weak markets or at poor locations. Combined with increasingly excessive and expensive site development and building designs, this has led to numerous underperforming lifestyle centers.

The new, generally accepted industry practice maintains that the lifestyle center model needs at least one full-sized department store, 80,000 to 120,000 square feet or more of office uses, a community use, such as a library, and strong inline retailers and restaurants to be economically sustainable. Hotels and residences also contribute to the vitality of the town center and should be included in as high a density as practical.

Village of Rochester, 350,000 sf Lifestyle Center; Town Planner: Gibbs Planning Group

Lifestyle centers are among the many shopping venues that seek large multiplex cinemas as co-anchors. The impact of cinemas on shopping centers, however, is mixed. Though cinemas generate significant traffic, only restaurants receive any consequential boost in sales from moviegoers.

With the exception of booksellers and art galleries, most retail categories are not positively influenced by movie theatres. Nevertheless, the cinema is often necessary for attracting many customers to restaurant venues, especially those far from major office markets. The restaurants can then, in turn, bring shoppers to the center

Because cinemas often require extensive surface or deck parking, their inclusion in a lifestyle or town center should be carefully evaluated before development. Many developers have concluded that department stores offer greater economic sustainability than cinemas.

Lifestyle center operators must limit their overall development costs in order to charge realistic rents and ensure a market rate of return on their investment. In general, lifestyle centers require surface parking and single-story retail structures.

Constructing multilevel buildings with residential or office uses above the first-floor retail level can increase building costs by up to 25 percent, an expense that cannot be offset by increased rents.

In the boom days of the late 1980s and 1990s, many communities were willing to contribute land, parking decks, or direct public subsidies to compensate for the increased expenses required to build and maintain mixed-use town centers.

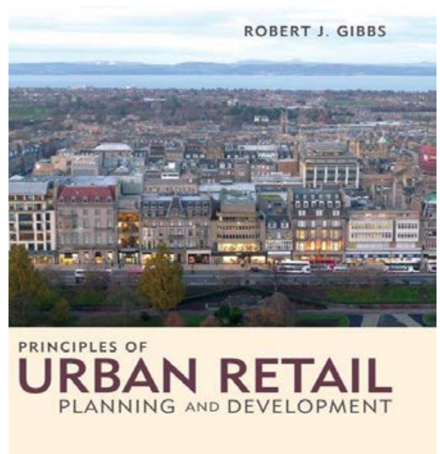
Today such public assistance is seldom available in most regions, and the lifestyle or town center must be sustainable in its own right.

Although town centers have plans that reflect many smart growth and Congress for the New Urbanism (CNU) principles, these centers can pose a potential challenge to historic downtowns.

The town center's main street, a collection of popular retailers and restaurants augmented by on-street and deck parking as well as modern retail management techniques,

offers an experience that the typical shopper perceives as "urban enough," making a visit to the nearby downtown a necessity.

An unintended consequence of this new format is that lifestyle and town centers may cause more harm to historic downtowns than the earlier-era regional centers that provided such a contrast to urban districts. Ideally, this popular shopping center model should be woven into the urban fabric of existing downtown commercial centers, such as the one built in Lake Forest's Market Square in 1916. *Robert Gibbs – Wiley 2012*



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MICHAEL GLEBA, MSUP, JD, PhD
International Making Cities Livable Conference- October 2023
(For discussion purposes)

LET THE NEIGHBORS DECIDE, TOO-
Prospects for Submunicipal Land Use Decision-making in the United Kingdom and the United States

Abstract:

In metropolitan areas around the world current residents often oppose the development of new and/or denser land uses, especially multi-unit housing. Expressing concerns that such projects are incompatible with their existing neighborhoods and that they would diminish residents' enjoyment of their homes as well as their property values. They also often voice disappointment that public review processes do not appropriately take their concerns seriously and the system is in some way "rigged" to favor developers, with any mitigation accruing to the municipal government rather than affected residents.

It has been widely observed that when such "Not in My Backyard" (NIMBY) opposition is effectively organized it can place urban and suburban neighborhoods into straitjackets, preventing them from evolving in response to changing market, economic, and demographic conditions.

As there will continue to be demand for new housing in and around major cities, there are increasingly calls to reform existing land use regulatory practices and institutions to facilitate its creation. In America, for example, this has led to numerous suggestions to reform the main land use control tool, municipal level zoning, which is portrayed as being too solicitous of incumbent NIMBYism-prone homeowners. However, zoning is in practice extremely hard to change, largely as a result of those homeowners' dominance of local politics, especially in suburban communities.

To address this, many proposed reforms emphasize diminishing local control in favor of states reasserting control over the zoning power they have traditionally delegated to their municipalities so as to curb their ability of municipalities (and their current residents) to exclude new housing. This has been seen in states such as California and Oregon passing laws overriding local zoning ordinances so as to allow two-, three- and multi- family dwellings to be built in single-family districts. The impulse to shape local zoning practice from above is now also finding energy at the federal level, with some discussing using the power of the federal purse to incentivize, or coerce, municipalities to modify their zoning bylaws and ordinances to allow for more diverse, and denser, forms of housing.

However, it is unclear is how or why any of these reforms would ameliorate NIMBY sentiments in any tangible way, and they risk further alienating public sentiment and increasing the belief that the development approval processes are at best exercises in gamesmanship between developers and government officials.

Therefore, while many indeed advocate for shifting more control over land use "upward" to the state or national levels, an alternate approach would be to instead look in the opposite direction and empower more decision making at the sub-municipal level to be exercised by the neighbors of proposed developments. Several such approaches are being explored and debated in the United Kingdom, described

with terms such a “hyperlocal zoning, and “street voting,” (with the latter the subject of a bill introduced in Parliament in 2021). A common thread is that such reforms would empower affected residents (rather than just local planning authorities) to authorize denser development on their streets. Importantly, it is thought that such schemes would facilitate such development not by simply imposing it on existing neighborhoods, but rather to do so through consultation and negotiations with current residents and giving them the incentive to accept and embrace additional development.

Cognizant of the differences between the legislative foundations for planning authority in the United Kingdom and the constitutional basis for zoning in America as established by the United States Supreme Court’s seminal 1926 Euclid v. Ambler decision, this paper will explore the prospects of such approaches to meet the increasing need for urban housing supply in both nations.

Short Bio

Dr. Michael Gleba’s professional, research, and teaching interests include zoning, land use, and public policy. He earned a Ph.D. in Law & Public Policy at Northeastern University’s School of Public Policy and Urban Affairs where he teaches courses on local government and land use/urban growth policy as an adjunct faculty member. He previously earned a B.A. from Manhattan College, an M.S. in Urban Planning from Columbia University and a J.D. from Boston College Law School.

A member of the Massachusetts Bar, Michael has represented private and public sector clients and has held leadership roles in state and local government, including as Manager of Rail for the Commonwealth of Massachusetts, Director of Planning for the City of Somerville, MA and, currently, working on land use policy issues and development review and permitting for the City of Newton, MA.

1. Introduction

1.1. The "3S" menace

In Portland, Oregon, on 23 October 2017, the keynote speaker to the ISOCARP-UNESCO Special Event to discuss Sustainable Development Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable (SDG 11 - Cities) was Ms. Hawa Deme, co-founder of Umuganda Africa. She highlighted that 95% of future urban expansion will occur in the Third World. The next speaker, Mr. Nicholas You, noted that in the next fifty years, humanity will spend more money on cities than we have cumulatively spent in all of human history, because the quantity of urbanism will double in capacity from 3 billion to 6 billion people (personal notes taken at the event).

The core of the problem is that there will be an additional urban population of 3 billion by 2050. Just over a third of that growth is expected to be in China, India and Nigeria, but the remaining two-thirds will be in the countries around those countries: a great arc of growth stretching from West Africa, through the Middle East, across Asia and into the Pacific. An additional 3 billion urban residents in thirty-three years translates into a need to build new cities with an average population of one million people, complete with hospitals, schools, workplaces, recreation and all the rest, at a fantastic rate, and it has to happen in places with low capacity and poor infrastructure. In short, the problem is one of rapid, massive urbanisation across this great arc of growth. The scale, speed and scarcity of resources required to address this problem are staggering and Chilean architect Alejandro Arevena rightly calls this the "3S Menace":

> *Let's start with the global challenge of urbanization. It's a fact that people are moving towards cities. and even if counterintuitive, it's good news. Evidence shows that people are better off in cities. But there's a problem that I would call the "3S" menace: The scale, speed, and scarcity of means with which we will have to respond to this phenomenon has no precedence in history. For you to have an idea, out of the three billion people living in cities today, one billion are under the line of poverty. By 2030, out of the five billion people that will be living in cities, two billion are going to be under the line of poverty. That means that we will have to build a one million-person city per week with 10,000 dollars per family during the next 15 years. A one million-person city per week with 10,000 dollars per family.* ***If we don't solve this equation, it is not that people will stop coming to cities. They will come anyhow, but they will live in slums, favelas and informal settlements****. [my emphasis] (Arevena, 2014)*

Hence, while diplomats and activists must keep us safe from nuclear war, and scientists and engineers must save us from global warming and species extinction, it falls to urban planners to keep the peace through the provision of healthy and harmonious cities for three billion people by 2050, and - as the Emperor Napoleon reportedly said - "We don't have a moment to lose!"

1.2. Two Thousand New, Million-Person Cities by 2050

When the priority is speed the need for effective planning is even greater than usual, because both the planning process and the plan itself must be first class. So, our first task is a plan for a program to plan and build new urbanism equivalent to two thousand new, million-person cities by 2050, in countries with little to no capability for this task.

I have written and/or presented on aspects of this problem and of possible solutions before, but have never previously attempted to prescribe a holistic solution. The earlier papers and presentations are here referenced as:

A. **"The Impending Revolution in Urban Planning Practice: Intelligent and automated, but will it be garbage in, garbage out?"** (51st ISOCARP Netherlands, 19-23 October 2015)
B. **"What's So Special About Special Districts?"** (CNU 24, Detroit MI USA, 8-11 June 2016)
C. **"Sustainability and the Revolution in Urban Planning"** (52nd ISOCARP Congress, Durban, South Africa, 12-16 September 2016)
D. **"Smart Planning for Smart Cities"** (PIA National Congress, Sydney, NSW, Australia, 3-5 May 2017).
E. **"The Jobless City – Revolution or Paradise?"** (53rd ISOCARP Joint Congress, Portland, OR, USA, 24-27 October 2017).
F. **"The Periodic Table of Urbanism"** (presented at CNU 26, Savannah, USA, 15-19 May 2018 and at ISOCARP, Bodo, Norway, 1-5 October 2018).

These papers and presentations have all been deliberately leading to this point (although not without some serendipity): the feasibility of solving rapid, massive urbanisation in the global south (RMUGS). Therefore, this paper relies heavily on parts of these preceding works, but they will only be further referenced where specifically referred to, in order to better emphasise the references to other author's work than my own. Note also, that my studies of the topics discussed in "D" and "F" above have continued to develop, so there are more recent references available, but for the purposes of this paper, the earliest reference is most appropriate.

This paper also assumes that the reader is familiar with the principles and practices of the New Urbanism.

1.3. The New Urbanism

The true impact of the post-Second World War, Brutalist deflowering of cities everywhere took some time to become apparent, but by the early 1960's writers such as Jane Jacobs (Jacobs, 1961), Herbert Gans (Gans, 1968) and Robert Goodman (Goodman, 1972) were exposing the symptoms. In some cases, they also provided insights into the causes and solutions, but it took another thirty years before the more advanced planners, architects and designers banded together and responded to auto-dominated urban sprawl with practical solutions. In the United States this took the name "The New Urbanism".

The New Urbanism has more than a passing similarity to City Beautiful: "Like New Urbanism, the 19th century [City Beautiful] movement redeemed city planning principles whose influence had waned and recognized that the design of physical space is important to the identity and cohesiveness of a community." (Stueteville, 2004). In the United Kingdom it does not have a clear name and is perhaps more a loose alliance of the Prince's Foundation for Building Community, English Partnerships, the now superseded Commission for Architecture and the Built Environment (CABE) and the still active Town and Country Planning Association (TCPA), founded in 1899 by Sir Ebenezer Howard himself. New Urbanist practice is also strong in parts of Australia and New Zealand (personal observation).

The New Urbanism, and its overseas cousins, have led a gradual roll back of decades of auto-dependent sprawl while simultaneously (and necessarily) developing a practice that has progressed rapidly from rediscovering the techniques behind the delightful works of past urbanist planners, architects and designers, such as Camillo Sitte, Raymond Unwin and John Nolan, to a body of knowledge and skills that is now well able to plan, design and build sustainable towns and cities: but is it ready for the Digital Revolution?

The description of a whole philosophy of planning is a task requiring many books, not just part of one paper, so I will leave the interested reader to inspect the 1993 Charter of the New Urbanism (Talen, 2013) and then read one of any number of books about the movement. A good place to start is the insightful and witty *The Geography of Nowhere: The Rise and Decline of America's Man-Made Landscape* (Kunstler, 1993), perhaps followed by the *The New Urbanism – Towards an Architecture of Community* (Katz, 1994), which provides an excellent, concise, technical introduction and a comprehensive collection of early examples.

2. Revolution in Urban Planning

2.1. An Additional Three Billion People

Urban planners and designers are faced with the task of housing an additional three billion people in towns and cities by the year 2050 (figure 1). It will be shown later that, not including China, India and Nigeria, this requires the equivalent of 2000 new, one-million person cities to be completed by 2050. If the program commenced now, in 2023, it would require the equivalent of building more than six one million-person cities every month for twenty-seven years (6 x 12 x 27 = 1,944). If climate change displaces another 200 million people, the task will be that much greater (Brown, 2008).

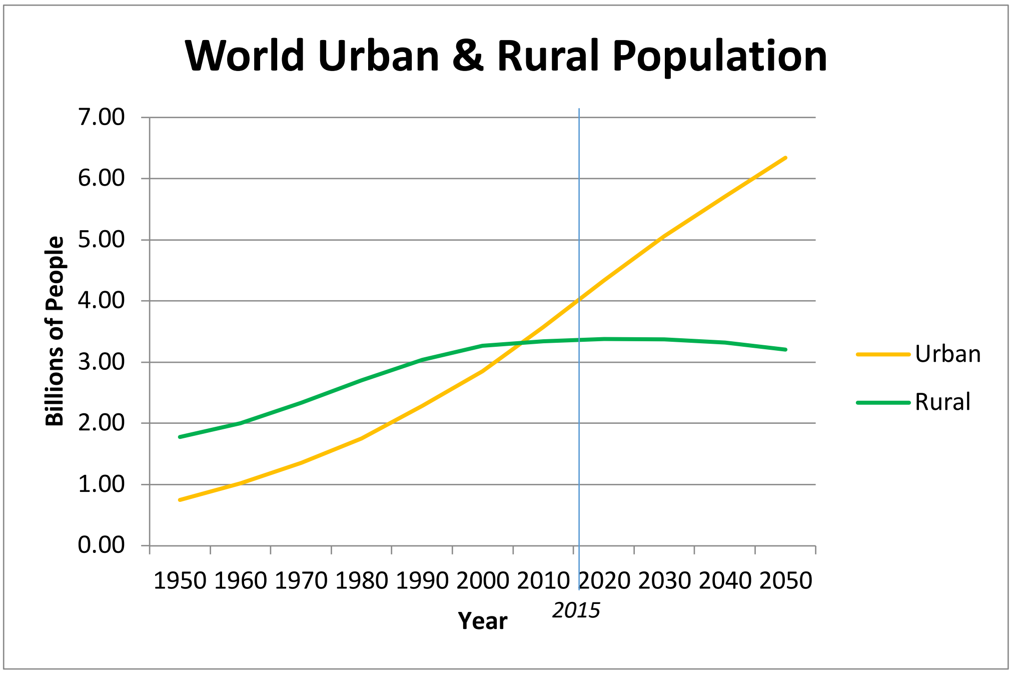

Figure 1: World Urban and Rural Population 1950 to 2015 (United Nations, 2014)

Compounding this problem, but also demonstrating that it might be part of the solution, the developing economies are generating large scale employment in their urban areas, some 900 million jobs in the thirty years from 1980 to 2010 (figure 2), but most of these jobs require the level of education that only a well-designed and managed large town or a city can provide.

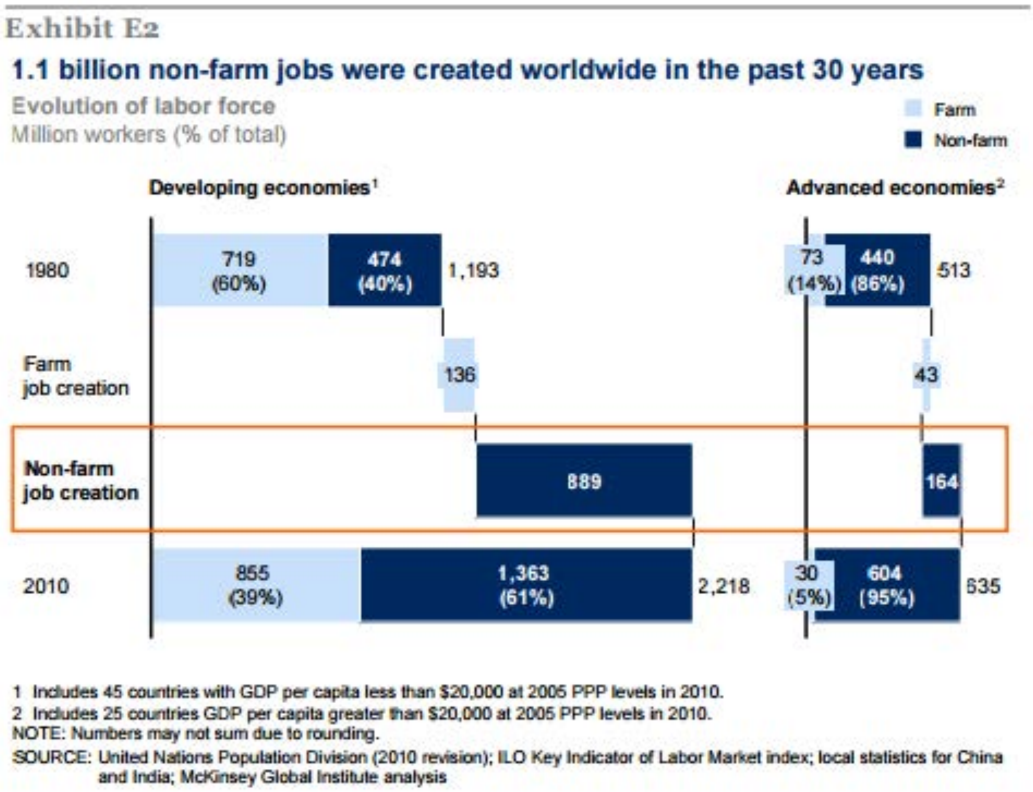

Figure 2: The growth of urban jobs from 1980 to 2010 (Dobbs *et al*, 2012)

China, since the 1980's, and India more recently have recognised this issue and responded with massive city building or urban improvement programs (World Bank, 2014, p. 3; Vikram, 2014), but only one-third of the additional three billion new urban dwellers are expected to be in China, India and Nigeria, the remaining two-thirds will be in the countries around those countries: a great arc of growth stretching from West Africa, through the Middle East, across Asia and into the Pacific.

Clearly, if massive new urban areas are required very quickly, then a plan that previously took the best part of a decade to prepare will now need to be completed in a tenth of that time. The planning process must therefore move from "slow and ponderous" to "fast and reliable", and must be conducted by efficient, well-managed planning agencies and at least equally competent consultants. This requires not only the adoption of all that the new technologies have to offer, but also the development of a plan-making paradigm that optimises the application of that technology in a way that produces good urbanism. In short, a planning paradigm that avoids the possibility of "garbage in, garbage out".

Over the last quarter century, the most significant advances in the understanding of urban areas, the practice of producing good urban planning and sustainable built outcomes, has come from the practitioners and academics who constitute the movement known as the New Urbanism. Three of these advances, the charrette, form-based codes and transect planning are particularly relevant. Many planners are already familiar with the two-fold improvement in efficiency that a good charrette process provides. Firstly, by shortening the plan making process through simultaneously interactive and iterative plan preparation and secondly by increasing the level of support for the plan across all stakeholders and concerned citizens, thereby shortening the approval process.

However, it is the combination of transect-based planning and form-based codes that, in my opinion, gives the opportunity to develop the New Urbanism further towards a systemisation that simultaneously enables localisation, which is, perhaps, the core conundrum of urban planning across the ages. Success will enable automation of the approvals process with the possibility of greater than eighty percent of applications being approved, almost instantaneously, on-line. The development of current transect-based planning practice toward this end is discussed in detail later in this paper.

If it is feasible to shorten the plan making process and the development approvals process then perhaps, we can, collectively as a profession, enable from now to the year 2050 an additional three billion people to live, learn, work and play in good, new cities and towns. Perhaps some of these cities will even stand the test of time and become the great cities of the Twenty-first Century!

Of course, "stand the test of time" is on old form of words, the modern equivalent is "to be sustainable". I will briefly address the strengths and failings of "sustainability' later, first it is important to consider the alternate case, unsustainability, particularly, in its worst-case scenarios.

2.2. The Limits to Growth

Whether history will refer to our current era as the 4th Industrial Revolution, the Digital Revolution, the Information Age or something else is not the concern of urban planners. What is important is that there will continue to be a civilisation with historians and philosophers who have the time and the inclination to argue about such things, because the alternatives are most likely:

- Mutually assured destruction by nuclear weapons (Caldicott, 2017);
- Mismanagement of the environment, leading to a sixth great extinction that will eventually include homo sapiens sapiens (Kolbert, 2014; Ceballos, Erlich and Dirzo, 2017, p. 7); and/or
- Mass migration, revolution and war through inadequate responses to rapid, massive urbanisation in the global south.

Collectively, we can refer to these as the “Limits to Growth” which have long been forecast to reach criticality in the middle of this century (Meadows *et al*, 1972), and which, if not overcome will lead to either no human civilization, no humans, or no planet at all. We are all, right now, part of an experiment in survival that is clearly not one that any sane person would want to see played out on their own species and on their own planet.

While the first two of humanity’s limits to growth are well understood, the third, rapid, massive urbanisation in the global south (RMUGS), as outlined above, is probably only common knowledge amongst urban planners, and some staff of the United Nations and related agencies.

It is a sorry testimony to the accuracy of the analysis conducted by Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, and William W. Behrens III in *Limits to Growth* (Meadows *et al*, 1972), that 2050, when two-thirds of the people on this planet will live in towns and cities, is our collective date with destiny: the most likely year of the demise of our civilisation that they warned us of almost half a century ago.

There are therefore now only two key questions for our profession:

1. Is it feasible to plan and construct the equivalent to two thousand new, million-person, sustainable cities, in countries with little to no capability for this task, by 2050; and, if the answer is yes,
2. Will we try?

In this paper I will answer the first question in the affirmative, but the second question requires a collective will that I have not previously seen demonstrated by our profession. Clearly, this is our last chance to discover it in ourselves.

3. Sustainability and the Revolution in Urban Planning

3.1. The Triple Bottom Line

Sustainability is usually illustrated by the three-circle 'Triple Bottom Line Model' Venn diagram, representing the three dimensions of sustainability (figure 3). It is a simple, but powerful model that has changed the paradigm and inspired people the world over to strive to create a more sustainable society.

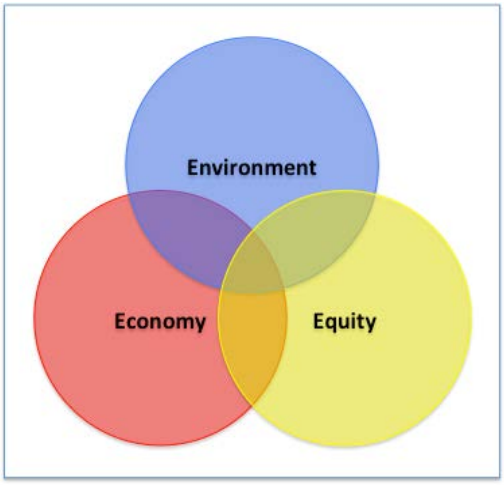

Figure 3: The Sustainability Diagram (Carter and Moir, 2012, p3; Wheeler, 2013).

While the concept of sustainability is vital if humanity is to survive past the middle of this century (Wheeler, 2013, p71) and its diagrammatic representation as three overlapping circles (a.k.a. the Sustainability Model) has been useful in promoting an understanding of what is required, the fact remains that of itself the diagram provides no immediate guidance decision making. In every case the decision maker, or his/er advisers, must analyse the detailed impacts of not only the proposal, but every facet of the proposal.

Figure 4: House, Apartment, or high-rise? ©Agatus: Image ID: 343732052

For example, how does the Sustainability Model guide a choice between the options shown in figure 4? The answer, of course is that of itself, it cannot. To make even a simple decision like this, recourse must be had to a long list of interrelated factors requiring extensive study and consideration.

However, by mapping sustainability, not as a Venn diagram of concepts, but as real things (figure 5) and then expressing the relationships between these things as an interaction model (figure 6) the inherent tension between the natural and built environments is revealed: **the built environment exploits the natural environment in order to maintain the economy and improve equity for "the people".**

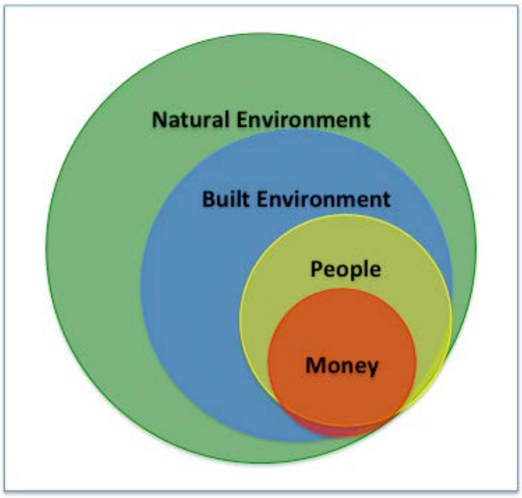

Figure 5: The four factors of sustainability as physical things.

This creates a 'tug of war' between two opposing 'goods' (i.e. it is good to protect the natural environment and it is good to provide for people by way of an economic and equitable built environment), but the difficulty of finding the sustainable middle ground has led to the development of two opposing camps, respectively pro and anti-development. Short term 'wins' for one side over the other encourages the feud to continue, resulting in long-term losses for society as a whole. We need to resolve this conflict, so that we can work together to resolve the existential crisis specified above.

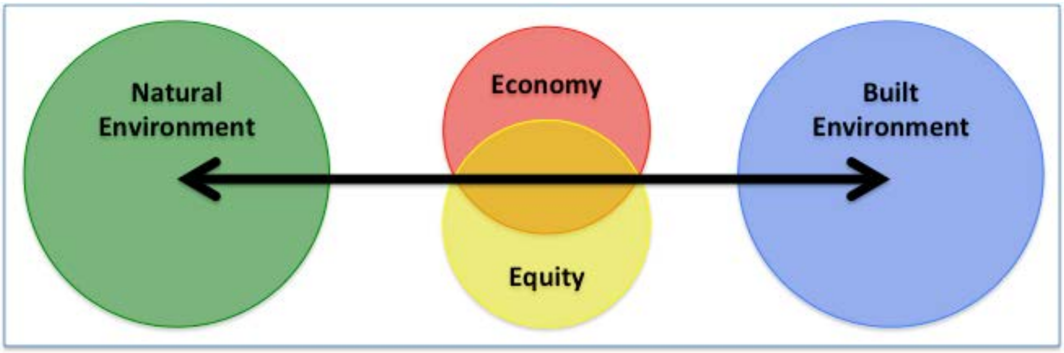

Figure 6: The four factors of sustainability in tension.

Figure 7: The natural and built environmental factors as a transect

The first step is to observe that figure 6 can also be mapped as a cartoon of a transect through an urban region, from watershed to waters' edge (figure 7), demonstrating that an understanding of the urban transect is fundamental to understanding urban sustainability.

3.2. Transect Planning

Many statutory planning systems use land use as their primary organising principle and then control built form by regulations specific to particular land uses. From the town of Seaside (1981, by Andre Duany and Elizabeth Plater-Zyberk of DPZ, Miami, USA, for town founder Robert Davis) onwards the New Urbanists have instead regulated built form first and then controlled land use, as necessary, by specific regulations (Katz, 1994).

The form-based code was further developed by adapting to it transect analysis from environmental science (Centre for Applied Transect Studies, 2016). This has resulted in a very useful body of knowledge and related planning and design techniques, including many images that are available on-line, such as figure 8 below, from the latest version of *The SmartCode – Version 9 and Manual* (Duany, Sorlein and Wright, 2008), which comprehensively details the use of transect-based plans and aligns them to the United States statutory planning system.

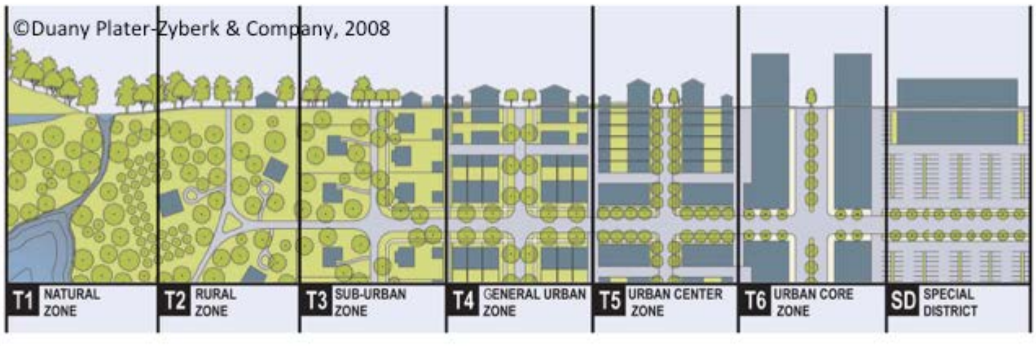

Figure 8: The current standard diagrammatic representation of the prototypical rural-to-urban transect.

It is also important to appreciate that the urban ecological zones designated as T1 to T6 are usually grouped into community units before areas are designed in detail (figure 9). Essentially, the urban structure is formed from these units and their supporting infrastructure.

The standard community units are usually:

- *Clustered Land Development* (CLD), e.g. a hamlet, typically consisting of T2, T3 & T4;
- *Traditional Neighbourhood Development* (TND), e.g. a village or a neighborhood, typically consisting of T3, T4 & T5;
- *Transit Oriented Development* (TOD) e.g. a neighborhood or district centre with good transit, it also typically consisting of T3, T4 & T5, but centred on a mass transit stop/station; and
- *Regional Centre Development* (RCD), e.g. a regional centre or the central buisiness district (CBD), which typically consists of T4, T5 & T6 with good transit.

Notably, a Special District is neither an urban ecological zone, nor a community unit. It is a catch-all category for everything else: "Some types of uses are justified in not fitting neatly into a transect ecozone and therefore must be treated separately. First, it is necessary to include a category (or "district") for land uses that are either exceedingly large, noxious, or for some other good reason do not fit automatically into an ecozone." (Duany and Talen, 2002, p.256). (Note that in this paper 'urban ecological zone' is preferred to 'ecozone'.)

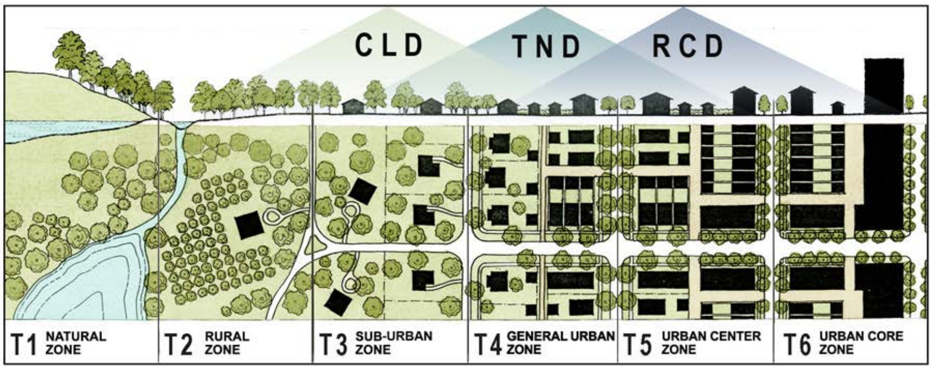

Figure 9: A variation on the transect diagram emphasising the prototypical relationship between transect elements and the community units: CLD, TND and RCD. (Sorlien, 2011)

This simple analysis clearly demonstrates that in urban planning the sustainability factors resolve into the application of a rural-to-urban transect that is already well understood, at least by leading practitioners and some academics. But is that all there is? Can every city plan be reduced to T1 to T6 plus the catch-all "Special Districts"? Clearly, as prototypical elements, T1 to T6 are almost unchallengeable, but perhaps Special Districts requires further examination.

4. What's So Special About Special Districts?

4.1. Boundary Conditions

Surveys of existing conditions and similar planning studies rarely pay attention to the boundary conditions of large areas devoted to a single purpose, but it is key to how such areas relate to the rest of the urban fabric.

Figure 10: A fortified boundary, approx. 250 x 150 metres or 820' x 490', protects the Acropolis

The Acropolis, rising majestically above the central area of Athens, Greece (figure 10) is possibly the archetype of all special districts. It is about the size of three city blocks, so it is not as large an element as it seems. Clearly, the defining feature is its fortified boundary, a wall designed to add to the natural defensive qualities of the hill on which it sits, while also increasing the area within which people could shelter in time of attack. Over the centuries, defenders of the Acropolis have never been defeated by direct assault, only by encirclement and the threat of starvation.

Figure 11: A secured boundary surrounds Buckingham Palace, part of an irregularly shaped complex approx. 520 x 610 metres or 1,700' x 2,000'

Buckingham Palace in London (figure 11) occupies a much larger area. The site is irregular in shape, but perhaps it could contain around fifteen city blocks. Unlike the Acropolis it has a secured boundary, one designed to be guarded, but not to withstand a heavily armed assault.

Figure 12: A fenced boundary (or in this case, a hedge) demarcating the front garden of this ΣAE Fraternity House's 420' x 200' plot (approximately 130 x 60 metres)

In contrast to the two preceding examples, a fenced boundary is very common. The term ‘fence’ is used here to indicate a demarcated boundary, as in the magnificent hedge around the ΣAE Fraternity House in figure 12. ‘Fenced’ also includes, low walls, ha-has and the wide expanses of ‘free-fire zone’ lawn and shrubbery used to discourage unregulated pedestrian access to campus style developments, such as a business park. In this context then, a “fence” is any form of physical demarcation that is more than a line on a map but less than the sort of fence or wall intended to deter a purposeful intruder.

To complete the set, we need only to add the case where the only demarcation of a boundary is by a few surveyor’s pegs or marks. This gives us the simple, but very useful symbols proposed at figure 13, in which the symbols for surveyed and fenced boundaries are standard drawing practice and the symbols for secured and fortified boundaries are standard NATO map-marking practice (respectively a barbed wire fence and a trench line). Finally, when a fenced, secured or fortified boundary encloses an area greater than four hectares (ten acres) drawing these symbols in red will highlight them as potential special districts.

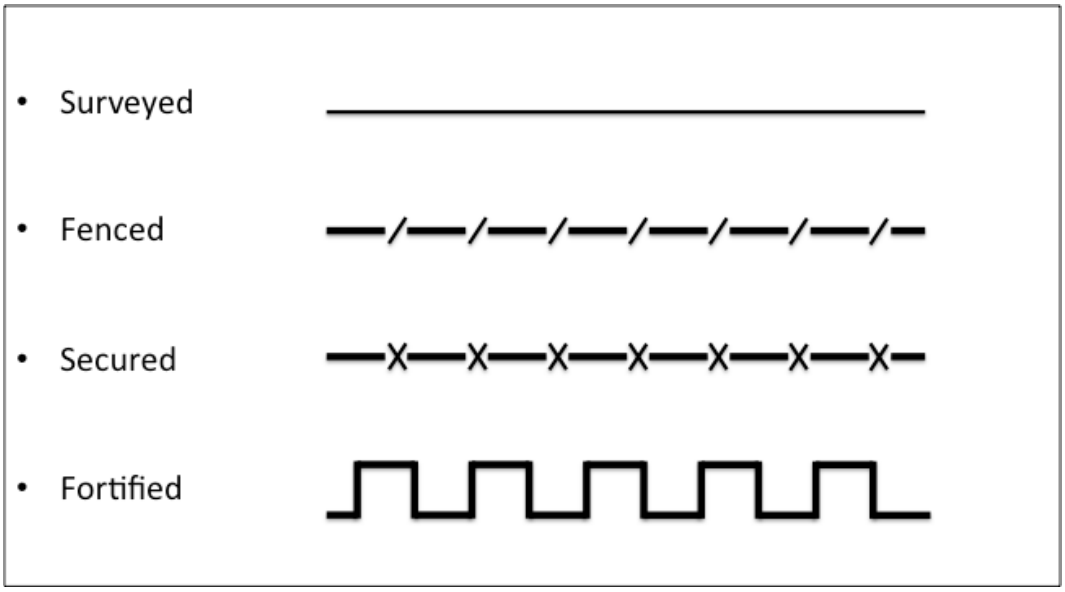

Figure 13: Graphics for boundary conditions

The key point is that physically defined (i.e. fenced, secured or fortified) boundaries constrain movement. The areas outside and inside might be walkable, but the community is prevented or discouraged from walking from one to the other. When these areas are smaller in size than a large city block (say 200 metres or 660 feet square) there is usually little impact on walkability, but when they cover even slightly larger areas than this they have a major impact on the urban fabric. Obviously, the impact is situational, but generally the larger the area enclosed, the greater the impact. This factor allows us to distinguish true special districts from the missing urban-ecological zones and to complete our understanding of the elements of urbanism.

4.2. The Periodic Table of Urbanism

If the prototypical urban transect from watershed to the city centre is expanded to the water's edge, and if within that transect any special districts, such as a jail, university, boarding school, etc. can be properly identified by a distinct boundary condition, then it is possible to arrange into one 'urban periodic table' (figure 14) the standard rural-to-urban transect extending from watershed to water's edge. This extended transect can now include all of the productive, transport and other uses in the city, the temporary and aberrant types of development, and an expanded range of community units, including special districts as now defined in the section following.

COMMUNITY UNITS:											
		Clustered Land Development									
			TND or, with transit, TOD								
				Regional Centre Development (generally with transit)							
	Special District (at least three zones, as appropriate to purpose, and within a physically defined boundary)										
TRANSECT ZONES:	T1 Natural	T2 Rural	T3 Sub-urban	T4 General Urban	T5 Urban Centre	T6 Urban Core	T7 Major Civic	T8 Parks & Rec'n	T9 Major Utility	T10 Industry	T11 Transport Facilities
SUBCLASSIFICATIONS											
Key Factor:	Science	Science	Density	Building Height			Use	Use	Site Area	Use	Use
TX.1			2-6 units/ac.	1-2 storeys	3-4 storeys	5-12 storeys	Cultural	Landscaped	Less than 5000 sq ft.	Services & Trades	Ports & Harbours
TX.2	Refer to environ-mental science for more detailed classification.	Refer to agricultural science for more detailed classification.	6-12 units/ac.	2-3 storeys	3-5 storeys	5-20 storeys	Religious	Sporting	5001 sq ft to 5 ac.	Manu-facturing & Ware-housing	Rail Yards
TX.3			12-16 units/ac.	2-4 storeys	3-6 storeys	5-21+ storeys	Government	Structured	More than 5 ac.	Refining & Smelting	Airports, Airfields & Landing Z's
TX.4			Civic uses that adjust their form across the transect (e.g. schools, places of worship, post offices, etc.)				Royal, Presidential or Ambass-adorial	Marinas			Spaceports
TEMPORARY AND ABERRANT DEVELOPMENT											
TX-(a)	Forestry	Un-economic Farms	Single Family Estates	Multi Family Estates	Shopping Centres and Strips	Edge Cities	Any of the above not adjoining or adjacent to T4, 5 or 6, as approp-riate to their scale	Any of the above not wholly adjoining roads, streams, rivers, etc., T1 and/or T2	To be identified	Industrial 'Parks'	To be identified
TX-(b)	Drilling & Wells	Hobby Farms	Mobile Home 'Parks'	Slums	Business 'Parks'						
TX-(c)	Quarries & Mines	Rural Residential	Shanty Towns		Shopping Malls						

Figure 14: The Periodic Table of Urbanism

Note that within figure 14, in the left hand column, 'x' represents the relevant T-zone in the row headed 'Transect Zone', e.g. T1.1 and so on. Note also that the numerical values given for some transect zones are tentative and require ground-truthing through case studies.

The Periodic Table of the Elements is deliberately arranged to demonstrate the periodicity and grouping of the atoms. Similarly, the columns in the Periodic Table of Urbanism are all grouped by function, while the core box of twelve transect zones (outlined in lilac) demonstrate the urban equivalent of periodicity. These three rows across four columns (T3.1 to T6.3) are typical local transects identifying four distinct, but co-dependent arrangements of built form. For example, suburbs at 5 to 15 units per hectare (2 to 6 units per acre) are only going to support general urban development one to two storeys in height and so on.

Studies and research to identify the mathematical relationships between each transect element, and related means of transport, are continuing and have formed the subject of more advanced papers on this developing analytical and predictive technique (Goldie, 2023).

The simultaneous complexity and simplicity of the Periodic Table of Urbanism hint at a greater order of things, too big to be considered here, but perhaps:

> *This is pretty remarkable evidence that there is a mysterious unity about the patterns found throughout the whole of creation. From the smallest of molecules to the biggest of planetary 'particles;' revolving around the sun, everything depends for its stability upon an incredible simple, very elegant geometric patterning - the grammar of Harmony.* (HRH The Prince of Wales, Juniper and Skelly, 2010, p. 118)

Whether towns of thousands of people and cities of millions are more or less complex than the 118 chemical elements so far discovered is debatable, but as Professor Dmitri Mendeleev is quoted as saying:

> *It is the function of science to discover the existence of a general reign of order in nature and to find the causes governing this order. And this refers in equal measure to the relations of man - social and political - and to the entire universe as a whole.* (Posin, 1948, p. 167)

Just as the Periodic Table of Chemistry identifies the physical components of our universe and is able to predict the relationships between them, the Periodic Table of Urbanism provides a comprehensive framework for describing the "general reign of order" in our towns and cities. It also enables the development of an algorithmic framework for both understanding existing urbanism and for plan making, as a necessary step towards the positive application of artificial intelligence to urban planning.

4.3. Special Districts as a Community Unit

As explained at section 3.2. Transect Planning, the transect zones are usually grouped into community units and the urban structure is formed from these units and their supporting infrastructure. The preceding discussion has now made it clear that the term 'special district' is not required to describe or classify the elements of urban sprawl, nor is it required to provide for the missing transect zones that have been tentatively catalogued above; however, there is a need for a term to describe special groupings of transect elements in circumstances that meet the following proposed definition (see figures 10 to 13 regarding fenced, secured and fortified boundaries). Therefore, I propose that:

> *A Special District is a special purpose community unit containing at least three urban-ecological zones within a physically defined boundary.*

Typical examples include airports, boarding schools, citadels (a heritage feature in many European cities), colleges, convents, hospitals, military bases, monasteries and universities, and would be labelled 'special district—airport', 'special district—boarding school', etc. Along with a defined boundary, these urban elements will also have an internal transect structure, as the examples at figure 15, below, notionally demonstrate. They are almost cities within cities.

Returning to the three examples of boundary conditions given above, the Acropolis (figure 10) can now be classified, in accordance with the Periodic Table of Urbanism at figure 14, as a Special District—Heritage with a fortified boundary and mostly containing the transect zone T7.1 Cultural; Buckingham Palace (figure 11) as Special District—Palace with a secured boundary and dominated by the transect zone T7.4 Royal; while the ΣAE Fraternity House (figure 12) is not a special district, just a very nice element within a T4 urban ecological zone.

Special District - Jail/Gaol	Special District - Barracks/Fort
Secured boundary (–x–x–)	*Secured boundary (–x–x–)*
T5 Administration, classrooms and theatres	T3 Married quarters
T5 Cell blocks	T4 Town centre
T8 Sports fields	T5 Bachelor quarters & barracks
T10 Workshops & stores	T5 Administration, classrooms and theatres
	T10 Workshops & stores
	T8 Sports fields & firing ranges
	T1 Close training area
Special District - University Campus	**Special District - Hospital Complex**
Fenced boundary (–/–/–)*	*Fenced* boundary (–/–/–)*
T5 Dormitories	T4 Specialist treatment & support facilities
T5 Theatres, lecture halls & seminar rooms	T6 Wards, theatres and administration
T6 Administration & libraries	T8 Gardens
T8 Gardens & sports fields	T10 Workshops & stores
T10 Laboratories, workshops & stores	T9 Incinerator

* 'fenced' means anything intended to demarcate private land, but to a lesser degree than 'secured' or 'fortified'.

Figure 15: Likely transect zones across some typical special districts

So, the answer to the question posed earlier "can every city plan be reduced to T1 to T6 plus Special Districts?" is no, but every city plan can be reduced to T1 to T11, with up to seven sub-classifications, a grid of up to seventy-seven urban ecological zones. As proposed at figure 14 above, the grid currently contains fifty-four defined urban ecological zones, but no doubt some of the blanks will be filled in after practical experience of its application.

It should be clear to all planners and urban geographers that a rural-to-urban transect comprised of the urban ecological zones proposed in the Periodic Table of Urbanism can be mapped across all urban areas. Transect-based plans are a subset of form-based codes and:

> *As of June 2019, we've tracked 728 codes* [in the United States and Canada] *that meet criteria established by the Form-Based Codes Institute (FBCI), as well as an additional 17 form-based guidelines. 439 of these are adopted, with others in progress. Even though form-based codes are 38 years old, 91% have been adopted since 2001* (Borys, Talen and Lambert, 2019).

So, transect planning has utility as a planning tool, but can it be used in conjunction with some form of artificial intelligence to predictably guide the preparation of plans in at least a partially automated process?

5. Smart Planning for Smart Cities

5.1. Artificial Intelligence Supported Planning

Professor Michael Batty is the Bartlett Professor of Planning at University College London where he is Chair of the Centre for Advanced Spatial Analysis and is a leading researcher in this field. Over two decades ago he wrote that:

Computer models of cities either attempt to simulate existing urban form or provide procedures for the design of optimal forms, but rarely both. The mechanisms used to model actual cities usually embody local behavioural descriptions without explicit optimizing,' whereas those that produce idealized forms seek to optimize in a more global fashion, often mirroring the viewpoint of the designer. (Batty, 1997)

More recently he published *The New Science of Cities* (Batty, 2013) in which he demonstrates a mathematical system where all actors (community, planner and politician) are replaced by algorithms. However, as in all situations involving the application of untested new technologies, it is appropriate to try many different approaches. Sometimes one or the other becomes the preferred standard, but more often than not each new approach encourages improvements in the others, leading to a convergence towards efficiency and effectiveness.

With this in mind, the approach that I propose aims to simultaneously "simulate existing urban form [and] provide procedures for the design of optimal forms", by mapping at the regional scale the following factors:

- Topography (shown by the thick white line in figure 16);
- Travel time to centre (shown as "ta" for travel time by automobile, "tb" for bus and "tt" for train in figure 16);
- Locational rent, in accordance with the work of Johann Heinrich von Thünen (1783–1850) who developed locational rent as a mathematically rigorous theory of marginal productivity (shown as "vr" for value of retail rents, "vm" for manufacturing rents and "vh" for housing rents in figure 16), (Wikipedia, 216a); and

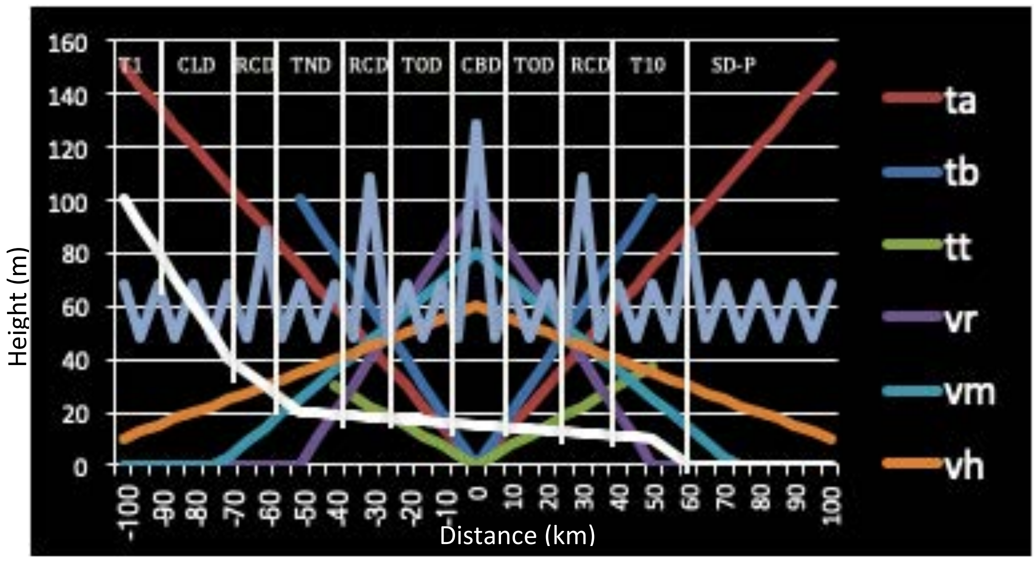

Figure 16: Analysis of urban structure by multiple factors along a theoretical transect.

- Total retail and commercial floor space, in accordance with Central Place Theory as proposed and utilised by the German geographer Walter Christaller (1893–1969), (shown as the light blue line in figure 16), (Wikipedia, 216b).

When these factors are combined into one graph (fig. 16) the results look slightly confusing (even in this fictional example) but when the transect-based planning community units are applied the urban structure is immediately clear: from left to right T1 (i.e. natural), then CLD (e.g. a hamlet), RCD (e.g. a small town on the edge of the urban area), TND (e.g. traditional fine-grained, mixed-use, walkable neighbourhoods), TOD (transit oriented development), CBD (central business district) and so on through to SD-P (e.g. a special district containing a port) on the coast.

Inclusion of additional operational theories of planning, such as the Chicago School models and Reticular Matrix (Ortiz, 2014) improves the reliability of the analysis, but for the purposes of this paper figure 16 is sufficient.

By repeating this exercise with parallel transects across the area to be planned, suitably designed prediction machines (Agrawal, Gans and Goldfarb, 2018) will produce an outline structure plan, as notionally illustrated at figure 17.

Figure 17: Illustration of how a first draft of a structure plan map might look when developed by an artificial intelligence analysing optimum urban structure along multiple parallel transects.

Applying this analysis to any urban area where the natural areas that are to be retained have been identified, and a transect-based synoptic survey and localising process has been completed, should very quickly produce a 'first-draft' urban structure plan. Refining this plan, checking infrastructure and traffic demand, etc. should follow expeditiously, because it is usually the process of preparing and testing the 'first-draft' many times that is the most time-consuming element. Note that the process of designing the community units in detail is still a professional design process, but this can be done in stages, as required, after the urban structure has been resolved and while the major infrastructure design is underway.

So, it has been demonstrated, using a hypothetical example, that standard urban metrics, applied using well understood theories can be combined with transect-based planning to automate the production of a 'first-draft' urban structure plan. With collective experience this process will become more rigorous and more reliable, producing the first draft of a metropolitan structure plan in hours instead of months and also vastly simplifying scenario testing

However, at the same time that the digital revolution is likely to accelerate urban planning processes, it is also likely to change at least one of the fundamentals of the city: employment. If there are no jobs, will cities cease to exist?

6. The Jobless City – Revolution or Paradise

It is highly likely that over the next two decades there will be a massive loss of industrial and service jobs in the western world, of the order of 80%, (Furman *et al*, 2016; CEDA, 2015) at exactly the same time as the mechanisation of agriculture in the global south is driving rapid, massive urbanisation in the global south; issues that humanity must deal with while also preventing nuclear war and avoiding biological annihilation.

Vivek Wadha, writing in the Washington Post[30] (Wadha, 2015) said that "We need a new version of capitalism for the jobless future". Perhaps a revival of co-operative ownership could be part of that model, an economy where:

- The citizens own the city;
- The city consists of all of the usual land uses (residential, schools, hospitals, etc.) renting these out, or operating them itself, as the citizens decide;
- The city owns the land of production (mining, agricultural and industrial);
- The city receives rents from the business owners or in-kind food and products;
- The city maintains itself and provides for the needs of its citizens in the form of food and clothing rations, access to education, health, recreation, entertainment, etc.; and
- The city distributes any surplus income to the citizens as a dividend and/or special purpose grants.

The Digital Revolution increases profits by decreasing labour, but there is no evidence yet that it decreases floor space. What will decrease is the need for worker transport, including parking. Therefore, robotised industrial land requirements might decrease by around 50% as parking areas are turned to more productive uses, but the roads and railways will probably be retained for the movement of raw materials and finished product. As the volume of production rises the value of the land rises and therefore rents can rise. There is no reason why a modern version of Ebenezer Howard's co-operatives could not capture that value (Howard, 1902, p. 58). Equally, urban and indoor agriculture reduces the agricultural hinterland required, thereby reducing land costs for a new city, and transport costs in bringing that produce to town. Areas of saving that could also be captured by a well-planned co-operative.

As explained earlier, "An additional 3 billion urban residents in forty years translates into a need to build a new city for a population of one million people, complete with hospitals, schools, workplaces, recreation and all the rest, at a rate of more than six a month" and clearly, building one new city of any form will have no impact on a problem of this magnitude. So, perhaps multiple experimental cities are required on each continent, the successes being quickly replicated (in type, not in exact design, which should always be bespoke) and then replicated again, increasing exponentially, until all of humanity that wishes to live in cities can do so to a satisfactory standard.

So, what are the options: scattered, idyllic rural villages, dense European urbanism or so far untested sci-fi archologies? Letchworth (population 35,000) near London, indicates that while the land ownership model may be relevant, the size is probably much too small, so that probably excludes idyllic rural village as an option, leaving archology, dense European city, or something in-between.

I have previously shown (Goldie, 2017) that both traditional European urbanism and a city-in-a-building archology could provide the physical models for the jobless cities that we should have started to build yesterday. Which of these will work best is likely to be determined by the degree to which each city's planning and design minimises environmental impact, maximises sustainability and, most critically, supports a functioning economic model that will "meet our needs as defined by the bottom two layers of Maslow's hierarchy of needs (physiological and safety) … thereby unleashing the next wave of human innovation and creativity in directions we can never imagine." (CEDA, 2015, p. 46)

7. Global Responses

There have been numerous high-level international meetings, forums, and conferences at which the problem of rapid, massive, urbanisation in the global south (RMUGS) is notionally addressed by goals, objectives and performance indicators (GOPI). These include the State of the Planet Declaration, the World Urban Forum, Habitat, the New Urban Agenda and the United Nation's sustainable development goals, as outlined below.

7.1. 2012 - The State of The Planet Declaration

The *Planet Under Pressure: New Knowledge Towards Solutions* conference (London, 26-29 March 2012) "... brought together nearly 3000 leading experts and decision-makers to discuss global challenges and offer new solutions." an additional 3000 people participated on-line. The first point in the State of the Planet Declaration is:

> *Research now demonstrates that the continued functioning of the Earth system, as it has supported the well-being of human civilization in recent centuries, is at risk. Without urgent action, we could face threats to water, food, biodiversity and other critical resources: these threats risk intensifying economic, ecological and social crises, creating the potential for a humanitarian emergency on a global scale.* (Brito and Smith, 2012, p. 1)

Unfortunately, the only actions proposed were to "fund and support capacity building in science and education globally ..." and related actions (Brito and Smith, 2012, p. 3).

7.2. 2001 - World Urban Forum

The World Urban Forum (WUF) is the world's premier conference on urban issues. It was established in 2001 by the United Nations to examine one of the most pressing issues facing the world today: rapid urbanization and its impact on communities, cities, economies, climate change and policies.

Organized and convened by UN-Habitat, the Forum has become one of the most open gatherings on the international arena, for exchanging views and experiences on urban challenges. The inclusive nature of the Forum, combined with high-level participation, makes it a unique United Nations conference and the premier international gathering on urban issues.

The World Urban Forum has the following objectives:

- raise awareness of sustainable urbanization among stakeholders and constituencies, including the general public;
- improve the collective knowledge of sustainable urban development through inclusive open debates, sharing of lessons learned and the exchange of best practices and good policies; and
- increase coordination and cooperation between different stakeholders and constituencies for the advancement and implementation of sustainable urbanization.

The Ninth session of the World Urban Forum (WUF9), was held in Kuala Lumpur, Malaysia in February 2018, and has been recognized by the United Nations General Assembly (resolution 70/210) as the first session to have a thematic focus on the implementation of the New Urban Agenda adopted at the United Nations Conference on Housing and Sustainable Urban Development, Habitat III.

The tenth World Urban Forum (WUF10, Abu Dhabi, UAE) and WUF11 (Katowice, Poland) maintained a strong focus on the New Urban Agenda, and WUF12, which will be held from 4–8 November 2024 in Cairo, Egypt, will no doubt provide another opportunity to review the implementation of this keystone global policy.

7.3. 2015 - Sustainable Development Goals

The Sustainable Development Goals (SDGs) are a collection of 17 global goals set by the United Nations. The broad goals are interrelated, though each has its own targets to achieve. The total number of targets is 169. The SDGs cover a broad range of social and economic development issues. These include poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy, environment and social justice. The SDGs are also known as "Transforming our World: the 2030 Agenda for Sustainable Development" or Agenda 2030 in short. The goals were developed to replace the Millennium Development Goals (MDGs) which ended in 2015. Unlike the MDGs, the SDG framework does not distinguish between "developed" and "developing" nations. Instead, the goals apply to all countries.

Paragraph 54 of United Nations Resolution A/RES/70/1 of 25 September 2015 contains the goals and targets. The UN-led process involved its 193 Member States and global civil society. The resolution is a broad intergovernmental agreement that acts as the Post-2015 Development Agenda.

The SDGs build on the principles agreed upon in Resolution A/RES/66/288, entitled "The Future We Want". This was a non-binding document released as a result of the Rio+20 Conference held in 2012. (United Nations, 1992, resolution 1, annex I)

The goal most relevant to this discussion is Goal 11: Sustainable Cities & Communities:

> *Make cities and human settlements inclusive, safe, resilient and sustainable.*

7.4. 2016 - Habitat III and the New Urban Agenda

The United Nations Conference on Housing and Sustainable Urban Development, known as Habitat III, concluded on 21 October 2016 in Quito, Ecuador, with delegations adopting the New Urban Agenda – a new framework that that lays out how cities should be planned and managed to best promote sustainable urbanization.

> *"We have analyzed and discussed the challenges that our cities are facing and have [agreed] on a common roadmap for the 20 years to come," Joan Clos, Secretary-General of the conference and Executive Director of the UN Human Settlements Programme (UN-Habitat), told participants at the closing session.* (UN News 2016)

The conference in Quito, lasted one week and drew around 36,000 people from 167 different countries, with a reported 50,000 also visiting the various associated exhibition areas.

Clos said that the document should be seen as an extension of the 2030 Agenda for Sustainable Development, agreed by 193 Member States of the UN in September 2015 (UN News 2016).

The Agenda for Sustainable Development's 17 Sustainable Development Goals (SDGs) recognized the power of cities and towns, which will constitute up to 70 per cent of the world population by 2050, to be the engine for sustainable growth in the future. The New Urban Agenda gives greater emphasis to this concept.

Implementation is covered by paragraphs 23 to 175 of The New Urban Agenda. (United Nations, 2017) Almost every paragraph starts with "We will ...", "We commit to ...", and so on. These statements include:

- "102. We will strive to improve capacity for urban planning and design and the provision of training for urban planners at national, subnational and local levels.",
- "109. We will consider increased allocations of financial and human resources, as appropriate, for the upgrading and, to the extent possible, prevention of slums and informal settlements, with strategies that go beyond physical and environmental improvements to ensure that slums and informal settlements are integrated into the social, economic, cultural and political dimensions of cities."; and
- "126. We recognize that the implementation of the New Urban Agenda requires an enabling environment and a wide range of means of implementation, including access to science, technology and innovation and enhanced knowledge-sharing on mutually agreed terms, as well as capacity development and mobilization of financial resources, taking into account the commitment of developed and developing countries and tapping into all available traditional and innovative sources at the global, regional, national, subnational and local levels, as well as enhanced international cooperation and partnerships among Governments at all levels, the private sector, civil society, the United Nations system and other actors, based on the principles of equality, non-discrimination, accountability, respect for human rights and solidarity, especially for those who are the poorest and most vulnerable."

In response to these points, or for other compelling reasons, there are programs designed to address such issues, for example:

> *From the Federal government's point of view, it is indeed essential to tackle the root causes for irregular migration. This includes improving living conditions and creating better perspectives in countries of origin, notably in Africa. The Federal government has already been very active in this field. This includes projects in education, vocational training, job creation, health, infrastructure or food security, to mention only a few. In the year of 2017, the German*

> *government has spent a total of 6.6 billion EUR to this end alone.* (Helmert, 2018)

The question is whether billions of Euros, dollars or dirhams directed piecemeal to education, vocational training, job creation, health, infrastructure, food security, etc. are sufficient to make a difference, or whether it would be better to direct all efforts to the one endeavour that is likely to provide a permanent solution: city building.

As the Germans say, *stadtluft macht frei* (the city makes you free).

7.5. Conclusions Regarding International Responses

While the goals, objectives and performance indicators developed and adopted at these various global meetings, forums and conferences are most worthy, it is notable that while there are many "we will's" there is no mention of 'how' or 'with'. Wars might happen by accident, but great cities do not. Even if they did, such good fortune is very unlikely in the great arc of growth stretching from West Africa through the Middle East, across Asia and into the Pacific, and most certainly not two thousand times in the next thirty years.

Figure 18: Residents line up to receive food in the besieged Palestinian camp of Yarmouk, Damascus, Syria 31 Jan 2014. ©AP/UNRWA

Notably, the most senior public official on the planet has warned that everything that humanity has done so far to address this challenge is not enough:

> *The UN Secretary-General has told a major climate change conference that the world faces a battle for its survival.*
>
> *António Guterres said despite the existential threat, not everyone was confronting the problem with due focus.*
>
> *Speaking in Abu Dhabi on Sunday, Mr Guterres also made an impassioned call for greater support to help develop the green economy.*

> *"The world is facing a grave climate emergency – disruption is happening now and faster than top scientists predict," he said.*
>
> *"Every week brings more devastation, floods, drought and…superstorms. All around the world, people are losing their homes and forced to migrate.*
>
> *"The situation only gets worse and we must act now with urgency. We have no time to lose."* (Dennehy, 2019)

Obviously, Franklin's Law is as true today as when the great man first coined it: "If the poor folks are happier at home than they can be abroad, they will not be lightly prevailed with to cross the ocean." (Benjamin Franklin, 1706-1790, from Zolberg, 2006, p. 46), So, not only are the goals discussed above sensible, they are based in long understood common sense, but the questions remain: how, when and where will these goals, objectives and performance indicators actually be implemented in sufficient scale to make a difference? How do we plan and build enough cities, or city expansions, well enough and quickly enough to solve a three-billion-person problem?

8. How to Plan and Build 2000 New, Million-Person Cities by 2050

8.1. Physical Resources – The Planning Staff

Whatever the technologies used to support the planning process they will not (at least not for a generation or two) replace the need for trained urban planners and designers.

At the local government level, such as the planning of a new town or city, the resources applied to planning depend upon many local factors, not least of which are the relevant laws and regulations of the state, but in my experience most of these factors can be subsumed into one constant, the size of community that one local government planer can manage if it is growing at 1% a year. Let us call this population the single planner population (SPP). For example, assume that this factor is constant within any particular state (i.e. emirate, province, nation, state, etc.), then the number of planning staff (S) will be given by the population (P) and the rate of growth, <u>actual or desired, whichever is the greater</u>, (R%) as follows:

$$S = \frac{P \times R}{SPP}$$

Finding the value of the single planner population (SPP) for any jurisdiction is simply a matter of auditing all planning organisations in that jurisdiction and taking the average (of course the audit has to normalise for consultant budgets and professional-to-support staff ratios in order to ensure an accurate comparison). As always there will be special cases and varying preferences for in-house teams over consultants, but in my experience this simple formula gives remarkably consistent results.

So if there is a town of 12,500 people growing at 1%, and the SPP for that state is 12,500 then the number of local government planners required to manage the plan making, plan implementation and administration for that town effectively and efficiently is one, because:

$$S = \frac{12{,}500 \times 1}{12{,}500}$$

$$S = 1$$

Scaling this up to a city of 1,000,000 growing at 1.5%, we get a staff requirement of one hundred and twenty, as follows:

$$S = (1{,}000{,}000 \times 1.5)/12{,}500$$

$$S = 120$$

Clearly, the same city, growing at twice the rate requires twice the staff, because:

$$S = (1{,}000{,}000 \times 3.0)/12{,}500$$

$$S = 240$$

Cities exist because they give economies of scale, but unfortunately, budget makers rarely recognise that in town planning increased size and/or rate of growth creates more problems, not fewer, because human interactions increase exponentially. The fact that this equation increases staff requirements geometrically, not exponentially, demonstrates that there are economies of scale in the planning of a city, but usually not to the degree desired by budget makers.

These same budget makers might also express a tendency to assume that technologies such as automated approvals will allow a reduction in staff. However, if this is done I am confident that the “garbage in, garbage out” rule will quickly assert itself and more planners, rather than fewer, will be required to sort out a mess that we do not have the time to deal with. It would be much more prudent to redeploy statutory planners to planning and urban design, or provide additional training in order to employ them as urban planning technologists, in order to ensure that the plans that are being converted into computer algorithms are sound, and that the outputs are audited for consistency with those plans.

If there is a short-term spare capacity in planning staff, then it would be wise for an agency (or group of agencies) to send them to undertake projects in less privileged jurisdictions. Revising Franklins Law slightly: “If disadvantaged people are able to live in nice towns and cities in their own countries, most of them will not want to leave." But, how many should they send? First, we require a likely rate of growth and initial population.

Given a proposed city of one million persons and assuming a density objective of 6,670 p/sq. km (e.g. Wikipedia, 2019 lists San Francisco at 6,226.3 p/sq. km in 2010), an average radius of 6.9 km giving an area of 150 square kilometres (sq. km) and an initial average density of 1 person/sq. km. Then, applying the standard formula for compound interest with A = 1,000,000 P = 150, and n = 30 years, the rate of growth (r) is calculated as follows:

$$r = n[(A/P)^{1/n} - 1]$$

$$r = 30[(1{,}000{,}000/150)^{1/30} - 1]$$

$$r = 30[6{,}666.7^{0.0333} - 1]$$

$$r = 30[1.3411 - 1]$$

$$r = 10.23 \quad \therefore R = 1023\%$$

Applying this growth rate to the staffing problem, and assuming an SPP of 12,500, gives:

$$S = (P \times R)/SPP$$

$$S = (150 \times 1023)/12{,}500$$

$$S = 153{,}450/12{,}500$$

$$S = 12.276$$

Therefore, an initial planning team of 12 full-time equivalent (FTE) urban planners, designers, other specialists (e.g. environmental scientists, urban geographers, surveyors, demographers, transport planners, planning engineers, social planners, planning technologists, etc.) and support staff (geographic information system operators, computer aided design (CAD) operators and administrative personnel) should be sufficient, on average, to produce a master plan for a city, or urban extension, of one million persons in three years. This calculation should be part of the annual budgeting process because the staffing need will change as the city grows.

A full-time equivalent team of twelve might seem to be a small number for a master plan for the equivalent of a city of one million people, but, counterintuitively perhaps, master planning a new city from scratch requires a smaller team than that required for the physical change management of an existing city with its myriad of issues, conflicts and individual applications for various consents.

In addition to confirming the site selection and preparing the master plan, this team will also be responsible for training the local team to implement the plan. Assuming that the local team have the relevant qualifications, then this should mostly be by on-the-job training (OJT), so they will be an additional resource, rather than a distraction from the main task.

Of course, the above assumes that the effective application of artificial intelligence to urban planning will not be available for some years, but every effort should be made to advance it, whether in the form described above, or by better approaches, because the task is very big and humanity needs to marshal to the task every resource available.

8.2. The Size of the Task

The next step is to confirm the size of the task.

Year	Urban population ($x10^9$)	Total Population ($x10^9$)	%
1950	0.75	2.50	30%
2009	3.42	6.80	50%
2050	6.40	9.60	67%
Increase 2009-2050=	2.98	2.80	106%

Figure 19: Urban Population 1950-2050 (from figure 1 above).

Figure 19 shows the total population increase for all of humanity and the increase in the urban population from 2009 to 2050, which is forecast as 2.98 billion. Excluding the one billion additional urban population forecast for China, India and Nigeria leaves 1.98 billion people to be housed in new urban settlements in the other countries within the great arc of growth (see, section 2.1 above). If these new settlements are assumed to be, on average, cities, or city extensions of 1,000,000 then the demand is for 1,980 new one-million-person cities, or equivalent urban expansions. If a 1% failure rate is allowed for (i.e. 19.8 projects) then this target can be rounded to 2,000.

Year	Growth Factor	Commencements During the Year	Total Number of MP Commenced	Total Number of MP Completed	% of Target
2020		7	7	0	0%
2021	2	14	21	0	0%
2022	2	28	49	0	0%
2023	4	28	77	7	0%
2024	4	56	133	21	1%
2025	4	112	245	49	2%
2026	4	112	357	77	4%
2027	4	224	581	133	7%
2028	4	448	1029	245	12%
2029	4	448	1477	357	18%
2030	4	523	2000	581	29%
2031				1029	52%
2032				1477	75%
2033				2000	101%

Figure 20: Masterplans required by year

Figure 20 shows that if we assume that, on average, each master plan can be completed within three years, and set up a program to commence seven masterplans in 2020 and grow the number of masterplan commencements by doubling the number of teams in the first two years and quadrupling them annually after that then, 2000 masterplans can be completed by 2033. Assuming twenty years for design and construction then 2000 new cities by 2053 is achievable. If new technologies and lessons learned on the first cities can be applied to speed up the process in later cities then possibly the whole task can be achieved by 2050, or earlier. So, the task is enormous, but feasible. The next question is cost.

8.3. The Cost of Planners and Plans

To estimate the cost, first of planning and then of design and construction of the infrastructure and key buildings, it is assumed that a level of commercial investment, owner-building or citizen labour will provide the majority of the lesser buildings.

As demonstrated at section 8.1 above, a planning team of twelve full-time equivalent (FTE) staff members at any one time should be capable, on average, of site selection and masterplan preparation for a new city for one million people within three years.

No of MP in progress	FTE per Team	Head Office	Total FTE	Wages Growth	Average Cost per FTE per Year	Total Salary Cost ($x10 ^{6})	On costs, operating expenses etc.	Total Cost per Year ($x10 ^{6})
7	12	13	97	1%	$100,000	10	100%	19
21	12	13	265	1%	$101,000	27	100%	54
49	12	13	601	1%	$102,010	61	100%	123
70	12	14	854	1%	$103,030	88	100%	176
112	12	15	1,359	1%	$104,060	141	100%	283
196	12	16	2,368	1%	$105,101	249	100%	498
280	12	18	3,378	1%	$106,152	359	100%	717
448	12	21	5,397	1%	$107,214	579	100%	1,157
784	12	28	9,436	1%	$108,286	1,022	100%	2,044
1120	12	35	13,475	1%	$109,369	1,474	100%	2,947
1419	12	41	17,069	1%	$110,462	1,885	100%	3,771
971	12	32	11,684	1%	$111,567	1,304	100%	2,607
523	12	23	6,299	1%	$112,683	710	100%	1,420
							Total Cost	15,815
							Program Length (Years)	13
							Averaged Yearly Cost	1,217

Figure 21: Planning Costs

At this point some assumptions are required. These are:

- That the definition of precisely what a master plan is in such circumstances is a matter for much discussion, so here "masterplan" is used in a very generic sense.
- That the planning teams require a "head office" team of twelve plus an additional person for every fifty teams, or part thereof.
- That the average salary per FTE is US$100,000.
- That the average employment on-costs (leave, allowances, insurance, training, etc.) plus the operating expenses (office space, furniture, equipment, materials, utilities, etc.) total to an equivalent of 100% of salary cost per FTE.
- That wages and on-costs increase due to inflation at 1% per annum for the duration of the project.

If these assumptions are correct, then figure 21 shows that the total cost of the planning program would be US$15.8 billion over 13 years, giving an average yearly cost of US$1.2 billion, including inflation. Obviously, this estimate should be rigorously re-examined before an actual program is initiated, but it is reasonable to expect that a formal actuarial estimate would not differ from this quick estimate by more than plus or minus 15% from the estimate above, giving a range of between US$1.0 B and US$1.4 B.

Project	Country	Designer/ Builder	Projected Population	Estimated Cost (US$M)	Duration (years)	Cost/Year/M Pers (US$M/yr)	Notes
Bahria Town Karachi	Pakistan	Bahria Town (Private)	1,000,000	1000	20	50	Assumed duration
Masdar	UAE	Foster + Partners	47,500	20,000	20	21,053	
Ramciel	South Sudan	Korea Land and Housing Corporation	250,000	940	5	752	Assumed population
New Songdo City	South Korea	Kohn Pedersen Fox	232,000	30,000	20	6,466	
					Average =	7,080	

Figure 22: Construction Cost Examples (from various websites)

Figure 22 shows that the construction cost of a sample of four new cities. Unfortunately, the available data is difficult to find and incomplete. Another complicating factor is that the range is very wide, from a cost per year per million persons of US$50 million for Bahria, a gated community outside of Karachi, to US$21 billion for Masdar City, the sustainability demonstration project next to Abu Dhabi International Airport. Considering each of these in turn:

- Bahria is a large project, but it does benefit from proximity to Karachi, a major city with significant (if reportedly inadequate) infrastructure, therefore the total projected cost could be artificially low;
- Masdar has not grown at anything like the initially projected rate and was designed to a very high construction standard, so this cost is probably unrealistically high;

- Ramciel is a totally new city in a remote area in a country typical of the great arc of growth discussed above, but a master plan has not been finalised and the estimate shown is from 2012, so it is possibly a little low; and
- New Songdo City is a high-rise city with a lot of new "smart city" technology and which has reportedly achieved only about one third of its projected occupancy (private site visit, 2018), and is therefore also probably unrealistically high for the type of project discussed here.

Year	Number of MP Completed (cumulative)	Number of Cities In Detailed Design & Construction	Cost/Year (US$M/yr)
2020	0	0	$0
2021	0	0	$0
2022	0	0	$0
2023	7	7	$7,000
2024	21	21	$21,000
2025	49	49	$49,000
2026	77	77	$77,000
2027	133	133	$133,000
2028	245	245	$245,000
2029	357	357	$357,000
2030	581	581	$581,000
2031	1029	1029	$1,029,000
2032	1477	1477	$1,477,000
2033	2000	2000	$2,000,000
2034		2000	$2,000,000
2035		2000	$2,000,000
2036		2000	$2,000,000
2037		2000	$2,000,000
2038		2000	$2,000,000
2039		2000	$2,000,000
2040		2000	$2,000,000
2041		2000	$2,000,000
2042		2000	$2,000,000
2043		1993	$1,993,000
2044		1979	$1,979,000
2045		1951	$1,951,000
2046		1923	$1,923,000
2047		1867	$1,867,000
2048		1755	$1,755,000
2049		1643	$1,643,000
2050		1419	$1,419,000
2051		971	$971,000
2052		523	$523,000
2053		0	$0
30		Total	$40,000,000
		Average	$1,333,333

Figure 23: Construction Cost Calculator based on cost estimates for Ramciel, South Sudan

Considering the above it is proposed that a cost per year per million persons of US$752 M for Ramciel be taken as starting point. Adding 30% as a worst-case margin of error gives a tentative US$1 B per year per million persons for the proposed 2000 new cities.

The data on the projected time for detailed design and construction is more reliable, with all but Ramciel proposing a twenty-year program, so this time frame will be adopted for this study.

Given the dearth of reliable, published data on these and other new city projects, a much more extensive and thorough audit by a team that has the resources to visit a much larger sample of new city projects would be necessary before deciding upon an overall project estimate. While a wide margin of error should always be allowed for early estimates of individual project costs (because a completed master plan is required before reliable construction cost estimating is possible), averaging over 2000 projects should be reasonably accurate.

Figure 23, above, shows that, assuming US$1 billion per year per million persons, construction costs start in the third year (2023), on completion of the first seven masterplans, at US$7billion a year, rising to US$2 trillion a year in 2032, but deceasing from 2043 as the twenty-year initial city building phase is completed and each city become self-funding.

As anyone familiar with city building would expect, the estimated average planning cost of US$1.4 billion p.a. for thirteen years is miniscule compared to the estimated average detailed design and construction cost of US$1.333 trillion p.a. for thirty years. Combined the total is US$1.3344 trillion p.a. for thirty years, but this still rounds to US$1.3 trillion p.a.

In addition, but not quantified here, an additional three billion people diverted from subsistence agriculture to productive cities, will itself increase the world economy, possibly by more than the US$1.3 trillion invested in the endeavour. However, this is an added benefit, the main objective is to save humanity from itself.

8.4. Feasibility

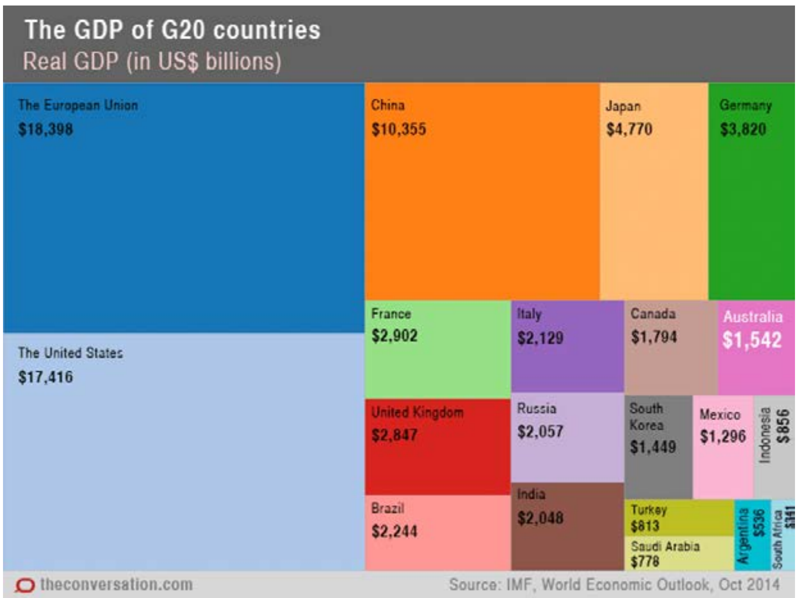

Figure 24: Gross Domestic Product (GDP) of the G20 countries in 2013-14

A preliminary cost of US$1.3 trillion p.a. for thirty years demonstrates that the costs of planning and building 2000 new cities in the great arc of growth from West Africa through the Middle East, across Asia and into the Western Pacific is not beyond the G20 countries and their combined gross domestic product (GDP) of US$78.4 trillion p.a. (in 2014), as illustrated in figure 24.

However, while it is economically feasible for the G20 countries to allocate 1.7% (US$1.3 T out of US$78.4 T) to solving rapid massive third-world urbanisation, it must be recognised that there is little likelihood of a political consensus to deliver that proportion of these countries' wealth in any one year, never mind a consistent policy over more than thirty years. Therefore, some other scenarios should be explored.

For example, if the design and construction costs of Bahria Town are accurate, and can be replicated across the Third World, then the average annual cost reduces to $67 B p.a., which is only 0.085% of the G20's GDP. This is more realistic, but would still require the leadership of a Sir Winston Churchill or President Harry Truman to deliver a G20 wide consensus. A further difficulty is that the Bahria development model is premised on the purchase of properties by those with a middle-class income in that market, it will therefore not result in the emptying of dark satanic slums and impoverished shanty towns for a better future in master planned cities "dense with skyscrapers gleaming like the nylon bristles of a brand-new toothbrush". (Blake, 1804; Calvino, 2002, p. 308)

An alternate, free-market plan would require a private consortium to fund the planning effort across the whole of the great arc of growth (US$1.4 B p.a. for thirteen years) and a single donation per city (spread over, say five years) of one billion US dollars (see Bahria Town Karachi in figure 22 above) to provide the initial infrastructure, possibly in return for naming rights. Perhaps the time will come when no self-respecting multi-billionaire would be able to resist the attraction of having a city named after them! The cities would need to be charter cities, meaning that citizens purchase their citizenship with cash or labour. This requires that the master plans provide for the sort of urbanism that is sufficiently dense to create an economically sustainable city, but able to be built with basic building skills and materials, for example the sort of dense urbanism of the older European cities discussed above at section 6.

Of course, all options would benefit from the fact that the economy of cities is strongly circular, meaning that the initial cash injection generates jobs that pay wages that are spent on rent and goods within the city, which then generate profits that fund developments that generate jobs, etc. However, this requires good governance, a planning consideration that must also be addressed if the full benefits of planning, designing, and building 2000 cities in the Third World are to be enjoyed by the citizens of those cities. This consideration could possibly benefit the charter cities option, provided that the internal governance of the city is strong enough to resist the interference of a corrupt national government.

Whichever model is adopted (and it could be a combination of one or more approaches) it is vital that these 2000 new cities provide very high-level triple-bottom-line outcomes. With good master planning they should start with good environmental outcomes and, as they should end migrations of desperation away from home countries, they have a head start in good social outcomes. However, there is little doubt that economic sustainability will require significant advances in the quality of governance in some of the countries in which these cities will be built. The issues raised in this simple statement are well beyond the scope of this paper, but must be addressed as part of this project. Given the time imperative it is necessary that such studies and proposals be conducted concurrently with the initial master planning phase and monitoring of the effectiveness of improvements in governance will, necessarily, last for many decades.

9. Conclusion

Urban planners and designers are faced with the task of housing an additional three billion people in towns and cities by the year 2050. If the program commenced this year, 2023, it would require the equivalent of building six one million-person cities every month for forty years. If climate change displaces another 200 million people the task will be that much greater. It is truly one of Alejandro Arevena's "3S Problems": a problem that is simultaneously large scale, requires a speedy response and must be dealt with by individuals or teams suffering a scarcity of means.

Compounding this problem, but also demonstrating that it might be part of the solution, the developing economies are generating large-scale employment in their urban areas, some 900 million jobs in the thirty years from 1980 to 2010, but most of these jobs require the level of education that only a well-designed and managed large town or a city can provide.

China, since the 1980's, and India more recently have recognised this issue and responded with massive city building or urban improvement programs, but only one-third of the additional three billion new urban dwellers are expected to be in China, India and Nigeria, the remaining two-thirds will be in the countries around those countries: a massive arc stretching from West Africa, through the Middle East, across Asia and into the Pacific.

Clearly, if massive new urban areas are required very quickly, the planning process must be fast and reliable, and conducted within, or for, efficient, well-managed planning agencies. This requires not only the adoption of all that the new technologies have to offer, but also the development of a plan making paradigm that optimises the application of that technology in a way that produces good urbanism. In short, a planning paradigm that avoids the possibility of "garbage in, garbage out".

The most significant advances in the understanding of urban areas and in the practice of producing good urban planning, and built outcomes, has been by the movement known as the New Urbanism. Three of these advances, the charrette, form-based codes and transect planning are particularly relevant. In particular, the combination of transect-based planning and form-based codes gives the opportunity to develop the New Urbanism further towards a systemisation that simultaneously enables localisation (perhaps, the core conundrum of urban planning across the ages). Success will enable automation of the approvals process with the possibility of some eighty percent of applications being approved, on-line, almost in an instant.

However, there is no time to lose waiting for such technological improvements, we need to start right now. The paper has demonstrated that if the funds and resources can be marshalled and fewer than one hundred planners and related professionals and support staff are deployed on seven new city projects within twelve months, then we can plan and build, from now to the year 2050, new urbanism sufficient to enable an additional three billion people to live, learn, work and play in good, new cities and towns.

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An evaluation of emotions induced by biophilic lighting colours using EEG and qualitative methods to support community well-being in urban spaces

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Abstract

This work tests the hypothesis that combining biophilic design principles with electrical lighting could increase people's connection to nature in the urban environment, generating positive emotions of relaxation to support well-being in the community. The study used previously tested biophilic lighting patterns, overlaid with lighting colour schemes inspired by sunset colours, representing biophilic colours. Three colours: pink, purple and warm white/amber were tested as biophilic colours in comparison to classic RGB lighting colours using EEG and an adapted Discrete Emotions Questionnaire (DEQ) with open questions. The EEG results showed that 100% of the sunset colours combined with the biophilic pattern had a positive emotional response as compared to the control. Contrastingly, only 33% of the RGB colours combined with the biophilic pattern had a positive response compared to the control. The DEQ results showed that the biophilic sunset colours had an 83% total increase in 'relaxed' compared to control and the non-biophilic RGB colours had a result of 61% less relaxed or more anxious than the control. Overall, the study applies a novel analysis method of EEG results in the context of lighting atmospheres and emotions, offers insights into people's emotional responses to biophilic colour schemes and, finally, suggests designs to implement the findings in existing urban spaces.

Keywords: Biophilic, Biophilia, EEG, Colour, Well-being, Light, Urban, Emotions, Cities, Relax, Stress, Happy

An evaluation of emotions induced by biophilic lighting colours using EEG and qualitative methods to support community well-being in urban spaces

Every year, a growing number of individuals are opting for urban living, with data showing that up to 75% of Europeans resided in developed regions by 2020 (The World Bank Group, n.d.). Although city life provides numerous advantages, it is not without health challenges. Residing in urban areas has been linked to heightened risks for mental health issues such as stress, anxiety, and mood-related disorders (Lederbogen, et al., 2011). Biophilic principles present a potential solution, suggesting that integrating natural, organic elements into our surroundings can be soothing. Essentially, biophilia implies that humans possess an inherent bond with nature. By interacting with nature or its representations, individuals can potentially feel emotions such as relaxation and joy (Kellert & Calabrese, 2015).

Common implementations of biophilic design often include physical natural elements like "plant/green walls" or enhancing natural light exposure. There's substantial evidence indicating that actual plants or direct exposure to nature can uplift moods and alleviate stress (William Browning, 2014). Yet, biophilic design also emphasises that nature analogues, like nature imagery or patterns, can also foster positive moods and relaxation (Kellert & Calabrese, 2015).

Considering the stress-urban living connection, an intuitive solution would be the addition of plants and greenery in urban areas. However, urban spaces often lack room to integrate natural parks or landscapes, especially when land competition is fierce (European Environment Agency, 2020). Lighting design might provide an innovative workaround. By using lighting patterns and colours inspired by nature, cities can use the positive effects associated with biophilic principles. This offers a unique way to rejuvenate urban environments and connect people to nature for better well-being.

Another consideration is extending the experience of nature into the night using lighting. It is well known that urban spaces, including green spaces, become inaccessible at night without suitable lighting. In particular, countries such as Denmark can have as little as 7 hours/day of daylight in winter making lighting increasingly important. This combination of a lack of daylight hours and limited access to nature further supports the need for a lighting solution at night to enhance people's connection to nature and well-being in city scapes. However, the need to retain darkness at night must be considered in any lighting solution. Combining natural analogues with the light itself could be a way to increase people's connection to nature without adding light to the trees or foliage at night. The concept could be an alternative lighting solution rather than an additional one, providing the illuminance that is already necessary at night while also offering a way to generate positive emotions for people's wellbeing.

Well-being, a multifaceted concept includes numerous aspects of an individual's health and lifestyle, has been extensively studied. Ruggeri et al. formulated an analytical tool estimating well-being across various nations, identifying 10 primary dimensions: Competence, Emotional Stability, Engagement, Meaning, Optimism, Positive Emotions, Positive Relationships, Resilience, Self-Esteem, and Vitality (Ruggeri, et al., 2020). For the purposes of this research, "Positive Emotions" stands out due to its relevance in linking biophilic design with emotion, mood, and stress reduction (William Browning, 2014).

While traditional studies largely depended on self-reporting to understand participants' emotions, electroencephalography (EEG) is now seen as a credible tool for assessing emotional states by analysing electrical activity of the brain (Costadopoulos, 2016). In this study, both EEG and qualitative methods are used to understand if merging biophilic design with electric lighting can enhance urban residents' connection to nature, promoting feelings of relaxation and communal well-being.

Background

Biophilic Design

The term "biophilia," explored in detail in Stephen R. Kellert and Edward O. Wilson's "The Biophilia Hypothesis" (Kellert & Wilson, 1993), is the innate human attraction to living organisms, driven by evolution. This concept suggests humans have an emotional connection to nature, resulting from our evolutionary history.

Biophilic design emerges from this concept, aiming to enhance human health and well-being by integrating natural elements into modern built environments. "14 patterns of biophilic design" by Browning, Ryan, & Clancy, details biophilic design's benefits, including improved cognitive function, accelerated healing, and stress relief. These effects depend on personal experiences, cultural contexts, and social norms. While direct exposure to nature offers the most significant benefits, even visual representations of nature such as artworks, shapes and forms are said to positively impact well-being.

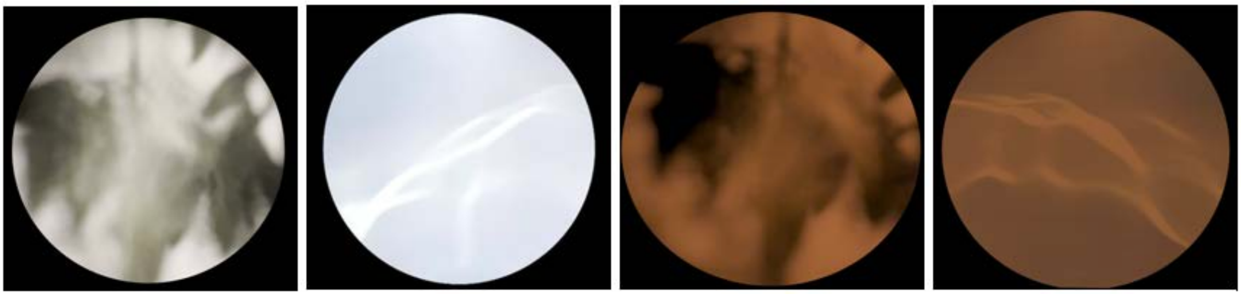
In Stephen R. Kellert's methodologies from "The practice of biophilic design" and the principles from "14 patterns of biophilic design" Kellert outlines various biophilic design strategies and classifies three types of biophilic experiences: direct nature exposure, indirect nature exposure, and spatial experience (Kellert & Calabrese, 2015). The interest of this research falls under the indirect experience of nature or natural analogues, described as organic, non-living recreations of nature. This includes shapes, colours, materials, patterns, and sequences found in nature, manifested as ornamentation, artwork, décor furniture, and given some form of visual representation.

Biophilic Patterns

In "Evaluation of emotions induced by biophilic lighting patterns using EEG and qualitative methods" Hill and Triantafyllidis created biophilic patterns and, after testing, identified two biophilic patterns with the highest positive emotional responses from participants (Hill & Triantafyllidis, 2023). Both patterns were designed to act as representations or analogies of nature and were called 'waves' and 'gum leaves'. The waves pattern was created by filming moving water reflections in slow motion. Whereas, the gum leaves pattern was created by collecting local plant leaves and creating lighting shadow patterns in a lighting laboratory. The results identified that waves had the most positive EEG experience and second most positive survey response. The gum leaves also had a positive emotional EEG result, although less than the waves. However, the survey response was the highest for the gum leaves rather than the waves (Hill & Triantafyllidis, 2023). This research paper uses the 'gum leaves' pattern for colour testing rather than the waves as the testing was conducted before the final results from Hill and Triantafyllidis were available. The 'Gum Leaves' had a highly positive response from participants so it was also a valuable pattern to test.

Figure 1.

Gum Leaves and Waves biophilic patterns in original colour and warm amber (Hill & Triantafyllidis, 2023)



Atmosphere

Gerhnot Böhme

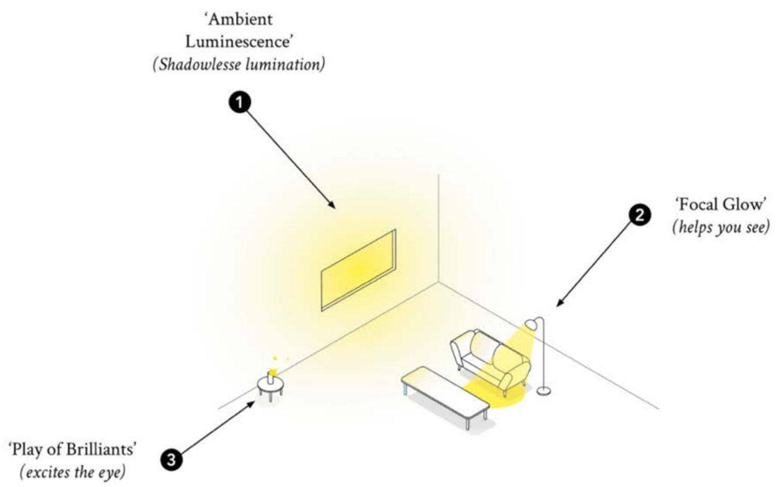
In his essay, "The art of the stage set as a paradigm for an aesthetics of atmospheres" (Böhme, 2013), Gernot Böhme delves into the idea of atmospheres relating to moods, describing them as "the emotional tinge of a space". Atmospheres envelop everything, merging various impressions into a single emotional state. They not only influence everything within them but also affect the mood of individuals experiencing them. Böhme notes that the nature of an atmosphere connects to the mood it conveys to its participants. While these atmospheres are somewhat elusive and heavily influenced by individual interpretation, designers can shape them. Böhme introduces concepts like 'generators' (conditions set in a space) and 'ekstases' (the aura or tone an object exudes) to describe how atmospheres can be fostered. He defines an atmosphere as the tangible presence of something or someone in a space. Crucially, Böhme emphasises light's role as a powerful 'generator', highlighting its transformative capability in influencing the ambiance and, consequently, the emotional response of individuals in a space.

Richard Kelly

Richard Kelly proposes a visualisation design approach for creating lighting atmospheres in Lighting as an essential part of architecture (Kelly, 1952). The approach includes imagining three essential lighting features that work together to develop one atmosphere within a space. These elements are focal glow, ambient luminescence and play of brilliance as shown in ***Figure 2*** below.

Figure 2

Richard Kelly's Lighting Layers (Kelly, 1952))



The first consideration for the atmosphere is focal glow. This is both a functional light for tasks such as reading as well as a focal point, drawing attention by providing light as a highlight.

The second lighting element is ambient luminescence. This is the indirect lighting in a space that provides shadowless illumination, importantly creating a feeling reassurance and calm "Ambient luminescence…suggests the freedom of space and can suggest infinity. It is usually reassuring. It quiets the nerves and is restful" (Kelly, 1952, p. 25).

Play of brilliants is the final element of the three key lighting features. This is the 'sparkle' of the design. Play of brilliants is something similar to a small candle flame or the sunlight sparkling across a body of water. It is the element of the design that stimulates the body and spirit, awakening curiosity “Play of brilliants excites the optic nerves, and in turn stimulates the body and spirit, quickens the appetite, awakens curiosity, sharpens the wit.” (Kelly, 1952, p. 25) Combining all three layers creates an overall atmosphere, and usually one of the three, focal glow, ambient luminescence or play of brilliants will be dominant in the design “Visual beauty is perceived by an interplay of all three kinds of light, though one is usually dominant.” (Kelly, 1952, p. 25) To summarise the lighting layers, number one, focal glow makes it easier to see, number two, ambient luminescence makes surroundings safe and reassuring and number three, play of brilliants, stimulates the spirit. (Kelly, 1952)

Colour

Descottes & Ramos

Coloured lighting can dramatically alter a space's ambiance, though its psychological effects remain subjective, as discussed by Descottes & Ramos (2011) in "Architectural Lighting: Designing with Light and Space". Key qualities of coloured lighting are the colour temperature, defined by Descottes as the appearance of emitted white light ranging from warm (reddish) to cool (bluish) hues, and coloured hues with their lightness and saturation. The Kelvin scale measures the colour temperature, with lower values indicating warm hues (reds) and higher values showing cool hues (blues). Cultural associations view red as warm (representing fire) and blue as cool (denoting snow and ice). In discussing coloured light, 'hue' refers to the main colour, 'lightness' indicates brightness, and 'saturation' describes colour intensity compared to a specific grey. Together, these attributes significantly impact lighting design to evoke particular atmospheres. Coloured lighting can offer unexpected transformations to traditional spaces when applied thoughtfully (Descottes & Ramos, 2011).

Richard Kelly

Kelly explains that we rarely naturally experience pure colours of light but instead, we are exposed to a combination of colour that varies throughout the day, depending on our location in the world “Seldom are we exposed to pure colour but daylight varies in colour from dawn to dusk, in various latitudes, and under various local climatic conditions from visual orange to deep blue.” (Kelly, 1952, p. 29). Varying combinations of deep reds, pinks, oranges and deep blues are explained as natural light experiences and related to the time of the day or evening. At sunset and twilight, the light travelling through the atmosphere results in longer wavelengths toward red and has a flattering effect on human skin “Before sundown…the resultant penetrating light is largely of longer wavelengths toward red. Human skin then looks best-the blood’s healthy circulation is intensified.” (Kelly, 1952, p. 30)

Later, after sunset the light reaching people is much heavier with short blue wave lengths and Kelly explains that artificial lighting is often warmer at this time. He also explains that using artificial blue light with pink highlights can have an effect similar to candles at twilight “After sundown…we can also use a background bluish diffusion as a foil for warm pink highlights to glamorize human features and skin-tone, just like twilight with candles or firelight.” (Kelly, 1952, p. 30). Overall these combinations of colours can be a way to develop naturally inspired, artificial lighting moods for evening and night time.

EEG

'Electroencephalography', commonly known as EEG, is a technique used to measure and record the brain's electrical activity changes (EMOTIV, n.d.). The brain's electrical signals are categorised into five primary types based on their frequency ranges: Delta (1-3 Hz), Theta (4-7 Hz), Alpha (8-13 Hz), Beta (13-30 Hz), and Gamma (31-50 Hz) (Jatupaidboon, et al., 2013). This method of recording the brain's electrical patterns offers quantifiable data that reflects instantaneous changes in the brain, related to emotional states. Costadopoulos' study explains that emotions can be connected to the activities of the brain and heart and that it's possible to detect shifts in both the brain's activity and heart rate for basic emotions (Costadopoulos, 2016).

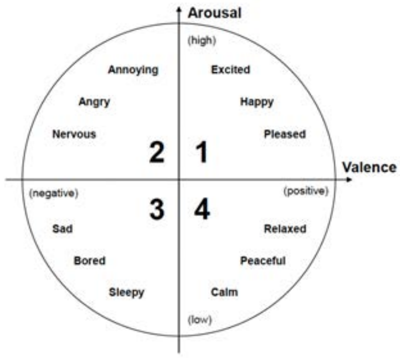
The task of associating EEG readings with distinct emotions has gained significant research interest. This process is influenced by various elements, including the participants, emotion models, stimuli, features, time frames, among others (Jatupaidboon, et al., 2013). Specifically, 'feature' denotes the EEG's signal attributes utilised in the analysis. Jatupaidboon and colleagues highlight that the Power Spectral Density (PSD) is a frequently employed feature tied to the EEG's frequency bands, showing consistent effectiveness in various studies (Jatupaidboon, et al., 2013). In the context of this research, the data is captured as PSD, which EEG software later transforms into 'average band power'. The average band power is effectively a number that “summarises the contribution of the given frequency band to the overall power of the signal” (Vallat, 2018).

EEG Emotional Model

The valence arousal model provides a way to connect EEG data with emotional experiences. Within this framework, two dimensions are presented: valence, which spans from negative to positive, and arousal, which covers a spectrum from calm to excited (Jatupaidboon, et al., 2013). Using the valence-arousal model, it is possible to identify emotional experiences of EEG participants. For instance, an emotion such as excitement would be characterised by positive valence and high arousal, whereas calm would show a positive valence with low arousal. ***Figure 3*** titled "Russell's Valence Arousal Emotional Model" (Galvão, et al., 2021) illustrates this 2D emotion classification using the valence and arousal method.

Figure 3.

Russell's Valence Arousal model (Galvão, et al., 2021)



Hill and Triantafyllidis applied this model using gamma waves to represent valence where a reduction in gamma waves represented an increase in valence (positive experience) and alpha waves to represent arousal where a reduction in alpha waves represented an increase in arousal. This research will apply the same methodology to analyse biophilic colours as previously applied by Hill and Triantafyllidis (Hill & Triantafyllidis, 2023).

Discrete Emotions Questionnaire (DEQ)

The Discrete Emotions Questionnaire (DEQ) introduced by Harmon-Jones et al. (2016) serves as a contemporary tool for measuring current emotional states. Unlike the PANAS scale which broadly measures positive and negative feelings over a period of time, the DEQ focusses on emotions experienced at a point in time. Especially useful for understanding participants' specific emotions in response to an event or stimulus, the DEQ underwent four trials to confirm its reliability, proving more sensitive than PANAS in assessing reactions to discrete events (Harmon-Jones, et al., 2016). The DEQ also offers adaptability, letting researchers use only relevant sections, reducing survey time.

The whole DEQ covers a range of emotions and four emotions (calm, anxious, relaxed and worried) were selected for this specific research. These four emotions could be organised into two groups: anxious (anxious and worried) or relaxed (calm and relaxed). A rating scale of 1-7 was provided for each pattern and emotion where 1 represented 'not at all' and 7 represented 'an extreme amount'. At the end of the questionnaire there were also an open question: "What was your favourite colour?"

Colour and design

Colours

Drawing from the works of Böhme, Richard Kelly, and Descottes & Ramos on colour, the choice was made to use the naturally occurring colour combinations perceived during sunsets. Sunsets captivate because of the noticeable changes in intensity and hues observed at this time of the day. Integrating sunset colours into the design allows for the extension of nature created by natural light shades into the evening using lighting.

Kelly believes that our cultural backgrounds affect how we see and feel about colours (Kelly, 1952). This idea guided the choice of sunset colours for the project, especially since it's based in Copenhagen, Denmark. Here, people often prefer warm lighting that looks like the soft glow from a candle. This kind of light makes them feel cosy and relaxed, much like the Danish idea of "Hygge," which means a warm, comfortable feeling. The main colour picked was a warm white from a sunset picture, labelled as "#D28D5A". Other colours were chosen to by keeping the same saturation and value from the warm colour but adjusting the hue.

Figure 4

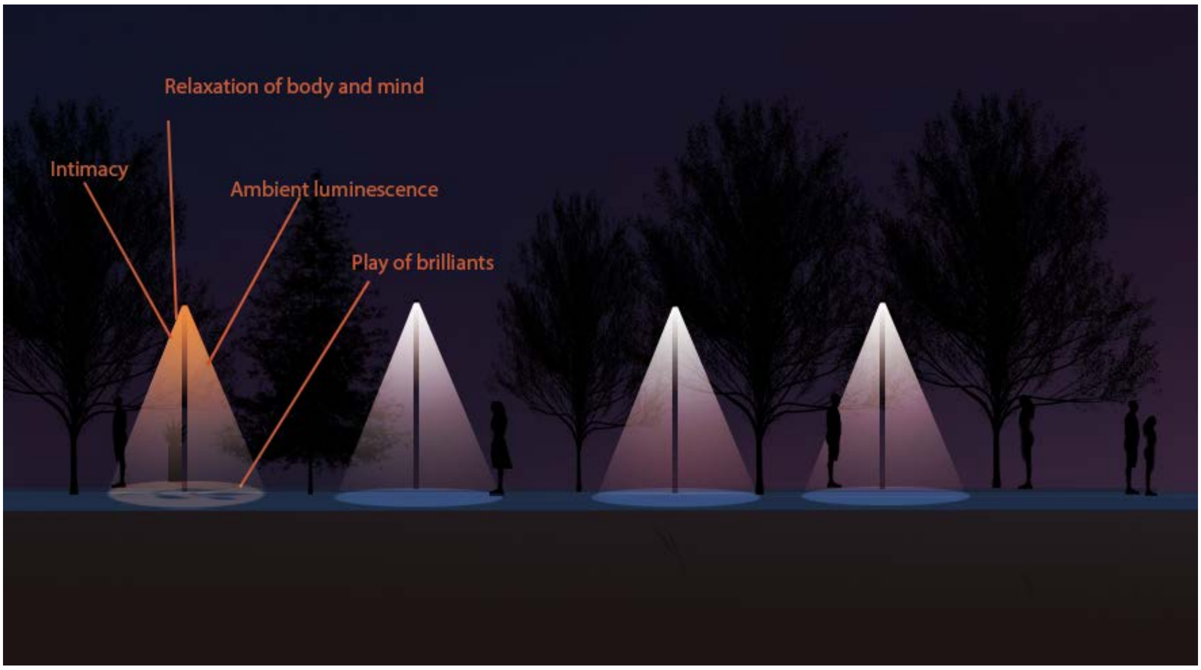
Picture of different sunsets in Denmark

Design

To contextualise how this research could be implemented in urban landscapes the figure below shows how the biophilic lighting patterns with sunset colours could be imagined. Importantly, it considers the atmosphere and, therefore, the emotional experience of people.

Figure 5

Initial Design Concept application utilising Richard Kelly's lighting layers



Experiment

This experiment tested the following hypothesis:

1. Sunset colours (warm, pink and purple) combined with a biophilic pattern projection will be more calming than standard RGB colours (red, green and blue) combined with the same biophilic pattern projection.

The test was designed as a mixed method using EEG for quantitative data and an adapted Discrete Emotions Questionnaire (DEQ) for qualitative data with five participants. The Unicorn Black EEG headset with 8 channels was used for testing participants with the band power software package. The questionnaire included ratings for each of the patterns as well as open questions. A total of 5 people participated in the test and it was completed in the lighting laboratory at Aalborg University in Copenhagen, Denmark.

Equipment

The following equipment was used for the experiment: Aalborg University Lighting Laboratory, Projector Sanyo XPL 200, Unicorn Black Bluetooth EEG set (8 channels) & band power software package, Madmapper software, Laptop connected to EEG, Laptop controlling the projector, participant consent forms and an Adapted Discrete Emotions Questionnaire.

Testing Parameters

The following testing parameters were considered:

1. Room layout – the layout of the room for the test was designed to ensure as little stimuli as possible other than the lighting projection. The projector was placed above and behind participants to ensure they are covered by the projection although not distracted or impacted by glare from the projector itself. A chair was provided as the test was approximately 9 minutes and it was important that the participants would be comfortable.
2. Control – a control was included in the test to provide a base comparison for the results. A plain warm spotlight was used to represent a typical spotlight. The colour was selected to represent a warm orange spotlight and stay consistent with the previous research from Hill and Triantafyllidis (Hill & Triantafyllidis, 2023). Additionally, the control was shown first as a baseline then in-between each or colour exposure. This provided a new 'baseline' or 'control' measurement for each stimulus.
3. Exposure time – The time that each participant was exposed to the pattern needed to be constant and long enough for the participants to adapt to the new stimulus. It was determined that the plain control spotlight be exposed for 30 second and each pattern would be shown for 60 seconds.
4. Randomisation – the order that the patterns were shown to each participant was randomised to ensure a fair comparison.
5. Patterns – The 'Gum Leaves' biophilic pattern from Hill and Triantafyllidis (Hill & Triantafyllidis, 2023) was used as the same pattern for each test colour to ensure consistency. The control was a warm amber spotlight.
6. Colour – the colour was selected from the sunset colours as described in the Colour Design section. The 'warm' was selected as the main colour for testing and was therefore applied to the control. The HSV value of this colour was 82%, 57%, 82% and the remaining colours were created by adjusting only the 'hue' and keeping all saturation (57%) and value (82%) constant across the colours.
7. Lux – the lux value for each pattern was kept constant in a range of 8-10 lux. This was to represent an approximate lux that would be used to install these projections outside at night as the typical outdoor lighting levels can be approximately 5 lux. Therefore, by adding patterns at approximately 8-10 lux the projections would be experienced without a high contrast to the surrounding environment.

Table 1 below lists the final HSV colour codes of the lighting colours that were projected for testing.

Table 1

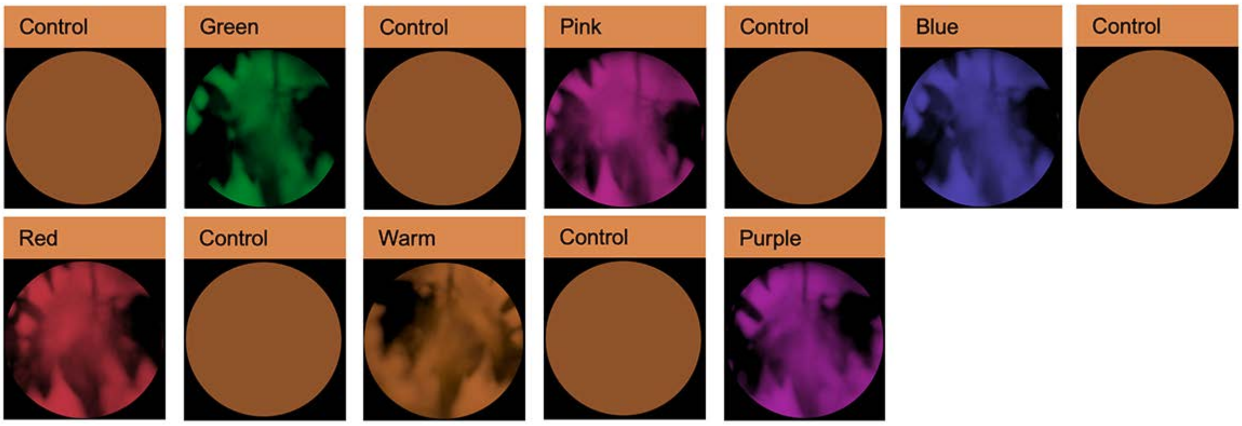
Colour HSV codes

Colour	#code
Red	#d25a5b
Green	#5ad26a
Blue	#5a62d2
Pink	#d25ab1
Warm	#d28d5a
Purple	#c65ad2

Figure 6 below shows an example of the final testing order for participant 2 where the 'control' was shown first for 30 seconds followed by the 'gum leaves' pattern for 60 seconds in a certain colour.

Figure 6.

Example of final testing order for participant 2



Procedure

1. The experiment started with the participants entering the room, where they signed a letter of consent, then they were positioned in the middle of the light lab. The light installed in the lab was turned on with a CCT of 2800 kelvin. From here the experiment was explained to the subject.
2. Next, the EEG headgear was installed on the participant's head and the signal was tested. As the equipment was wireless, the signal was monitored from a laptop computer in the same room.

3. The light for the room was then turned off and the warm projected spotlight was turned on once the signal was stable.

4. In the next step of the test, a sequence of the patterns was shown to the participants, and recordings of the brain signal started at the same time. The experiment ran for 9 minutes, where the coloured gum leaves had an exposure time of 60 seconds, and a control warm spot light was shown at the beginning and in between each pattern for 30 seconds.

5. At the end of the sequence the EEG recording software was stopped and the EEG equipment was removed. Once the EEG test was completed, the participants filled out the adapted the Discreet Emotional Questionnaire (DEQ) and answered the open question.

Figure 7.

Experiment Set-up

Results

EEG Analysis and Results

The results from the EEG were saved as an excel file per participant. The unicorn EEG software automatically provides the data as 'bandpower' for analysis of the different brain wave frequencies. The software collected 25 samples per second, resulting in 13500 rows of data per participant for analysis for this test (9 minutes). The number of columns of data was 70 columns representing the brainwave data from the 8 channels connected to each participant's head. Alpha and Gamma brainwave column data was extracted from the excel files for analysis. These columns of Alpha and Gamma signals were automatically averaged by the software from the eight channels (the eight connections to the head). The column data was then averaged into per second values for each stimuli and corresponding control. Next, the stimuli value was divided by each corresponding control resulting in a per second value/control for each stimuli (pattern). At this point the values were then converted into a percentage and then percentage change from the control for ease of comparison. Each participant's data was considered individually and then finally, the data was weighted for each participant and averaged to create one overall graph. This ensured all participant's values were comparable to one another.

Figure 8.

Overall EEG results for all participants and colours

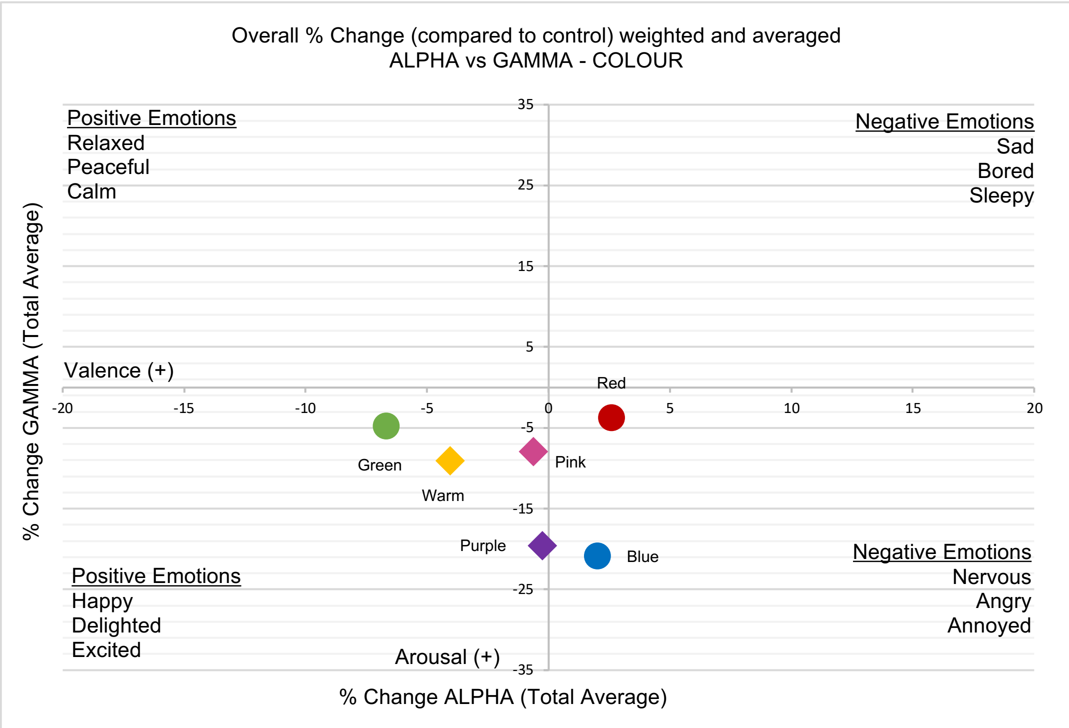


Figure 8 above shows the biophilic colours (warm, pink and purple) as diamonds and the non-biophilic or 'RGB' (red, green and blue) as circles. The control is represented at (0,0). The results show that 100% of the sunset colours combined with the biophilic pattern had a positive emotional response as compared to the control. Contrastingly, only 33% of the RGB colours (green only) combined with the biophilic pattern had a positive response.

DEQ Results

Participants' responses were considered in such a way that anxious (anxious and worried) represented 'negative' and relaxed (calm and relaxed) was understood as a 'positive' response. Overall this gave a total positive response and total negative response to each projection including a rating for the control projection (plain warm light). For ease of comparison to the EEG data, the survey data was transformed into percentage change from the control so that 0 on the Y axis in

Figure 9. represents the control.

Figure 9.

Overall DEQ results for all participants

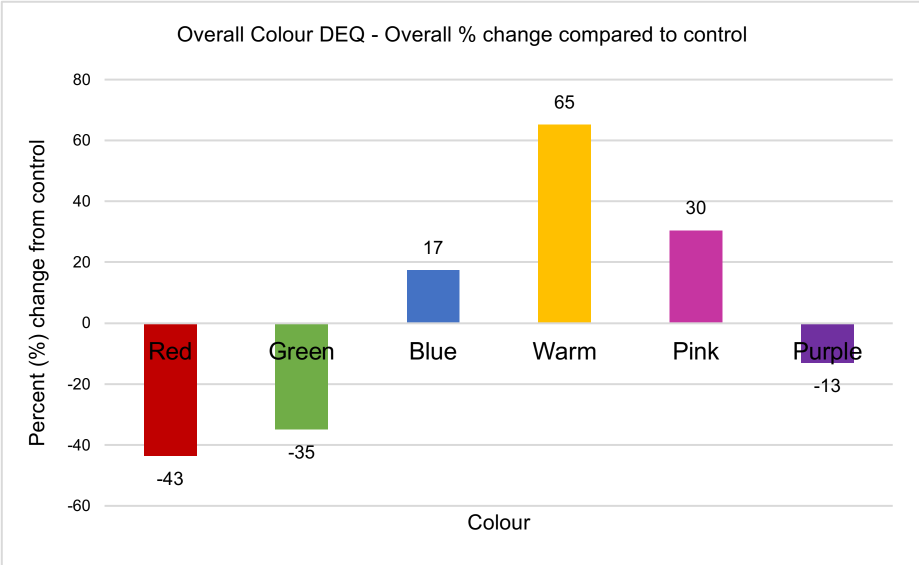


Figure 9. above demonstrates that overall the biophilic sunset colours had a 83% total increase in 'relaxed' compared to control and the non-biophilic RGB colours had a result of 61% less relaxed or more anxious than the control.

Open Questions

After the participants finished the EEG and DEQ survey there was one open question relating to the colour. **Table 2** below shows these results.

Table 2

Open Question 'favourite colour' count

Colour	Red	Green	Blue	Warm	Pink	Purple
Total count	1	0	1	2	0	1

Comparative Results

Considering the overall EEG results compared to the overall DEQ results there is a positive consistency regarding the 'warm' colour. It is the second most positive result from the EEG and the most positive DEQ result by far. Additionally, the red colour also suggests some correlations between the EEG and DEQ as the most negative experience in both the EEG and DEQ. These correlations between most preferred and least preferred were also identified in the individual participant results. For example, participant two listed their favourite colour as warm and their individual EEG showed warm as the most positive experience (valence) and most relaxing. Another example is participant four who listed their favourite colour as blue and noted that red was stressful. The EEG data for participant 4 demonstrated that blue was their most positive (or least negative experience as participant 4 responded negatively to all colours) and that the red colour was the most negative.

Discussion

The following hypothesis was tested:

1. Sunset colours (warm, pink and purple) combined with a biophilic pattern projection will be more calming than standard RGB colours (red, green and blue) combined with the same biophilic pattern projection.

The overall results from the EEG and survey indicate a preference for the biophilic sunset colours as compared to RGB colours. The combination of warm, pink and purple has a more positive valence value overall and the highest rating for relaxation from the DEQ. EEG results specifically indicate 'warm' as the second most positive valence response with green as the most positive valence response. Warm, however, has a lower arousal than green as well as significantly higher relaxation ratings than green in the DEQ data. The 'warm' colour overall had positive results from the EEG as well as the highest positive result from the survey. Warm was also indicated by 2 of 5 participants as their favourite colour. Considering using these results for urban design it is reasonable to use warm (as well as the two other sunset colours) as an appropriate colour to create a positive feeling. However, it is more likely a feeling of joy rather than relaxation due to the slight increase in arousal that is clear from the EEG results. This is likely due to the dynamic movement of the patterns that were used in the testing. Perhaps static colours would otherwise be less arousing but not necessarily more positive. It should also be understood that while warm has an overall positive rating, there were still two participants who experienced a negative valence in relation to warm. Participant 1 had a slightly negative response with a slight arousal. Participant 4 also had a negative valence however, participant 4 had a negative response to all colours. This highlights the subjectivity of colour design and that this is a pilot study that requires more participants for further indications.

Green also produced noteworthy results. In the EEG testing green had overall one of the most positive results with the highest valence response but combined with arousal. In contrast, the survey results for green were very negative and had the second worst rating (second to red). Perhaps this could be due to the DEQ asking about being 'relaxed' rather than joyful as the increase in arousal is the opposite of relaxed. Alternatively, cultural associations with green such as poison could be related to negative associations to the green colour. It is unclear at this stage however, given the discrepancy between survey results and EEG results the green is not a colour that will be considered in the design.

Overall the colour testing provides a promising foundation but remains at least somewhat subjective and personal. For example, although overall 'red' had a negative response for most of the five participants, participant 1 listed red as their favourite colour, rated red as the most relaxing in their survey and their EEG response was also positive suggesting a feeling of delight or excitement. In contrast participant 4 found red very negative, with a significant decrease in valence, listed red as the most anxious in the survey and commented that red reminded them of scary movies. With further testing and more participants these personal preferences may have less impact on the overall results, revealing clearer societal colour preferences.

Proposed Design Solution

Regarding the final colour selection, sunset hues consistently evoked positive and enjoyable perceptions. Notably, the warm orange-white tint emerged as the predominant choice, validated by both qualitative (survey) and quantitative (EEG) methodologies. This particular hue resonates with the cultural nuances of Copenhagen, where warmer colors are traditionally associated with the concept of "Hygge," denoting a serene and comforting ambiance.

Given these empirical findings, the warm hue derived from the sunset palette is recommended for the biophilic lighting design. It's relevant to note that all assessments were conducted at a luminance level of 8-10 lux, chosen to optimise nighttime visibility without introducing excessive contrast.

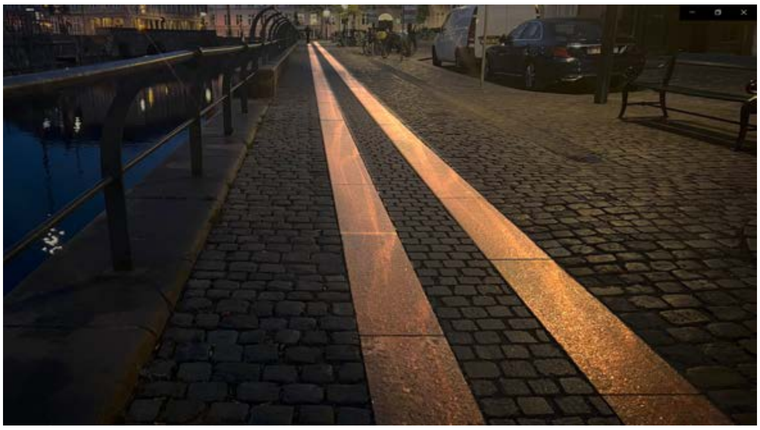
This final pattern options themselves are informed by previous research by Hill & Triantafyllidis encompassing both EEG metrics and survey responses that indicated that patterns of waves and gum leaves stimulated positive experiences. The waves pattern demonstrated the highest positive valence response, rendering it a primary contender for the intended atmospheric design. However, the gum leaf pattern also yielded significant positive outcomes, suggesting its potential as an alternative or complementary design element (Hill & Triantafyllidis, 2023). Subsequently, these two patterns were considered and finally the waves were selected and combined with the warm hue. A subsequent section diagram provides a visual representation of the proposed design.

Figure 10.

Final design proposal section drawing.

Figure 11.

Warm coloured wave pattern visualisation along the canals of Copenhagen. Link to video illustration: https://vimeo.com/713495713



Limitations and Future Works

This study was completed in a lab setting involving only five participants, which limits the statistical significance of the findings. Serving as a preliminary investigation, it lays the groundwork for more extensive testing, potentially involving a larger participant pool and real-world urban settings rather than controlled lab environments. It's also important to note that EEG interpretations can be influenced by personal memories and associations linked to specific colours and patterns. Increasing the participant size might mitigate the influence of individual biases.

One significant observation was the heightened arousal associated with dynamic pattern movements compared to the static control. This observation influenced the assumption that positive emotions would encompass feelings like "relaxing”. Instead, the data indicated a stronger association with emotions like "happy" and "delight." One solution is to test the colours without any pattern first and instead with only static plain coloured light as a baseline of the experience of the colours without any influence from the pattern. Additionally, future iterations of the DEQ questionnaire should perhaps incorporate terms like "joy" or "delight." Moreover, moving away from a rating scale and instead using more distinct questions, such as asking for participants' "most liked" and "least liked" responses, could align more closely with EEG outcomes and offer clearer insights for participants.

Future testing of colours themselves should consider further investigating the colour green. It was the most positive colour result from the EEG but also received negative ratings from the DEQ. This could be considered further to also test different colour combinations and gradients that are closer to what is typically experienced in nature.

In relation to applying the design in urban settings there also needs to be a reflection on the available technology and associated cost of installation. At the moment the two typical options are gobo projectors or normal video projectors. Typical gobo projectors lack the customisation to implement these specific patterns and projectors are expensive, difficult to maintain and protect in public, outdoor spaces. Also, the design and testing could also be applied in an indoor environment such as a stressful office or hospital where people need a supportive atmosphere and the technology is more easily installed.

Conclusion

This research was inspired to discover how lighting design can help to reconnect people to nature in urban cities, creating atmospheres of relaxation, supported by quantitative and qualitative testing to support well-being in the community. EEG and qualitative surveys provided a foundation indicating a preference for biophilic lighting colours including warm amber lighting and sunset colours particularly compared to typical RGB colours. Furthermore, the EEG testing methodology and analysis showed interesting correlations between the EEG data and survey outcomes, further supporting the use of this approach in future research.

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<u>**Impromptu encounters in planned spaces: how urban areas can promote wellbeing and mental health in cities through design of public spaces**</u>

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Abstract

Social networks are not established or maintained in a vacuum. Places and spaces in which interactions occur are key. People are social creatures. This is a well-known narrative. If this is the case, how have we become so used to isolation from others, even when situated in the most densely populated places? Nearly half of people living in cities report feelings of loneliness. Modern life can appear to be unconducive to everyday interactions, particularly in a post-pandemic, work-from-home world. One can understand everyday encounters as a vessel for integration, an education on others, exposure to others. Encounters can bolster existing societal support networks and pave way for novel ones. They can be further understood as both a privilege and a necessity for most. In fact, most encounters and social networks protect mental health.

Pro-social design of public spaces can foster environments in which positive and good quality interactions can occur. Public spaces act as a vessel for facilitation of social networks. These spaces permeate most aspects of urban living. Through policy and planning, cities can develop places and spaces to work for the population. Encouragement of use of spaces and promoting positive perceptions of places can lead to increased usage and more time spent there. This is conducive to creating ‘bumping places’ where people can meet and interact regularly on an impromptu basis, strengthening and expanding social networks. The facilitation of routine and voluntary involvement with others in these spaces - such as parks, streets, and markets - expands and strengthens social networks, creating more pathways to support and form a more resilient population.

This paper and accompanying presentation explore the intersections between public urban spaces and the idea of ‘bumping places’ as means of promoting mental health and wellbeing of city residents.

Introduction

People are social creatures. This is a well-known narrative. If this is the case, how have we become so used to isolation from others, even when situated in the most densely populated places? Nearly half of people living in cities report feelings of loneliness. The loneliness and social isolation experienced in our most densely populated areas cannot be blamed on the geographical location, rather it is those who planned, implemented, and built these ecosystems who are responsible.

According to Rath and Harter (2010), one needs 6 hours of social interaction a day to thrive. This may seem like a feat considering many people’s modern, digital lifestyles and a post-pandemic environment. How can we reconnect with one another, and encourage others to do so through the design of our urban landscapes?

It is important to note that social interaction need not always be formal, personal, or direct. Social interaction can also take place at “modest levels” such as being amongst others in public urban spaces, fulfilling elements of the need for social contact in an undemanding way

(Kazmierczak & James, 2007). This can also be understood as informal, impromptu encounters and can be envisioned and put into practice in the form of urban 'bumping places' (Roe & McCay, 2021); places where people can meet and interact regularly on an impromptu basis, strengthening and expanding social networks.

These encounters and interactions can, and arguably should, be quite mundane. One can understand everyday encounters as a vessel for integration, an education on others, exposure to others. It can subtly bolster support of existing societal support networks and pave way for new ones. Encounters can be further understood as both a privilege and a necessity for most.

Impromptu encounters can be - somewhat ironically - planned into the urban space. Places and spaces can be designed to be more appealing. It is understood that social networks are not established or maintained in a vacuum, it is imperative to have a platform or location for these networks to be built from.

Effective, multi-disciplinary design of public spaces can foster environments in which positive and good quality interactions can occur. Public spaces act as a vessel for facilitation of social networks. These spaces permeate most aspects of urban living. Through policy and planning, cities can develop places and spaces to work for the population. Encouragement of use of spaces and promoting positive perceptions of places can lead to increased usage and more time spent in those locations. The facilitation of routine and voluntary involvement with others in these spaces - such as parks, streets, and markets - expands and strengthens social networks, creating more pathways to support and form a more resilient population.

This paper explores the intersections of public urban spaces and the idea of 'bumping places', or impromptu encounters through urban design and planning as a means of promoting wellbeing and mental health of city residents. The paper acts as a discussive precursor to a wider PhD project exploring mental health, social isolation, and loneliness in cities.

Urbanicity and urban mental health today

Mental health is a key public health challenge facing urban areas today. Living in urban areas tends to be associated with better levels of physical health than in rural areas due to easier access to education, employment, and health care services (Dye, 2008). Despite this, many aspects of urban living have been found to be detrimental to mental health. Environmental determinants such as pollution, unnatural environments, and aesthetics alongside many social determinants including inequalities, income, discrimination have been found to have links with various mental health disorders such as depression and schizophrenia. From a psychiatric perspective on individual levels, it is imperative to find solutions to these issues, however, on a population level the issue of poor mental health and well-being in cities is becoming evident and thus has gained the attention of public health professionals and urban policy makers alike.

Living in urban areas has been known to be a risk factor for over five decades (Weeke et al., 1975). This suggests a key question: why has more not been done to improve urban wellbeing since then and what measures are in place to mitigate these risk factors?

The way in which urban residents interact with, and are affected by, spaces and places play a major role in health outcomes. This means that despite the general trends of better physical health outcomes in urban areas, research has shown that living in urban areas can act as a risk factor to mental health. Evidence suggests, for example, that social fragmentation – an absence or underdevelopment of connections between a society and groupings of certain members – may play a role in the increased incidences of psychosis in urban areas (Heinz et al., 2013). Creating socially connected spaces through impromptu encounters therefore is beneficial to mental health. Frieling et al. (2018) find that social connectedness is a key driver of wellbeing and resilience, stating that "socially well-connected people and communities are happier and healthier, and are better able to take charge of their lives and find solutions to the problems they are facing.".

The commonly urban experience of feeling alone in a crowd is socially isolating (Bennett et al., 2018). In past decades, several authors have considered social isolation and a rapidly ageing population to be a primary problem facing cities in higher income countries (Mullins et al., 1996). This continues to be a pertinent issue.

The urban environment has great influence on those who find themselves within it. This can be understood through the concept of urbanicity. Urbanicity in the context of public health has been defined as the impact of living in urban areas at a given time (Vlahov & Galea, 2002). This plays a role in contextualising public mental health in cities. The way in which an environment impacts people is key to understanding determinants and outcomes of mental health.

What are impromptu encounters?

Impromptu encounters encompass those little everyday interactions many may see as insignificant. They can involve shared interactions with strangers such as enjoying a public piece of art, bumping into a friend or colleague, having a chat with a neighbour. These encounters are special in the way in which they do not require planning from an individual or group. What they do require, however, are spaces in which people feel they can use and frequent. Places where people feel a sense of belonging and feel welcomed.

Informal encounters are equally important in an urban context. Meeting with people in the park, at a community space, going to classes or events all can contribute to improved mental health and wellbeing. Yet these encounters are not necessarily a priority in urban planning, design, and policy. Whilst these can occur in private urban spaces such as a hired venue or in the home, there is arguments that spending time in welcoming public spaces can enhance these interactions and experiences, boosting the positive outcomes accrued.

'Bumping places', this paper argues, are an intersection between planning or policy and mundane, daily life. They can be harnessed by urban actors to influence outcomes of public mental health. Informal, impromptu encounters can be envisioned and put into practice in through these 'bumping places' (Roe & McCay, 2021); bolstering urban social networks and improving spatial and social connectivity in cities, thus promoting and supporting good wellbeing and mental health.

Public spaces and mental health

The shared and public spaces of a city can have great impacts on mental health outcomes. This is a multilayered process. The people and place have the potential to influence each other. A city and its public spaces can be understood as a living environment. A living environment in the context of cities can be defined as an “assembly of the natural and built environment which is offered to the inhabitants of the place who perform various kinds of social, cultural, religious, economic, and political activities which induce peculiarities in the character of the living environment.” (Tiwari et al., 2015). This suggests that public spaces should be conceptualised as multi-use and interwoven amenities that provide locations for the performance of urban life. It suggests that uniqueness, or peculiarities of a place, constitutes its individuality and is influenced heavily by the make-up of its built and natural environment. This concept allows for opportunity to harness the possibilities of planning this assembly in order to be conducive to good wellbeing and mental health in cities through the design and planning of public spaces.

Think of a welcoming space. One might consider interactive activities, art, nature, feelings of safety and security, cleanliness, light, amongst others. Think of a less than welcoming space. It may involve a lack of stewardship, a lack of feelings of safety, mistrust of those who share the space.

Spaces which are attractive to people, as they should, attract people to them. This increases the possibility for interactions. When these spaces are used - for catchups, sport, leisure, errands, relaxing – they become ‘bumping places’. The more people choose to spend time in a place, the more likely an interaction will occur. The use of planning and design can aid these impromptu encounters. One wants these interactions that occur to be positive. So much focus, as established, has been on how to design out crime. What if we could kill two birds with one stone and reduce crime as a happy byproduct whilst primarily encouraging experiences that are restorative and positive to mental health? If these natural spaces are well kept, well lit, accessible, and comfortable, the risk of crime will naturally decrease due to informal surveillance by users which is off-putting to those considering committing a crime- an “eyes on the street notion” (Wekerle, 2000).

Urban design can be utilised to creatively help deliver determinants of recovery which include the facilitation of relaxation, social support, community trust, and a sense of belonging and security (McCay et al., 2019). This can involve pro-social design.

Work in the sphere of nursing, for example, can show that socially prescribed activities can improve wellbeing. These activities must occur somewhere, in places where socialising can occur. A study found that spending time in a café was strongly associated with social interaction and a change in positive mood state, but time spent interacting with animals and visiting green spaces could also be used to promote social interaction in those who tend to be more socially isolated or withdrawn (Mckenzie et al., 2021). This further demonstrates a way that multiple disciplines and professions find consensus, agreeing there are types of spaces and places that may further encourage social interactions and therefore improve wellbeing. Even if these socially prescribed activities are not directly prescribed, there are ways of encouraging these positive behaviours through the design of cities.

Green and blue spaces

When one thinks of ‘the urban’, parks, gardens, and waterfronts may not be the first things that come to mind. These green and blue spaces can play a vital, multifaceted role in urban mental health. Green spaces have been found to provide a place for conversation, to engage in joint group activities, and promote a general sense of community (Maas et al., 2009).

Green and blue spaces are attractive. They are rarely thought of conceptually as an unpleasant place. They encourage restorative processes to help offset stresses of daily urban life. The aesthetics of a well-maintained natural space have been found to promote good mental health. Being in nature is consistently found to make people healthier and happier. In fact, a lack of greenspace can act as an element which contribute to overarching 'urban stress' (Krabbendam et al., 2021).

Natural spaces which attract people aid impromptu interactions. Routines which involve parks and waterways such as walking a dog, playing sport, or reading on a bench on a weekend facilitates moments in which people can choose to connect with others, in part through processes of proximity and recognition.

Natural spaces are often identified as favourite spaces, this is indicated to be consisted across cultures meaning that an investment in natural spaces in cities would be beneficial across cultural contexts and intra-city demographics (Newell, 1997). These are spaces that have the potential to be used by all if made accessible and welcoming to all. Thus, this provides opportunity for mingling with others people may not come across in alternative urban settings.

From an environmental perspective, these spaces can help counteract and mitigate environmental challenges, especially those increasing and changing due to climate change. The changing climate has been found to be detrimental to mental health in many ways- from distress caused by often negative changes to people's local area and personal lives, losses people encounter, and uncomfortable climates (Bourque & Cunsolo Willox, 2014). Green and blue spaces can cushion us. They provide vessels for the sequestration of carbon, offsetting the major emissions occurring in our cities, they provide shade and shelter and cooling effecting in our heatwaves, and help with drainage and water absorption when it rains heavier than expected. Therefore, the presence of green and blue spaces in cities are not just useful in creating 'bumping places' and bolstering social interactions, they can also bring peace of mind to our urban populations, encourage restorative processes, and set them up for the future, enhancing the sustainability and resilience of our cities.

Community and shared spaces

Community spaces can be conceptualised as somewhere for people to gather and connect, to pursue shared activities and interests. They enable people to do things together. To connect. Religious centres, markets, community centres, sports centres are just some examples. These spaces usually have a more defined purpose, yet this intended purpose often brings opportunity for alternative uses. A local religious building, primarily used for worship, can be used to host local events unrelated, or less directly linked, to religion. A sports centre which hosts exercise classes can provide opportunity for post-work out chats. Lund (2003) finds that environments where people choose to be pedestrian due to good access to shared spaces such as shops and parks result in residents walking more, increasing instances of interactions and social ties with neighbours.

The community spaces provided in urban areas can act as a trigger for establishing and nurturing social networks and connections. This can be expanded into traditionally linear public spaces such as the street. These shared spaces with less restricted identities hold the power to be adaptable and influential public spaces, as their structure lends itself to fulfilling many functions, such as facilitating mobility, recreation commerce, aesthetics, as well as social interactions and public health (Gong et al., 2019).

Prosocial design of cities

Urban environments may not have been designed with the goal of social isolation; however, it does appear to be an unintended consequence of much of the infrastructure we see today. It might be time that we reconsider how we perceive cities. The ancient Greeks, for example, "spoke of communities rather than cities made of buildings" (Scott, 2016). In order to design cities in a way in which we encourage social connection and healthy communities, we could reshape our concept of cities to represent them as a vessel for communities to exist and thrive in rather than regarding them as physical entities. When designing, cities should be seen as a living environment rather than a built environment, with a focus on social connections. Cities are adaptive and dynamic environments, contrary to what the perceived immobility of a landscape oft defined by its hard infrastructure.

The Oxford Dictionary defines prosocial as "relating to or denoting behaviour, which is positive, helpful, and intended to promote social acceptance and friendship.". Prosocial design can therefore be understood as design which intends to be helpful, positive, promoting friendship, connections and social acceptance. Prosociality originates in behavioural studies but can be extrapolated elsewhere including urban governance and public health. The fundamental grounding crosses disciplines. This is an aspect of urban spaces in which interdisciplinary cooperation has the opportunity to flourish. Good mental health has to be a priority that extends beyond the health sector (McCay et al., 2019). There is a need for prosocial design and development in cities. Prosocial design paves the way for positive and sustainable social networks and functions in cities.

Levels of prosociality can be understood through people's co-operative tendencies (Corcoran & Marshall, 2017). Within societies which promote a prosocial ethos, loneliness - or at least social isolation - tends to be minimal across historical contexts.

Integrating the impromptu into the planned

A neighbourly city

A broadening of our conceptualisation of neighbours and neighbourhoods in our urban areas could be useful. The concept of a neighbourly city has been introduced in recent years (Roe & McCay, 2021). A sense of community and connection is vital for a neighbourly city, it creates a sense of belonging. Public spaces for some create an opportunity to feel a sense of connection and community (Collins et al., 2022). This can be harnessed.

Roe and McCay (2021) define a neighbourly city, quite logically, as a place which is 'neighbourly'. This encompasses increasing social cohesion, feelings of local belongingness, and conviviality, reducing social isolation, and facilitating the development of and sustaining of social networks and subcultures. A neighbourly city is a place 'where people from all walks of life can come together and enjoy public spaces' (Roe & McCay, 2021). It involves a variety of features and factors. A neighbourly city invites interactions in various spaces and places in a city. These can range from public such as streets and parks, to semi-public such as community gardens and markets (Ganji & Rishbeth, 2020). The city itself should be a space for interactions and it should be designed and treated in this manner.

The concept of a neighbourly city arises from understanding of how loneliness and social isolation impact mental health. It locates itself within the concentric model of a refined socially connected restorative cities framework (Siew et al., 2023). A neighbourly city, much like many concepts interwoven in the sphere of public mental health, does not exist and cannot exist in a vacuum and relies on a holistic understanding of the urban social and physical environments.

Safe and welcoming spaces

To encourage a population to use a space, it should be safe and welcoming. Inviting. Refer back to your own vision of a welcoming space and reflect on how that would impact how you would use a space.

The layout of a space has significant social implications and is particularly associated with feelings of safety, crime, and social integration. If a space can be designed and developed with the aim of creating an environment where social integration is encouraged, positive externalities should be experienced from an individual level to a community level. This is particularly true if these spaces are designed in partnership between various actors including people from within the community. Design of space can be used to empower local actors and groups by creating useful and engaging places whilst also providing opportunity for agency and actualisation at a local level. Conscious attention to urban design can reduce crime significantly whilst simultaneously encouraging participation in community life and enhancing community pride (Talha, 2008).

Perceptions of safety are key to facilitating impromptu interactions. In places in which there is high neighbourhood disorder, trust in neighbours decreases (Kwak, 2003). Jane Jacobs' original notion of "eyes on the street" should be combined with other arguments found in her book: *The Life and Death of Great American Cities* (Jacobs, 1992). The book further identifies that public spaces are most successful when there is an encouragement of a range of users and activity. A mixed land-use, which can be achieved in urban public spaces, has been shown to contribute positively to the social attributes of communities such as improving the feelings of security and wellbeing in these spaces (Elkin et al., 1991).

Despite this concept of encouraging various, diverse people to use public spaces existing for more than 7 decades, there is still much work to be done.

When reading literature surrounding crime prevention, one may come across Crime Prevention Through Environmental Design (CPTED) (Seo & Lee, 2017). This thinking has striking overlap with creating spaces that are beneficial to mental health and conducive to healthy, positive interactions with others. Using CPTED or adjacent place-making concepts, cities can be designed to become safer by facilitating the use of spaces in a way in which encourages the lessening of incidents of antisocial behaviours.

A lack of neighbourhood pride, perceptions that a neighbourhood is unsafe to walk alone in after dark, and a perception that a neighbourhood is not close knit are all strong predictors of self-reported health issues according to (Collins et al., 2009). This suggests that in order to make a safe and welcoming environment, not only is the issue of fear of crime needing to be addressed but also concepts of place attachment and belonging. This can be increased through the way in which people interact with spaces and places in their vicinity.

When people feel welcome and safe it encourages feelings of attachment. Repeated visits to a place enable the development of a meaningful bond with a place. This contributes to "feelings of familiarity, rootedness and self-esteem" (Subiza-Pérez et al., 2020). These feelings of attachment and belonging consequently provide restorative and vital experiences and feelings which can counteract detrimental impacts of experienced social isolation.

Those who have a sense of attachment to places are more likely to conserve them (Comstock et al., 2010), creating longer term social ties with those in the locality (Mesch & Manor, 1998). Furthermore, environments which are attractive due to their security encourages more stable communities over time and invites others to move in (Brounen et al., 2012). With this in mind, it should be noted that there is a consistent and valid risk of gentrification when this rejuvenation of spaces occurs. It is imperative that those involved in the design of policy and places in urban settings are acutely aware of this and protect those who may be at risk of displacement through these mechanisms.

Creating aesthetically attractive places is important. Viewing the natural beauty has been seen to improve wellbeing and restorative processes, this has also been paralleled in some cities where similar benefits have been accrued when viewing similar, man-made beauty in the form of public art and architecture (Seresinhe et al., 2019). A 21st century Human Ecology Framework by the Institute for Advanced Studies in Culture (2015) builds upon the traditional ideals of the "True", "the Good," and "the Beautiful", acknowledging that it is vital that there is beauty for a city to truly thrive. The beautiful, in urban health research is largely associated with natural beauty emphasising the importance of the presence of and access to quality urban green and blue spaces. The beauty of a place plays a significant role in the attraction of people to a place (Razak et al., 2016), and as understood if people are not attracted to a place the chances of impromptu encounters occurring there are slimmer.

"Beauty remains at the heart of why people care" about places (Mayes, 2018)

Using place aesthetics, one can design places and spaces in which people can collectively feel awe, pride, or other emotions as influenced by the beauty of the place. Aesthetic places attract people. The place itself can become an attraction, a place people want to and choose to spend time in and enable a new opportunity for people to spend time in each other's vicinity, even company. This can be as simple as an attractive walkway, a unique art piece, well kept natural spaces, thoughtfully designed buildings. Even public infrastructure has the opportunity to be beautiful. Reflect on times where you may have been moving through an urban area and noticed, appreciated, a more intricately designed bollard, street lamp, a colourful telephone box.

Lingering and/or loitering

The definition of loitering is "to stand or wait around without apparent purpose" (Dictionary). It is associated with negative behaviours and is illegal in some places. It is often thought to precede antisocial or criminal activity. The definition of lingering is often also associated with the negative, being defined as "to remain or stay on in a place longer than is usual or expected" (Collins Dictionary).

It is interesting how societies have labelled simply spending time in a place with no visible purpose to outsiders as almost pre-criminal. Or suggesting there is a time limit to spend in a place. These societal expectations of how we use space seems, through the use of language and sometimes practice, to be passively policed by peers and other users of space. Spending time in places seems to therefore have been discouraged, especially for those who may already face prejudices from others in cities. As established in this paper, it is more difficult to interact and have spontaneous moments with others if time is not spent in a place- be it regularly or for extended periods.

How can we then reframe our understanding of spending time in spaces? Furthermore, how can we encourage people to spend more time in spaces? Maybe it is time that lingering and loitering are seen as beneficial – mindful even. Spending time in a place for the sole purpose of spending time with no purpose can act as respite from people's heavily planned and scheduled lives.

A potential reason for loitering and lingering being seen as problematic to others may be due to the presence of hostile architecture, and other design which has discouraged and inhibited the spending of time in certain places. If places are not designed to be used it may appear suspicious when people try to do so.

If we view a city as a living environment, or a pedestrian environment; if the space is made appropriate for use by people residents may walk more, resulting in opportunities to develop social ties with neighbours and increasing the sense of community (Ko et al., 2006; Lund, 2002). If people, through walking for example, take longer to traverse their local areas; opportunity for spontaneous interactions increases when compared to more isolated travel options such as using a car. Spaces that facilitate this type of movement may require spaces to rest and recuperate, particularly for some members of society. To rest somewhere can be redefined to linger. A rest on a walk with an interesting and engaging environment which feels safe and welcoming would encourage an extension of the time spent there- making it appear as though one may be waiting around without purpose. But the purpose is to embrace the city. To enjoy moments. To take up space unapologetically. To make new connections.

Reevaluating societal perceptions of lingering and loitering can encourage mindfulness and leisure in urban spaces, promoting spontaneous interactions and connection. Furthermore, a shift in how lingering and loitering are perceived can provide opportunity for greater engagement with urban landscapes without fear of judgment of negative consequence.

Playful and engaging spaces for all

Making our cities playful and engaging across generations can be key to integrating interactions not only within generations but across generations. Places which provide opportunities for all demographics to participate increase the chances of them becoming 'bumping places'.

Intergenerational play or interactions build healthy, sustainable population dynamics. It eases divides between demographics and create multilateral support networks. Furthermore, research suggests that social interactions, including intergenerational experiences, outweigh mental and physical health condition in affecting the success of older people's ageing. An ageing population combined with social isolation across the wider population has been considered to be a pertinent issue facing cities. Creating spaces which are inclusive and enjoyable to both an older demographic and working age or youngsters can help combat both of these key problems.

Given the ageing populations exhibited across the world, successful ageing should be considered a priority in urban public health policy. Moreover, healthy ageing does not begin at 65, it is a lifelong effort. This denotes a need for engaging spaces and cross-generational spaces across a lifetime. It can be exemplified broadly as cushioned, playful spaces for children, places where teens can safely explore new independence, spaces for working-age adults to recuperate and socialise outside of work, and of course places that provide a useful and welcoming space for the older generations in our cities. Ideally, places and spaces which have the capacity to cater for all will be more evident in urban areas.

Relating back to literature on green and blue spaces, the sensory aspects of a city can be just as important when considering design for interaction. Spaces and places that inspire people to stay and experience sensations, whether they be visual or other, provide more ample opportunity for impromptu interactions and shared experiences.

Accessibility is a key issue when considering designing in interactions. Accessibility on every level should be taken into account. Just as with encouragement of intergenerational engagement, access across abilities, ethnicities, and income-levels amongst others should be a focus. Again, it is crucial to balance this rejuvenation and opportunity with a consideration for potential gentrification and displacement of vulnerable communities. Equitable access is key in creating sustainable practices in cities.

Conclusion

It is apparent that there are profound intersections between public urban spaces and mental health through encounters, particularly through the creation or facilitation of ‘bumping places’. It is evident that the way in which people interact with their environments plays a pivotal role in shaping mental health outcomes in cities. The present-day prevalence of loneliness and social isolation in urban areas underscores a need for proactive measures from diverse disciplines and actors to foster social connections through the use of urban space. It transcends disciplinary boundaries, urging cooperation among urban planners, architects, public health experts, and community members.

The use of urban design- whether that be through the physical or social realms – emerges as a powerful tool to reshape urban landscapes in ways that promote friendships, community bonds, and social acceptance. This ultimately leads to more resilient and mentally healthy populations. The importance of shared spaces that are welcoming and safe cannot be overstated in this context. These spaces provide the opportunity for people from all backgrounds to engage with one another and forge connections.

Mixing demographics is a way in which social networks can be strengthened and divides within cities weakened. This is not always simple, however creating spaces where *all* feel welcomed and able to use is a great place to start. If all types of people choose to use a space, they are exposed to each other and are able to learn from and about one another, interacting through natural, informal pathways – creating the potential to create a greater sense of agency about mixing with others than through formal schemes and initiatives. That is not to say these initiatives and schemes do not have a significant place in urban mental health and relationship building, however that is not the focus of this paper.

In conclusion, in the pursuit of promoting mental health and wellbeing in urban areas, it is clear that the design of public spaces is not just a matter of streamlining or convenience; it is a powerful tool for fostering social connections, creating engagement, reducing isolation, and building resilient and thriving communities. To create cities that truly prioritise the mental health of their residents, we must continue to invest in pro-social design, encourage community engagement, and recognize the potential of 'bumping places' as vehicles for meaningful human connection in our bustling urban environments.

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Possible Urban Regenerations.
The University of Notre Dame Graduate Students' project for the Ostiense-Marconi Quadrant

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Abstract

The post-pandemic has brought great investment in revitalizing the economies of various countries brought to their knees by the crisis.

Unfortunately, however, many of the investments put in place, -presented as a *"green revolution"* and a *"digital revolution"*- already proved to be measures aimed at serving the interests of specialized industry rather than the environment.

In Italy, the various Laws for "*Urban Regeneration*" -precedent and subsequent to the COP 26 and COP 27 resolutions in line with that trend- appear to be more intended to allow the depreciation of historic and valuable properties, facilitating their change of ownership, rather than addressing the need for building replacement of "*modern*" buildings, made of "*light walls*" and perishable materials.

Indeed, lawmakers, totally at the mercy of builders, have legislated so that they can get their hands on valuable areas of cities, which are much more attractive to the real estate market ... a phenomenon that is allowing reckless demolitions of beautiful buildings, replaced by properties with no relation to their context. We are allowing our roots to be ripped out by generating a depersonalizing environment -because "*valid*" for every place- destroying the most important aspect of urban planning: sustaining and developing a sense of belonging!

Yet a different, if you will, even more profitable path for short-sighted speculators would be there, and it is the one that was put into practice in the early twentieth century, in the period of maximum and uncontrolled expansion of cities like Rome. A tested and not experimental method, therefore, whose socio-economic-environmental validity would deserve to be kept in mind, rather than reinventing the wheel every day to keep up with the times

After all, if we really wanted to consider ourselves an "*evolved society*", we would have to reread the wonderful definition left to us by Edmund Burke: «*A healthy civilization is one that maintains intact relations with the present, the future and the past. When the past feeds and sustains the present and the future, you have an evolved society*».

This is what I carry forward in my work and with my students at the University of Notre Dame School of Architecture and this paper shows an example of possible "urban regeneration" developed in two phases by two different groups of my Graduate Program students.

Keynotes
Urban Regeneration, Green Revolution, Digital Revolution, Urbanism, Urban Sociology, University of Notre Dame School of Architecture

Premise

For several years now, Italian cities have been witnessing, defenseless, the direct attack of developers on historic buildings. An attack unleashed thanks to the acquiescence of legislators who, with the approval of deleterious laws (Piano Casa[1], Urban Regeneration[2]), have created the conditions to be able to justify demolitions and reconstructions - with cubage premium - of buildings within prestigious areas ... the demolition of Villino Naselli in the Coppedè district of Rome still screams revenge[3].

Whoever legislates, or whoever within municipalities promotes a project or regulatory change, generally acts as a marketing expert who, following the technique of "*claiming*"[4], deceives people by playing on words so as to convince them that good is being done to them[5].

The "*claim*" technique is in fact the same one that has led the legislator to include, among the topics of "*urban regeneration*", the topic of the alleged "*seismic efficiency*" of buildings -even those that have passed unscathed for centuries by dozens of seismic events- as well as that of the "*energy efficiency*" of historic buildings, whose apartments possess thick walls with thermo-hygrometric capacities that no modern wall or "*coat*" could match[6].

The latest frontier of the "*claim*" technique applied to urban planning legislation, is that of DL 77/2021, "*Governance of the National Revitalization and Resilience Plan and First Measures to Strengthen Administrative Structures and Accelerate and Streamline Procedures*" -which, by using positive terms and arguments such as "*revitalization*," "*resilience*," and "*acceleration and streamlining of procedures*", intends to bamboozle the Italians into believing that they are being given a great gift ... while the reality of the facts is that it will end up devastating valuable areas of cities, turning cultivated fields into expanses of photovoltaic panels and wind turbines, and endangering territories and seas with drilling and landfills of all kinds[7].

As far as the Capital is concerned, as I recalled in an article published in July after the hearing at the Urban Planning Commission[8], Resolution No. 120 of the Capitoline Council (14/04/2022) invited its Offices to formulate a proposal for "***revision and actualization of the Technical Implementation Rules of the current PRG***", an initiative, we read, intense to make such revisions a form of "***simplification and coordination to other regulations***" ...

In this case - still using the "*claim*" technique - speaking of "***Urban Regeneration***", the promoters recount that they want to aim for a "***zero land consumption by 2050***" ... too bad, however, that this sharable goal turns out to be linked to the call for the ***updating of the Quality Charter and the Public City Charter***, as indispensable tools of effective management that, if misdirected, **risks endangering the historic buildings and the social fabric of the city**: a fear confirmed by the dangerous proposals made by ACER and the Order of Architects of Rome at the Festival of Architecture 2022.

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1 https://www.consiglio.regione.lazio.it/consiglio-regionale/?vw=leggiregionalidettaglio&id=9172&sv=vigente
2 https://www.consiglio.regione.lazio.it/consiglio-regionale/?vw=leggiregionalidettaglio&id=9313&sv=vigente
3 https://www.picweb.it/emm/blog/index.php/2017/10/13/novita-sul-progetto-di-via-ticino-3-a-firma-del-presidente-dellordine-degli-architetti-di-roma/
4 https://www.mysocialweb.it/claim/
5 https://www.picweb.it/emm/blog/index.php/2017/11/06/il-moderno-sacco-di-roma/
6 https://www.picweb.it/emm/blog/index.php/2021/12/09/larmageddon-dei-centri-storici-ex-lege/
7 https://www.gazzettaufficiale.it/eli/id/2021/07/30/21A04731/sg
8 https://www.picweb.it/emm/blog/index.php/2022/07/20/osservazioni-alla-delibera-di-giunta-comunale-roma-n-120-2022-riguardante-le-modifiche-delle-norme-tecniche-di-attuazione-del-piano-regolatore-generale/

Certain laws, certain proposed changes to regulations, are clearly dictated by the builders' need to be able to get their hands on those portions of the city characterized by buildings and urban conditions that are much more attractive to the real estate market. The builders have evidently realized that the "*modern neighborhoods*" on which they have focused their cementing efforts no longer attract anyone.

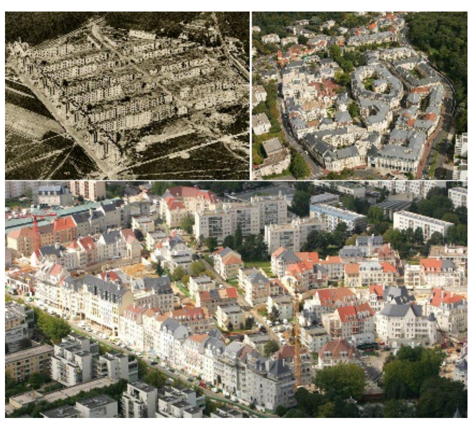
On closer inspection, however, it should be acknowledged that certain responsibilities should not be sought solely in the speculative aims of builders -who are merely doing their job- but in the way architecture and urban planning are theorized and designed in our country.

In fact, those who legislate and those who build, regardless of their speculative aims, do so as a function of the way Architecture and Urbanism Theory has been legislated and done in the last century in Italy, which has brought with it a dominant design trend that has generated flat and depersonalizing, if not downright criminogenic, neighborhoods where the importance of the identity of places has been totally disregarded...

A way, different, of doing urban planning and architecture abroad

Unlike in Italy, in the name of an unjustified cultural inferiority complex, in the rest of the world - in parallel with the sad *international way of "designing for any place"* - for more than thirty years a greater freedom of thought has allowed the realization of urban planning-architectural projects of great value, not only on an aesthetic level, but above all on a social, environmental and economic level, neighborhoods that have led to a rediscovery of the importance of respecting and developing the "*sense of belonging*" of residents, which post-war urban planning and architecture had made them forget.

This is the case, for example, of the former difficult neighborhood of Le Plessis-Robinson[9] in the suburbs of Paris, razed to the ground and replaced, starting in 1990, by a splendid neighborhood that has been a huge success at the urban, environmental, social and economic levels, so much so that it has become a model of development repeated in many other dramatic French banlieues, as well as an inspiration for similar interventions abroad.



Le Plessis-Robinson in the Paris suburbs, before and after demolition and reconstruction

A way, different, of teaching urban planning and architecture abroad

At the academic level, it should be remembered how many foreign universities, especially American ones, aware of the need for change in the way of "*designing cities*" and thinking about mobility, have for years

9 https://www.picweb.it/emm/blog/index.php/2018/01/23/le-plessis-robinson-quando-la-rigenerazione-urbana-quella-vera-paga-il-driehaus-prize-2018-a-marc-e-nada-breitman/

activated study programs in our country aimed at enabling their students to experience Italian urbanism and architecture, so as to understand the dynamics of its development and be able to design sustainable cities and architecture, worthy of being lived in.

This is the case at the University of Notre Dame School of Architecture -where I have had the honor of teaching since 2001- which, since 1969, has activated a permanent course in Italy that obliges all of its third-year undergraduate students and those in the *Master's program in Urbanism & Architecture*, to spend an entire year in Italy, retracing the main stages of the Grand Tour, not already from a romantic neoclassicist perspective, but to understand the dynamics that led to the development and consolidation of certain "*regional characteristics*" that make each place unique.

Our students in the degree program do not learn to use an architectural "*style*" obtusely, but they learn a method of reading places -valid for every corner of the planet- that enables them to be able to operate, everywhere, with respect for places and people, rather than in the name of their own egos.

Virtuous models of our recent past for a better future

This approach, respectful of places, traditions and people, is the same one that I personally put into practice in my profession and have accurately described in my publications[10]. It is not, however, knowledge that, like yet another guru, I claim to derive from myself, but simply something based on the work of many professionals, institutions and associations, active up to a certain period of recent history that, never before, it would be necessary to take back into consideration, before committing further missteps on the occasion of the application of the PNRR[11] and Building Bonuses.

In this regard, there is another fundamental aspect to be considered in order to avoid the repetition of the mistakes made in the last one by those who, self-proclaiming to be part of an *educated elite*[12], have used human beings as guinea pigs on which to experiment their urban-architectural fantasies, which are often perverse: designing the city cannot disregard the active involvement of the citizenry, especially those bangs of the population who, in recent decades, have been denied the right to public space.

As in fact demonstrated by the case of the "*Committee for the Economic and Moral Improvement of Testaccio*" in the early twentieth century[13], I consider necessary the involvement of associations interested in the "*care of the Public Thing*" because, today as then, this turns out to be the most correct way to arrive at an urban design sensitive to the needs of all citizens.

If this - different - way of looking at urban design were to become the practice, we would not only witness

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[10] *"Tvarus Miestas Yra Įmanomas" – Traduzione in Lituano del libro "La Città Sostenibile è Possibile - The Sustainable City is Possible"*, a cura di Almantas Samalavičius. Kultūros Barai Edition, 2022; *"Rigenerazione Urbana – Urban Regeneration"* (prefazione di Rob Krier), Vertigo Edizioni, Roma 2021; *"Noi per lo ZEN" – Progetto di Rigenerazione Urbana del Quartiere San Filippo Neri (ex ZEN) di Palermo* (prefazione Rob Krier), GEDI Gruppo Editoriale SpA, Roma 2017; *Architettura e Genetica - Cosa Insegnare. Gli equivoci e i pregiudizi ancorati al concetto di "modernità"* (prefazione C. Lanzi) Simmetria, Roma, 2012; *La Città Sostenibile è Possibile,* (prefazione P. Marconi), Gangemi Roma 2010; *Verso un'Architettura Sostenibile. Ripensare le nostre città prima che collassino* (prefazione P. Portoghesi), Gangemi, Roma 2007; *Architettura e Urbanistica, Istruzioni per l'Uso*, (prefazione Léon Krier), Gangemi, Roma 2006; *Contro Storia dell'Architettura Moderna: Roma 1900-1940*, Alinea, Firenze 2004;

[11] The PNRR (National Recovery and Resilience Plan) is the plan approved in 2021 by Italy to revive its economy after the COVID-19 pandemic in order to enable the country's green and digital development.

[12] https://www.picweb.it/emm/blog/index.php/2017/08/07/sul-disastro-urbanistico-successivo-al-iv-ciam-del33-e-sulla-possibilita-di-far-rinascere-le-nostre-citta/

[13] https://www.picweb.it/emm/blog/index.php/2017/08/01/il-quartiere-testaccio-di-roma-e-la-politica-dellicp-agli-albori-della-sua-esistenza-un-importante-precedente-da-cui-imparare/

a reawakened interest in architecture on the part of ordinary people, who would no longer see the architect and the builder as dangerous subjects to be fought, but we would also witness a radical change in our cities, such that the term suburbia would disappear from vocabularies ... which would translate into a huge volume of business for builders, much larger than that generated by individual interventions to replace a building within a valuable context.

Imagine what the gradual replacement of all of Italy's suburbs - energy-intensive and crime-ridden - with neighborhoods worthy of the same status as the historic city could mean. The country's economy, in the medium to long term, would benefit enormously, and, at the same time, the environment would benefit as well, thanks to the use of durable and sustainable materials and, above all, thanks to urban realities re-sized on humans rather than cars.

Urban Regeneration of the Former Ostiense-Marconi Industrial Area.

To give an idea of what such an approach might entail -as, moreover, already demonstrated by my urban regeneration projects for Corviale in Rome and ZEN in Palermo[14]- I provide below a brief explanation and some images of the project developed by my students in the Graduate Program at the University of Notre Dame for the former Ostiense-Marconi industrial area.

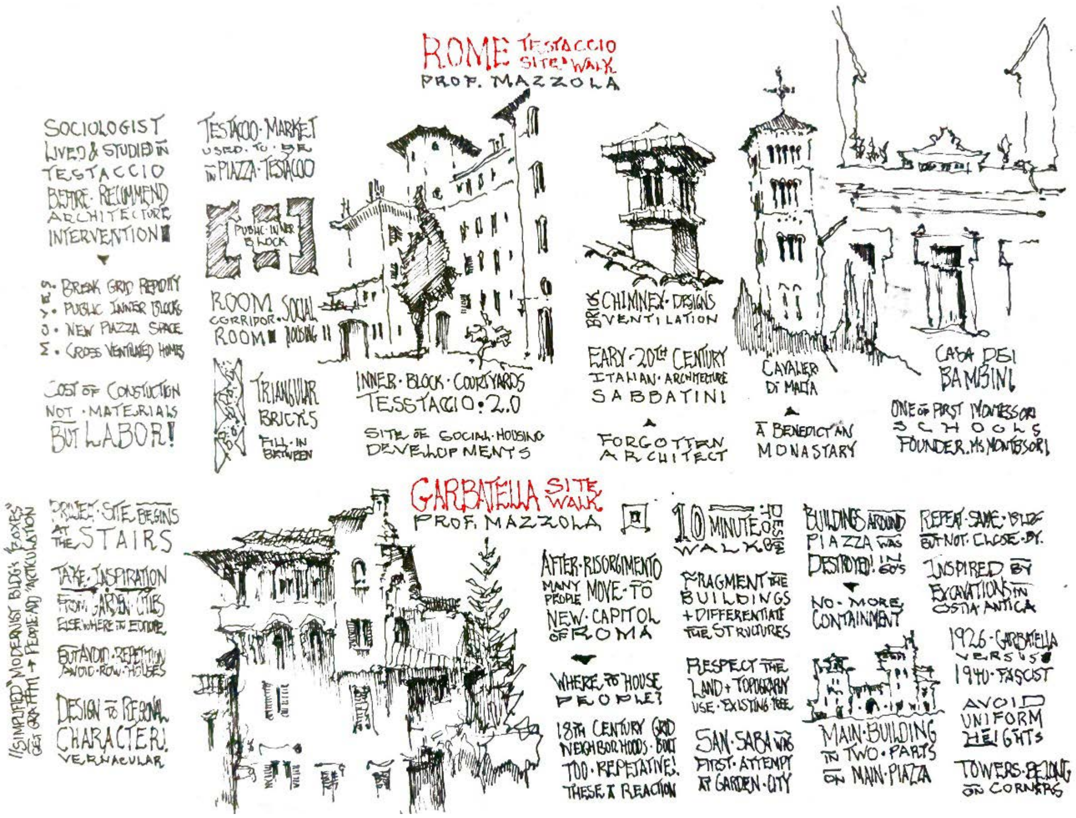
Ostiense-Marconi industrial area: in yellow the Spring Semester 2022 project area, in red the Fall Semester 2022 project area

The project, which covers a vast area of about 1.5 square kilometers, was tackled in two phases, by two different groups of students led by me, who were asked to interact with local people - subject matter experts and/or ordinary residents - in order to achieve a result that would be respectful of the places and the people, as well as of the environment and the pre-existences to be saved.

As usual for my courses, before proceeding to urban design, tackled in teams, the students analyzed cities, first by studying some urban sequences converging on the Pantheon, then by analyzing the early twentieth-century neighborhoods located close to the project area (Testaccio, San Saba, Ostiense and Garbatella). This investigation made it possible to develop an "*abacus*" of urbanistic-architectural character -different from neighborhood to neighborhood but consistent with the city- apt to define the lexicon most appropriate to the places.

[14] http://www.vertigobookshop.it/1/rigenerazione_urbana_ettore_maria_mazzola_11606855.html

Some images of the "*abacus*" contained in Sam Usle's sketchbook



Some images of the "*abacus*" contained in Sam Usle's sketchbook

At the end of the urban design, which, as mentioned above, was carried out as a team and somewhat "*participatory*," each student developed the architecture of a block or building based on the master plan.

The former Ostiense-Marconi industrial area in its current state and in the Urban Regeneration proposal developed by students of the Master of Urban and Architectural Design program at the University of Notre Dame School of Architecture. The lighter portion of the project is the portion developed by Spring Semester 2022 students, the darker portion the portion developed by Fall Semester 2022 students

During the Spring Semester 2022, the group consisting of Anna Drecksler, Alessandra Giannasca, Braiden Green, Monica Medina, Matthew Piatt, Dylan Rumsey, Nicolas Sabogal, Nadia Samir, Samuel Stuttard, and William Womack tackled the design of the industrial area between Via Ostiense and Viale Marconi, an area of about 1.0 sq. km, the margins of which can be summarized as follows:

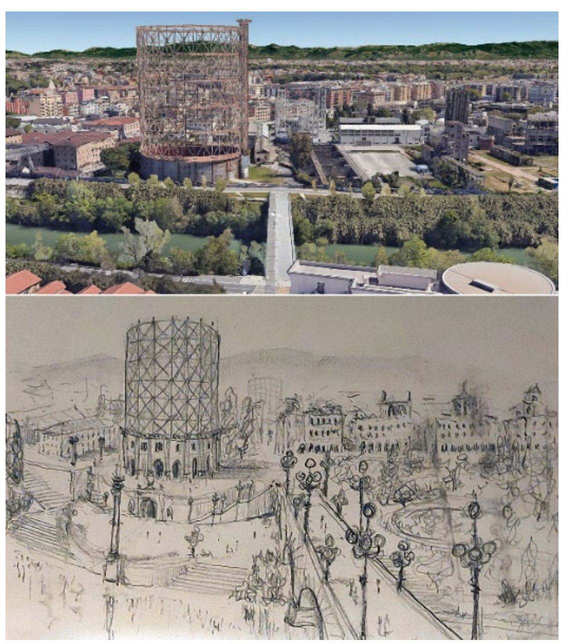
1. "Marconi Area," right bank of the Tiber: Lungotevere di Pietra Papa, via Enrico Fermi, via Giuseppe Peano, via Blaserna, vicolo di Pietra Papa, via Pacinotti, via Alfredo Nobel, via Baccio Baldini, linea ferroviaria, Ponte dell'Industria;

2. "Ostiense Area," left bank of the Tiber: Ferrovia, via del Porto Fluviale, via Ostiense, Riva Ostiense;

The current conditions of the area, regardless of the presence of some cultural and/or social activities, are of immense degradation and decidedly inhospitable. Except for the presence, almost hidden, of the Centrale Montemartini Museum and the Academy of Fine Arts, accessible exclusively from the Via Ostiense, the rest of the area along the left bank of the Tiber incites only fear; nor has the presence of the new, pedestrian-friendly Ponte della Scienza improved the situation.

The Riva Ostiense is indeed a sinister place where no one, after dusk, can dare to walk, yet this place, characterized by vegetation and the presence, unknown to the Romans, of the mouth of the Almone River, could be an extraordinary place for the day and night life of the city. The Riva, by the way, ends against a gate bordering a private parking lot that, it was explained to us, has been the subject of litigation for decades.

Except for the Italgas facilities, many of the industrial structures in the off-limits areas are looking severely dilapidated, especially those made of reinforced concrete such as the water tank tower and adjacent warehouses, which appear to be at risk of collapse. Of course, the gazometers, a symbol of the area, present themselves as artifacts to be enhanced. In the project, in fact, the main gazometer, transformed into a sort of botanical garden, towers above a staircase, inspired by the Port of Ripetta, that connects it to the river and gives access to the river park along the Riva Ostiense.



Graduate Program Spring 2022 - Initial sketch for the monumental descent to the Tiber and Park from the Gazometer

Graduate Program Spring 2022 - Initial sketch for the monumental descent to the Tiber and the mouth of the Almone River

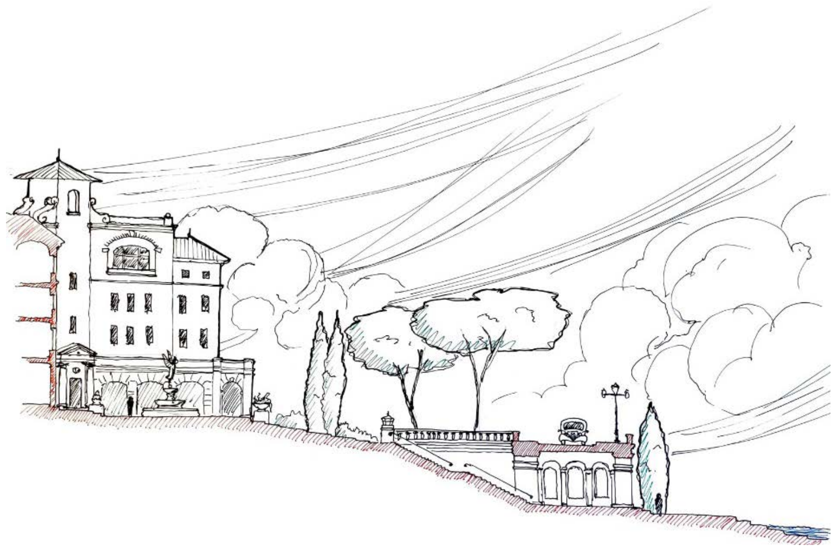
Along the opposite bank, bordered by Lungotevere Gassman, the area shows similar conditions of degradation, although some of the former industrial buildings, made of masonry, show a less worrisome state of preservation and, certainly, deserving of recovery. The western boundary of the area is bordered by the back of the sinister high-rise buildings of Viale Marconi, while along the southern edge it is bordered by Via Enrico Fermi, a wide road that seems to want to continue bypassing the Tiber (as, moreover, provided for in the old PRG) near the Centrale Montemartini, but which abruptly stops at the Lungotevere Gassman.

Within the area, in the vicinity of the structures used by the Teatro India, the ground is lower than the level of the Lungotevere Gassman, which suggested the possible realization of an underground "*piazza-theater*" that, underpassing the Lungotevere, also serves as access to the river, where a landing for a water transportation system was envisioned. A new location for the Church of Sts. Aquila and Priscilla has also been proposed at this central square.

The project that was proposed for this first part, in addition to what has already been described, proposed the construction of 2 new bridges, one pedestrian at the current Customs Offices and one, vehicular and pedestrian, that from Via Enrico Fermi crosses the Tiber behind the Centrale Montemartini.

The absolute non-existence of socializing urban spaces, perceived during the visit to the area and confirmed by discussions with the guests at the mid-term reviews, led the planners to think first of all about the "*design of the city*", that is, defining the "*system of voids*" and proposing a possible ring-shaped pedestrian sequence, straddling the two banks, characterized by as many as 14 squares and/or small squares enlivened by commercial and refreshment activities.

From this perspective, the Riva Ostiense, between the Gazometro and the Centrale Montemartini, would come to be configured as a terrace on the river bordered on one side by the garden park on the river and, on the other, by a series of porticoed buildings that could host restaurants and bars capable of bringing life to this forgotten area of the city. At the southern end of this riverside promenade a rectangular apsidal plaza connects with the underlying mouth of the sacred Almone River on one side and with a piazza, worthy of that definition, on which the Centrale Montemartini Museum overlooks.



William Womack - study section for the descent to the mouth of the Almone River.

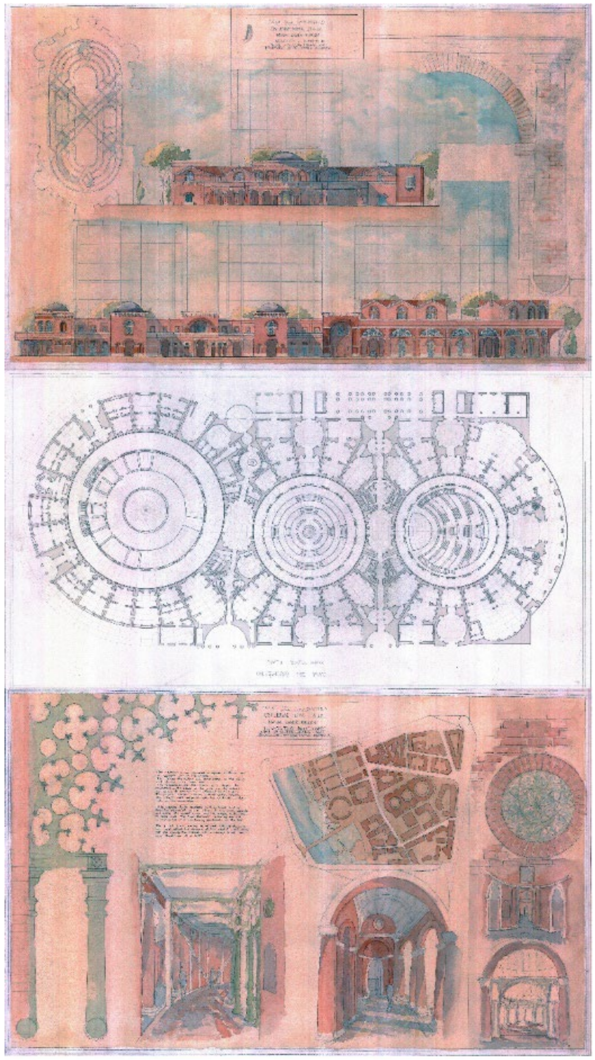
In addition to the design of greenery along the banks of the Tiber, the analytical study of the historic city and early 20th-century neighborhoods eventually led the students to propose a series of courtyard buildings with interior gardens that will house playgrounds for children and areas for the elderly.

Current and planned aerial views

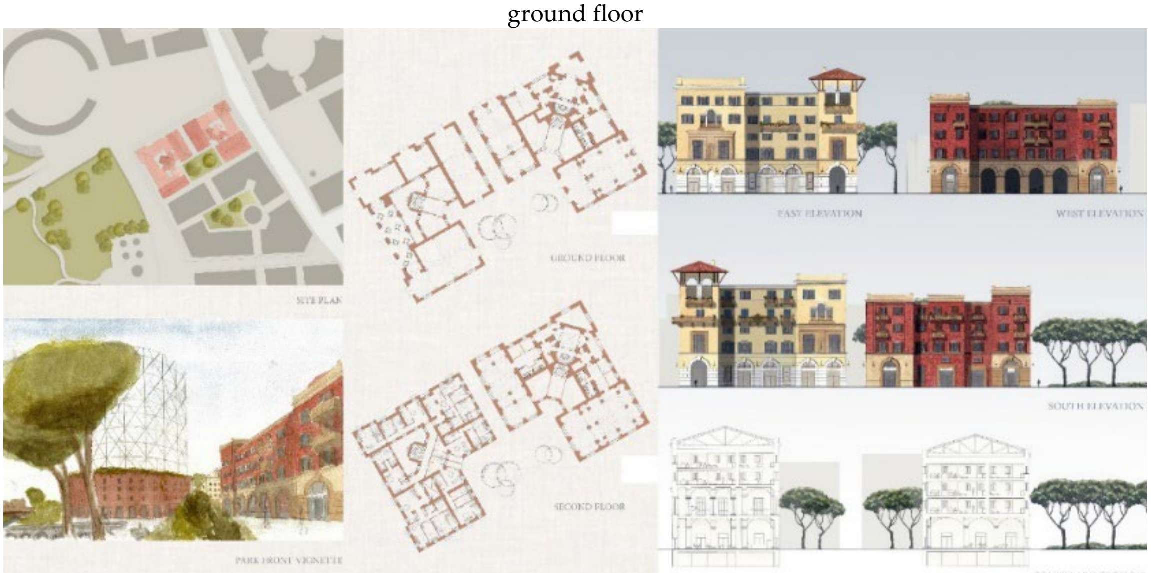
Graduate Program Spring 2022 - main pedestrian routes and project squares.

Graduate Program Spring 2022 - project vehicular circulation.

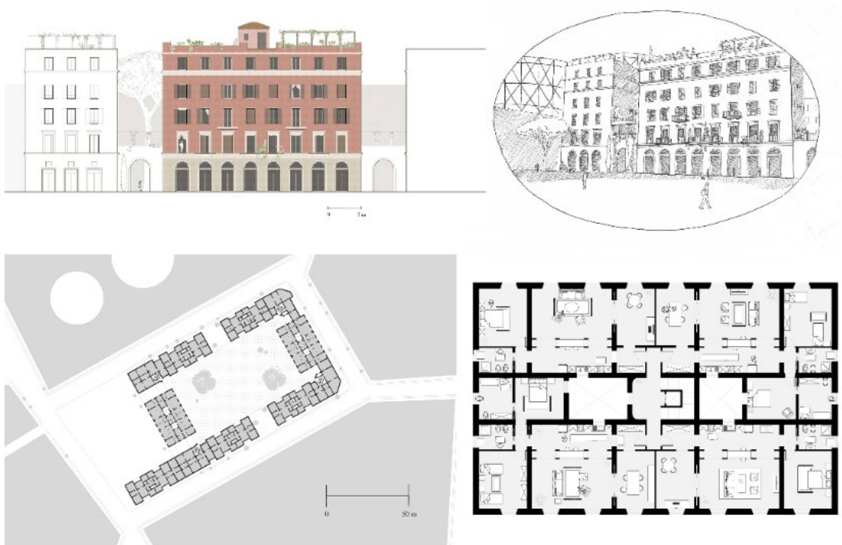
Graduate Program Spring 2022 - the Green



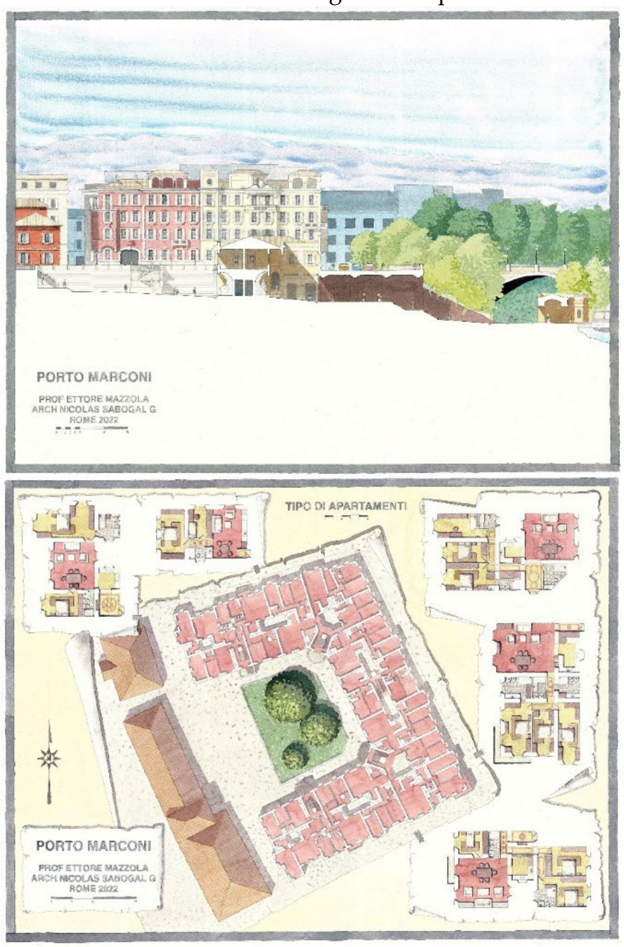
Nadia Samir - Transformation of the three minor Gazometers into a multifunctional complex with commercial ground floor



Monica Medina, mixed residential building and dance school on Gazometer Square



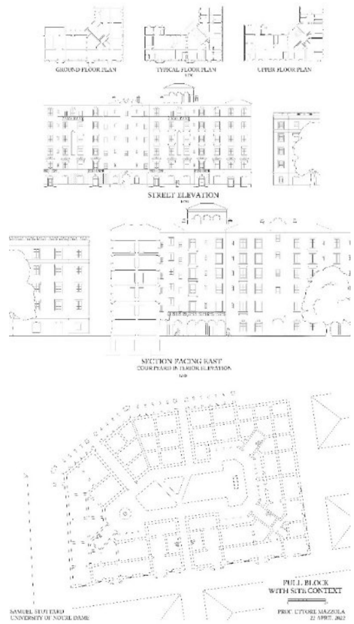
Anna Drecksler - Mixed residential building on the square next to the Gazometers.



Nicolas Sabogal - Mixed residential building abutting the "Square-Theater" that connects to the River Port

William Womack - Mixed-use residential lot between the Museum Square of the Centrale Montemartini and the descent to the mouth of the Almone. The waterfront frontage hosts a range of commercial and dining activities designed to enliven the Riva Ostiense during daytime and nighttime hours.

Braiden Green - Mixed Residential lot abutting the India Theater



Samuel Stuttard - Isolated mixed-use residential.

Alessandra Giannasca - Mixed residential use block - Insertion plan, floor plans and section

Dylan Rumsey - Mixed residential block, floor plans, main elevation and section


Matthew Piatt - Parish Church of Saints Aquila and Priscilla


Matthew Piatt - Parish Church of Saints Aquila and Priscilla

The task given to the students also involved the evaluation of the costs for demolitions, those for new construction, for the construction of the underground garages and for creation of the park and various green arrangements - calculated according to the current parameters provided by the Order of Architects and the Municipality of Rome - as well as the evaluation of the proceeds from the sale of the apartments, offices, boxes/garages, stores and laboratories, calculated according to the parameters provided by the Real Estate Exchange for the area concerned. In the overall evaluation of the proceeds, it was also assumed that 30 percent of the residential units would be devolved to social housing with an estimated rent of €200/month for each apartment of 100 square meters, for a total of 1093 apartments.

This method, regularly used abroad, for example in the cited case of Le Plessis-Robinson in France or in the Netherlands, as we had pleasantly witnessed on the occasion of the project -realized- developed with my students in Brandevoort in 2007[15], was the rule also in Rome and in Italy in the early twentieth century[16], a method not only useful for the integration and emancipation of the less fortunate social classes, but also fundamental to zero the cost of construction of social housing.

In return for an investment of € 904,388,397.56, a return of € 2,691,807,810.00 was estimated, that is, a net gain, by subtracting costs, of € 1,787,419,412.44, to which € 2,623,200.00 would be added each year from the rent of social housing.

The former Ostiense-Marconi industrial area in the Urban Regeneration proposal developed by students of the Master of Urban and Architectural Design program at the University of Notre Dame School of Architecture. The lighter portion of the project is the portion developed by students in Spring Semester 2022, the darker portion the portion developed by those in Fall Semester 2022

[15] https://www.simmetria.org/images/stories/pdf/rivista_18_2013_a5.pdf

[16] https://www.picweb.it/emm/blog/index.php/2017/08/01/il-quartiere-testaccio-di-roma-e-la-politica-dellicp-agli-albori-della-sua-esistenza-un-importante-precedente-da-cui-imparare/

The portion of the project east of the Via Ostiense, on the other hand, was developed during Fall Semester 2022 by the group of graduate students consisting of Mashkur Abdullahi, Claire Andrew, Patrick Beck, Samuel Flanders, Daniel Hwang, Mary Leihy, Shauni Priyam Sikder, Fernando Silva, Benedict Smyth, Nathan Thomas, and Samuel Usle, who tackled the design of the area from the former General Markets to the Basilica of St. Paul Outside the Walls and the Garbatella, which was subdivided as follows:

1. North - Via Francesco Negri (the program asked to consider connecting this area to the railway line and the former Ostiense Terminal for Fiumicino);

2. East - the northern boundary is identified by the buried railway line over which two pedestrian bridges pass (to be redesigned) and the recent Settimia Spizzichino vehicular bridge; at the second bridge the area includes Piazza Giancarlo Vallauri and Piazza Pantero Pantera at Garbatella, while the southern edge, along Via Alberto Guglielmotti and Piazza Benedetto Brin, ends after Marcella and Maurizio Ferrara Gardens,

3. South - the edge of the area follows the route of Via delle Sette Chiese and that of Via Alessandro Cialdi along the railway and then turns onto the bridge (to be redesigned) over the railway and follows Via Giulio Rocco, to Via Ostiense

4. West - for this boundary, which follows Via Ostiense, students were asked to consider the new urban conditions defined by the project developed by the Graduate Program student group of the previous Spring Semester 2022.

This area has many critical issues and, at the same time, great potential. The analysis of the site suggested the need to create a connection of the area not only with the Garbatella neighborhood to the east and the Ostiense Marconi neighborhood to the west, but also has to connect with the Ostiense Station to the north and the Basilica of St. Paul Outside the Walls to the south.

The presence of the railroad, as well as that of the recent Settimia Spizzichino Bridge, rather than being seen as a limitation, was seen as a great opportunity to realize attractive urban planning solutions capable of creating life where there is none today.

Starting from the north, wanting to create a pedestrian connection to the Ostiense Station, a pedestrian bridge was proposed to be built from Via Francesco Negri to connect to Via Francesco Antonio Pigafetta. These two cul-de-sac streets, in fact, seem to have been waiting for such a connection for years.

At the arrival of the bridge on the Ostiense side, a small square has been proposed that gives access to a longitudinal park that runs along the railway: a necessary presence not only to create public greenery but, at the same time, to act as a physical and acoustic barrier to the railway. From this small square also starts the structuring axis of the entire intervention, along which a series of seven squares follow one another, characterized by special buildings and commercial and socializing activities.

The first square one encounters, behind the former Mercati Generali complex, gives access to the former market complex transformed into a University Campus for the Roma Tre University and to a sports complex, the latter created by transforming the beautiful Fish Market pavilion by Eng. Saffi, which would house an Olympic-size swimming pool.

On the side facing the railroad, surrounded on three sides by the public park, a new headquarters for the Roberto Rossellini State Cine-tv Institute of Higher Education has been proposed, while the south side of the square features a large porticoed courtyard lot connected to the campus. Between this block and the park, the main pedestrian axis, lined with commercial and restaurant activities, descends so as to underpass the Settimia Spizzichino Bridge and continue in the direction of the Basilica of St. Paul Outside the Walls.

Upon exiting the underpass, one reaches a square from which one can access the bridge that, bypassing the railway, gives access to the Underground Railway. In this case, the renovation of the existing bridge has been proposed.

The main road continues uphill to reach a square that forms the center of gravity of the entire intervention where a new church has been proposed, to the right of which is the pedestrian bridge connecting with Garbatella.

Here it was proposed to replace the abandoned covered pedestrian bridge, which connects Via degli Argonauti and Piazza Giancarlo Vallauri, by proposing a new covered bridge, featuring commercial activities along the lines of the Ponte Vecchio in Florence and the Rialto Bridge in Venice. Given the location and intended function, the designer felt the need to propose a medieval architecture in line with that of the first core of Garbatella ... which was much appreciated by those - technical and non-technical - who took part in the presentation of the project.

The structuring axis continues in a southerly direction, flanked by a mixed residential building on the right -acting to screen the buildings of the new Rectorate of the University of Roma Tre- and by the public park on the left, arriving at another square, set behind the splendid building of Vincenzo Fasolo, now the seat of the DAMS of the University of Roma Tre.

The idea of screening the new buildings of the Rectorate arose as a result of the meetings of the participatory process with some citizens: in those meetings, in fact, an absolute univocity of thought emerged that considers these new buildings totally inappropriate. The most frequent terms (the repeatable ones) we recorded are "*absurd*," "*decontextualized*," "*heavy*," "*irreverent*," "*ugly*" and "*ridiculous*," etc. However, rather than proposing their demolition, as many were proposing, we opted for a more realistic "*shielding*" ... waiting for time - which is a gentleman - to take its course.

Before entering this square, one encounters on the left an access to the park which, in turn, gives access to a small pedestrian bridge that, bypassing the railway, leads to a "*piazza/theater*" resting on the Garbatella hill that ends on Via Alberto Guglielmotti. This Square/Theater would result an important permanent infrastructure apt to host the summer shows that currently take place in the meager temporary space that is realized in the green area that flanks Piazza Brin. Reconstruction of some of the buildings of the initial Garbatella core has also been proposed on this front.

Returning to the square beyond the railway, and heading south, the main route deviates slightly to the west heading towards Via Giulio Rocco and diagonally crossing a small square that gives access to the University of Roma Tre campus and leads to the bridge - reconstructed - that connects Via Rocco to Via Alessandro Cialdi and to the Plinio Marconi staircase that leads back to Piazza Brin.

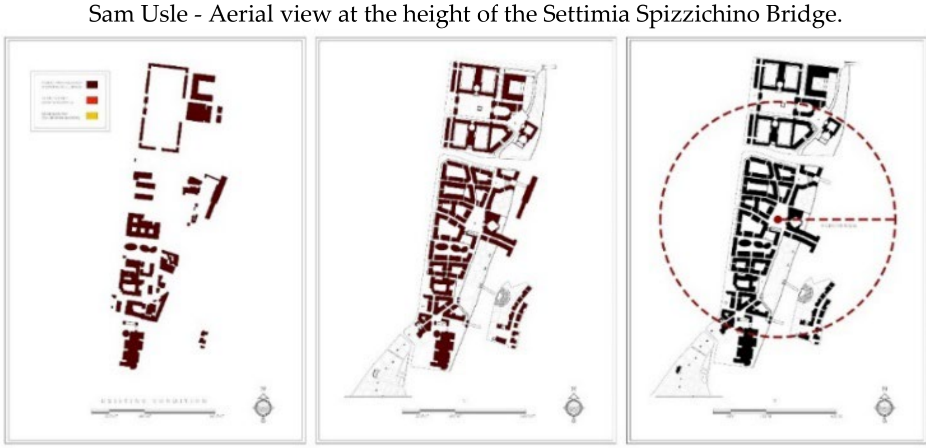
The main route then leads to Schuster Park, which has been proposed to be radically redesigned, creating a path flanked by a series of votive shrines leading to the marvelous Basilica of St. Paul Outside the Walls, finally an integral part of a city on a human scale.

Unlike the portion planned in Spring Semester, which is predominantly for mixed residential use, the evaluation of the costs and benefits of this area, which has a predominantly public use, has obviously led to less profitable accounts, but not for this reason in the red; in fact, even considering the amount of housing to be given away free of charge to the residents of the buildings that were proposed to be replaced, even in this case the final balance was positive, for a total of "*only*" € 20. 195,699.00, which, when added to those on the other side, brings the entire intervention to a net gain of € 1,807,615,111.44, plus, of course, the annual rental income from social housing.

Overall, considering an average of 4 residents per 100-square-meter apartment, between the two areas planned by the two student groups it would be possible to settle 21944 residents, compared to the current estimated 1,500 or so.

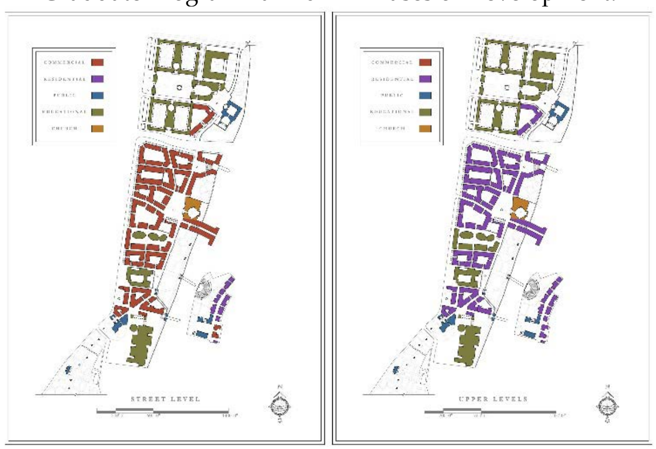
In practice, rather than persevering in the consumption of land outside the city and/or in demolition and reconstruction in valuable areas, filling the degraded voids of the city and regenerating the suburbs would make it possible to start a process of recompacting the urban fabric and a real "*green*" transformation of the city that, in addition to achieving the energy goals imposed by the "*ecological transition*", would lead to a large-scale and long-lasting growth of the local economy ... a model applicable for any other Italian and foreign urban reality.

Sam Usle - Aerial view at the height of the Settimia Spizzichino Bridge.



Graduate Program Fall 2022 - Before and after intervention diagrams and outline of the "*5-minute walk*" city

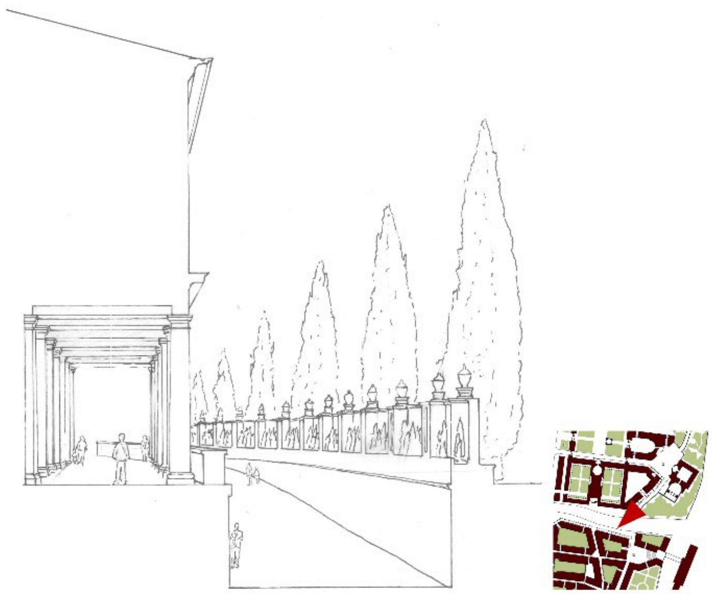
Graduate Program Fall 2022 - Phases of Development.



Graduate Program Fall 2022 - Ground Floor and Upper Floor Use Designations.

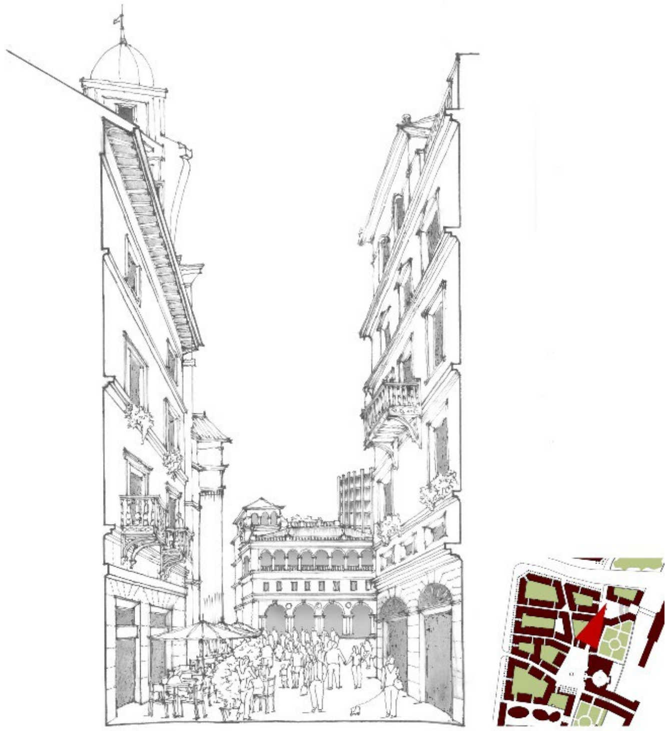
Graduate Program Fall 2022 - Dimensional comparison study between Roman and project squares.

Graduate Program Fall 2022 - Comparison of historic, Garbatella neighborhood and project urban blocks



Graduate Program Fall 2022 - Perspective section main road descending under the Spizzichino Bridge

Graduate Program Fall 2022 - Spizzichino Bridge Underpass View.

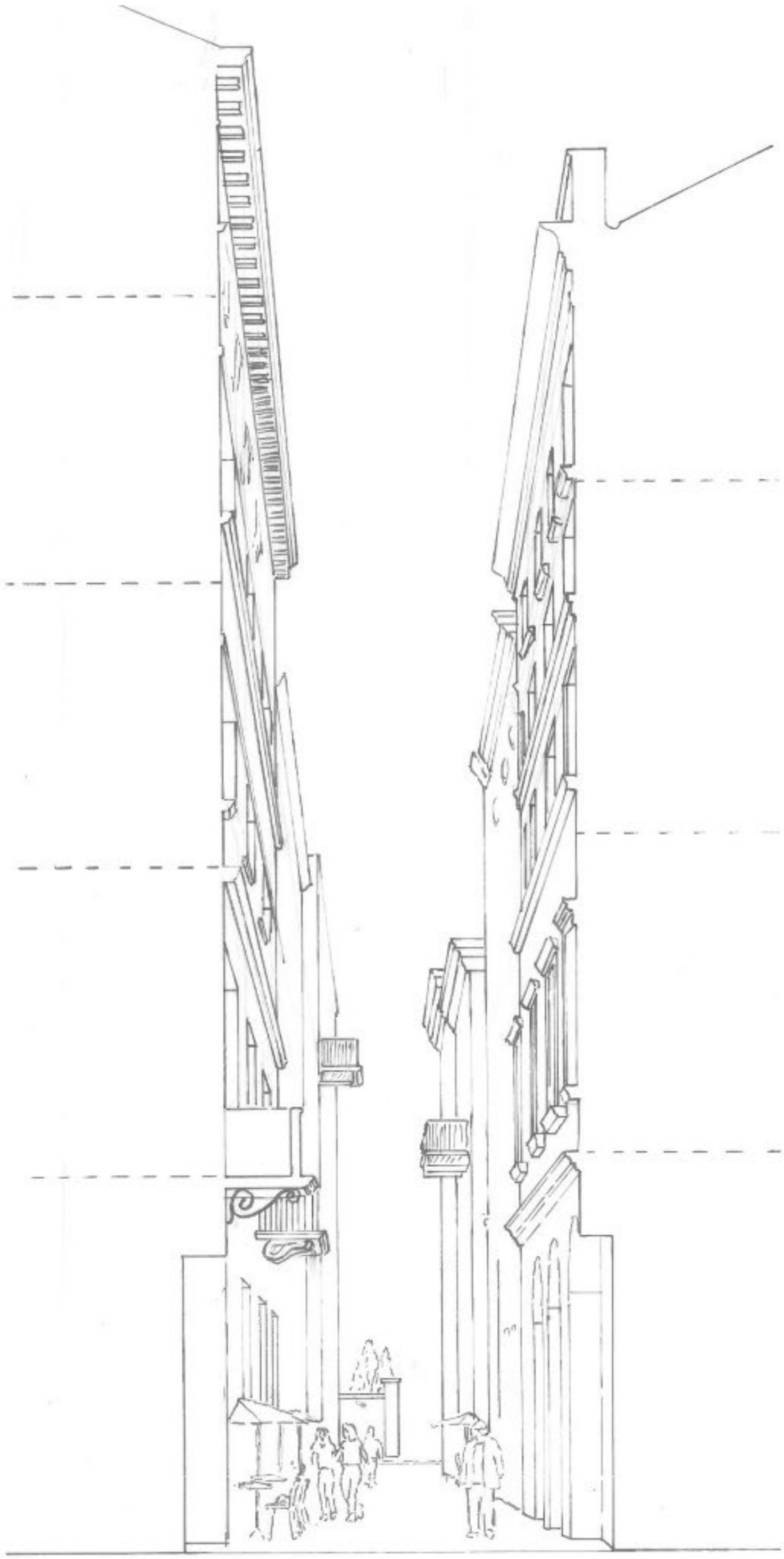


Graduate Program Fall 2022 - Main Square entrance view from main axis

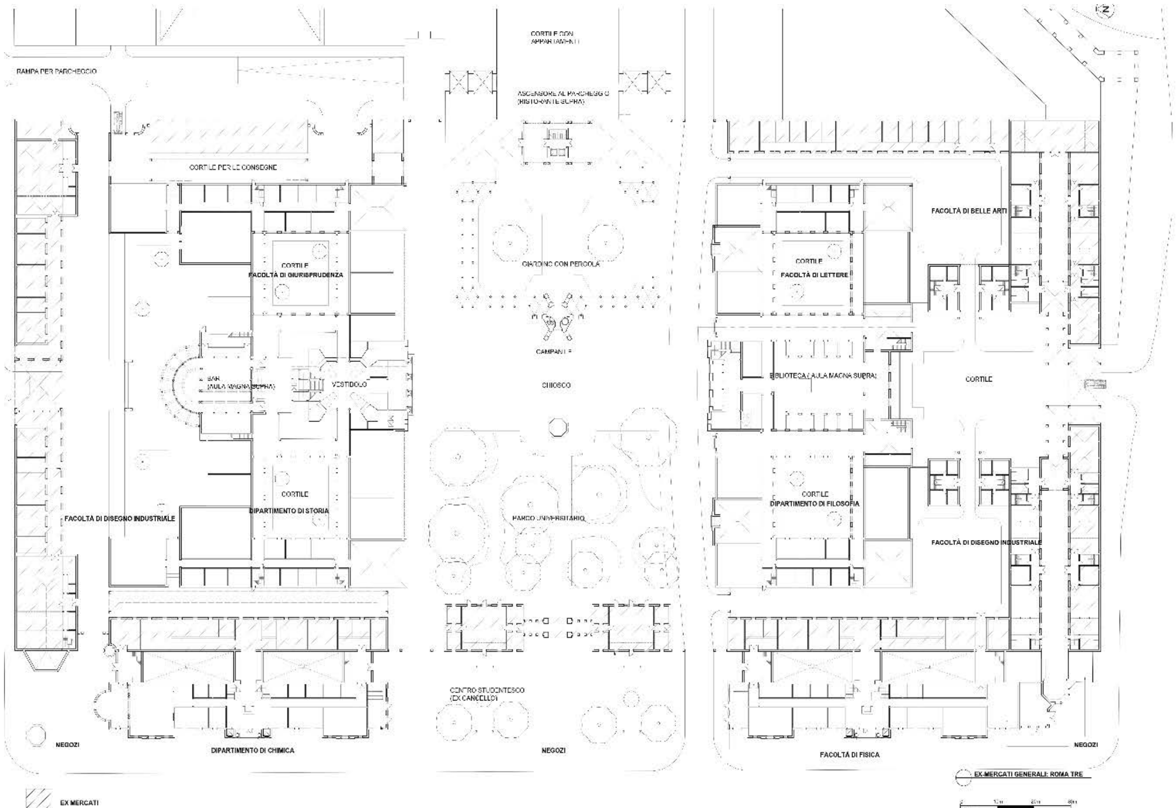
Graduate Program Fall 2022 - View access to commercial bridge from Piazza

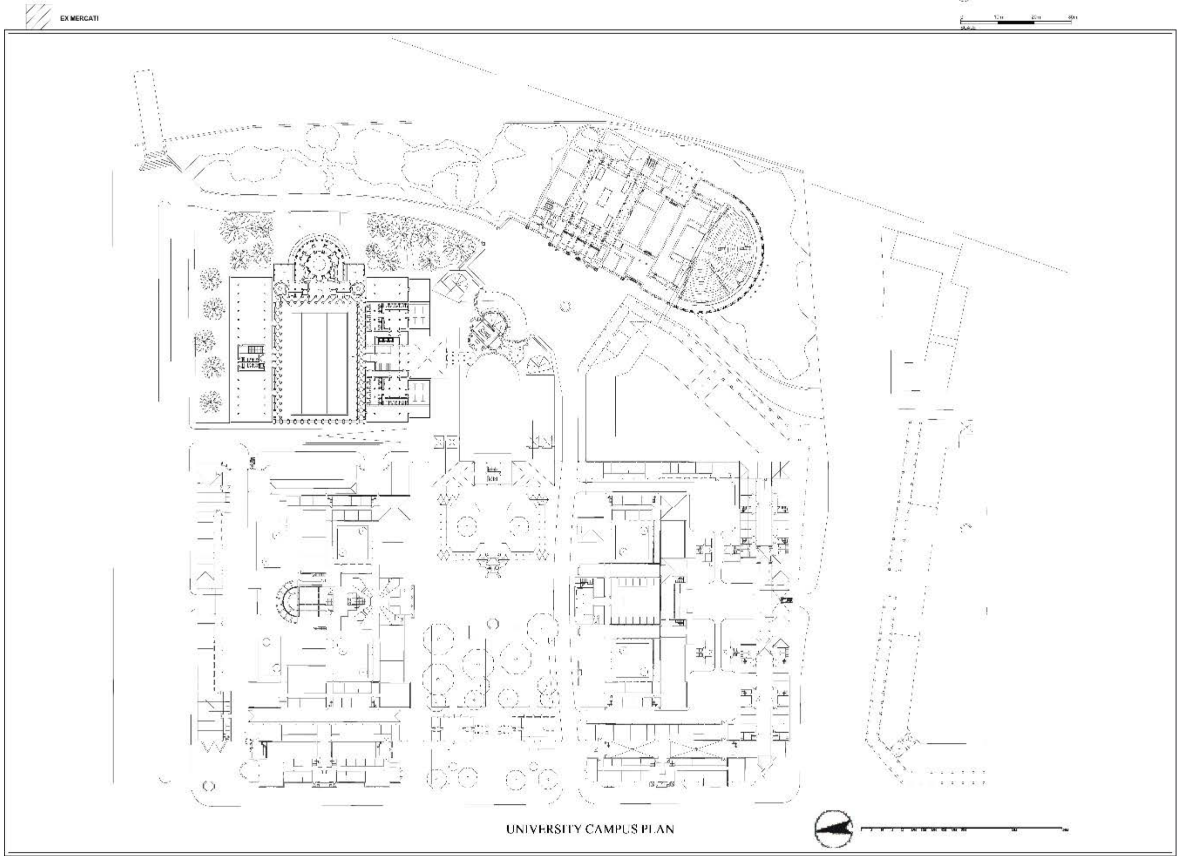
Graduate Program Fall 2022 - Main Square entrance view from Via Ostiense

Graduate Program Fall 2022 - View along the main road after the piazza

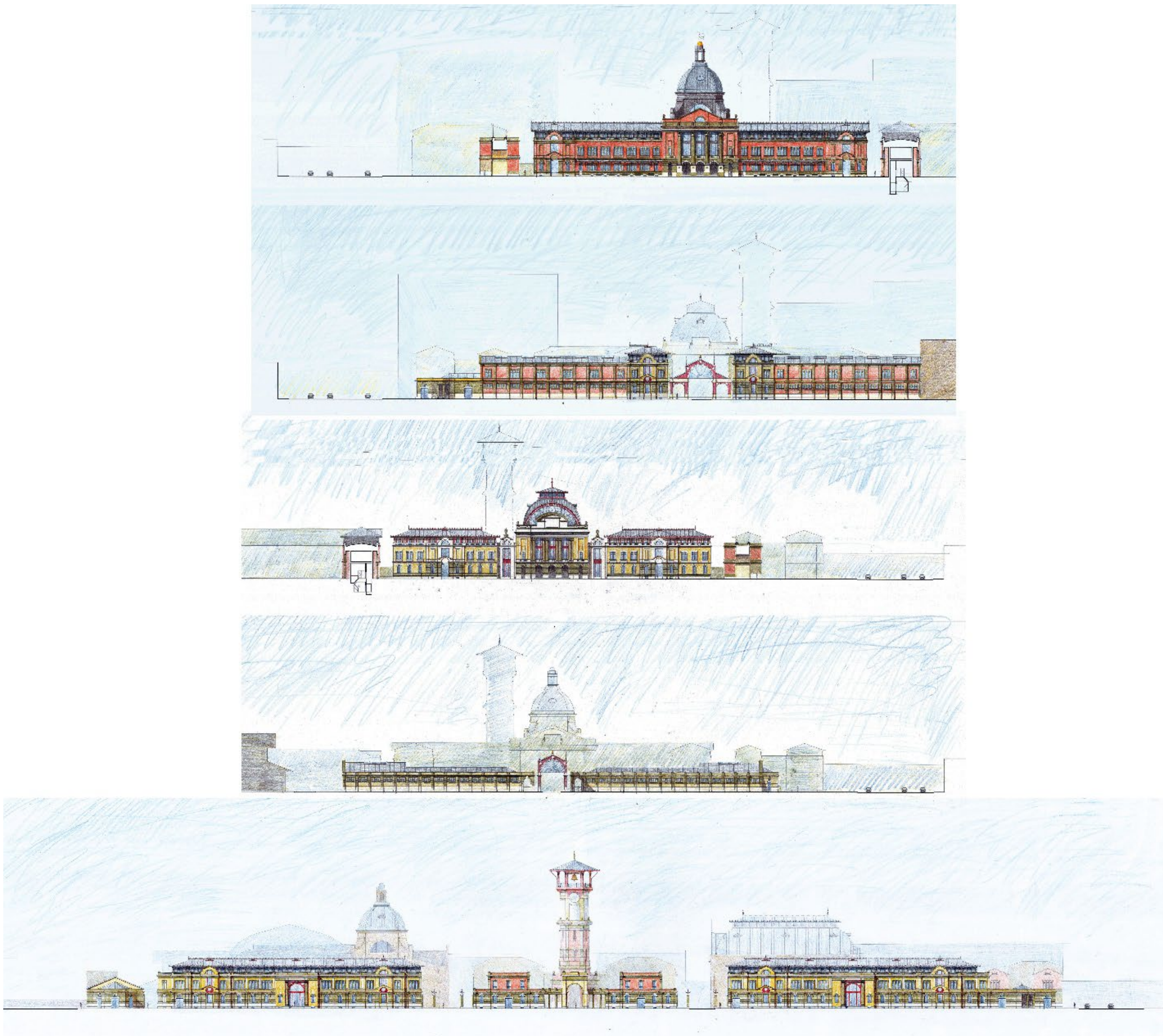


Graduate Program Fall 2022 - Perspective section road abutting the new Rectorate

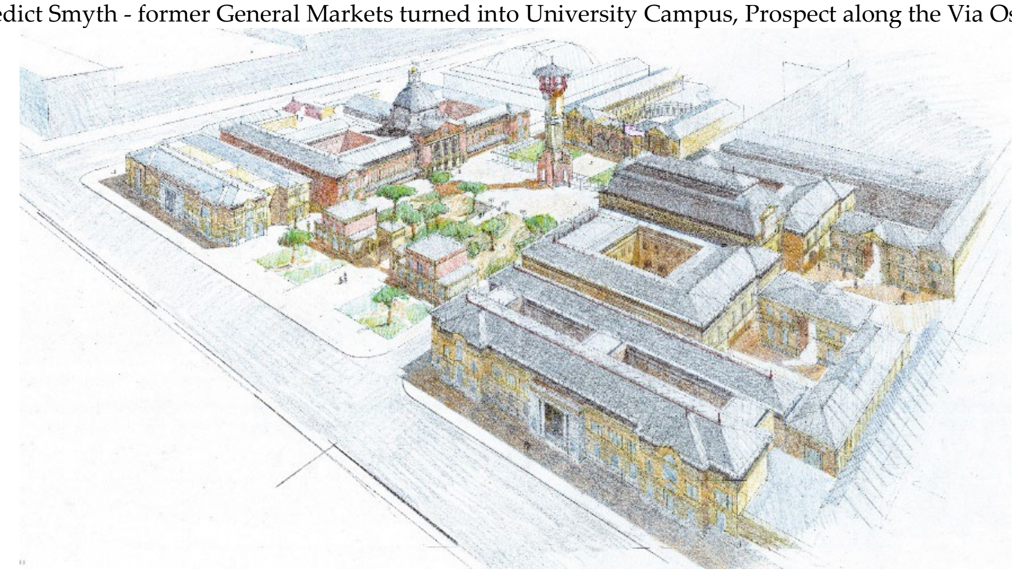




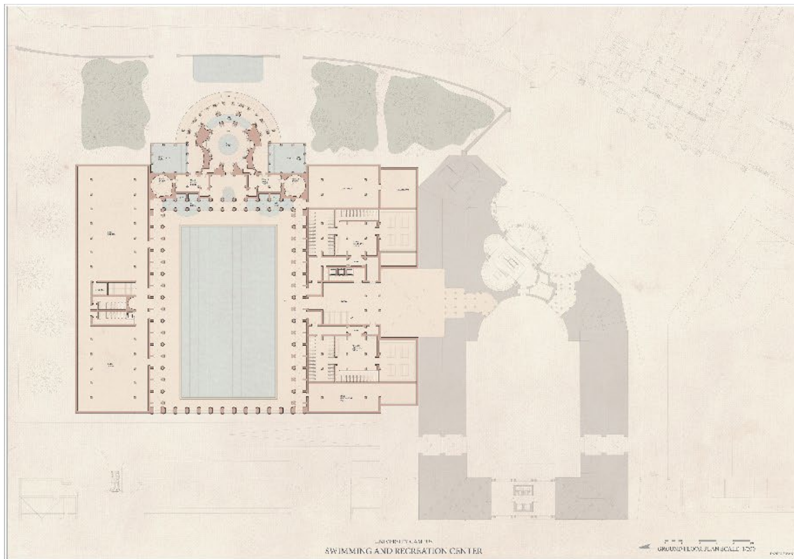
Benedict Smyth - Transformation of the former General Markets into a University Campus. General Plan and Ground Floor Plan.

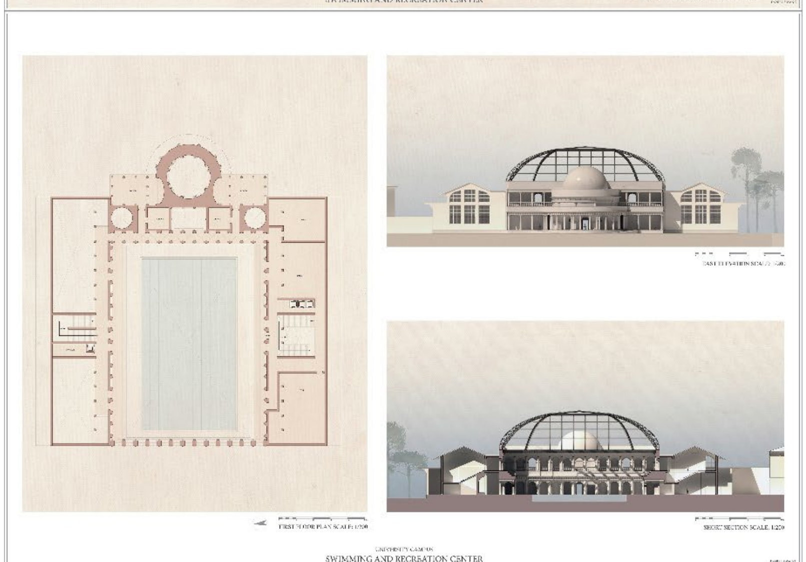


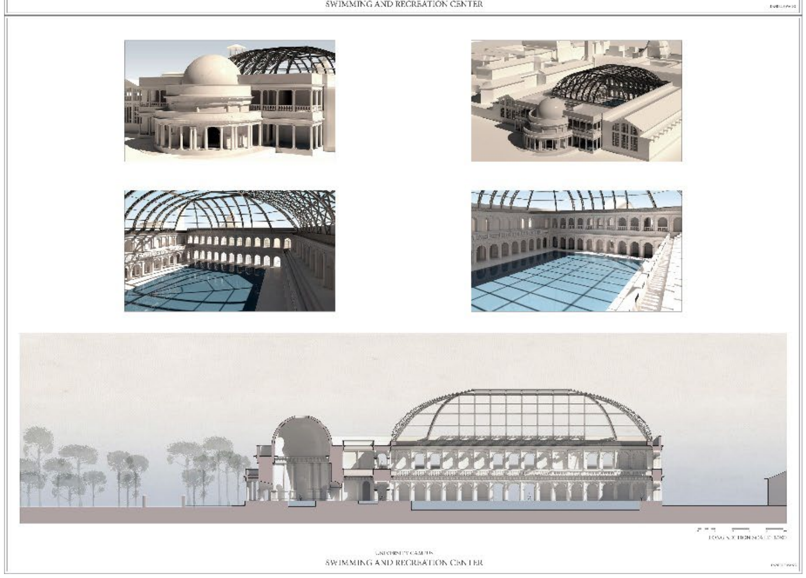
Benedict Smyth - former General Markets turned into University Campus, Prospect along the Via Ostiense



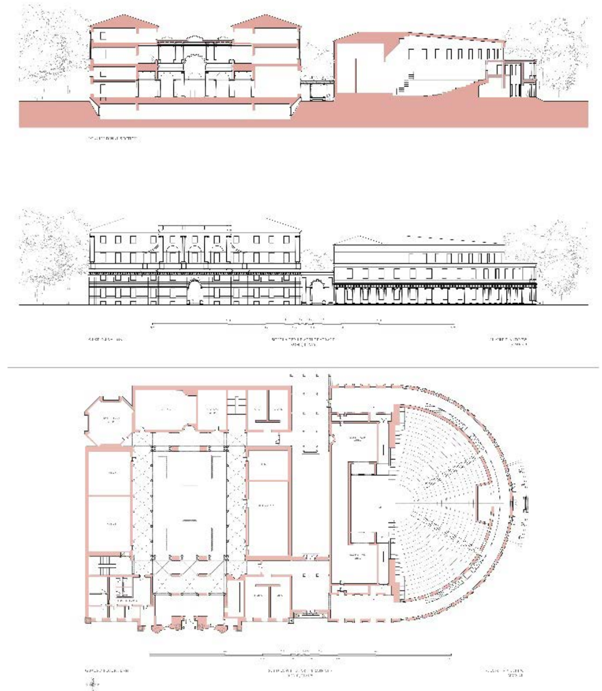
Benedict Smyth - former General Markets turned into University Campus, Aerial View from Southwest







Daniel Hwang - Former Fish Market turned into sports center for water sports

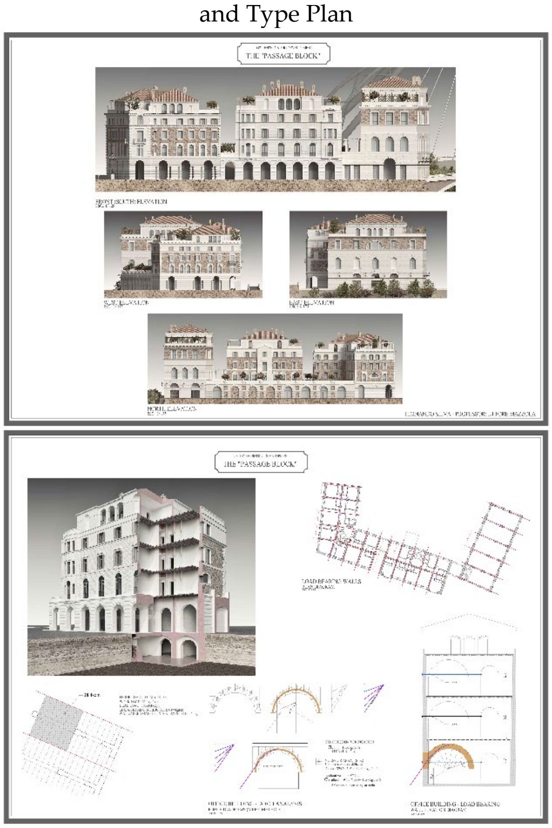


Claire Andrew - New Roberto Rossellini Cine-tv State Higher Education Institute. Piazza elevation and cross section.

Mashkur Abdullahi - Mixed Residential Isolation on First Square - Floor Plan Type.

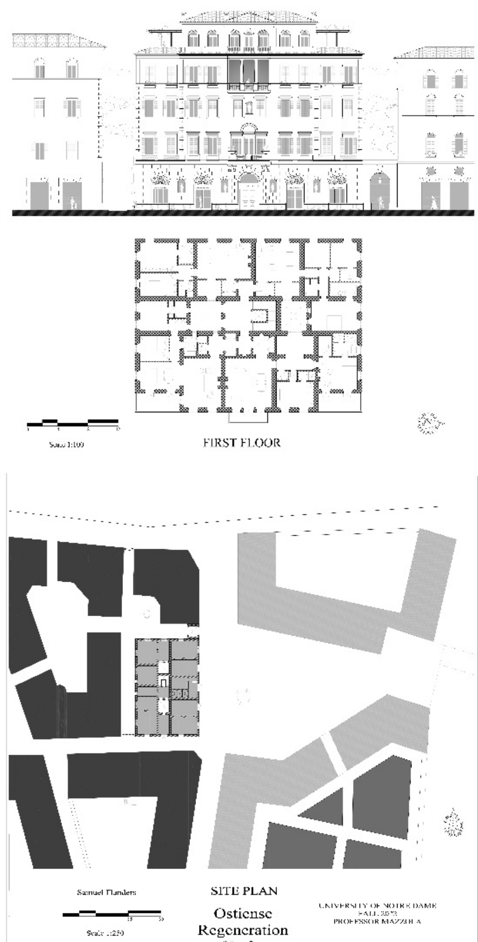
Mashkur Abdullahi - Mixed residential block on First Square

Fernando Silva - Mixed residential block and parking lot abutting the Settimia Spizzichino Bridge. Ground Floor Plan and Type Plan

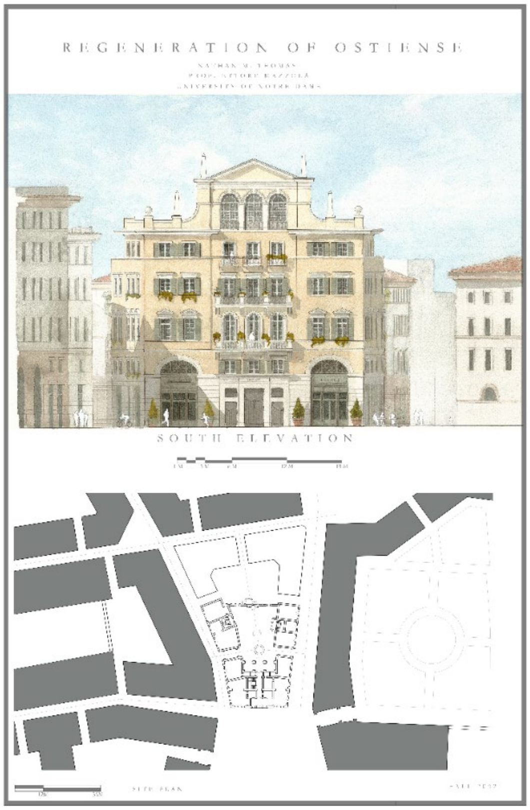


Fernando Silva - Mixed residential block and parking lot abutting the Settimia Spizzichino Bridge. Structural elevations, structural cutaway and structural verification

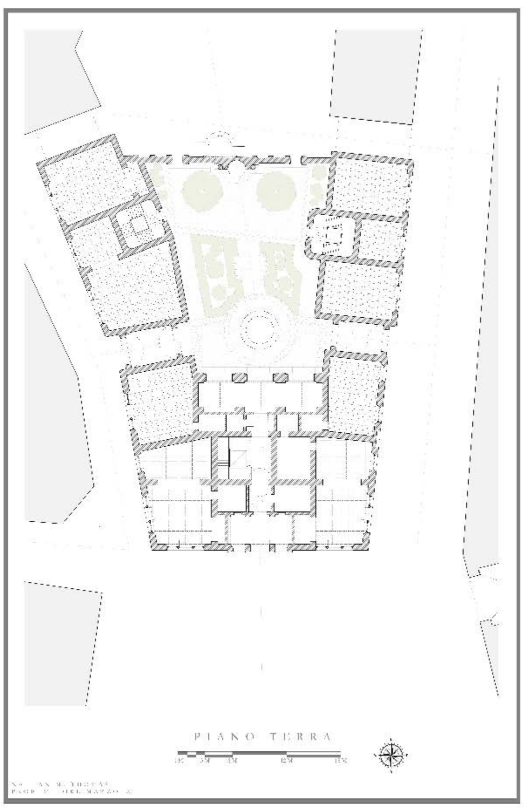
Fernando Silva - Mixed residential block and parking lot abutting the Settimia Spizzichino Bridge. Perspective views

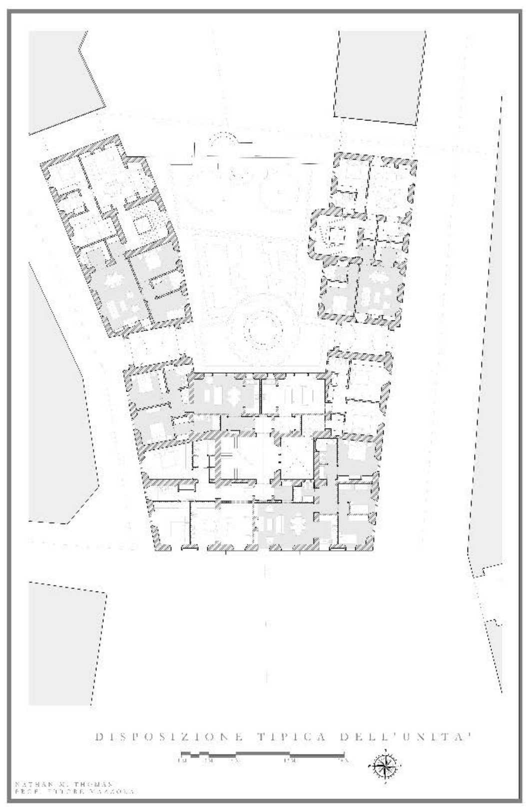


Samuel Flanders - mixed residential block in the square giving access to the subway bridge - General Plan, Typical Floor Plan and main elevation on the square

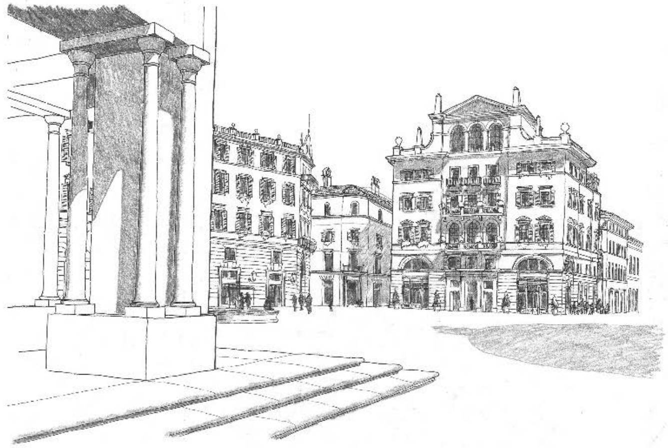


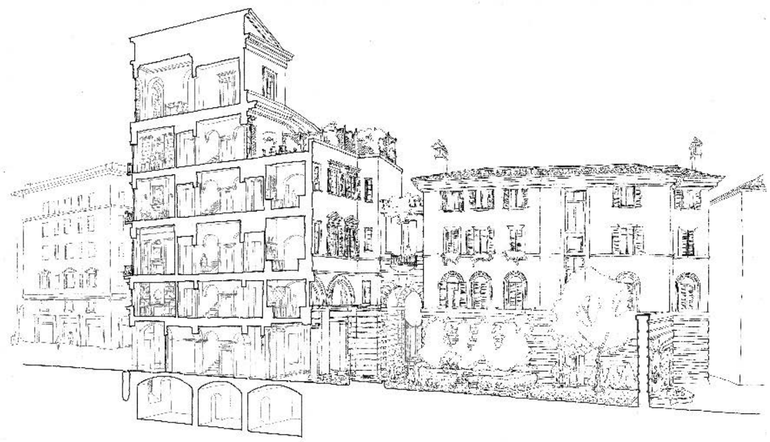
Nathan Thomas - mixed residential block in the main square. General plan and elevation on the Square



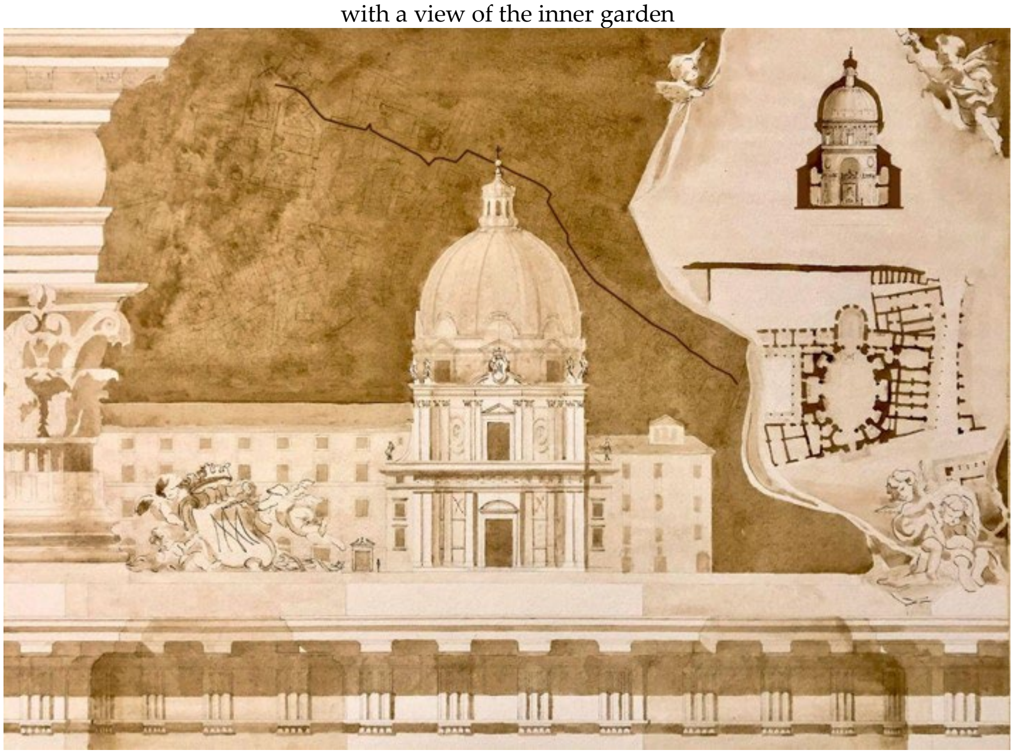


Nathan Thomas - mixed residential block in the main square. Ground Floor Plan and Floor Plan Type.

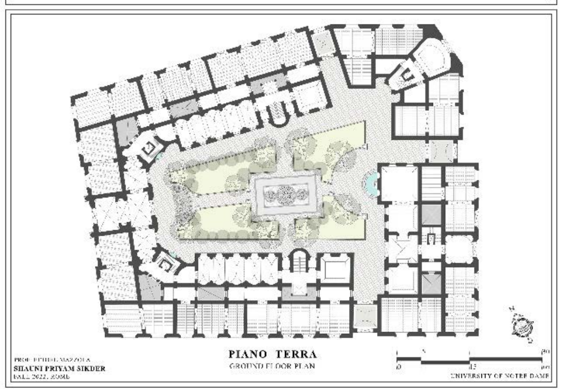




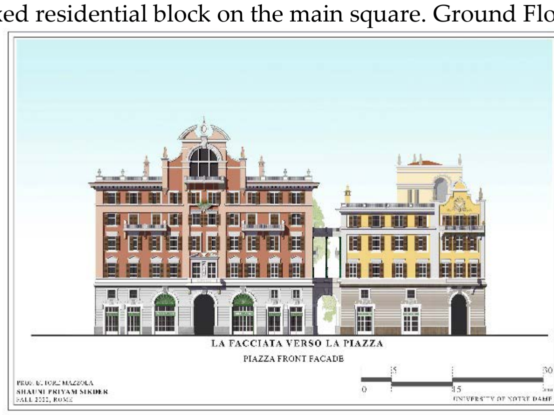
Nathan Thomas - Mixed residential block in the main square. Perspective on the Square and Perspective Cutaway with a view of the inner garden



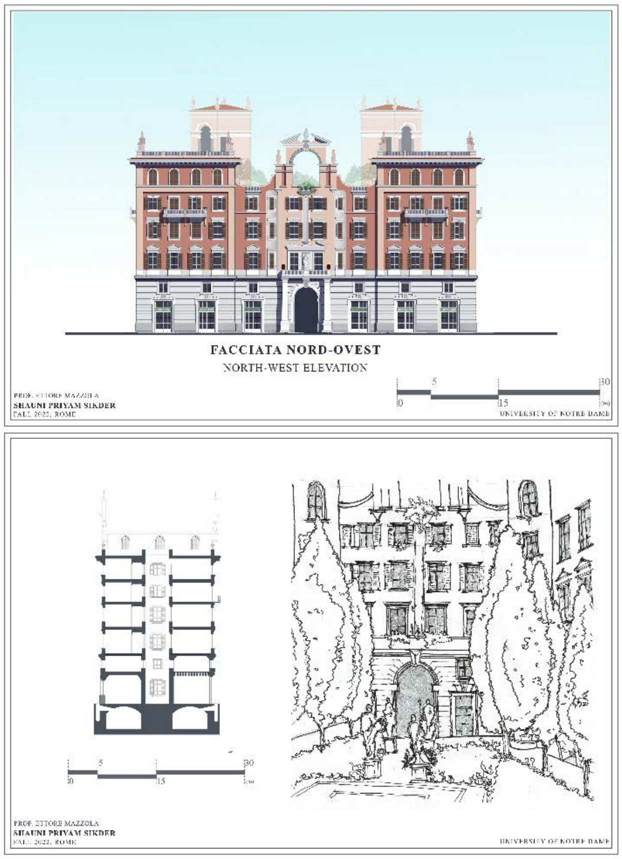
Mary Leihy - Church and convent in the central square



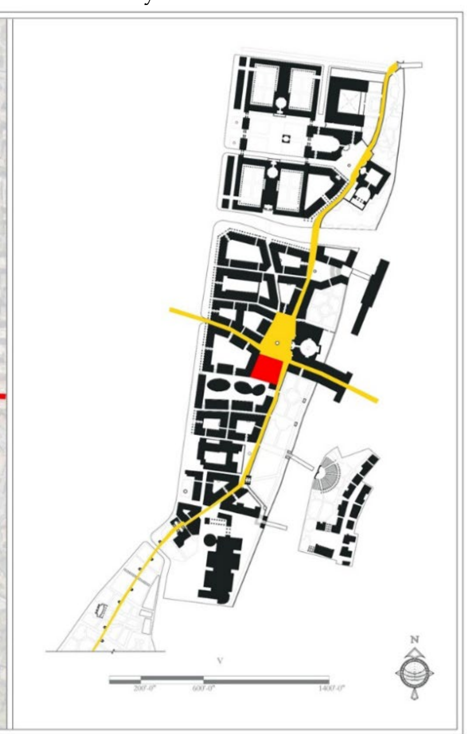
Shauni Priyam Sikder - Mixed residential block on the main square. Ground Floor Plan and Floor Plan Type.



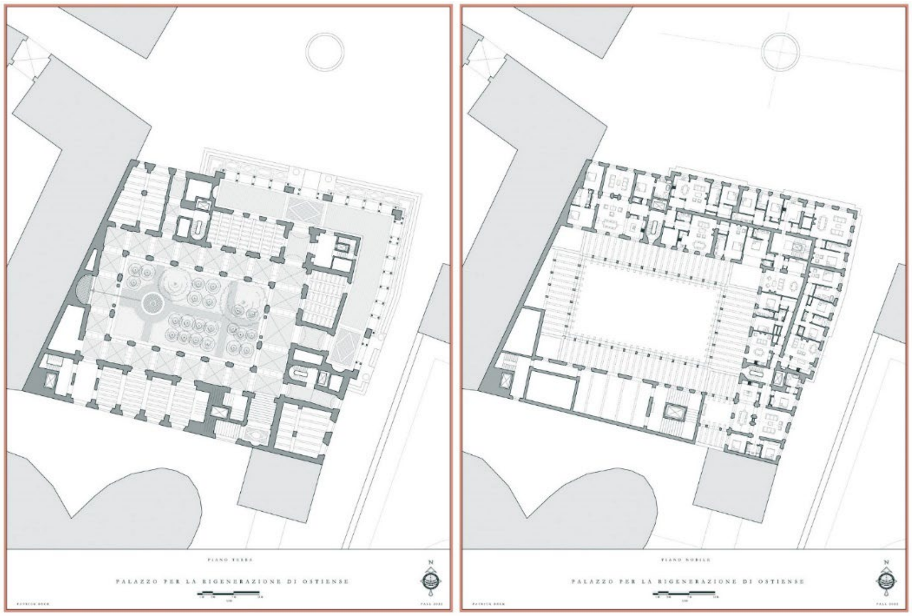
Shauni Priyam Sikder - Mixed residential block on the main square. Square elevation, Side elevation and subdivision of buildings and apartments.



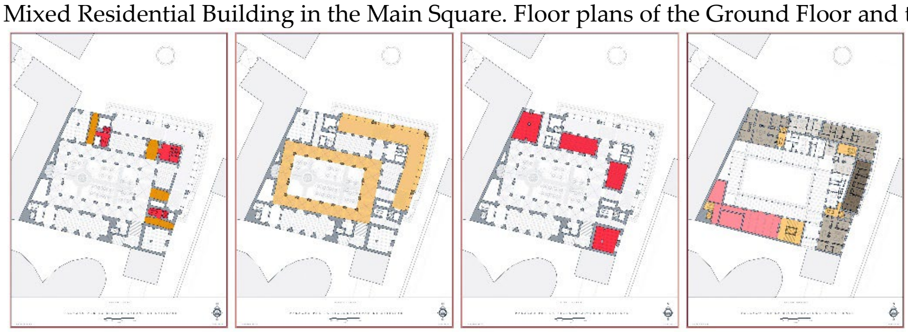
Shauni Priyam Sikder - Mixed residential block on the main square. Northwest elevation, cross section of the block and interior view of the courtyard



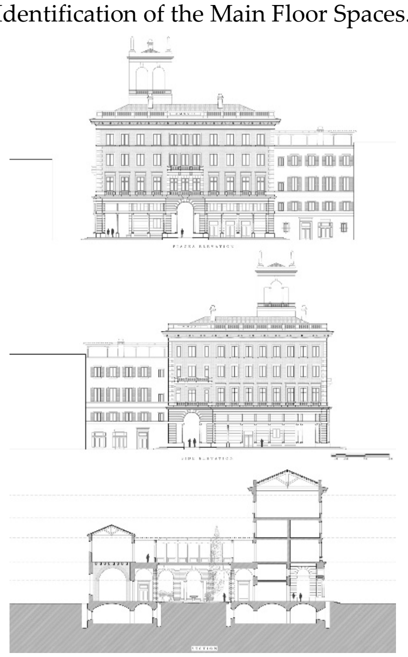
Patrick Beck - Mixed Residential Building in the Main Square. Location plan and indication of the main pedestrian axes of the urban plan



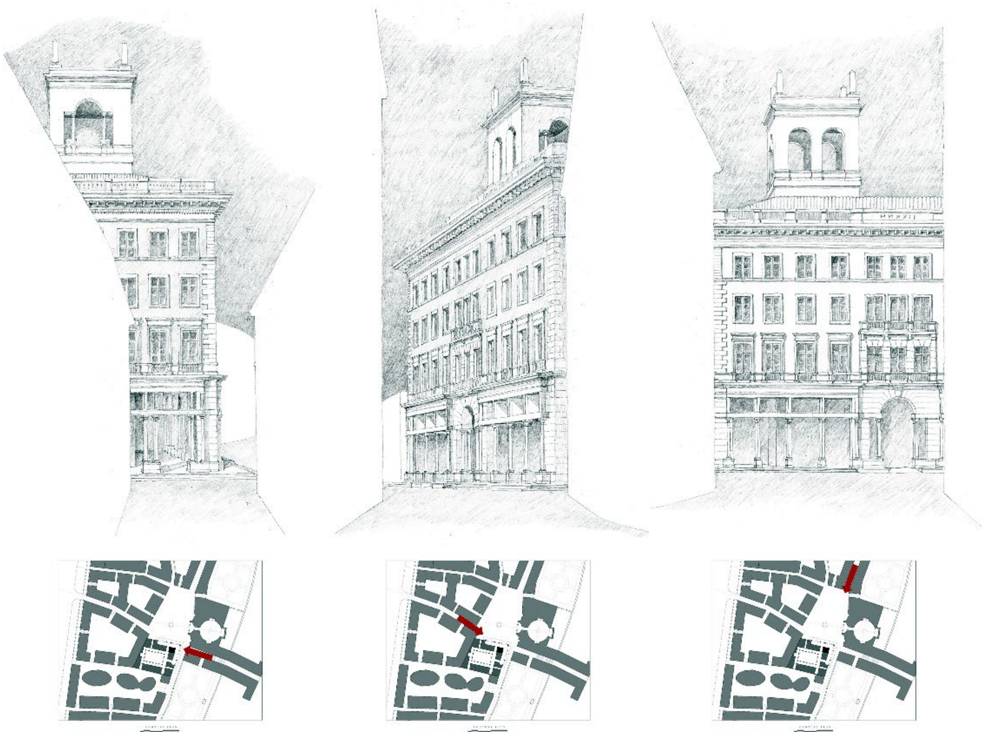
Patrick Beck - Mixed Residential Building in the Main Square. Floor plans of the Ground Floor and the Main Floor



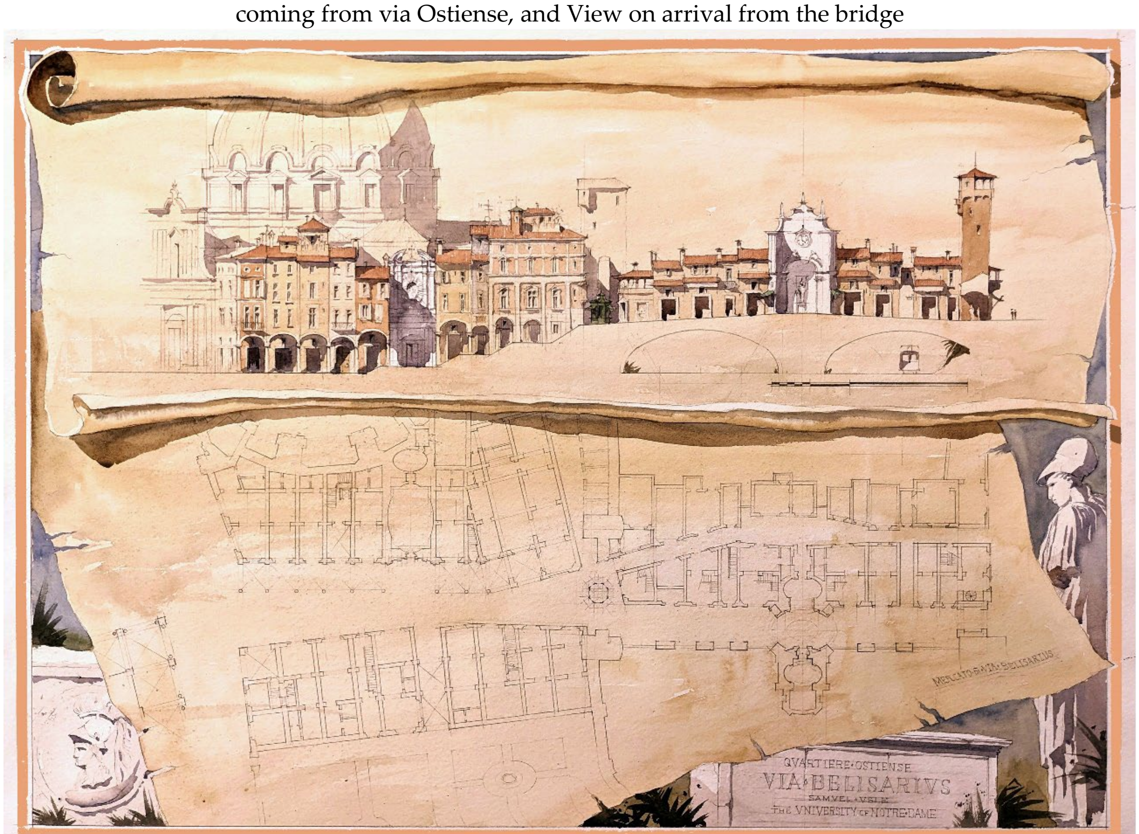
Patrick Beck - Mixed Residential Building in the Main Square. Identification of the Ground Floor Spaces and Identification of the Main Floor Spaces.



Patrick Beck - Mixed Residential Building in the Main Square. Square elevation, Side elevation and Section.



Patrick Beck - Mixed Residential Building in the Main Square. View of the square coming from the north, View coming from via Ostiense, and View on arrival from the bridge



Samuel Usle - Commercial Bridge over the Railroad. Plan and elevation-section along the axis of the bridge.

Samuel Usle - Commercial Bridge over the Railroad. Aerial view from the south, perspective views and cross section.

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July 20 2019

White Paper

on

TALL BUILDINGS RECONSIDERED
The Growing Evidence of a Looming Urban Crisis

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Centre for the Future of Places – Stockholm

And

Neaman Institute for National Policy Research at Technion – Israel Institute of Technology

Centre for the Future of Places

Samuel Neaman Institute
for National Policy Research

TALL BUILDINGS RECONSIDERED:
The Growing Evidence for a Looming Urban Crisis

EXECUTIVE SUMMARY

At a time of unprecedented speed of construction of tall buildings around the world, evidence-based evaluations of their drawbacks as well as claimed advantages are remarkably infrequent (Ng, 2017). Given the potential for long-term impacts of unknown magnitude, this situation seems to warrant urgent remedy. As a contribution to that goal, this research summary looks specifically at negative impacts, which we find are under-reported. Specifically, we find significant negative impacts in the following categories:

1. ***Economic externalities.*** There is evidence that tall residential buildings with for-sale units are significantly more likely to fail economically over time. A hardly addressed but important issue is the built-in market failure in meeting the maintenance costs of towers – especially residential towers – with condominium type ownership. Contrary to intuition, the maintenance costs broadly rise with height, reaching prohibitive sums that many households will at some point not be able to afford. Towers are thus destined to faster deterioration, greater difficulties in upgrading to newly expected standards, and major, unaddressed economic and urban challenges when the time comes to replace these towers.There is also evidence that the higher cost of tall residential for-sale buildings can fuel gentrification and make surrounding housing less affordable (Lehrer and Wieditz 2009).

   There is also some evidence that tall buildings tend to suppress small-scale entrepreneurial activity by replacing older, smaller, more affordable commercial spaces with larger more expensive ones.

2. ***Social impacts.*** There is abundant cautionary research on the negative social impacts of residential tall buildings and their associated urban typologies, both for residentsand for adjacent communities. These include greater isolation and loneliness for some populations, greater rates of depression and even suicide, and suppression of street-based social interaction (particularly for tall buildings with garages for private automobiles).

3. ***Impacts on the natural environment.*** There is evidence that tall buildings do not contribute significantly to urban sustainability, and that arguments to that end are often greatly exaggerated. Evidence shows that many tall buildings with claims to sustainability have performed poorly on environmental criteria in actual post-occupancy evaluations. Tall buildings also have higher embodied energy and resources than lower building typologies, greater exposure to energy heat and loss, and higher negative impacts on access to natural daylight and passive heating by adjacent buildings.

4. ***Impacts on the human environment.*** There is ample research indicating that tall buildings have many negative impacts on the livability of their adjacent public and private spaces. These include shading effects, wind effects, loss of sky view, canyon effects (concentration

of pollutants at street level), and aesthetic effects for larger numbers of residents, which, when judged by residents to be negative, affect more residents negatively for taller buildings. This problem is compounded by evidence of a significant divergence between what professionals and non-professionals judge to be a proper and pleasing building design, which becomes more consequential for more residents when buildings are taller, and thus more conspicuous. There is also an inherent cognitive bias in any profession, which in the case of architecture and development, can have negative ramifications for laypersons' quality of life.

Background

In the last several decades, the number and height of tall buildings has greatly increased in many cities around the world. The benefits of these new buildings are widely discussed: symbols of civic identity, profitable engines of economic development, new homes and offices affording beautiful views, and accommodations for new urban growth in a more compact and (it is alleged) sustainable form.

Indeed, it has become a truism among many sustainability advocates that tall buildings are, by sheer virtue of the higher volume of building they provide per given footprint, paragons of sustainability. Some architects and other boosters now offer highly exuberant prescriptions for the building of many more "sustainable skyscrapers," often with fanciful designs and technological features. Some proponents advocate a wholesale move to super-dense "skyscraper cities," while others simply tout the green credentials of particular tall buildings, like London's Gherkin or Manhattan's New York Times Building.

These are strong claims, which should require strong evidence. In fact, troubling evidence points to many problems with tall buildings, on social, economic and even ecological grounds. Far from being paragons of sustainability, evidence indicates on the contrary that they are a highly problematic urban typology. At the very least, in light of this evidence, the burden should be on those who (for often understandable reasons of self-interest) are exuberant boosters of the type, to show that their negative impacts have been mitigated, and claims for their positive contributions have been fully substantiated. In particular, this should be a minimum prerequisite for any move to deregulate building height rules – which is indeed under way in a number of cities.

We must certainly acknowledge the numerous advantages and appealing qualities of tall buildings for their own residents (and to the developers' profit margin). They can afford wonderful views to residents, or at least they can when not blocked by other similar tall buildings. However, it seems clear that, given the pace of growth of tall buildings – in both number and height – a sober assessment of the evidence is long overdue.

Looking at the evidence

To be clear, the research does show that places like Manhattan and Vancouver, BC, perform well on ecological criteria: They conserve farmland and natural areas, they have relatively low energy use and emissions per person, and they have relatively efficient use of resources per person (notably in things like buildings, pavement, etc.).

But how much of this is due to the presence of tall buildings? Is it possible that tall buildings are not a significant contributor in and of themselves?

More pointedly, does the research show that there significant negative impacts that we, as responsible practitioners, must bear in mind?

In a word, yes -- on both counts. One problem is that the current knowledge about the impacts of tower buildings is still rudimentary, especially regarding residential towers, and it is replete with unsupported assumptions about the ostensible benefits of tower buildings.

To be sure, there is a small but growing body of research on the benefits and drawbacks of tall buildings, and this research gives a decidedly mixed picture. This research shows that there are significant negative ecological and even economic impacts of tall buildings, as well as other negative factors, and the ecological benefits are not as great as is often assumed. We summarize some of this research below, and offer a sampling of citations.

Definition

First, for the purposes of this paper, we define a "tall" building as any building more than fifteen storeys. This is a somewhat arbitrary definition, since both positive and negative impacts of taller buildings increase with height, and there are many complex factors at play, including materials, engineering requirements, local building codes, view sheds, and other variable factors. Nor are the impacts continuous by height, but rather, they are influenced by a series of "tipping points" above which different materials, structural designs, lift and egress designs, and other changes are required. Nonetheless, there is a significant difference between a ten-storey building and a twenty-storey one, sufficient to draw a line of definition between them.

Three common types

Where tall buildings do exist in these cities, they often fall disproportionately into two categories. They are usually either single-use or limited mixed-use office buildings, or they are residential towers inhabited primarily by upper-income families. A third type of building is the public housing project created by government. Since these structures are rarely above fifteen storeys, we will not focus on that type in this paper.

However, it is worth noting that many of the taller (but below fifteen storeys) buildings that house the poor have an unhappy history. There is extensive research on their dysfunctions, calling into question their social suitability for families, their impact on children, their psychological impacts, their relation to their open spaces and propensity for crime, and other social issues. Moreover, in most cases these are not simply correctable design defects, but inherent problems stemming from isolation from the ground, lack of eyes on the street, and other attributes of taller buildings. These problems are clearly present and even exacerbated when residential buildings are above fifteen storeys.

Office buildings, a common type of tall building within city centres, by definition don't by themselves increase residential density, but depend for many of their claimed benefits on their location and the pattern of commuting. If they are confined to largely single-use office districts whose employees empty out in the evening, decamping to remote residential enclaves, then this is clearly not much of an ecological benefit.

A. Economic and legal impacts

1. The illusion of internal economic efficiency masks the real cost of long-term maintenance of towers.

Contrary to conventional wisdom, tall buildings often entail *higher* rather than lower maintenance costs per unit, despite the large number of owners; the taller, the more complex, although not quite in a linear relationship (for details see Alterman 2010). A further problem is related to the structural attributes of tower buildings, which operate like complex, closed machines that are not amenable to structural changes. Unlike regular buildings, in towers it will not be possible to grant additional development rights in the future (incentive zoning) to finance the necessary updating costs. Tower buildings are less amenable to structural modifications, so there is a greater danger that their relative value will eventually diminish, causing them to lose their position in the housing market, and thus to deteriorate faster than smaller apartment buildings. In addition to current expenditures for routine maintenance, comparatively larger investments are required for periodic repair and replacement of expensive machinery, large scale upgrading and renovation of the whole building and so on, than applies to regular buildings.

The problem of financing maintenance is much more severe in residential towers (almost always in condominium ownership) than in office towers. These edifices have built-in susceptibility to market failure in their decision structure. The large number of households in a tower along with the high absolute costs of maintenance are breeding ground for "free riders". This means, that even if the monthly payment is not met by a few households, the elevator is likely to continue to run and the stairs cleaned for many months before the "free rider" effect leads to organizational or economic collapse. Especially challenging would be the higher periodic investments needed for upgrading the technologies, or Any initial socially based understanding among the original owners is likely to erode over time, as apartments change hands or are rented out, and as the costs rise due to building deterioration. As the time range expands, and higher investments are needed for renovation, it becomes increasingly likely that many of the original owners will have moved out. An 'intergenerational' problem then arises, whereby upon sale, each owner has an interest in passing on the onus of financing maintenance to the new purchasers. When this happens on the large scale of a residential tower, the effect on deterioration is inevitable.

2. The legal frameworks differ across countries, but their impacts are barely researched.

Since residential towers are almost always in condominium ownership (called strata in Pacific countries), there is a special legal structure that determines or guides decision making and the mutual obligations of the apartment ownership; However, the differences in the legal structures are not socio-economically neutral. The decision-making rules may have direct or indirect implications for participation, social inclusion or exclusions. Furthermore: various legal requirements in the law to prevent payment defaults along with the legal powers of the condominium association could have major impacts on the costs of maintenance and thus on the future of the buildings' good functioning. The different legal formats can also impact the socio-economic composition of the ownership and reinforce the inherent exclusionary attributes of towers.

Condominium laws differ from country to country. There is no published large-scale comparative research on a wide span of countries' laws and practices and their urban impacts in practice. There are however a few published papers on one or a few countries. Harris (2011) analyzes British Columbia. Alterman's 2010 paper compares Florida and Israel, and Garfunkel's paper (2017) presents part of the findings of a larger research project in-progress by Alterman and Garfunkel encompassing four countries.

Alterman's comparison of Florida and Israel reports on two legal regimes which may represent the two extremes on the range of condominiums laws: In Florida the law is very sophisticated in its attempt to assure funding for long-term maintenance of condominiums. It grants the condominium association a draconic legal right - to take over any apartments if the owner has not paid the monthly fees for more than a month! The Association can then sell the apartment, deduct what is owed, and give the rest to the owner. In addition, the law requires that apartment buyers put aside a heft fund for future repairs, to be managed by the association. These drastic rules come hand in hand with scores of pagers of legal caveats and rules placed both on the developer and on the buyers. To meet these legal and financial requirements, buyers would need to hire a slate of legal and economic experts, thus raising the costs of apartment purchase. These are exclusionary factors built into the legal requirements. (Despite all these protections many condominiums did not survive the 2008-9 crisis when the condo associations found themselves with too many defaulted apartments and a weak market).

At the other extreme is the Israeli "thin "law, which is typical of many other countries as well. It has the minimal elements necessary to run a condominium, and has served the country well for 70 years – a country where the vast majority of urban residents live in condominiums (spanning most price levels). However, the simply condo laws are not geared to assure the long-term maintenance of tower buildings. With scores and hundreds of owners the social fabric that could work with 10-20 owner is silenced. The absolute maintenance costs, as noted, are also much higher. Although the law does not require hiring of building-management corporations, towers have not practical choice but to do so. The entrance of maintenance companies changes the entire decision-making structure, adding third players in the game, with many unanticipated repercussions. Research on these repercussions is still embryonic. The Israel Ministry of Justice is currently considering legal changes, but these are not likely to tackle the inherent costs of maintenance – probably even exacerbating the problem.

3. The claims that tall buildings provide a stimulus for economic development are weak.

Another issue that should be considered is the relation of real estate development, and tall building development specifically, to the economic development strategy of a city. Indeed, tall buildings are often linked to economic development and the growth of jobs by many proponents. Some advocates of tall buildings, like Harvard economist Edward Glaeser, favor a kind of "supply-side" development strategy using real estate development to create jobs, and to lure wealthy people into the city to generate additional economic opportunities for others.

To be sure, there is strong evidence that real estate development can serve as a spur to economic growth. Cities like Phoenix, Las Vegas and Atlanta have explicitly used suburban real estate development in exactly that way. Arguably the economic development of the American middle class was fueled in part by suburban real estate development, along with the growth in automobiles and household goods. The question now is what is the quality of this economic growth, and how sustainable is the model?

There is some evidence that real estate development per se is a short-lived contributor to a regional economy, and that it can also produce unintended negative consequences. Vancouver, for example, experienced explosive growth of tall buildings beginning in the 1990s, and the surging wealth in the city also contributed to its high cost of living. The city is now in the midst of a broad civic debate about the wisdom of tall buildings, with many people expressing misgivings – a debate that is not typically acknowledged in proponents' arguments.

There is a strong alternative argument about the dynamics of cities, most famously articulated by the urbanist Jane Jacobs. She argued for a diverse city, with diverse uses, and diverse building ages and costs. In such a city, she argued, there are opportunities for entrepreneurship at a range of economc price points and "rungs of the ladder." The problem with the supply-side model may be that it focuses too much on one end of the economic spectrum, and it thereby exacerbates inequality and the under-performance of some sectors of the economy. Jacobs' "slow burn" approach, while it may not produce the quantity of riches for some sectors that the urban supply-side model does, nonetheless produces a steadier, more sustainable form of urban growth – and one most likely to preserve a city's livability, which is also a key economic asset.

B. Resource and ecological impacts

1. The claims for benefits from density are not supported by the evidence.

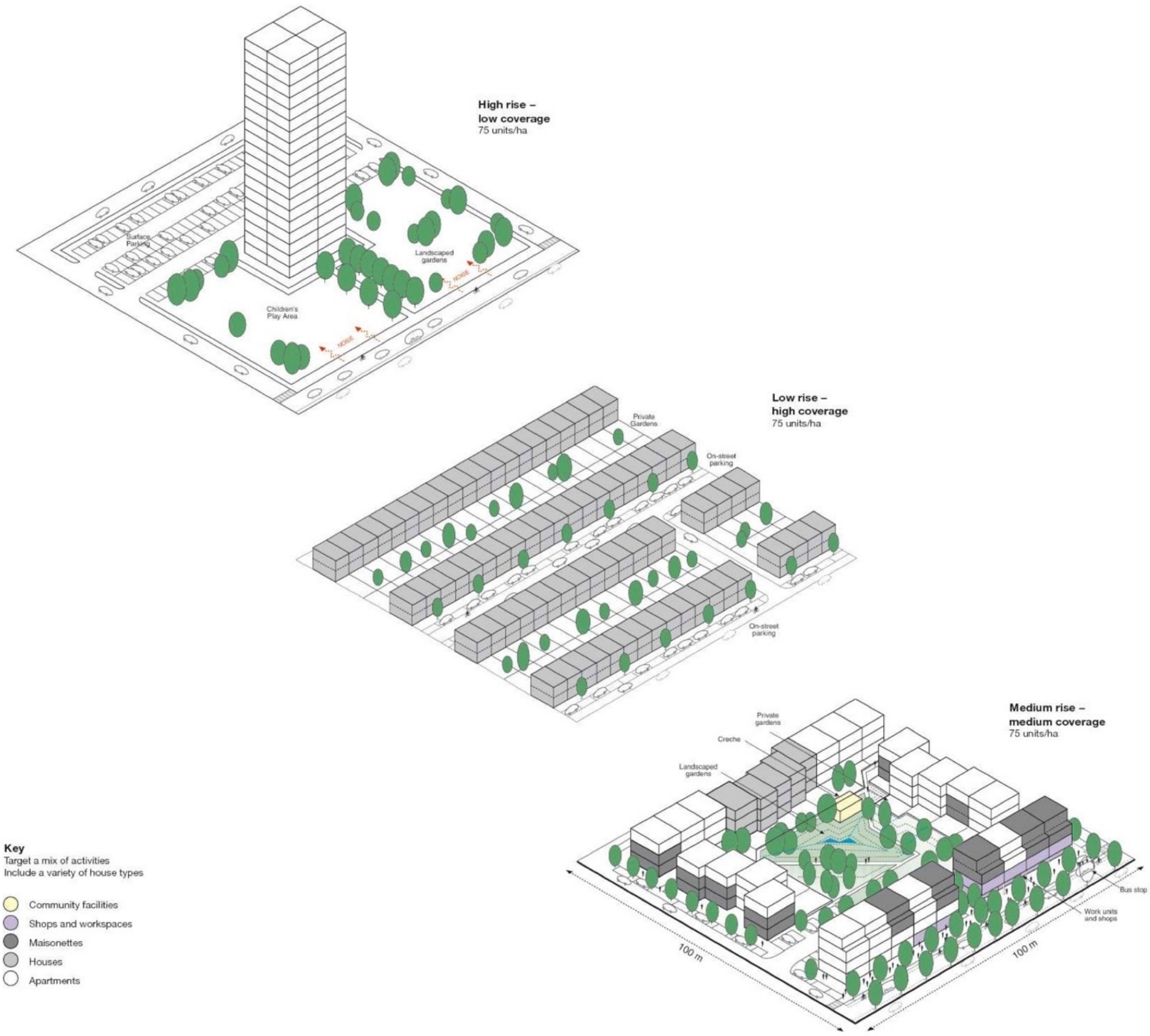
One of the most common arguments for the benefits of tall buildings is that they create dense settlement patterns that are inherently beneficial in reducing energy, resource consumption and emissions. A related argument is that the denser form of tall buildings reduces sprawl.

But as a recent UK House of Commons report concluded, "The proposition that tall buildings are necessary to prevent suburban sprawl is impossible to sustain. They do not necessarily achieve higher densities than mid or low-rise development and in some cases are a less-efficient use of space than alternatives."

Often cities like New York and Vancouver are cited as stellar examples of dense ecologically superior cities with tall buildings. It's usually assumed that it's the tall buildings in these cities that give them the edge.

As noted earlier, these cities are indeed very positive when it comes to carbon and other ecological metrics. But it's often overlooked that tall buildings are only a fraction of all structures in these places, with the bulk of neighborhoods consisting of rowhouses, low-rise apartment buildings, and other much lower structures. They get their low-carbon advantages not only from density per se, but from an optimum distribution of daily amenities, walkability and access to transit, and other efficiencies of urban form.

Figure One. Density and tall buildings are not synonymous. A drawing by Sir Richard Rogers shows the same density in three completely different urban typologies. From the Urban Task Force, 1999.



From an urban sustainability perspective, it is not just density, but the efficient placement of people and their activities, that is important. A dense downtown, far away from a dense bedroom community, may actually be worse, from a carbon point of view, than a less dense mix of the two.

Furthermore, research shows that the benefits of density are not linear, but taper off as density increases. In other words, there is an optimum density, above which the negative effects of density start to increase over the positive ones. That "sweet spot" seems to be in the neighborhood of about

50 people per acre. Many cities around the world achieve this density without tall buildings, while creating a very appealing, livable environment (e.g., Paris and London, as well as the aforementioned parts of New York, Vancouver et al.).

2. There is other cautionary evidence about the negative ecological consequences of tall buildings.

Research literature documents the following problems:

1. Increasingly high embodied energy of steel and concrete per floor area, with increasing height, requiring more resources and energy per unit of useable floor space.
2. Relatively inefficient floorplates due to additional egress requirements (e.g. multiple stairs).
3. Less efficient ratios of common walls and ceilings to exposed walls/ceilings (compared to a more low-rise, "boxier" multi-family form — as in, say, central Paris).
4. Significantly higher exterior exposure to wind and sun, with higher resulting heat gain/loss.
5. Challenges of operable windows and ventilation effects above about 30 stories.
6. Diseconomies of vertical construction systems, resulting in higher cost per usable area (not necessarily offset by other economies — these must be examined carefully).
7. Limitations in insulation and solar gain of typical lightweight curtain wall assemblies (there are efforts to address this, but many are unproven).
8. Challenge of maintenance and repair (in some cases these require high energy and cost).

3. Evidence from post-occupancy research on environmental performance is not encouraging.

When actually measured in post-occupancy assessments, many tall buildings have proven far less sustainable than their proponents have claimed. In some notorious cases they've actually performed worse than much older buildings with no such claims. A 2009 New York Times article, “Some buildings not living up to green label,” documented the extensive problems with several noted sustainability icons. Among other reasons for this failing, the Times pointed to the widespread use of expansive curtain-wall glass assemblies and a failure to account for increased user consumption of energy.

Partly in response to the bad press, the City of New York instituted a new law requiring disclosure of actual performance for many buildings. That led to reports of even more poor-performing sustainability icons. Another Times article, “City's Law Tracking Energy Use Yields Some Surprises,” noted that the gleaming new 7 World Trade Center, LEED Gold-certified, scored just 74 on the Energy Star rating — one point below the minimum 75 for “high-efficiency buildings” under the national rating system. That modest rating doesn't even factor in the significant embodied energy in the new materials of 7 World Trade Center.

Things got even worse in 2010 with a lawsuit ["$100 Million Class Action Filed Against LEED and USGBC"] against the US Green Building Council, developers of the LEED certification system (Leadership in Energy and Environmental Design). The plaintiffs in the lawsuit alleged that the USGBC engaged in "deceptive trade practices, false advertising and anti-trust" by promoting the LEED system, and argued that because the LEED system does not live up to predicted and advertised energy savings, the USGBC actually defrauded municipalities and private entities. The suit was ultimately dismissed, but in its wake the website Treehugger and others predicted, based on the evidence uncovered, that "there will be more of this kind of litigation."

This is a paradoxical outcome. How can the desire to increase sustainability actually result in its opposite? One problem with many sustainability approaches is that they don't question the underlying building type. Instead they only add new "greener" components, such as more efficient mechanical systems and better wall insulation. But this "bolt-on" conception of sustainability, even when partially successful, has the drawback of leaving underlying forms, and the structural system that generates them, intact. The result is too often the familiar "law of unintended consequences." What's gained in one area is lost elsewhere as the result of other unanticipated interactions.

For example, adding more efficient active energy systems tends to reduce the amount of energy used, and therefore lowers its overall cost. But, in turn, that lower cost tends to make tenants less careful with their energy use — a phenomenon known as "Jevons' Paradox." Increasing efficiency lowers cost, and increases demand — in turn increasing the rate of consumption, and wiping out the initial savings. The lesson is that we can't deal with energy consumption in isolation. We have to look at the concept of energy more broadly, including embodied energy and other factors.

There are often other unintended consequences. A notable case is London's sustainability-hyped "Gherkin" (Foster & Partners, 2003), where the building's open-floor ventilation system was compromised when security-conscious tenants created glass separations. Operable windows whose required specifications had been lowered because of the natural ventilation feature actually began to fall from the building, and had to be permanently closed. The ambitious goal of a more sophisticated natural ventilation system paradoxically resulted in even worse ventilation. (See also Capeluto et al 2003).

4. Life-cycle costs and energy retrofitting affect towers' role in emissions

The life-cycle costs of constructing towers in various specific geographic contexts are also not factored into the cost calculations by developers or consumers. These too are worthy of more research.

Because most older buildings are low or mid-rise, there is little research on environmental retrofitting of towers, especially not on residential towers. The global agenda is increasingly focusing on zero-energy consumption and on installing renewable energies in building, and standards and technologies are in flux. For example, new solar energy technologies to paste on windows and walls, will soon be economically viable . Tower buildings consume much energy, but also offer a lot of potential window and wall surface areas . But towers, especially condominium towers, are likely to prove recalcitrant. The legal framework and the already high costs of maintenance (without counting in energy) are likely to make such retrofitting difficult. Towers might not be good friends of the climate-change agenda.

5. No building is an island

Another major problem with green building programs happens when they treat buildings in isolation from their urban contexts. In one infamous example ["Driving to Green Buildings"], the Chesapeake Bay Foundation moved its headquarters to the world's first certified LEED-Platinum building — but the move took them from an older building in the city of Annapolis, Maryland to a new building in the suburbs, requiring new embodied energy and resources. The added employee travel alone — what's known as "transportation energy intensity" — more than erased the energy gains of the new building.

The theory of resilience points to the nature of the problem. Systems may appear to be well engineered within their original defined parameters — but they will inevitably interact with many other systems, often in an unpredictable and non-linear way. We look towards a more "robust" design methodology, combining redundant ("network") and diverse approaches, working across many scales, and ensuring fine-grained adaptivity of design elements. Though these criteria may sound abstract, they're exactly the sorts of characteristics achieved with so-called "passive" design approaches.

Passive buildings allow the users to adjust and adapt to climactic conditions — say, by opening or closing windows or blinds, and getting natural light and air. (Capeluto and Shaviv 2001). These designs can be far more accurate in adjusting to circumstances at a much finer grain of structure. They feature diverse systems that do more than one thing — like the walls that hold up the building and also accumulate heat through thermal mass. They have networks of spaces that can be reconfigured easily, even converted to entirely new uses, with relatively inexpensive modifications (unlike the "open-plan" typology, which has never delivered on expectations). They are all-around, multi-purpose buildings that aren't narrowly designed to one fashionable look or specialized user. And perhaps most crucially, they don't stand apart from context and urban fabric, but work together with other scales of the city, to achieve benefits at both larger and smaller scales.

6. Older, shorter buildings often perform surprisingly well.

Many older buildings (prior to the age of cheap energy) took exactly this "passive" approach, simply because they had no alternative. In an era when energy was relatively expensive (or simply not available) and transportation was difficult, buildings were naturally more clustered together in urban centers. Their shape and orientation exploited natural daylight, and typically featured smaller, well-positioned windows and load-bearing walls with higher thermal mass. The simple, robust shapes of these buildings allowed almost endless configurations. In fact, many of the most in-demand urban buildings today are actually adaptive reuse projects of much older buildings.

The results of this passive approach are reflected in good energy performance. While New York's 7

World Trade Center actually scored below the city's minimum rating of 75 out of 100, older buildings in the city that had been retrofitted with the same efficient heating, cooling, and lighting technologies fared much better: the Empire State Building scored a rating of 80, the Chrysler Building scored 84.

But age alone is clearly not a criterion of success. The 1963 MetLife/PanAm building (Walter Gropius & Pietro Belluschi), now a half-century old, scored a dismal 39. Another mid-century icon, the Lever House (Skidmore, Owings & Merrill, 1952), scored 20. The worst performer of all was Ludwig Mies Van der Rohe's iconic Seagram building, built in 1958. Its score was an astonishingly low 3.

What's the problem with these buildings? As the earlier New York Times article noted, they have extensive curtain-wall assemblies, large window areas and other limitations. On a fundamental level, as we can now begin to see from resilience theory, they lack many crucial resilient advantages of older building types. There may be something inherent in the building type itself that is non-resilient. The form language itself could be an innate problem — something that, according to systems thinking, no mere bolt-on "green" additions can fix.

7. Perhaps it's time to re-assess "Oil-interval" architecture?

Architectural critic Peter Buchanan, writing recently in the UK magazine, The Architectural Review, placed the blame for these failures squarely at the feet of the Modernist design model itself, and called for a "big rethink" about many of its unquestioned assumptions ["The Big Rethink: Farewell To Modernism — And Modernity Too"]. Modernism is inherently unsustainable, he argued, because it evolved in the beginning of the era of abundant and cheap fossil fuels. This cheap energy powered the weekend commute to the early Modernist villas, and kept their large open spaces warm, in spite of large expanses of glass and thin wall sections. Petrochemicals created their complex sealants and fueled the production of their exotic extrusions. "Modern architecture is thus an energy-profligate, petrochemical architecture, only possible when fossil fuels are abundant and affordable", he said. "Like the sprawling cities it spawned, it belongs to that waning era historians are already calling 'the oil interval'."

C. Social and health impacts

1. In addition to ecological and economic impacts, the research literature also paints a rather damning picture of social impacts, for both residents and those around them.

1. Psychological effects on residents, especially children. After surveying the literature, Gifford (2007) concludes that "the literature suggests that high-rises are less satisfactory than other housing forms for most people, that they are not optimal for children, that social relations are more impersonal and helping behavior is less than in other housing forms, that crime and fear of crime are greater, and that they may independently account for some suicides."

2. Social effects, particularly at the street. Tall buildings can function in effect as "vertical

gated communities," failing to activate longer stretches of streets with ground-level doors and windows. (We discuss this problem in more detail below.) This problem is exacerbated with tall buildings that have their own internal garages, through which residents may enter and depart without ever setting foot in the public realm.

3. Shading of other buildings and public spaces. This has obvious impacts on degree of sunlight and skyview, and impacts on those who are using the public realm.

4. Ground wind effects. Some of these effects can become quite strong (e.g the so-called "Venturi effect") which can make public spaces unpleasant. The proverbial "windswept tower plaza" seems to be more than a stereotype.

5. Heat island effects. Tall buildings clustered together are known to trap air and heat it, placing increased demand on cooling equipment in warm climates, and making adjacent public spaces less habitable.

6. "Canyon effects". Similarly to heat island effects, canyon effects can trap pollutants, reducing air quality at the street and in public spaces.

7. Psychological impacts for pedestrians and nearby residents. This is a more difficult area to evaluate and depends greatly on the aesthetics of a particular building. However, there is research to show that a design that is (or comes to be) experienced as ugly by adjoining residents can significantly degrade their experience of the public realm and quality of place.

2. Vertical gated communities?

Residential towers – almost inevitably in condominium ownership - have a built-in capacity to take on aspects of gated communities, whether intentionally or not. Towers must be self-contained in controlling vertical traffic. They have expensive machinery that must be maintained and thus, as noted, must charge significant maintenance costs. Towers have many housing units, and therefore must have an effective decision-making mechanism that is unlikely to be in a "town meeting" format. The inevitable anonymity and the physical inability to see who comes in and out, increased issues of security. Gated communities thrive on the perception of need for security (Atkinson & Blandy, 2005; Blandy 2011). Tower condominiums invest sizable resources in technologies such as key fobs, CCTV and reception desks. This, in turn, serves to support claims that tower condominiums, as urban enclaves, act as a source for urban fragmentation (Warner, 2011; Webster and Glastz, 2006)

Thus, even if tower condominiums don't exercise overt selection of owners based on income, lifestyle, number of children etc., they do become "vertical gated communities" to some extent. Gatedness limits interaction and social capital across socio-economic groups (Margalit 2009). Moreover, like horizontal gated communities, they bottle up the activity of residents that might otherwise help to enliven the public realm. Lastly, there is the simple and rather embarrassing fact that when it comes to residential density, you can't count people more than once: if wealthy tower residents have two or three homes, then their residential population count has to be divided between these. This fact alone reduces the conventional density count of some higher-end residential tower neighborhoods (like those in Vancouver) significantly.

2. Additional evidence from research on the divergence between architects' and laypersons' aesthetic judgments

A basic question about any building is its contribution to the public realm, and to the aesthetic qualities that are most valued by citizens. This comes down to the even deeper question, "for whom do we build?" Do we build only for our own buyers, or for our own professional community? Or do we need to take into account, in a democracy, the preferences of others whose experience of our buildings in within the public realm? If so, what are those preferences, and how do they align, or diverge, from those of professionals?

In the case of tall buildings, this question takes on much greater importance. A six-story building that is disliked by non-architect residents might be a problem for the neighborhood, but a sixty-story building that is disdained by non-architect residents (and possibly visitors too) becomes a problem for the entire city.

Here the research is also quite cautionary (see Appendix II for citations). In a widely cited survey of other research, psychologist Robert Gifford and his colleagues reported that "architects did not merely disagree with laypersons about the aesthetic qualities of buildings, they were unable to predict how laypersons would assess buildings, even when they were explicitly asked to do so." The researchers pointed to previous studies showing cognitive differences in the two populations: "Evidence that certain cognitive properties are related to building preference has already been found."

The researchers stressed that architects did not simply disagree aesthetically with non-architects: they literally *could not see* the difference between their own aesthetic preferences and those of non-architects. "It would seem that many architects do not know, from a lay viewpoint, what a delightful building looks like. If we are ever to have more delightful buildings in the eyes of the vast majority of the population who are not architects, this conundrum needs study and solutions."

Of course, every profession has its own biases and cognitive limitations, and it's unfair to suggest that architects are unique. Every profession is a bit like the proverbial "carpenter with a hammer, for whom every problem looks like a nail." We see the world through the lens of our own training and experience, and sometimes our specialized concerns become detached from the concerns – perhaps even the common sense – of our own clientele.

In social psychology, this well-known problem is described by what is known as "Construal Level Theory." The more removed we are from the concrete experience of, say, how buildings affect real people in ordinary life, the more we must construe our work and its goals in abstraction – and the more remote those "construals" can become from human beings and their needs. Of course the same is true for planners, developers, business owners or anyone else working in the built environment.

But in the case of architects, the research is helping to explain a particularly consequential way of seeing the world. It seems that, where most people see objects in context, architects as a group (and, we should add, their art-connoisseurs and media boosters) tend to focus on objects in isolation from their contexts. Where most people look for characteristics that help buildings to fit in and to increase the overall appeal of their surroundings, architects seem to focus narrowly on the attributes of buildings that make them stand out: their novelty, their abstract artistic properties, their dramatic (even sometimes bizarre) contrast.

Some researchers have concluded that this peculiar way of seeing comes from architects' unique studio education. Students must stand out in a highly competitive environment, and they do so by winning praise for the clever novelty of the art-objects they produce. In the abstracted world of studio culture, those objects are usually very far removed indeed from their real-world contexts – as anyone who has taught studio, like me, can readily observe.

But of course, this training turns out to be useful preparation for the role that architects must too often play in the modern development process: they must "brand" their buildings, their clients and themselves as attention-getting novelties, the better to compete as commodities with others.
This focus on the design of novel art-objects is a historically exceptional development. Up to the 20th century, architecture was by necessity a close adaptive response to its human and natural context. On that concrete foundation, architecture explored its more abstract expressions.

As the urbanist Jane Jacobs pointed out, this is a healthy relationship between life and art: namely, life serves as the foundation upon which the art is an enrichment of meanings. But as Jacobs warned, when this relationship is confused – when abstract art seeks to supplant concrete life – the results are very bad for life, and probably bad for art too.

But as Jacobs also observed, this is precisely what professionals allowed to happen – even encouraged to happen – in the 20th century. The marketing allure of their fine art was used to rationalize, even glamorize, a toxic industrialization of the built environment. The results of this malpractice are evident today in ugly, dysfunctional cities and towns all around the globe.

Of course many architects blame others for this degradation of settlements: developers, engineers, or the non-architects who design a large percentage of structures. But architects occupy a singular leadership position, whether by action or inaction. It is architects whose influential ideas about cities and buildings profoundly shape what others can do in the built environment – perhaps by deeming certain kinds of designs "fashionable" or "edgy" – or conversely, "reactionary" or "inauthentic."

Historically, it was also architects who helped to shape the most beautiful, enduring, well-loved cities, towns and buildings of human history. As we enter a time of unprecedented urbanization – on track to produce more urban fabric in the next five decades than in the previous 10,000 years – it is architects who now have an urgent responsibility to lead a humane, sustainable form of settlement for the future.

But the new research findings make it clear that this will require some major soul-searching.

Outmoded ideologies and practices must be fundamentally reassessed. The distorted conception of architecture as fine-art novelty, in dramatic contrast with its context – with its environment, and with its history – must be reformed. In its place we require an architecture of life – one responsive to human need, and to the patterns of nature and history.

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Warner E. Mildred, 2011. Club Goods and Local Government, *Journal of the American Planning Association, 77*:2, 155-166

Webster Chris, Glastz George. 2006. "Dynamic urban order and the rise of residential clubs". In *Private Cities.* Ed. Glasze Georg, Webster Chris, Frantz Klaus. 218-231. London: Routledge

APPENDIX I:
RELEVANT EXAMPLES FROM RESEARCH ON TALL BUILDING IMPACTS

Guedi Capeluto, Abraham Yezioro, Daniel Gat and Edna Shaviv (2003). "Energy, Economics and Architecture." Proceedings of the Eighth International IBPSA Conference, Eindhoven, NL August 11-14, 2003.

Excerpt:

"Very often, high rise buildings are proposed as a means of achieving high urban density. However, t**all buildings may cause environmental problems like high wind velocities in open spaces around them, as well as extended shadows over nearby houses and open spaces** (HELIOS, 1999, 2000). Moreover, the construction cost of high-rise buildings is steep (Tan, 1999, Gat, 1995). **When all these factors are taken into account it is not a priori clear that the desired high urban density can be achieved by tall buildings along with an acceptable solution to the above mentioned environmental problems. Recent studies have shown that a reasonable density may be achieved with six stories high buildings while preserving the solar rights of neighboring buildings, as well as open spaces among them** (Capeluto and Shaviv, 2001)."

Citations given above:

Shaviv, Yezioro and Capeluto. (1999) The Influence of High-Rise Buildings on their Energy Consumption and Urban Shading. HELIOS Ltd., 1999.

Tan W. (1999). "Construction Costs and Building Height." Construction Management and Economics, Vol. 17, pp. 129-132.

Gat D. (1995). "Optimal Development of a Building Site." Journal of Real Estate Finance and Economics, Vol. 11, pp. 77-84.

Capeluto I.G., Shaviv E. (2001). "On the Use of Solar Volume for Determining the Urban Fabric." Solar Energy Journal, Vol. 70, No. 3, Elsevier Science Ltd., pp. 275-280.

G.J. Treloar, R. Fay, B. Ilozor, P.E.D. Love (2001). "An Analysis of the Embodied Energy of Office Buildings by Height." *Facilities,* 2001 Volume: 19 Issue: 5/6 Page: 204 - 214 ISSN: 0263-2772 DOI: 10.1108/02632770110387797 Publisher: MCB UP Ltd

Abstract:

"Aims to compare the energy embodied in office buildings varying in height from a few storeys to over 50 storeys. The energy embodied in substructure, superstructure and finishes elements was investigated for five Melbourne office buildings of the following heights: 3, 7, 15, 42 and 52 storeys. **The two high-rise buildings have approximately 60 percent more energy embodied per unit gross floor area (GFA) in their materials than the low-rise buildings.** While building height was found to dictate the amount of energy embodied in the "structure group" elements (upper floors, columns, internal walls, external walls and staircases), other elements such as substructure, roof, windows and finishes seemed uninfluenced."

Excerpt from conclusion:

"Alternatives to tall buildings should be sought, but where unavoidable, measures to reduce the size of the building, reduce the intensity of material usage (especially energy intensive and

nonrenewable materials) and to minimise wastage should be fully explored."

Gifford, Robert (2007). "The Consequences of Living in High-Rise Buildings." Architectural Science Review 02/2007; 50(1):2-17. DOI: 10.3763/asre.2007.5002

Abstract:

A full account of architectural science must include empirical findings about the social and psychological influences that buildings have on their occupants. Tall residential buildings can have a myriad of such effects. This review summarizes the results of research on the influences of high-rise buildings on residents' experiences of the building, satisfaction, preferences, social behavior, crime and fear of crime, children, mental health and suicide. Most conclusions are tempered by moderating factors, including residential socioeconomic status, neighborhood quality, parenting, gender, stage of life, indoor density, and the ability to choose a housing form. However, moderators aside, **the literature suggests that high-rises are less satisfactory than other housing forms for most people, that they are not optimal for children, that social relations are more impersonal and helping behavior is less than in other housing forms, that crime and fear of crime are greater, and that they may independently account for some suicides**.

Kunze, J. (2005) "The Revival of High-rise Living in the UK and Issues of Cost and Revenue in Relation to Height." Masters thesis, UCL (University College London).

Abstract:

"The following report explores the recent revival of tall residential buildings in the UK as well as issues of costs and revenues for such projects. The first part of the paper focuses on the background and the preconditions of the revival. The history of tall residential buildings and its impact on the image of highrise living is explored as well as some of the debate that surrounds the topic. However, the vast amount of related social, urban design and environmental issues are not part of the analysis. The phenomenon of the revival is described in numbers of completed buildings and with examples of built and proposed projects. Characteristics like the new type of occupiers and the provision of affordable housing are highlighted. The second part of the report and the main part of the research focus on the economic drivers behind tall residential developments. The issues of building costs and sales prices in relation to height are explored and values are gathered in several interviews with professionals. The findings are analysed and applied in a series of model calculations for developments with heights from 5-50 storeys. It seems that the disadvantages of building high are not balanced out by a premium in sales prices for height. **The evidence found suggests that the economics of tall residential buildings change dramatically above 20 storeys.** This corresponds with the height of structures that were built in recent years. However, the paper concludes that the data available was not sufficient to establish robust quantitative relationships between residential developments of different heights and that it is necessary for the benefit of all that more research on this topic is made publicly available."

Buchanan Peter (2007). "The Tower: An Anachronism Awaiting Rebirth?"
Harvard Design Magazine: "New Skyscrapers in Megacities on a Warming Globe"
Number 26, Spring/Summer 2007

Excerpt:

"Is the tall building an anachronism? Does it, like sprawling suburbia and out-of-town shopping malls, seem doomed to belong only to what is increasingly referred to as "the oil interval," that now fading and historically brief moment when easily extracted oil was abundant and cheap? The answer is probably "Yes"....

" ... What kind of city nurtures [today's] very different workforce that is in touch with and wants to live in accord with its deeper values? Ask people how they believe they should really live; the clearer they become about this, the more obvious it is that such a lifestyle is very difficult in the contemporary city. Do we want to live in a city of glistening towers, of spectacle and the restless excitement that fuels and is fuelled by excessive consumption? Or would we prefer a mid-rise city with a more finely grained, more intricately rich and varied urban fabric offering choice, contrast, respite, and surprise - a convivial city where community has a chance of being reestablished? **Sustainability requires not only that we lessen our ecological impacts, but also that we create the urban and cultural frameworks in which we can attain full humanity, in contact with self, others, and nature. This might be the real reason that the tower seems an anachronism.** There may be a few clusters of green towers here and there, but their presence might be limited in the compact and convivial cities of the future."

Bowker, G. E., D. Heist, S. G. Perry, L. Brixey, R. S. Thompson and R. W. Wiener (2006). “The Influence of a Tall Building on Street-Canyon Flow in an Urban Neighborhood. U.S. EPA Office of Research and Development, National Exposure Research Lab. Presented at 28th NATO/CCMS International Technical Meeting, Leipzig, Germany, May, 2006.

Mead, M. Nathaniel (2008). “Canyons Up the Pollution Ante” Environmental Health Perspectives, July 2008; Vol. 116, No. 7, p. A28.

Excerpt:

" … a new study focuses on how traffic emissions are dispersed within urban street canyons -- **streets that are lined with tall buildings on both sides. Within these domains, large quantities of pollutants are released near the ground from motor vehicle exhaust, then trapped and concentrated within the canyon walls.** Urban street canyons also tend to contain a lot of people, potentially making these areas high-risk zones for big cities. … population exposure to traffic pollutants in New York’s urban street canyons can be up to 1,000 times higher than exposure to a similar amount of emissions in other urban settings."

House of Commons (2001). “Tall buildings: Report and Proceedings of the House of Commons Transport, Local Government and the Regions Committee.” Sixteenth report of Session 2001-02. London, UK Stationery Office, 4 September 2002, HC 482-I

Excerpt:

"The main reason that the Committee held an inquiry into tall buildings was to identify the contribution which they can make to the urban renaissance. We found that contribution to be very limited. **The proposition that tall buildings are necessary to prevent suburban sprawl is impossible to sustain. They do not necessarily achieve higher densities than mid or low-rise development and in some cases are a less-efficient use of space than alternatives.** They have, for the most part, the advantages and disadvantages of other high density buildings. They can be energy-efficient, they can be part of mixed-use schemes and they can encourage the use of public transport where there is spare capacity, but so can other types of high density developments. Tall buildings are more often about power, prestige, status and aesthetics than efficient development."

APPENDIX II:

RELEVANT EXAMPLES FROM RESEARCH ON DIVERGENCE OF ARCHITECTS' AND LAYPERSONS' AESTHETIC JUDGMENT

Brown, G., & Gifford, R. (2001). Architects predict lay evaluations of large contemporary buildings: whose conceptual properties?. Journal of Environmental Psychology, 21(1), 93-99.

Abstract

Evidence suggests that architects as a group cannot predict the public's aesthetic evaluations of architecture. In this study, practicing architects predicted laypersons' responses to large contemporary building, and again these predictions were poorly correlated with ratings by laypersons, although some architects' predictions were better than others, and architects were able to predict accurately that lay ratings in general would be more favourable than their own. To understand why most architects are unable to predict reactions to particular buildings, the architects' predictions were analysed in relation to their own and lay ratings of the buildings' conceptual properties. **The results suggest that architects are unable to exchange their own criteria for conceptual properties for those of laypersons when they predict public evaluations, which leads to self-anchored, inaccurate predictions.** This was supported by showing that the best-predicting architects related their evaluations to buildings' conceptual properties in a manner similar to that of the laypersons. Implications for design are suggested.

Ghomeshi, M., Nikpour, M., & Jusan, M. M. (2012). Evaluation of Conceptual Properties by Layperson in Residential Façade Designs. Arts and Design Studies, 3, 13-17.

Abstract

When it comes to aesthetic evaluation of a design, architects and non-architects differ from each other. This study demonstrates how aesthetic evaluation of buildings could be predicted. These predictions are important for architects as they can be used to find the users preferences and expectations of the design. Preference is considered to involve conceptual evaluation about whether the design is liked or disliked. In environmental preference, this type of conceptual evaluation might be conscious or unconscious. The aim of this study is to identify the essential conceptual properties that are related to aesthetic evaluation of façade designs using qualitative methodology. As a result it can be concluded that not all the conceptual properties are related to aesthetic evaluation of the design. Some conceptual properties are not important from the eye of non-architects and some are highly important. Findings of this research could help architects to understand the perception of non-architects.

Hubbard, P. (1984). Diverging evaluations of the built environment: Planners versus the public. The urban experience: A people–environment perspective, 125-133.

Hubbard, P. (1996). Conflicting interpretations of architecture: an empirical investigation. Journal of Environmental Psychology, 16(2), 75-92.

Abstract

The idea that environmental preferences are not solely determined by the characteristics of individuals, but instead are socially constituted, has fundamentally challenged many traditional psychological analyses of landscape preference and meaning. In this paper, an attempt is made to suggest that the two interpretations are by no means incompatible, and that there is a growing need for an environmental psychology that recognizes the importance of both individual and social factors. Drawing on traditions within European social psychology, this paper demonstrates how the quantitative analysis of social representations can be used to identify both differences and commonalities in peoples' interpretations of architecture. Specifically, **this study reports on one segment of a larger empirical study investigating differences in architectural interpretation between planners, planning students and public respondents.** These interpretations were examined using multiple sorting techniques, with respondents asked to sort 15 examples of contemporary architecture according to their own criteria. INDSCAL analysis of this data facilitated the recognition of a shared conceptualization of these architectural stimuli, but also demonstrated a number of important inter-group and inter-individual differences in architectural interpretation, which were evident as variations from this common conceptualization. The paper concludes by discussing the implications of this study for research in environmental psychology, particularly stressing the need to consider notions of power and ideology.

Trope, Y., Liberman, N., & Wakslak, C. (2007). "Construal levels and psychological distance: Effects on representation, prediction, evaluation, and behavior." *Journal of Consumer Psychology:* the official journal of the Society for Consumer Psychology, 17(2), 83.

APPENDIX III

RELEVANT EXMPLES FROM RESEARCH ON ECONOMIC DEVELOPMENT, REAL ESTATE AND URBAN FORM

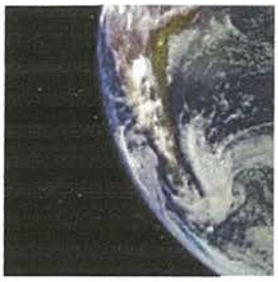
Jacobs, J. (1961). *The Death and Life of Great American Cities.* New York: Random House.

Jacobs, J. (1970) *The Economy of Cities.* New York: Vintage Press.

Glaeser, E. L., Kallal, H. D., Scheinkman, J. A., & Shleifer, A. (1991). *Growth in Cities* (No. w3787). National Bureau of Economic Research.

Glaeser, Ed. (2011). "How Skyscrapers Can Save the City." The Atlantic, February, 2011. Available on line at http://www.theatlantic.com/magazine/archive/2011/03/how-skyscrapers-can-save-the- city/308387/

(TBC)



Katarxis Nº 3

The Kind of Problem Architecture Is

Returning to Jane Jacobs' final chapter of
The Death and Life of Great American Cities

Jump to Excerpt

The "new science" of organised complexity is new only by historical standards. But its revolutionary implications are still transforming many fields, and still suggesting to us new models of thought and action. Nowhere is this more relevant -- or more incomplete -- than in the fields of planning and architecture.

It is true that many of the ideas of organised complexity, translated into notions of mixed use and interactive diversity, have for some time been transforming the field of urban planning. For example, they were inspirational in the formation of New Urbanism as a movement in the US. As far back as the early 1960's, seminal thinkers like Jane Jacobs and Christopher Alexander (in the latter's landmark paper A City is Not A Tree) already recognised its powerful implications in challenging the existing basis of architecture and planning, and arguing a powerful case for reform.

Many architects and planners have read Jacobs' "The Death and Life of Great American Cities," and may well recall the seminal last chapter called "The Kind of Problem a City Is." Anyone who is unfamiliar with this text -- or anyone who would like to be reminded of the astonishing perspicacity of this chapter -- would do very well indeed to read, or re-read, this remarkable work. (See extended excerpt below.)

Jacobs talks about the history of scientific thought and its relation to the ways in which we think about and act upon cities. She notes how modern science really took off, around the time of Newton, when it mastered so-called two-variable problems, like linking how many houses one has over here to how many stores one can have over there. Or in physics, in which the laws of motion, for example, are two-variable problems.

But in the early twentieth century, something interesting had begun to happen: through statistics and probability we learned to manage very large numbers, where you had myriad variables interacting. The interesting thing that we found was that you could manage those phenomena as statistical averages without knowing much about the actual interactions.

This statistical science translated into the phenomenal technological power of the industrial revolution of that period. Much of our industry and the prodigious output of 20th century modernity was rooted in these powerful new statistical methods. And indeed, Jacobs points out that the early ideas of Le Corbusier and others, and the later ideas of planners -- often to this day -- rely upon this notion of large statistical populations.

So just as there has been a progression in science, there has been a progression from, say, the rigidly formal, "rational" plans of, say, Haussmann, or of Ebenezer Howard and his neatly segregated Garden City plans, through to the more statistically informed plans of Le Corbusier, implemented around the world by the likes of Robert Moses and others.

In either case the problem of cities was seen as one of devising reductive engineering schemes, seeking to isolate smoothly-functioning mechanical parts in place of "messy" organic conditions. This was seen as advancement and modernisation. But in the former case it was two-variable engineering, and in the latter case the problem of cities was also seen as one of statistical mechanics operating on large numbers. The newer science was added to the old.

Meanwhile, the biological sciences had to move beyond the statistical world of so-called "disorganised complexity" and begin to understand the phenomenon called "organised complexity" – the area in the middle, between simple two-variable problems and large numbers of variables. Biologically speaking, that's where the phenomenon of life occurs. It turns out that the problems of the human environment are more like these problems of "organised complexity". As Jacobs writes,

> ...While city planning has thus mired itself in deep misunderstandings about the very nature of the problem with which it is dealing, the life sciences... have been providing some of the concepts that city planning needs... And so a growing number of people have begun, gradually, to think of cities as problems in organized complexity--organisms that are replete with unexamined, but obviously intricately interconnected, and surely understandable, relationships...

And she points out how the planning and architecture professions were at that time, 1962, mind you, mired in the old sciences. She says

> Today's plans show little if any perceptible progress in comparison with plans devised a generation ago. In transportation, either regional or local, nothing is offered which was not already offered and popularized in 1938 in the General Motors diorama at the New York World's Fair, and before that by Le Corbusier. In some respects, there is outright retrogression. None of today's pallid imitations of Rockefeller Center is as good as the original, which was built a quarter of a century ago....

Then she summarises what she considers the lessons of organized complexity:

> In the case of understanding cities, I think the most important habits of thought are these:
> 1. To think about processes;
> 2. To work inductively, reasoning from particulars to the general, rather than the reverse;
> 3. To seek for "unaverage" clues involving very small quantities, which reveal the way larger and more "average" quantities are operating.

She sums up the problem as follows:

> As long as [we] cling to the unexamined assumptions that [we] are dealing with a problem in the physical sciences [that is, of mechanics], city planning cannot possibly progress. Of course it stagnates. It lacks the first requisite for a body of practical and progressing thought: recognition of the kind of problem at issue. Lacking this, it has found the shortest distance to a dead end.

Today we have already begun to think differently about "the kind of problem a city is." What we have not yet begun to do -- and an essential task, given that complex systems are often scale-free -- is to re-assess the closely-related "kind of problem architecture is." This publication is one still-early step in that process.

- *Michael Mehaffy*

Top

The kind of problem a city is

(Excerpt from *The Death and Life of Great American Cities*)
Jane Jacobs

...Thinking has its strategies and tactics too, much as other forms of action have. Merely to think about cities and get somewhere, one of the main things to know is what kind of problem cities pose, for all problems cannot be thought about in the same way. Which avenues of thinking are apt to be useful and to help yield the truth depends not on how we might prefer to think about a subject, bur rather on the inherent nature of the subject itself.

Among the many revolutionary changes of this century, perhaps those that go deepest are the changes in the mental methods we can use for probing the world. I do not mean new mechanical brains, bur methods of analysis and discovery that have gotten into human brains: new strategies for thinking. These have developed mainly as methods of science. Bur the mental awakenings and intellectual daring they represent are gradually beginning to affect other kinds of inquiry too. Puzzles that once appeared un-analyzable become more susceptible to attack. What is more, the very nature of some puzzles are no longer what they once seemed.

To understand what these changes in strategies of thought have to do with cities, it is necessary to understand a little about the history of scientific thought. A splendid summary and interpretation of this history is included in an essay on science and complexity in the 1958 Annual Report of the Rockefeller Foundation, written by Dr. Warren Weaver upon his retirement as the foundation's Vice-President for the Natural and Medical Sciences. I shall quote from this essay at some length, because what Dr. Weaver says has direct pertinence to thought about cities. His remarks sum up, in an oblique way, virtually the intellectual history of city planning.

Dr. Weaver lists three stages of development in the history of scientific thought: (1) ability to deal with problems of simplicity; (2) ability to deal with problems of disorganized complexity; and (3) ability to deal with problems of organized complexity.

Problems of simplicity are problems that contain two factors which are directly related to each other in their behavior—two variables--and these problems of simplicity, Dr. Weaver points out, were the first kinds of problems that science learned to attack:

> Speaking roughly, one may say that the seventeenth, eighteenth and nineteenth centuries formed the period in which physical science learned how to analyze two-variable problems. During that three hundred years, science developed the experimental and analytical techniques for handling problems in which one quantity--say a gas pressure--depends primarily upon a second quantity--say, the volume of the gas. The essential character of these problems rests in the fact that . . . the behavior of the first quantity can be described with a useful degree of accuracy by taking into account only its dependence upon the second quantity and by neglecting the minor influence of other factors.
>
> These two-variable problems are essentially simple in structure . . . and simplicity was a necessary condition for progress at that stage of development of science.
>
> It turned out, moreover, that vast progress could be made in the physical sciences by theories and experiments of this essentially simple character . . . It was this kind of two-variable science which laid, over the period up to 1900, the foundations for our theories of light, of sound, of heat, and of electricity . . .which brought us the telephone and the radio, the automobile and the airplane, the phonograph and the moving pictures, the turbine and the Diesel engine and the modern hydroelectric power plant . . .

It was not until after 1900 that a second method of analyzing problems was developed by the physical sciences.

> Some imaginative minds [Dr. Weaver continues] rather than studying problems which involved two variables or at most three or four, went to the other extreme, and said, "Let us develop analytical methods which can deal with two billion variables." That is to say, the physical scientists (with the mathematicians often in the vanguard) developed powerful techniques of probability theory and of statistical mechanics which can deal with what we may call problems of disorganized complexity...
>
> Consider first a simple illustration in order to get the flavor of the idea. The classical dynamics of the nineteenth century was well suited for analyzing and predicting the motion of a single ivory ball as it moves about on a billiard table... One can, but with a surprising increase in difficulty, analyze the motion of two or even three balls on a billiard table . . . But as soon as one tries to analyze the motion of ten or fifteen balls on the table at once, as in pool, the problem becomes unmanageable, not because there is any theoretical difficulty, but just because the actual labor of dealing in specific detail with so many variables turns our to be impractical.

> Imagine, however, a large billiard table with millions of balls flying about on its surface . . The great surprise is that the problem now becomes easier: the methods of statistical mechanics are now applicable. One cannot trace the detailed history of one special ball, to be sure; but there can be answered with useful precision such important questions as: On the average how many balls per second hit a given stretch of rail? On the average how far does a ball move before it is hit by some other ball? . . .
>
> ...The word "disorganized" [applies] to the large billiard table with the many balls... because the balls are distributed, in their positions and motions, in a helter-skelter way . . . But in spite of this helter-skelter or unknown behavior of all the individual variables, the system as a whole possesses certain orderly and analyzable average properties...
>
> A wide range of experience comes under this label of disorganized complexity... It applies with entirely useful precision to the experience of a large telephone exchange, predicting the average frequency of calls, the probability of overlapping calls of the same number, etc. It makes possible the financial stability of a life insurance company... The motions of the atoms which form all matter, as well as the motions of the stars which form the universe, all come under the range of these new techniques. The fundamental laws of heredity are analyzed by them. The laws of thermodynamics, which describe basic and inevitable tendencies of all physical systems, are derived from statistical considerations. The whole structure of modern physics... rests on these statistical concepts. Indeed, the whole question of evidence, and the way in which knowledge can be inferred from evidence, is now recognized to depend on these same ideas... We have also come to realize that communication theory and information theory are similarly based upon statistical ideas. One is thus bound to say that probability notions are essential to any theory of knowledge itself.

However, by no means all problems could be probed by this method of analysis. The life sciences, such as biology and medicine, could not be, as Dr. Weaver points out. These sciences, too, had been making advances, but on the whole they were still concerned with what Dr. Weaver calls preliminary stages for application of analysis; they were concerned with collection, description, classification, and observation of apparently correlated effects. During this preparatory stage, among the many useful things that were learned was that the life sciences were neither problems of simplicity nor problems of disorganized complexity; they inherently posed still a different kind of problem, a kind of problem for which methods of attack were still very backward as recently as 1932, says Dr. Weaver.

Describing this gap, he writes:

> One is tempted to oversimplify and say that scientific methodology went from one extreme to the other... and left untouched a great middle region. The importance of this middle region, moreover, does not depend primarily on the fact that the number of variables involved is moderate large compared to two, but small compared to the number of atoms in a pinch of salt... Much more important than the mere number of variables is the fact that these variables are all interrelated... These problems, as contrasted with the disorganized situations with which statistics can cope, show the essential feature of organization. We will therefore refer to this group of problems as those of organized complexity.
>
> What makes an evening primrose open when it does? Why does salt water fail to satisfy thirst?... What is the description of aging in biochemical terms?... What is a gene, and how does the original genetic constitution of a living organism express itself in the developed characteristics of the adult? . . .
>
> All these are certainly complex problems. But they are not problems of disorganized complexity, to which statistical methods hold the key. They

are all problems which involve dealing simultaneously with a sizable number of factors which are interrelated into an organic whole.

In 1932, when the life sciences were just at the threshold of developing effective analytical methods for handling organized complexity, it was speculated, Dr. Weaver tells us, that if the life sciences could make significant progress in such problems, "then there might be opportunities to extend these new techniques, if only by helpful analogy, into vast areas of the behavioral and social sciences."

In the quarter-century since that time, the life sciences have indeed made immense and brilliant progress. They have accumulated, with extraordinary swiftness, an extraordinary quantity of hitherto hidden knowledge. They have also acquired vastly improved bodies of theory and procedure--enough to open up great new questions, and to show that only a start has been made on what there is to know.

But this progress has been possible only because the life sciences were recognized to be problems in organized complexity, and were thought of and attacked in ways suitable to understanding that kind of problem.

The recent progress of the life sciences tells us something tremendously important about other problems of organized complexity. It tells us that problems of this kind can be analyzed--that it is only sensible to regard them as capable of being understood, instead of considering them, as Dr. Weaver puts it, to be "in some dark and foreboding way, irrational."

Now let us see what this has to do with cities.

Cities happen to be problems in organized complexity, like the life sciences. They present "situations in which a half-dozen or even several dozen quantities are all varying simultaneously and in subtly interconnected ways." Cities, again like the life sciences, do not exhibit one problem in organized complexity, which if understood explains all. They can be analyzed into many such problems or segments which, as in the case of the life sciences, are also related with one another. The variables are many, but they are not helter-skelter; they are "interrelated into an organic whole."

Consider again, as an illustration, the problem of a city neighborhood park. Any single factor about the park is slippery as an eel; it can potentially mean any number of things, depending on how it is acted upon by other factors and how it reacts to them. How much the park is used depends, in part, upon the park's own design. But even this partial influence of the park's design upon the park's use depends, in turn, on who is around to use the park, and when, and this in turn depends on uses of the city outside the park itself. Furthermore, the influence of these uses on the park is only partly a matter of how each affects the park independently of the others; it is also partly a matter of how they affect the park in combination with one another, for certain combinations stimulate the degree of influence from one another among their components. In turn, these city uses near the park and their combinations depend on still other factors, such as the mixture of age in buildings, the size of blocks in the vicinity, and so on, including the presence of the park itself as a common and unifying use in its context. Increase the park's size considerably, or else change its design in such a way that it severs and disperses users from the streets about it, instead of uniting and mixing them, and all bets are off. New sets of influence come into play, both in the park and in its surroundings. This is a far cry from the simple problem of ratios of open space to ratios of population; but there is no use wishing it were a simpler problem or trying to make it a simpler problem, because in real life it is not a simpler problem. No matter what you try to do to it, a city park behaves like a problem in organized complexity, and that is what it is. The same is true of all other parts or features of cities. Although the interrelations of their many factors are complex, there is nothing accidental or irrational about the ways in which these factors affect each other.

Moreover, in parts of cities which are working well in some respects and badly in others (as is often the case), we cannot even analyze the virtues and the faults, diagnose the trouble or consider helpful changes, without going at them as problems of organized complexity. To take a few simplified illustrations, a street may be functioning excellently at the supervision of children and at producing a casual and trustful public life, but be doing miserably at solving all other problems because it has failed at knitting itself with an effective larger community, which in turn may or may not exist because of still other sets of factors. Or a street may have, in itself, excellent physical material for generating diversity and an admirable physical design for casual surveillance of public spaces, and yet because of its proximity to a dead border, it may be so empty of life as to be shunned and feared even by its own residents. Or a street may have little foundation for workability on its own merits, yet geographically tie in so admirably with a district that is workable and vital that this circumstance is enough to sustain its attraction and give it use and sufficient workability. We may wish for easier, all-purpose analyses, and for simpler, magical, all-purpose cures, but wishing cannot change these problems into simpler matters than organized complexity, no matter how much we try to evade the realities and to handle them as something different.

Why have cities not, long since, been identified, understood and treated as problems of organized complexity? If the people concerned with the life sciences were able to identify their difficult problems as problems of organized complexity, why have people professionally concerned with cities not identified the kind of problem they had?

The history of modern thought about cities is unfortunately very different from the history of modern thought about the life sciences. The theorists of conventional modern city planning have consistently mistaken cities as problems of simplicity and of disorganized complexity, and have tried to analyze and treat them thus. No doubt this invasion of the physical sciences was hardly conscious. It was probably derived, as the assumptions behind most thinking are, from the general floating fund of intellectual spores around at the time. However, I think these misapplications could hardly have occurred, and certainly would nor have been perpetuated as they have been, without gear disrespect for the subject matter itself-cities. These misapplications stand in our way; they have to be hauled out in the light, recognized as inapplicable strategies of thought, and discarded.

Garden City planning theory had its beginnings in the late nineteenth century, and Ebenezer Howard attacked the problem of town planning much as if he were a nineteenth-century physical scientist analyzing a two-variable problem of simplicity. The two major variables in the Garden City concept of planning were the quantity of housing (or population) and the number of jobs. These two were conceived of as simply and directly related to each other, in the form of relatively closed systems. In turn, the housing had its subsidiary variables, related to it in equally direct, simple, mutually independent form: playgrounds, open space, schools, community center, standardized supplies and services. The town as a whole was conceived of, again, as one of the two variables in a direct, simple, town-greenbelt relationship. As a system of order, that is about all there was to it. And on this simple base of two-variable relationships was created an entire theory of self-contained towns as a means of redistributing the population of cities and (hopefully) achieving regional planning.

Whatever may be said of this scheme for isolated towns, any such simple systems of two-variable relationships cannot possibly be discerned in great cities--and never could be. Such systems cannot be discerned in a town either, the day after the town becomes encompassed in a metropolitan orbit with its multiplicity of choices and complexities of cross-use. Bur in spire of this fact, planning theory has persistently applied this two-variable system of thinking and analyzing to big cities; and to this day city planners and housers believe they hold a precious nugget of truth about the kind of problem to be dealt with when they attempt to shape or reshape big-city neighborhoods into versions of two-variable systems, with ratios of one thing (as open space) depending directly and simply upon an immediate ratio of something else (as population).

To be sure, while planners were assuming that cities were properly problems of simplicity, planning theorists and planners could not avoid seeing that real cities were not so in fact. But they took care of this in the traditional way that the incurious (or the disrespectful) have always regarded problems of organized complexity: as if these puzzles were, in Dr. Weaver's words, "in some dark and foreboding way, irrational."

Beginning in the late 1920's in Europe, and in the 1930's here, city planning theory began to assimilate the newer ideas on probability theory developed by physical science. Planners began to imitate and apply these analyses precisely as if cities were problems in disorganized complexity, understandable purely by statistical analysis, predictable by the application of probability mathematics, manageable by conversion into groups of averages.

This conception of the city as a collection of separate file drawers, in effect, was suited very well by the Radiant City vision of Le Corbusier, that vertical and more centralized version of the two-variable Garden City. Although Le Corbusier himself made no more than a gesture toward statistical analysis, his scheme assumed the statistical reordering of a system of disorganized complexity, solvable mathematically; his towers in the park were a celebration, in art, of the potency of statistics and the triumph of the mathematical average.

The new probability techniques, and the assumptions about the kind of problem that underlay the way they have been used in city planning, did nor supplant the base idea of the two-variable reformed city. Rather these new ideas were added. Simple, two- variable systems of order were still the aim. But these could be organized even more "rationally" now, from our of a supposed existing system of disorganized complexity. In short, the new probability and statistical methods gave more "accuracy," more scope, made possible a more Olympian view and treatment of the supposed problem of the city.

With the probability techniques, an old aim--stores "properly" related to immediate housing or to a preordained population--became seemingly feasible; there arose techniques for planning standardized shopping "scientifically"; although it was early realized by such planning theorists as Stein and Bauer that pre-planned shopping centers within cities must also be monopolistic or semi-monopolistic, or else the statistics would not predict, and the dry would go on behaving with dark and foreboding irrationality.

With these techniques, it also became feasible to analyze statistically, by income groups and family sizes, a given quantity of people uprooted by acts of planning, to combine these with probability statistics on normal housing turnover, and to estimate accurately the gap. Thus arose the supposed feasibility of large-scale relocation of citizens. In the form of statistics, these citizens were no longer components of any unit except the family, and could be dealt with intellectually like grains of sand, or electrons or billiard balls. The larger the number of uprooted, the more easily they could be planned for on the basis of mathematical averages. On this basis it was actually intellectually easy and sane to contemplate clearance of all slums and re-sorting of people in ten years and not much harder to contemplate it as a twenty-year job.

By carrying to logical conclusions the thesis that the city, as it exists, is a problem in disorganized complexity, housers and planners reached--apparently with straight faces--the idea that almost any specific malfunctioning could be corrected by opening and filling a new file drawer. Thus we get such political party policy statements as this: "The Housing Act of 1959... should be supplemented to include... a program of housing for moderate-income families whose incomes are too high for admission to public housing, but too low to enable them to obtain decent shelter in the private market."

With statistical and probability techniques, it also became possible to create formidable and impressive planning surveys for cities--surveys that come out with fanfare, are read by practically nobody, and then drop quietly into oblivion, as well they might, being nothing more nor less than routine exercises in statistical mechanics for systems of disorganized complexity. It became possible also to map out master plans for the statistical city, and people take these more seriously, for we are all accustomed to believe that maps and reality are necessarily related, or that if they are not, we can make them so by altering reality.

With these techniques, it was possible not only to conceive of people, their incomes, their spending money and their housing as fundamentally problems in disorganized complexity, susceptible to conversion into problems of simplicity once ranges and averages were worked out, but also to conceive of dry traffic, industry, parks, and even cultural facilities as components of disorganized complexity, convertible into problems of simplicity.

Furthermore, it was no intellectual disadvantage to contemplate "coordinated" schemes of city planning embracing ever greater territories. The greater the territory, as well as the larger the population, the more rationally and easily could both be dealt with as problems of disorganized complexity viewed from an Olympian vantage point. The wry remark that "A Region is an area safely larger than the last one to whose problems we found no solution" is not a wry remark in these terms. It is a simple statement of a basic fact about disorganized complexity; it is much like saying that a large insurance company is better equipped to average out risks than a small insurance company.

However, while city planning has thus mired itself in deep misunderstandings about the very nature of the problem with which it is dealing, the life sciences, unburdened with this mistake, and moving ahead very rapidly, have been providing some of the concepts that city planning needs: along with providing the basic strategy of recognizing problems of organized complexity, they have provided hints about analyzing and handling this kind of problem. These advances have, of course, filtered from the life sciences into general knowledge; they have become part of the intellectual fund of our times. And so a growing number of people have begun, gradually, to think of cities as problems in organized complexity--organisms that are replete with unexamined, but obviously intricately interconnected, and surely understandable, relationships. This book is one manifestation of that idea.

This is a point of view which has little currency yet among planners themselves, among architectural city designers, or among the businessmen and legislators who learn their planning lessons, naturally, from what is established and long accepted by planning "experts." Nor is this a point of view that has much appreciable currency in schools of planning (perhaps there least of all).

City planning, as a field, has stagnated. It bustles but it does not advance. Today's plans show little if any perceptible progress in comparison with plans devised a generation ago. In transportation, either regional or local, nothing is offered which was not already offered and popularized in 1938 in the General Motors diorama at the New York World's Fair, and before that by Le Corbusier. In some respects, there is outright retrogression. None of today's pallid imitations of Rockefeller Center is as good as the original, which was built a quarter of a century ago. Even in conventional planning's own given terms, today's housing projects are no improvement, and usually a retrogression, in comparison with those of the 1930's.

As long as city planners, and the businessmen, lenders, and legislators who have learned from planners, cling to the unexamined assumptions that they are dealing with a problem in the physical sciences, city planning cannot possibly progress. Of course it stagnates. It lacks the first requisite for a body of practical and progressing thought: recognition of the kind of problem at issue. Lacking this, it has found the shortest distance to a dead end.

Because the life sciences and cities happen to pose the same kinds of problems does not mean they are the same problems. The organizations of living protoplasm and the organizations of living people and enterprises cannot go under the same microscopes.

However, the tactics for understanding both are similar in the sense that both depend on the microscopic or detailed view, so to speak, rather than on the less detailed, naked-eye view suitable for viewing problems of simplicity or the remote telescopic view suitable for viewing problems of disorganized complexity.

In the life sciences, organized complexity is handled by identifying a specific factor or quantity--say an enzyme--and then painstakingly learning its intricate relationships and interconnections with other factors or quantities. All this is observed in terms of the behavior (not mere presence) of other specific (nor generalized) factors or quantities. To be sure, the techniques of two-variable and disorganized-complexity analysis are used too, but only as subsidiary tactics.

In principle, these are much the same tactics as those that have to be used to understand and to help cities. In the case of understanding cities, I think the most important habits of thought are these:

1. To think about processes;

2. To work inductively, reasoning from particulars to the general, rather than the reverse;

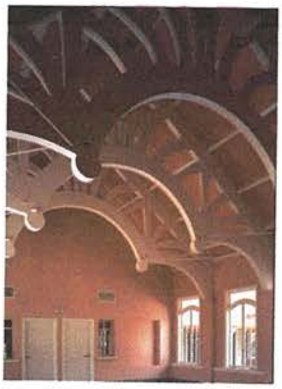
3. To seek for "unaverage" clues involving very small quantifies, which reveal the way larger and more "average" quantities are operating.

If you have gotten this far in this book, you do nor need much explanation of these tactics. However, I shall sum them up, to bring out points otherwise left only as implications.

Why think about processes? Objects in cities—whether they are buildings, streets, parks, districts, landmarks, or anything else--can have radically differing effects, depending upon the circumstances and contexts in which they exist. Thus, for instance, almost nothing useful can be understood or can be done about improving city dwellings if these are considered in the abstract as "housing." City dwellings--either existing or potential--are specific and particularized buildings always involved in differing, specific processes such as unslumming, slumming, generation of diversity, self-destruction of diversity.

This book has discussed cities and their components almost entirely in the form of processes, because the subject matter dictates this. For cities, processes are of the essence....

Top



Norton Commons

Norton Commons was conceived as a mixed-use project that would celebrate the concept of community. Its greatest contribution as a New Urbanist project is how it helps to complete and balance its single-use zoned, suburban context by creating a walkable, mixed-use and event-focused regional node at the sprawling edge of Metro Louisville. The guiding vision was to urbanize the land while preserving a sizable percentage as public as parkland, playgrounds, and gathering spaces. It includes a range of housing types that serve a diverse population and a generous commercial program not otherwise available in northeast Louisville making this neighborhood a regional destination.

Context: Located 20 minutes northeast of downtown Louisville, the 600-acre community straddles the boundary between the Louisville Metro Area (once Jefferson County) and Oldham County. The plan includes two denser, more mixed-use neighborhoods on the Louisville side, and a small residential hamlet on the more rural Oldham County side. I-71 forms the southern border while to the east and west are large-lot subdivisions. Prior to Norton Commons the only retail and services in the vicinity were big-box shopping centers along I-71 and nearby I-265.

Civic Realm: The community includes two elementary schools, a church, three community pools, a YMCA, a 2,500-seat outdoor amphitheater, a fire station, dog parks and a community garden—in total roughly 155 acres of civic open space. The open space system was designed with Olmsted's fabulous Louisville parks in mind.

Expanding the Innovative Legacy of the Property: The Norton Commons story begins with a love of the land. The Norton family patriarch, George W. Norton, was a civic, cultural and business leader and founder of a broadcast network and television station who also loved farming and used the property to showcase progressive, environmentally sensitive farming techniques on a weekly TV program.

As the growth of the neighboring communities crept closer the Nortons realized that it was only a matter of time before the expansion would encroach upon the farm. As the development of the land was inevitable, Traditional Town, LLC, approached Mr. Norton's daughter, Mary Norton Shands, who enthusiastically supported the walkable mixed-use development approach that would honor the traditions and principles of her family and enable the creation of a community. The Norton Family and the development team formed a partnership to become the Town Founders and hired DPZ to prepare a master plan based on Louisville's historic walkable neighborhoods. Michael Watkins Architect, LLC was hired to oversee design development and serve as town architect and continues in those capacities today.

The Norton Commons master plan allowed the farm to transition from a showcase for progressive agriculture to an award-winning walkable, mixed-use community.

Single-family homes facing Meeting Street Park.

Live-work units in the Neighborhood Center.

2,500-seat amphitheater.

Neighborhood Center

Central Square on Movie Night

DESCRIPTION

- **Regional/Town Plan.** Two Neighborhoods and a Hamlet at the suburban, northeastern fringe of Louisville, Kentucky's metro area.
- **Infill/Greenfield Site.** Though primarily a greenfield site, the property had been disturbed. Previously serving as a farm, as well as a recreational and event venue, the site was surrounded by suburban housing enclaves.
- **Includes affordable/subsidized/social housing.** There is a broad range of for-sale and for-rent residential including subsidized and workforce housing.
- **Land area:** 595 (436 + 159) acres
- **Open space upon completion:** 155 acres of woodlands, park lands, open space and civic space.
- **Transect Zones**:
  - South Neighborhood T3, T4, T5
  - North Neighborhood T3, T4, T5
  - Hamlet T3
- **Property value assessment:**
  - 2003 .... $2,058,700
  - 2021 .... $852,890,320

TIMELINE

- **Design charrette** 1997
- **Zoning ordinance approved** 1999
- **Master plan zoning approved** 2000
- **Construction began** .... late 2003
- **First residence occupied** 2005
- **Construction completed** .... 70% in 2021
- **Completion (estimated)** 2025

PROGRAM

- **Entitlements**
  - Residential .... 2880 units
  - Commercial .... 560,000 sq. ft.
- **Built as of April 2021**
  - Residential .... about 1,600 units (includes MF complexes of 237 and 273 units)
  - Commercial .... about 300,000 sq. ft.
  - Civic .... Fire station
  - Child care .... (2)
  - Elementary school .... (2)
  - Church .... (1)
  - YMCA .... (1)
  - Community pools .... (3)
  - 2,500-seat Outdoor amphitheater .... (1)
- **Percent Completed**
  - South Neighborhood 99%
  - North Neighborhood 50%
  - Hamlet 5%

April 28, 2021

1997 CHARRETTE PLAN

SOUTH NEIGHBORHOOD PROGRAM

Residential

Single-family, Detached	712
(Sale Price: $240,000 to $2.3 million)	
Townhouses	82
Mansion Apartments	94
Large-scale Apartments	302
237 E Carlisle (273 N Village)	
Age-Restricted, Subsidized Apartments	24
Work-force Apartments	21
Live/Work Units	60
Total	***1,310 units***

Commercial

Office	194,508 sq. ft.
Retail & Services (incl. ground floor of live/work units and mixed-use buildings)	88,729 sq. ft.
Total	***283,237 sq. ft.***

Civic

1 Fire Station

2 3 Child Care (2)

4 Elementary School

5 YMCA

6 7 Community Pools (2)

8 2,500-seat Outdoor Amphitheater

Civic Spaces (includes parks, greens, squares, plazas and playgrounds)

PROJECT TEAM

Charles Osborn, III and David Tomes
TRADITIONAL TOWN, LLC
Town Founder

DUANY PLATER-ZYBERK & COMPANY
Master Planner

MICHAEL WATKINS ARCHITECT, LLC
Town Architect

SABAK, WILSON & LINGO
Civil Engineering & Landscape Design

GARR CAMPBELL
Landscape Design

PLACEMAKERS, LLC
Pattern Book

CITY OF LOUISVILLE
Public Agency

LESSONS LEARNED

When Norton Commons hosted a National Town Builders Association Roundtable, the team shared lessons learned in a one-hour, one-minute each, rapid-fire session. These are the highlights:

1. **Never stop learning.** Listen, read or visit to learn everything you can. I've learned over time that people who are doing our type of work are like a fraternity rather than competitors.
2. **Your work has a positive influence on the way people live.** This can lead to a great deal of personal satisfaction.
3. **It's worth the time and effort to create beautiful streets and public spaces.** We sell real estate, that is, buildings such as homes and businesses...but what we really sell is largely outside these spaces. The tree lined street, the square, the parks, pools, cafe or the table outside of it, the YMCA or the church....these are the things that create the greatest lasting value.
4. **All of us enjoy learning the 'right way' to do something.** We have learned that builders, tradesmen and designers appreciate learning the 'correct or proper detail,' the acquired knowledge or skill then becomes a source of pride, a badge of honor.
5. **Recognize excellence whenever possible.** In my role I am often called to critique work. As such, I find it is very important to recognize excellence in building or design whenever possible.
6. **Design codes and other regulating documents** should be drafted in a way that allows for internal review and approval without government or agencies need to get into your business.
7. **A developer should try to be as 'expert' in the rules as the governmental authority or agency that tries to enforce it.** We have to deal with all kinds of authorities and agencies. You learn that many of these departments have rules that conflict with one another. Well intended rules often forget the good intention they were created to serve. Knowledge and common sense are good tools to make arguments with!
8. **There is no such thing as a free lunch is often the truth, giving away land can be expensive if you aren't careful!** A difficult lesson, we have donated some civic sites. I would encourage a lawyer to look at the details of the transfer. However, from experience I can tell you to cap your legal expenses in some fashion. Public agency lawyers have all the time in the world to dicker with contracts. Let them do the draft and pay your attorney to make the corrections.
9. **Well intentioned people can do great harm!** We have public streets, but I posted a 15 mile per hour limit. A neighbor thought people were speeding and petitioned the city for speed bumps. The city came out, and raised the limit to 25 miles per hour.
10. **Getting enough built so the public understands what we are doing can be a challenge.** Renderings are important but the quicker you can build the first square, park or tree lined street with the buildings behind it, the better off you will be.
11. **In the television comedy, WKRP Cincinnati, station manager Mr. Carlson said this after a disastrous Thanksgiving promotion in which he tossed live turkey out of a helicopter, "As God is my witness, I didn't know that turkeys couldn't fly."** Sometimes the best plans or promotions don't work the way you intend. Be better the next time.
12. **On our team it is important to have everyone knowledgeable in keeping the vision.** There is plenty of room for everyone, including competing builders and designers on the team, but we have low tolerance for competitors speaking badly about each other to the public. We spend a lot of time educating with the idea that shared knowledge makes everyone better.
13. **You can't create a 'civic place' and not expect to have civic discussion.** You create a place like this, and people will have opinions about everything you do...the architecture, park, pool, etc. It used to bother me, but then I realized this civic discussion was generally about all of the things that no other neighborhood has...the things that set us apart.
14. **In creating and selling a place like Norton Commons you have to learn to communicate in terms that set you apart.** Other places can't use terms such as 'civic, square, park, promenade, amphitheater, YMCA, school, coffee shop or corner store' to talk about their developments.
15. **You can't control the competition, keep your eye on what you can control.** Be the best at your own game...great coaches know that their team must be prepared for the game.
16. **Markets change and you need to have plans that allow for flexibility in product offerings.** We have the ability to adjust lot sizes within certain parameters without an onerous planning process. Critical in times of economic chaos.
17. **Churchill said, "When in hell, keep going."** You need to have a plan, especially in large projects, that allows for inevitable market shifts. Largely to the credit of our equity investors, in the worst of times it always seemed busier here than anywhere else because of the civic buildings and public areas we kept under construction. During these bad times we had 15-30% of the annual new homes sales volume in Metro Louisville.
18. **Good news is the best publicity you never bought.** News agencies are looking for good stories to report. From our earliest days we have given media important news to write about and had several front-page Sunday stories...you can't afford to pay for this type of advertising.
19. **Keep the vision!** There are lots of challenging economics. You find yourself confronted with 'short term' economic needs that if not carefully handled can hurt 'long term' value. Be patient and continue to create things that add value.
20. **"Code or Pattern Book", used to be a big argument among New Urbanists.** I want every tool I can have in order to educate and keep the vision, we have combined both into one document.
21. **Value talent!** We use our Town Architect for building approvals, tweaking development plans and even selling clients on ideas.
22. **No building permit without the Town Architect's stamp of approval.** We wrote this into our documents and get concurrence from the building permits office. It is an essential tool in controlling the architectural design.
23. **Require builder compliance deposits.** Protect against damage to infrastructure, incomplete or noncompliant work.
24. **Utilize a Builder Guild.** We have a Guild in order to help educate and measure builder performance. Acceptance into the Guild is a requirement to build in Norton Commons. We use an outside agency, Guild Quality from Atlanta, to screen our applicants to the Guild. The best tool you have for a poorly performing Guild Member is to not sell them more lots.
25. **Encourage the use of designers and architects who know your project requirements.** We invest a lot of time and money getting builders, designers and architects trained for our project. Use them! Also have your builders repeat good designs; set a minimum number of times it must be built.
26. **Most builders think they are the greatest designers and salesmen in the world.** I have learned this to generally not be the case. Builders should build and let the other professionals help them to build more!
27. **If possible, tackle a small project, even a model home, in your target market first.** It's a great way to get a handle on the approval process, construction cost, contractor skills, market interest, and the like.
28. **Start with a master plan by an experienced designer, then, finish with the same plan.** In other words, get a great master plan and make changes only cautiously and deliberately. Before "fixing" the plan, or asking or allowing the engineers to do so, make sure the original intent is clearly understood.
29. **There is more to open space and the public realm than sod.** Find a landscape architect who can refine the program of the public realm and detail (not decorate!) it appropriately. The landscape and its furnishings should support and facilitate community life, often inconspicuously—as Olmsted's work in Louisville demonstrates.
30. **Accessorize.** Communities, both physical and social, need civic art. Set the example and encourage others to follow.
31. **Listen to the buyers and the sales staff.** Builders often seem desperate to do something "different". Why be different when you could build something that sells?
32. **Grading can be a slippery slope.** Work the grades out on the drawings, not in the field.. These small lots can't be wasted on unnecessary and costly steps, walks and walls.
33. **Outdoor rooms, not yards.** Design the outdoor rooms integrally with the floor plan and as intentionally as you do the indoor rooms, with consideration given to furniture placement, lighting, power, water, storage, etc.
34. **Anything goes—within a very narrow range.** Count on designers and builders to resist your design constraints, despite routinely working within them. Don't think twice about it.
35. **Lean and Mean.** Mean what you say, say only what you mean. Do not include anything you don't intend to enforce.
36. **Rules rule!** Enforce the rules.
37. **Accept exceptional exceptions.** They make the place infinitely more interesting.
38. **Educate and train the designers and builders.** I do, we do, you do. Books, site visits, drawing instruction, precedent field trips, tours.
39. **Listen to the builders.** Builders are not always irrational. Builders are an endless source of information that serves to further refine the design code.
40. **Cast your characters.** Craft your third places and your retail carefully. Seaside's Modica Market, Norton Commons' Karem's and Verbena's are run by great community ambassadors. Such places sell real estate and build community. And the Verbena omelets ain't bad either.
41. **Empower the residents—with useful things.** You got them to buy into community, don't expect them to wait until you're done to get involved. Direct and equip their enthusiasm toward meaningful and useful ends.
42. **The sales team and developers will have to help business owners increase traffic and potential sales without expecting a commission-the payout will be in the end.**
43. **Builders should have preliminary approval and know the Regulating Plan before showing plans to buyers.**
44. **Don't be afraid that to realize that your neighborhood is not for everyone, both buyers and builders.**
45. **Your residents are your best salespeople**. Find a way to showcase them at your events.
46. **Remember to continually educate residents on the land plan and how it affects daily life.**
47. **Do not waiver on your land or lot pricing.** If you do, it will be a constant battle to maintain full price from then on.
48. **If you know you have a hole in your product offering, do whatever it takes to get that missing product in your inventory.** As much as your entitlement will allow, offer diversity in product availability to the public – type, size and pricing.
49. **Be firm with your policies and requirements**. Always remember you are creating and maintaining value.
50. **Use centralized sales no matter what obstacles you face.** Make your sales team a true team and realize no one tells the story of your neighborhood better than your team.
51. **Towns can take it.** Don't say "no" to anyone. Figure out how to make them a part of the community. Towns accommodate most every need and desire that individuals, families and communities have. Allocate the use appropriately with the neighborhood and then design to fit.
52. **Take a 5-minute walk!** When the post office refuses to deliver the mail, when a buyer insists on a one-story house on a lot designated for two stories, when the surveyor staking the house out for the excavator calls to say the contract house doesn't fit on the lot, take a five-minute walk and absorb the legacy that you are leaving—a neighborhood for 17 multi-generation families, a price point spread of over 5 times accommodating households of a wide range of incomes living in proximity, kids riding their bikes to school, teenagers hanging out at the pizza joint or the Y, the provision of many daily needs—groceries, child care, work place, places of worship all within walking distance—in short, a neighborhood that already supports community life and will continue to do so for generations.
53. **Finally, move in!** Among the most impressive testimonies of the success of Norton Commons is that most of sales and development team and many of the builders live and/or have their offices right here in the neighborhood—a great testimony to the place. The team that is building this place care deeply about it—and it shows.

ADAM Architecture

WINCHESTER, ENGLAND

Nansledan

Newquay, Cornwall, England

Opposite page, top: Aerial view of Nansledan taken in December 2021 to show the areas which are complete (nearly 600 homes) and under construction.

Bottom: About 5 percent of buildings have "special" elevations—in this case, a local stone from Callywith near Bodmin. The use of these expensive materials is deployed where they have the most visual impact, for example terminating a view at the end of a street, and the houses can be either open market or affordable. Across each phase of development there is a target build price per square foot, and if some buildings are essentially overcapitalized, others will be undercapitalized so that across the phase the build price is correct.

Development, at least in the United Kingdom, is generally not popular. It is not popular because, too often, those who will be affected by the development are not properly engaged with and listened to during the evolution of a design; because what is promised at the planning stage is not delivered on site; because the design and quality of what is delivered, especially commercial housing, is lamentable; and because those affected by the development do not reap any tangible benefit from it.

It is a vicious circle. Because development is not popular, regulation becomes ever more complex and onerous to try to force better outcomes. But this rule by the stick and not the carrot only raises the speculative cost of planning applications, which squeezes smaller developers out of the market. This leaves the national plc housebuilders—whose formulaic business model rarely includes the delivery of non-residential uses and is focused upon bland repetition, high profit, and short-term financial horizons—to dominate the market. The system is well and truly broken. The challenge therefore is to establish new approaches if we are to improve the quality of new development; to tailor it better to meet local needs; to ensure that those affected feel the benefits that it can bring; to deliver non-residential uses to enable lower carbon lifestyles; and so, through doing all these things, to make development popular once more.

UNDERSTANDING THE AREA

We are all blinded by familiarity, so the time taken by a design team to understand the urban, architectural, and landscape patterns that define the local character of an area helps to inform a more sensitive and appropriate design response, and can help residents to see with fresh eyes what is special about where they live. This realization, then, can open the door to the possibility that new development could build upon those defining characteristics. It enables the codes not only to articulate the principles of good design, but also to respect the best aspects of local identity. In parallel, early and ongoing public consultation, listening to local needs and working with the residents and other local interest groups to find creative ways of meeting those needs, helps to build confidence that development will directly benefit the local community.

A CLEAR VISION

Understanding local needs and the character of an area can lead to the clear articulation of a set of guiding development principles against which, over time, the project and the team can be measured. It is a slow process, but a clear path to securing delivery (see below) and the track record of a landowner, developer, and consultant team of delivering sites in accordance with a set of clear principles can help persuade the local community, the council, and other statutory consultees that the devel-

This page, top left: Overlay of the Nansledan masterplan showing the mixed centers of each urban quarter within a five-minute walk of each house, and with a ten-minute walk of Market Street, the new sub-town center at the heart of Nansledan. Bottom left: Place Logic study of the Nansledan masterplan that identifies the desirability of some routes (shown in red), over others. The quietest streets are shown in blue. Place Logic was used to confirm the natural "hot spots" on the network where commercial uses are most likely to thrive.

Right: Figure and ground plan of the areas of Nansledan that are complete or currently under construction.

opment team genuinely desires to collaborate on the delivery of a high-quality scheme that is in tune with local needs. It is vital during construction that there is an ongoing process of consultation to highlight evolving needs and to identify things that have not worked well in completed phases in order to avoid repeating mistakes.

LONG-TERM STRATEGIC THINKING

Few development sites in the UK sell more than 100 homes a year. That is the typical rate of absorption into a local market. This pace of delivery does not compromise quality and makes it possible to integrate local materials, labor, and building components, which not only reflects the local identity but also puts money back into the local economy.

The UK Government's planning policies are captured in the National Planning Policy Framework (NPPF). In 2021 the NPPF was updated[1] and, as a result, local authorities are now required to have longer time horizons than previously to facilitate more strategic planning. With short horizons, development will tend to occur in small, piecemeal parcels that do not facilitate the necessary improvements to infrastructure and do not deliver wider public benefits. As a direct result of short-term planning, most settlements in the UK and elsewhere today are blighted by a ghastly bland and impermeable crust of incremental, monocultural housing estates that form like cancers around the more integrated and mixed-use historic core, frustrating pedestrian and cycle movements. As a consequence, more people will resort to their cars to get around. It is absolutely vital therefore that urban extension sites on the edge of existing settlements are considered both in the context of how they link to the current urban edge, to the historic core, and to how, in time, they in turn will connect to the next phase of development.

Long-term strategic master plans are required to deliver new mixed-use walkable neighborhoods. These master plans, in essence, are movement networks, and the final form of each urban block is only determined when that phase of development comes forward. In this way, each phase of development is well attuned to the current property market, so helping to husband long term value. The nature of these movement networks should reflect established regional character to help ensure that the development feels like it belongs to its setting in terms of the widths and attributes of each type of street; the scale of squares; the relationship to topography, the prevailing weather, and so on. Digital analytical tools such as Place Logic[2] or Space Syntax[3] should be used to identify key nodes where mixed uses will thrive.

As part of the vision principles, long-term sustainable strategies should be developed for energy, transport, green infrastructure, employment, play, food, and water. These need to be reviewed throughout the life of the development to embrace change and to ensure that standards continue to rise. The ambition should be to strengthen and diversify the local economy, responding to local needs and putting as much money from the development as possible back into the local community so that those most affected by the development enjoy the resulting economic warmth. Sustainable development is not just about the delivery of low-carbon houses; it is about the creation of places that enable low-carbon patterns of living.

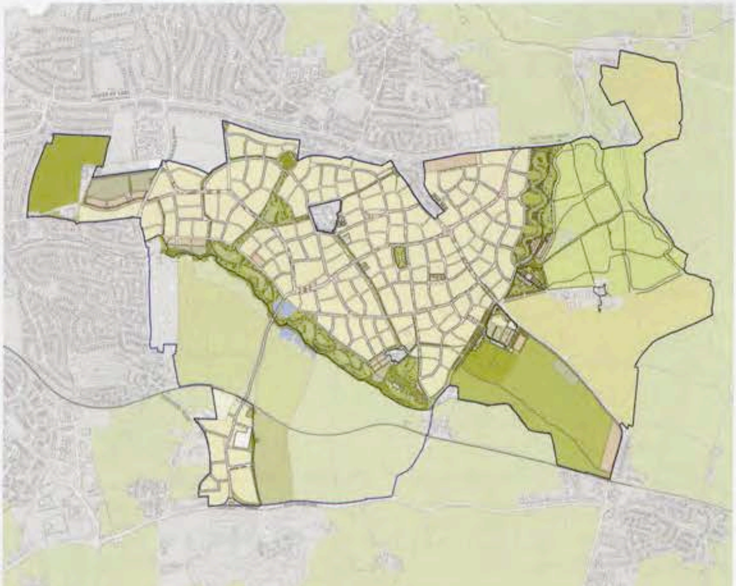
Design codes, working in concert with the master plan, ensure that the character of the architecture reflects the particular character of each street in terms of form, massing, set back, materials, architectural detail, and public realm materials, and that the green infrastructure is properly woven through the development. The team needs to think carefully about what needs to be coded, how it is coded, and who is to administer the code. Landowners with a long-term interest in a development are arguably more likely to be consistent than a local authority which, over the life of a large scheme, will be subject to officer churn and, quite possibly, to several changes of political ideology.

SECURING DELIVERY

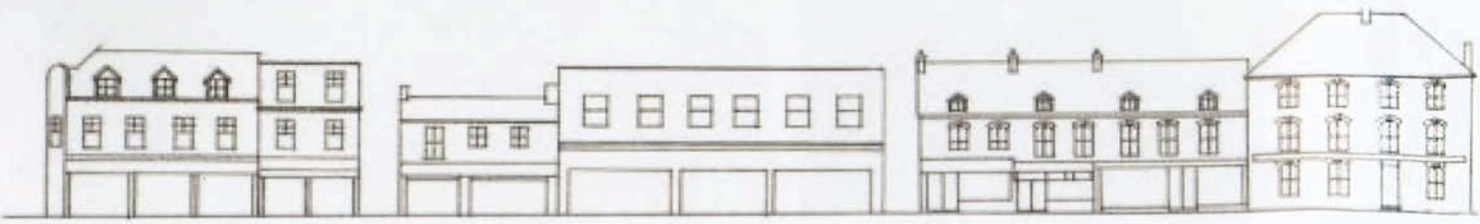
The conventional model of delivery too often means that what is promised at the planning stage to a community is diluted during the

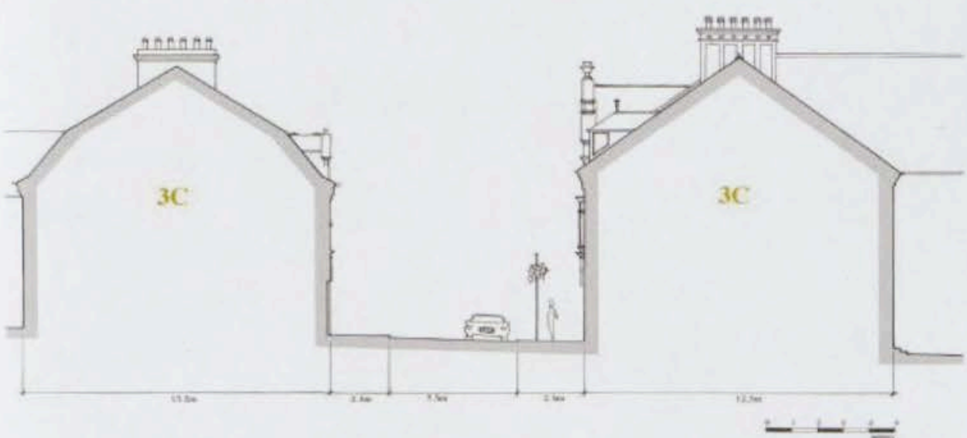
This page, left: Nansledan is Cornish for *"wide valley,"* which describes the topography of the site. At the bottom of the valley the Chapel Stream runs east-west toward the sea. The railway line into the heart of Newquay runs to the south of the stream. Unlike Poundbury, the new High Street runs through the heart of the development, facilitating the closure of two dangerous at-grade rail crossings, and providing the necessary heat of passing traffic to fuel a wide Market Street as the new sub-town center at the heart of Nansledan.

Right: Masterplan for Nansledan, produced by ADAM Urbanism after an Enquiry by Design charette run by The Prince's Foundation.



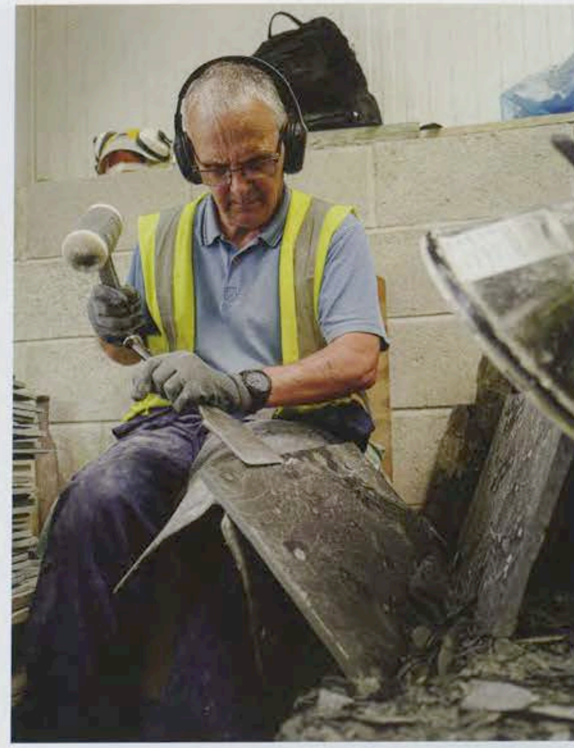

CENTRAL SQUARE
75m
130m
150m
BANK STREET
BANK STREET
MANOR ROAD





Opposite page, top left: Top end of Nansledan High Street, defined by 2.5–3 story townhouses; formal railings and pavements at a continuous level promote pedestrians and cyclists over cars.

Bottom of opposite page, and this page: Pattern book extract showing the attributes of the High Street in the historic core of Newquay.



Left: An aerial view of the top of the High Street at Nansledan.

This page, top: Cornish slate being worked for Nansledan. This random width diminishing course material is used on most of the smaller cottages and terraced houses. It reflects local character; has very low embodied carbon; has a proven track record of withstanding the full fury of the Atlantic weather, and puts money back into the local economy. Nansledan takes no more than 60 percent of the material from the quarry, which ensures that it is available for other sites across the county. On the strength of the Duchy's contract, the supplier has bought more land and employed more apprentices, so this local business has benefitted. The slate chips are used as a permeable surface, and the other quarry waste is used for road sub-base material. Bottom: View across the wildflower meadows of the SANG, looking toward Nansledan.

build-out, which, as set out above, is one of the key reasons why communities are rightly nervous of development and distrust developers.

But His Royal Highness the Prince of Wales's estate, the Duchy of Cornwall, working in partnership with their solicitors, Farrer and Co, have developed a new form of collaborative contract—a Common Aspiration—that creates a legal environment in which landowner and developer work together in partnership. This enables the vision of the landowner to be tempered with the commercial acumen and innovation of the developer partners, but with the landowner maintaining control at each stage of the project, requiring sign off of the planning and working drawings and, in time, the finished building before the latter can be sold to a third party. Buyers then sign a Design and Community Code covenant that requires them to maintain their house and element of the public realm in accordance with the landowner vision. Some people may conclude that this additional regulation is not desirable, but the evidence from built schemes proves otherwise: development schemes controlled in this way consistently achieve a 10-20 percent premium or more at the time of initial sale. Buyers are willing to pay more for a better building and the certainty that the place where they will live is to be looked after properly. Over time there is clear evidence too, tracked through resale values, that such places significantly out-perform the local market once the higher quality is recognized and the place becomes known as a premium address.

By working in this collaborative way, the houses in the main can be standard housebuilder plans, but arranged on the site to create better streets and urban places, and with bespoke public realm elevations that are regulated by the code. The cost of this approach need not amount to much more than 10 percent of the normal build cost and can be offset by the additional sales premium.

A key consideration is how the land is sold. The land must be held in the right way if the landowner is not to be penalized through taxation as a development land trader through sequential sale of land parcels. The Common Aspiration model can be established with up-front land sales so that the achieved price per square foot of one phase sets a land value for the next phase. Alternatively, the landowner can harvest a percentage of the sale price of each property. The latter takes longer but is arguably more objective, and, as it ties up less of the developers' cash, should produce an added dividend for the landowner.

The Common Aspiration model enables the creation of a consortium of developers, where teamwork is infused with controlled competition to stimulate innovation, quality, the establishment of local supply chains, and the creation of long-term added value.

The added commercial value of this approach means that there are additional funds available to subsidize the delivery of affordable housing. Furthermore, the normal "bean-counter" approach to construction cost on a building-by-building basis can be replaced with a phase-wide approach with an agreed overall build price per square foot. Some buildings are more prominent than others in placemaking terms and so they can be over-capitalized with more expensive materials and architectural detail. These abnormal costs can be offset by other buildings in less prominent places that are constructed at lower cost. The better, prominent buildings add value to the development overall and help to create the premium value across the wider site.

With the predominance of national plc housebuilders in the UK market,[4] the lack of delivery of employment space is a critical issue. Housebuilders generally don't understand employment space and don't want to build it. Looked at on its own, new employment space may not be viable, but new housing built next to new employment space is often worth more and so, in the round, it can stack up commercially. The delivery of true mixed-use walkable new communities therefore will usually depend either upon a landowner with a clear vision and long-term interest, and/or a master developer who can act as puppet-master to arrange for individual developers to deliver elements of the

Opposite page, top: A typical secondary street at Nansledan has more subdued architecture and boundary wall treatment than the High Street. Bottom: Shared surface tertiary lane, which reflects local character and offers protection from the Atlantic weather while regulating traffic speeds naturally by design. The street character codes require the architectural character of the buildings and the palette of materials to reinforce the hierarchy, so promoting wayfinding and identity.

scheme within a coherent long-term vision and a wide strategic economic framework.

Long-term thinking and a Common Aspiration collaboration helps to deliver high-quality green infrastructure at agreed trigger points. Each house on a new development, making allowance too for an element of the wider infrastructure, will produce about 100 cubic yards of spoil. Conventionally this is taken to a landfill site but at significant cost, and often to the intense irritation of neighboring settlements who can have years of heavy, dirty vehicles driving through their towns and villages. But if the landowner owns the hinterland, this can be integrated with a spoil strategy, saving a significant amount of money that can be invested in other aspects of the development, while enjoying more support from the neighboring community whose lives will not be blighted by "muck away."

REWARDS FOR SUCCESS

The UK Government's White Paper, *Planning for the Future*,[5] published in 2020, encouraged the use of Local Development Orders (LDO) to reward good developments with reduced regulation to stimulate better outcomes.

The Duchy's development at Nansledan ultimately will create 4,000 new homes and 4,000 new jobs. It has been on-site since 2015 and now has nearly 600 homes complete. Nansledan secured an LDO in 2021.[6] At the time of writing, this is the largest LDO yet granted in the UK. Cornwall Council has worked in close partnership with the Duchy since 2003 to hone the vision of this development, encouraging the consortium, bound together by a Common Aspiration Contract, to develop a long-term vision for how the depressed economy of Newquay can be strengthened and diversified over the next fifty years. The Duchy and their team have shown by example that they can deliver better development and to a higher standard than can be required by the planning system. It was for this reason that they were invited to apply for an LDO.

The LDO sets the parameters for detailed planning consent for the whole development. Authority is delegated to the landowner to administer the process and, while some have voiced concerns that LDOs take authority away from local politicians, all the usual checks and balances are maintained, and there are regular periods of review. If a landowner is found not to have acted within the agreed parameters, the LDO can be rescinded.

By removing the delay and risks of a normal planning process, LDOs can help to attract investment in new commercial activity: a company looking to build a new office or manufacturing plant can be on site within a matter of months and with no planning risk. LDOs therefore have a vital role in stimulating the regeneration and diversification of the local economy.

The pages of history are littered with developments that were designed in detail and secured planning consent, but which were rendered unviable because the market shifted before they could be built. An LDO, in contrast, fused with the long-term and flexible strategic masterplan explained above and the supporting strategy and vision documents, can accommodate change more readily, which can help to create a more resilient environment for development.

Until we get better at the delivery of new mixed walkable neighborhoods we will not deliver low-carbon or zero-carbon development. Houses that are zero carbon in construction and zero carbon in operation are vital, but unless we create new places that enable low-carbon or zero-carbon patterns of living, we have only answered a part of the exam question.

The houses completed at Nansledan are predominantly built with concrete block and render. The concrete blocks are made from recycled china clay waste from St Austell, about 10 miles from the site. The roofs are predominantly slate from Cornwall, or elsewhere in the UK, and the houses are built to very high air tightness standards. As a result of using local, low-carbon materials and high standards of construction, they already exceed the RIBA 2030 carbon target[7] and the Consortium is now working collaboratively toward the LETI standard,[8] which it expects to achieve within the next few years. By following the principles set out in this essay, Nansledan is delivering more sustainable development with better social and economic outcomes for all parties, including the wider community and the region. Supported by an LDO, it is meeting local needs—30 percent of the new homes are affordable for local people, and over 70 percent of the buyers of the open-market houses are from local post codes.

Nansledan has grown because the local community wants the tangible benefits that it brings.[9] It is ten years since work first began on Tregunnel Hill, another small Duchy site in Newquay where the ideas that underpin the approach at Nansledan were trailed. Over that time, on account of the principles set out in this essay, the land value has all but doubled, yet still it is predominantly local people who are buying property there. It is living proof that these principles are one way in which to deliver better, more sustainable, more beautiful, and more popular development. At a time of unprecedented demand for new housing, this is our one opportunity to get it right—let's do our best to ensure that we do not waste it.

HUGH PETTER *is an architect and urban designer. He is a director of ADAM Architecture, specializing in classical and traditional design. His projects include new buildings and renovations and alterations to historic properties for private, commercial, and institutional clients, and he undertakes urban design projects at all scales for the Duchy of Cornwall, Blenheim, Burghley, and other landed estates. Nansledan at Newquay is cited regularly as an exemplar by the UK Government, and has won numerous awards.*

1 The National Planning Policy Framework was revised on July 20, 2021. See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf.

2 Place Logic is a digital network analysis tool developed by ADAM Urbanism. See https://www.placelogic.org.uk/.

3 See https://spacesyntax.com/.

4 About 65 percent of the new homes built in the UK each year are by a few national plc housebuilders.

5 Ministry of Housing, Communities, and Local Government, *Planning for the Future*, white paper on planning, August 2020. Tregunnel Hill, the trail site for Nansledan, is on the front cover. See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/958420/MHCLG-Planning-Consultation.pdf.

6 Nansledan Local Development Order. See https://www.cornwall.gov.uk/planning-and-building-control/local-development-orders/nansledan-local-development-order/

7 See https://www.architecture.com/about/policy/climate-action/2030-climate-challenge for more about the RIBA 2030 Climate Change Challenge.

8 The London Energy Transformation Initiative Climate Emergency Design guide is at https://www.leti.london/cedg.

9 Create Streets, "A Place to Call Home," 2018. See https://www.createstreets.com/wp-content/uploads/2018/05/A-place-to-call-home-online-version.pdf.

From Vision to Action – **Planning, Designing, and Delivering Restored Connections Among the Historic Downtown Districts and Public Spaces of Santa Rosa, California**

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59th International Making Cities Livable (IMCL) Conference
Poundbury (Dorchester), England
October 10 - 13, 2023

ABSTRACT

At the 58th IMCL Conference in 2022, the authors introduced a formidable urban divide, an "elephant in the room", forged by a sprawling shopping mall and elevated freeway, that separates Courthouse Square and Railroad Square, the two key districts of historic downtown Santa Rosa, a major city in the heart of Northern California's wine country. In their paper, *A Downtown Reimagined*, the authors articulated how to breach this barrier conceptually through innovative strategies of walkable urban design, land development, and intermodal transportation, all grounded in recognized precedents and the visions of IMCL's Principles of True Urbanism.

In this paper, the authors delve deeper, exploring the steps and details required to deliver a plan of action capable of reversing the barrier's adverse impacts on Downtown's social connections, functional circulation, and commerce—thus releasing the shackles on Downtown's identity, vibrancy, sense of place, equity, and community pride.

In the realm of placemaking, this paper expands upon the first paper's concepts, exhibits, and diagrams—addressing in detail the scales, forms, and aesthetics of complete streets, public spaces, urban landscape, and activating built development—focused specifically on the "Three Connections" that pass through the barriers between Courthouse Square and Railroad Square.

In the realm of action, the authors examine the constellation of challenges and opportunities that line the path to reuniting Downtown, offering policies and recommended actions related to placemaking, governance/leadership, planning policy/regulations, public participation, equity, accessibility/mobility, infrastructure, sustainability, development financing, stewardship, and the public/private partnerships required to deliver the vision.

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I. INTRODUCTION

Santa Rosa – "Out There. In the Middle of Everything"[1]

The City of Santa Rosa (see Figure 1) is located approximately 55 miles north of San Francisco in central Sonoma County. Santa Rosa occupies an area of 42.7 square miles, with a population of about 180,000. Even with this size of population, Santa Rosa has maintained a small-town feel. Santa Rosa has varied topography, with large expanses that are more level together with rolling hills scattered throughout its area. Santa Rosa has a number of urban creeks, two of which—Santa Rosa Creek and Matanzas Creek—pass through Santa Rosa's Downtown.

The larger County of Sonoma is about 1,768 square miles in size with a population of 494,336. Santa Rosa is located inland by about 20 miles from the Pacific Ocean. Santa Rosa is the county seat of Sonoma County and the largest city between San Francisco and Portland, Oregon. Santa Rosa is one of eight incorporated cities in Sonoma County. Within the region, Santa Rosa serves as a major business, medical, technology, and service center.

Santa Rosa is not only close to the ocean and beaches but also a gateway to the world-renowned wine region of Sonoma Valley, the historic Redwoods in nearby Armstrong Woods, the Russian River that extends to the Pacific Ocean, several State Parks (including Jack London State Park) that offer a variety of hiking and recreational opportunities, a broad range of dining opportunities, and the Charles Schulz Museum in the hometown of the revered "Peanuts" cartoonist. Within the immediate downtown area are the Luther Burbank Home and Gardens, beautiful Julliard Park, and historic residential neighborhoods.

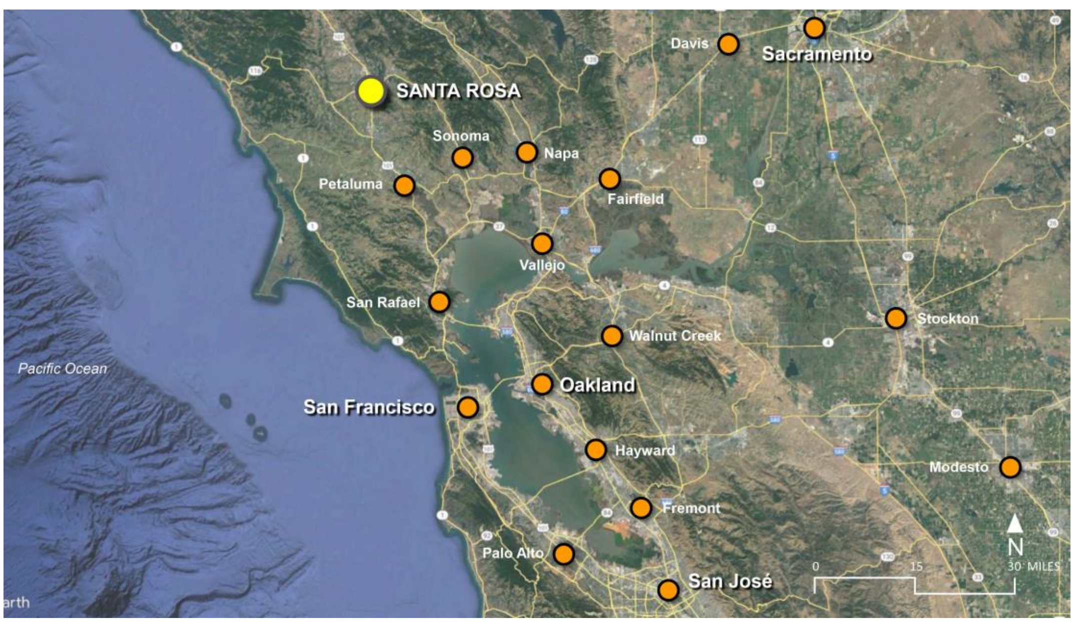

Figure 1 – City of Santa Rosa, in the north Bay Area region of Northern California.

[1] "Santa Rosa: Out There. In the Middle of Everything" is the motto of the tourism marketing campaign of the City of Santa Rosa's Economic Development Division.

Historic Background

Prior to European settlers coming in the early 1800s to this area of "Alta California" that is now Santa Rosa, it was inhabited by members of the Southern Pomo Native American Tribe. Among the founding settlers was the Carrillo family. The City of Santa Rosa was originally mapped in 1854, with a rectangular street grid around a town plaza (see Figure 2). That plaza has become known today as Courthouse Square, located within the Downtown District.

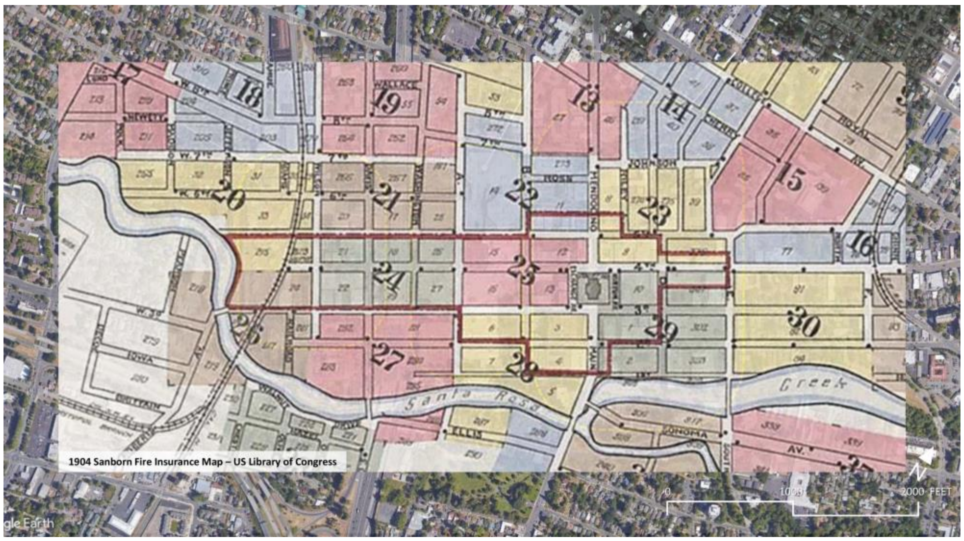

Figure 2 – Sanborn Fire Insurance Map of downtown Santa Rosa in 1904, showing historic street grid, Courthouse Square, railroads, and Santa Rosa Creek.

Santa Rosa was formally incorporated as a city in 1868. In 1871, the first train arrived at Railroad Square, located near the western terminus of 4th Street and west of what is now Courthouse Square. Initially, the town's economy was strongly based on agricultural trade. Several railroad lines were extended to various locations within Santa Rosa in the latter half of the 19th and early 20th centuries to support this trade.

Over time, Railroad Square and Courthouse Square became important commercial centers. Financial and governmental institutions (including the County Courthouse located in the Square), housing, and retailing came together in a loosely knit development pattern to form Santa Rosa's downtown.

II. A DOWNTOWN DIVIDED

From the beginning of the 20th Century, the growth of downtown Santa Rosa has been impacted by many significant events, circumstances, and actions over time. Among these are:

- The devastating 1906 earthquake that also leveled downtown San Francisco, during which the original Sonoma County Courthouse was destroyed.
- The movement in the USA towards more decentralized, auto-dependent development patterns, generally during the latter part of the 20th century.

- Constructing in 1949—then elevating in 1966—U.S. Highway 101 through the center of the larger downtown area.
- Urban renewal in the 1960s leading to clearing of 40 acres of downtown urban fabric, clearing the way for the construction of the expansive Santa Rosa Plaza Mall.
- Channelizing and burying Santa Rosa Creek through Downtown in the 1960s.
- Another substantial, damaging earthquake in 1969.
- Extension of Mendocino Avenue through Courthouse Square in 1970, made possible by post-earthquake demolition of the second County Courthouse .
- Development of mid-rise, rather monotonous, office/commercial buildings with minimal street-level pedestrian activity around the south quadrants of Courthouse Square, including along 3rd Street and extending south along Santa Rosa Avenue.
- Completing Santa Rosa Plaza Mall in 1983.

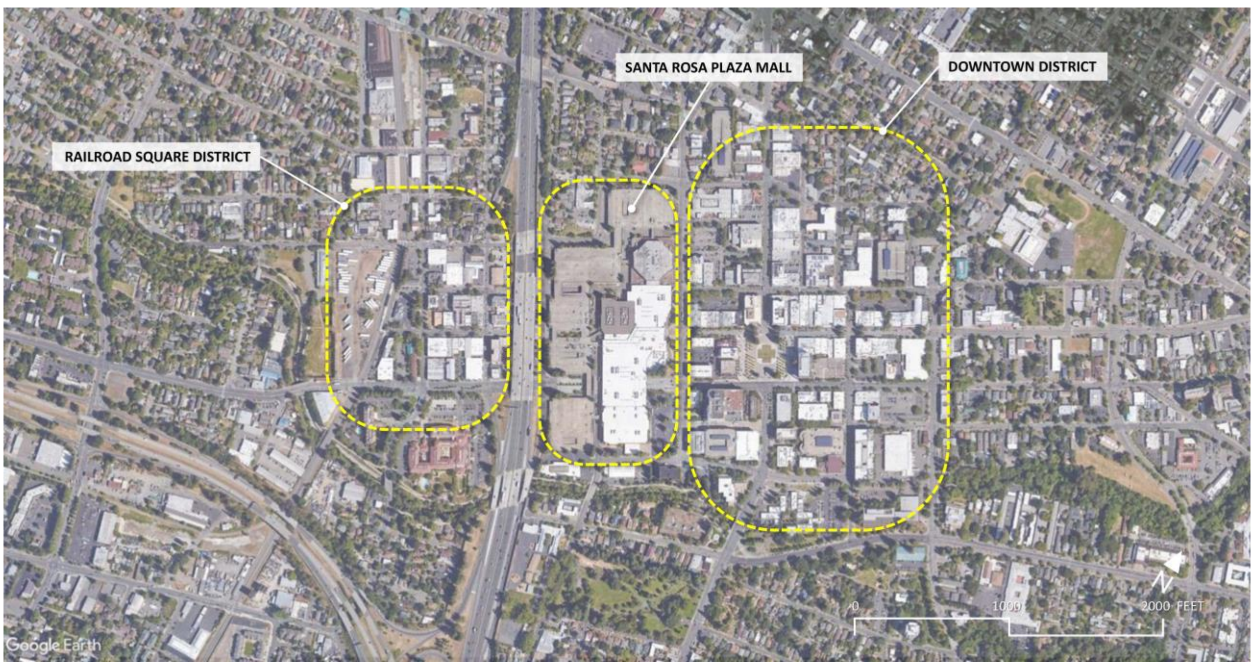

Figure 3 – Railroad Square, the Santa Rosa Plaza mall, and Downtown.

Among these events, circumstances, and actions, two actions stand out: the development of Santa Rosa Plaza Mall and construction of the elevated US 101 freeway (see Figure 3). The combination of these urban barriers—in particular, their interruption of connection and movement along the critical 4th Street corridor—has negatively impacted social interactions, functional circulation patterns, and commercial flows between the eastern downtown area associated with Courthouse Square, and the western area associated with Railroad Square. In our first paper, we described the collective impact of these formidable urban barriers as Downtown's "Elephant in the Room."

Courthouse Square

The area of Courthouse Square dates to the first official map of Santa Rosa filed and recorded in 1854, featuring 10 streets and a plaza later to become known as Courthouse Square. Similar to Railroad Square, Courthouse Square became an important commercial center in Santa Rosa with banking, lodging, and mercantile services in the surrounding area.

The first official courthouse for Santa Rosa was dedicated on the plaza in 1884. An earthquake in 1906, generally known as the San Francisco Earthquake, destroyed the Courthouse and much of the downtown. The Courthouse was rebuilt in 1908 on the same site. Following another earthquake in 1969, the Courthouse was deemed unsafe and it was demolished.

In 1970, following demolition of the Courthouse, Mendocino Avenue to the north and Santa Rosa Avenue to south were extended through Courthouse Square to connect, effectively dividing the square. This was followed by much community discussion about the loss of the community's focal point and sense of place. Based on these sentiments, a reunification plan was developed and a scaled-back version of what was first offered as the community's "Green Living Room" was adopted and completed in 2017.

While Courthouse Square is reunited, the desired sense of place, vitality, and source of community pride is still being debated. The square is quite open and serves larger community events like farmers' markets, sporting events like marathons and bike races, and outdoor music performances—yet it lacks a sense of enclosure and a diversity of outdoor and covered settings that are nurturing, inspiring, and hospitable, or communicate what Santa Rosa is all about.

Railroad Square

As Santa Rosa became an important regional commercial hub in the later part of the 1800s, Railroad Square, with its formal passenger railway depot constructed in 1872, became a well-connected commercial subcenter within Downtown and the greater Santa Rosa community, and a vital point of access to the wider Sonoma region and beyond.

After Highway 101 bisected Santa Rosa's downtown in 1949, and experiencing diminishing rail service and a more dispersed pattern in the distribution of goods and services in the region, Railroad Square lost significant vitality. In the 1970's, merchants and property owners banded together to form the Railroad Square Historic District to better market and improve the District. In 2017, the Sonoma-Marin Area Rail Transit (SMART) passenger service was initiated between Santa Rosa and the city of San Rafael approximately 40 miles to the south, with ferry connections to San Francisco. SMART continues to expand and the Railroad Square district continues to seek opportunities to improve and revitalize the area.

A Mall and a Freeway

The urban planning, design, and development strategies presented in this paper are predicated on our assessment that reconnecting and reuniting Railroad Square and Courthouse Square is foundational to restoring the health and vitality of downtown Santa Rosa. With the barrier of mall and freeway breached, a broad and exciting range of other strategies to invigorate Downtown are more effectively supported, filling-in and completing Downtown's urban potential.

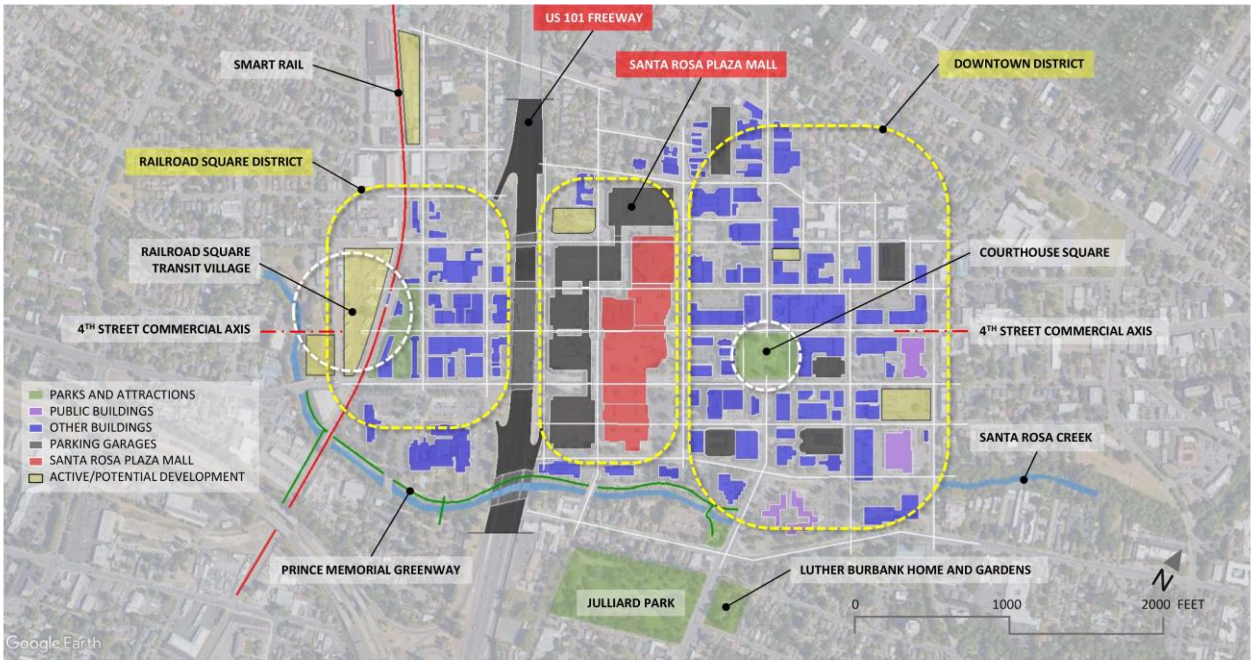

Figure 4 – A Formidable Urban Divide: Barriers between Railroad Square and Downtown.

Figure 4 is a stark illustration of the walls that separate Downtown from Railroad Square. Opened in 1983, the Santa Rosa Plaza is a blandly suburban 2-3 level fully enclosed shopping mall stretching over 4 blocks and 10 acres of historic urban fabric. The mall is wrapped on two sides by a connected chain of low-level parking garages, displacing an additional 5 city blocks. At over 27 acres, the combined "footprint" of mall and parking occupies a significant portion of Downtown's overall area.

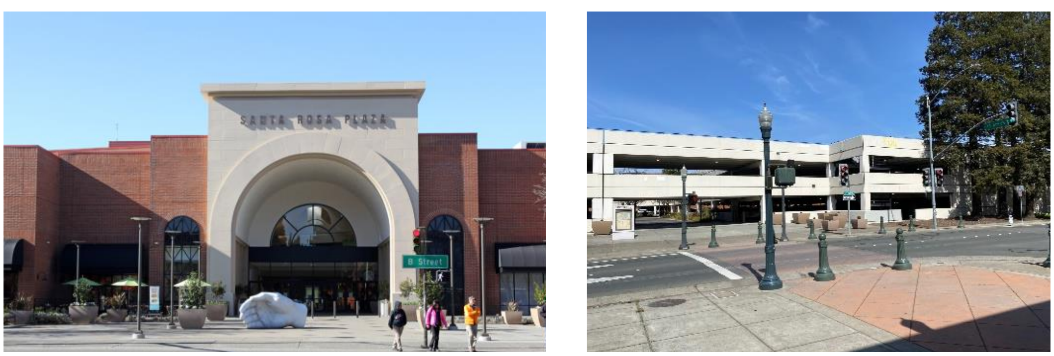

Figure 5 – Mall entrances from 4th Street in Downtown (left), and through mall parking garages from 4th Street in Railroad Square (right).

Pedestrians can enter the mall's "front door" at the west end of 4th Street in Downtown, pass through the mall and between parking garages, reemerge on 4th Street, and walk under the freeway to reach Railroad Square – however, this passage is circuitous, unpleasant, and constrained by the mall's hours of operation. Although public and relatively short, 4th Street's passage under the freeway is dark and featureless, albeit somewhat mitigated by recent urban design improvements.

III. A DOWNTOWN UNITED

As the 20th Century drew to a close, the City began to reassess the conditions threatening the vitality of Downtown, including the barriers separating Railroad Square and Courthouse Square. In 1998, the City commissioned a R/UDAT[2] study, *City Vision – Santa Rosa Urban Design Project*. The study included recommendations that have already led to major urban design improvements—predominately the reuniting of Courthouse Square (see Figure 6) —while laying the foundation for 21st Century planning and for the visions explored in this paper, most significantly the reconnection of the 4th Street corridor through the Santa Rosa Plaza Mall.

Figure 6 – Looking west: reunited Courthouse Square (bottom), Santa Rosa Plaza Mall (center), the US 101 freeway and Railroad Square (top). The grassed "cross" in Courthouse Square outlines the footprint of the first Sonoma County Courthouse, destroyed in the 1906 earthquake.

Eating the Barrier one bite at a time! – The Downtown Station Area Specific Plan

In our research for our papers, the *City of Santa Rosa Downtown Station Area Specific Plan* (or DSASP), first adopted in 2007 and then revised and re-adopted in 2020, stands tall for its depth of analysis and for establishing a solid progressive planning context that empowers, among many other ideas, the key principles and strategies we are advocating. Indeed, in one way, our papers can be read as supportive commentaries on the DSASP, answering the questions "What visions does this plan empower?", "What might they look like?", and "How can we make them happen?"

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[2] R/UDAT (Regional/Urban Design Assistance Team), a program of the American Institute of Architects (AIA), brings together outside and local experts and stakeholders to convene highly focused design and planning workshops, or "charrettes' ', to assess challenges and develop visions and strategies.

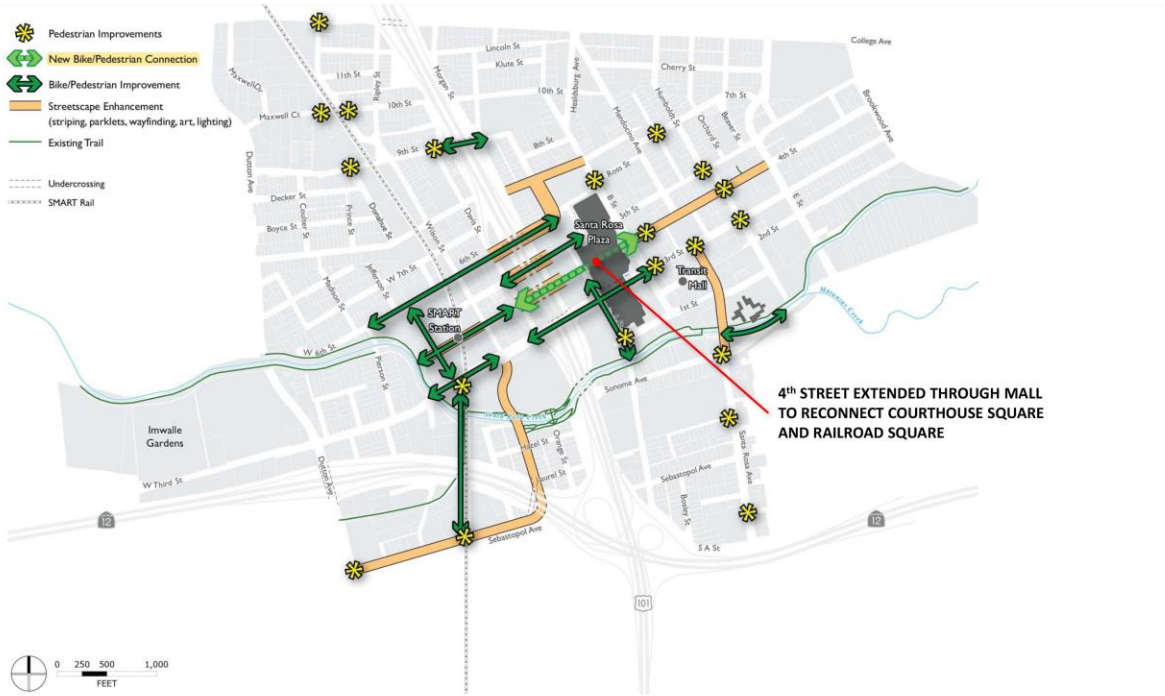

Figure 7 – Map[3] from *City of Santa Rosa Downtown Station Area Specific Plan*, illustrating geographic scope and key mobility and urban connection policies (label added by author).

The DSASP's scope covers the entirety of Downtown, a 720-acre district (see Figure 7) that encompasses Courthouse Square, Santa Rosa Plaza Mall, and Railroad Square. The following is a sample of key goals and policies in alignment with many of the ideas we are advocating[4].

- Goal MOB-3, "Strengthened east-west connections and links between Old Courthouse Square and Railroad Square", applies to all possible connections through the mall and under the freeway (including Santa Rosa Creek), taking on the "Barrier" directly.
- Policy MOB-3.1, "Reconnect Fourth Street to provide bicycle and pedestrian access through the Santa Rosa Plaza Mall", recognizes (as we do) the most vital corridor between Courthouse Square and Railroad Square to reconnect.
- Policy MOB-3.2, "Work with Caltrans to provide space for and permit pop-up retail, food, and performances in the underpasses …", applies to all streets (including 4th Street) that pass under the freeway.
- Policy MOB-4.4 advocates (among other public transit improvements) a "Downtown Loop service, connecting the Transit Mall [near Courthouse Square] and SMART Station [in Railroad Square]."

[3] City of Santa Rosa (2020). *City of Santa Rosa Downtown Station Area Specific Plan*. p. 3-12
[4] City of Santa Rosa. pp. 3-14, 3-16

IV. REVEALING THE VISION

The Three Connections

Our previous paper offered five packages of land use and urban design strategies, organized as a collective vision for transforming Downtown's vitality, accessibility, and qualities of place. Key to addressing the Downtown's formidable urban divide, three of the packages—the focus of this paper—apply to urban corridors passing under the US 101 elevated freeway and under, around, or through the Santa Rosa Plaza Mall:

- 4th Street Pedestrian Corridor – the historic commercial axis connecting Downtown and Railroad Square, currently blocked by the mall.
- 6th Street / 7th Street Corridor – north of 4th Street, a linking of two minor streets providing vehicular access between Downtown and Railroad Square, around the mall's north end.
- 3rd Street Corridor / Prince Memorial Greenway – south of 4th Street, a major collector street passing under the mall, and a separate multi-purpose trail along historic Santa Rosa Creek and greenway.

What links these packages is that each involves changes to the layout and function of the mall. One theoretical scenario could involve complete removal of the mall and undergrounding of the elevated freeway—opening up the possibility of restoring the city's historic street grid—however, we have chosen instead to engage the mall as an accepted, settled land use and explore how it can best support Downtown's transformation.

This approach is consistent with the DSASP, which holds the mall and Downtown's traditional storefront retail to represent differentiated, synergistic regional and local markets, both of which are critical to Downtown's current and future economic vitality[5].

Reimagining the Mall

While the Santa Rosa Plaza Mall today may well be the key component of the formidable divide capping Downtown Santa Rosa's urban development potential, we see the mall tomorrow as the iconic catalyst of Downtown's reconnection. What this will require, while supporting the mall's regional retail role, is an inspired mix of physical and programmatic strategies that shift the nature of the mall from an internalized "building" to a vibrant "village" that engages the urban life around it and draws the city in.

In the next three sections, visions of these strategies are at play, drawn collectively from Urban Form (the design of buildings, spaces, and corridors), Realms (the interplay of public and private domains), Land Use (mixed use, horizontal and vertical), and Parking (planning possibilities liberated through consolidation).

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[5] City of Santa Rosa (2020). *City of Santa Rosa Downtown Station Area Specific Plan*. p. 2-5

Connection 1 – The 4th Street Corridor

As described above, strengthened connections between Railroad Square and Courthouse Square is a foundational goal of the DSASP, backed by a key policy to reconnect the 4th Street corridor through the Mall, for use by pedestrians and cyclists. We agree completely, noting in our previous paper, "… if nothing else is completed, this strategy alone would be transformational."

Existing conditions along the 4th Street corridor through the Mall and under the freeway are shown in Figure 8, an enlargement of the Downtown existing conditions map shown in Figure 3.

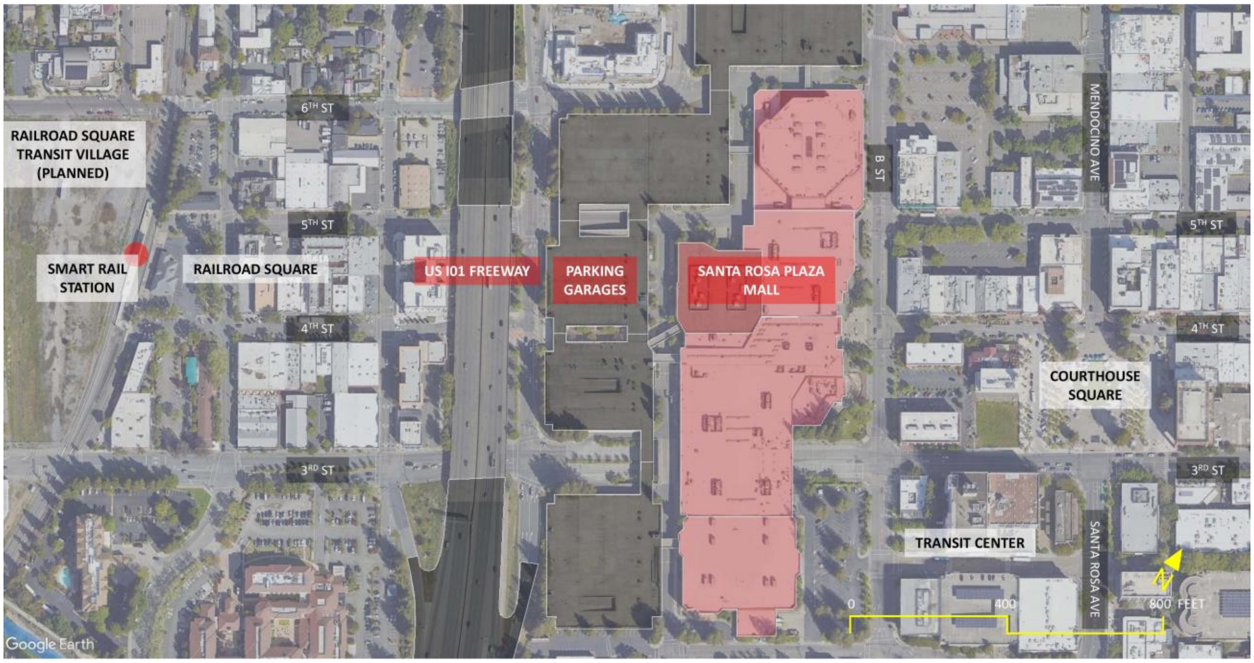

Figure 8 – Existing conditions: the 4th Street Corridor, blocked by the Santa Rosa Plaza Mall.

Our strategy for "breaching the barrier" is to reconnect the 4th Street corridor in the image of a traditional "High Street", a bustling procession of engaging experiences that pull you in and guide you through the Mall and under the freeway. This "externalized" shopping experience—mall as "village" not "building"—has strong mid-20th Century roots in the early "outdoor" phase of shopping center evolution, and continues today in centers such as San José, California's iconic (and extraordinarily popular!) Santana Row.

Moving westward from Courthouse Square to Railroad Square, following are the key elements of our recommended strategy (see Figure 9):

- **Grand Arcade** – Passing through the mall itself, the Grand Arcade creates a 500-foot-long arcaded pedestrian shopping street along the 4th Street axis, inspired by traditional 19th Century models such as London's revered Leadenhall Market (see Figure 10). Although conceived as a mall improvement, the Arcade would function as a public street, requiring a special public/private partnership between the mall and the City to maintain security, urban amenity, and unimpeded public access.

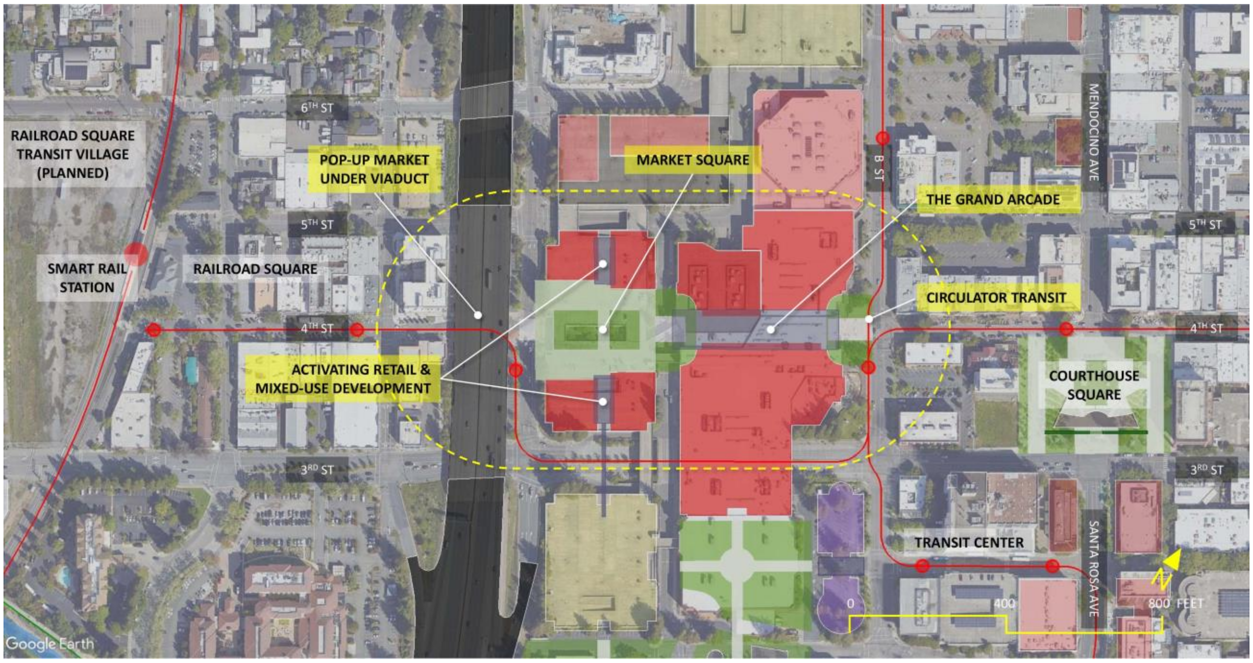

Figure 9 – Proposed key elements: the 4th Street Corridor.

Figure 10 – Shopping Arcade in London's historic Leadenhall Market.

The eastern portal of the Arcade is centered on 4th Street, at the same location as the mall's existing east entrance (see Figure 5). The Arcade can then follow one of two optional paths cutting through the existing mall structure (see Figure 11), offering a measure of flexibility in how the Arcade can be accomplished:

- "Axial" Path – Arcade follows a straight line along the axis of 4th Street, replicating the historic path of the 4th Street connection between Courthouse Square and Railroad Square.
- "Zig-Zag" Path – Arcade follows the zig-zag line of the existing east-west pedestrian concourse through the Mall, diverging from the 4th Street axis to accommodate a stand-alone department store, connected to the mall and under shared ownership.

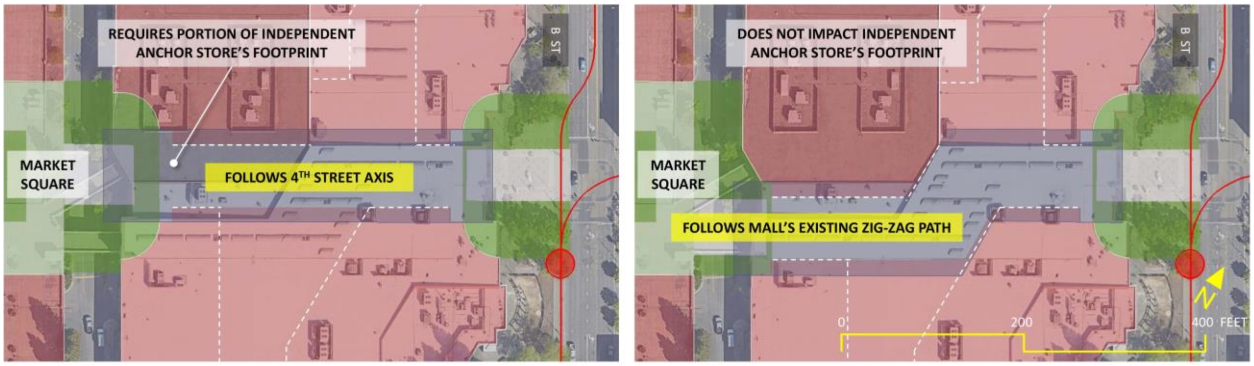

Figure 11 – Grand Arcade alternatives: the "Axial Path" and the "Zig-Zag Path."

In our assessment, both path options offer strong albeit distinct urban design experiences. The Axial path projects a satisfying, ceremonial passage of 4th Street through the mall and under the freeway, establishing precedence of the street grid over the urban form of the mall. Although the Zig-Zag path defers to the anchor store's urban form, the result is a more intimate street with changing vistas that draw the pedestrian forward.

- **Market Square** – Passing through the mall, both options of the Grand Arcade open up into Market Square, a vibrant urban gathering place framed by ground-level retail and mixed-use development. In the sequence of movement along the 4th Street corridor, the plaza provides an expansive spatial release between the Arcade's enclosure and the passage under the freeway.

  Market Square is envisioned as an intense mix of specialty retail and services, indoor/outdoor dining, active and passive open space, children's play opportunities, and outdoor performance. In imagining the size, shape, scale, and programming of the plaza and its framing mixed-use development, we looked to the central plaza of the "Pruneyard", a highly successful "village-style" shopping center, under continuous refinement since it first opened over fifty years ago in the San Francisco Bay Area city of Campbell.

  Figure 12 shows a scaled comparison of Market Square and the Pruneyard's central plaza. Both spaces, of a similar size and scale, are contained and activated by 2 and 3 story development, with upper-level shaded balconies and deep transitional indoor/outdoor spaces at plaza level. Photos of the Pruneyard plaza (see Figure 13) illustrate what's possible at Market Square.

Figure 12 – Market Square and the Pruneyard's central plaza, compared at same scale.

Figure 13 – Views of the central plaza at the Pruneyard Shopping Center.

- **Parking Consolidation** – The combination of Market Square and its framing development will displace the two existing 3-level parking garages that flank the 4^{th} Street axis, accounting for approximately 1,200 spaces. A key part of our strategy, further explained in "Connection 2 – The 6^{th} Street / 7^{th} Street Corridor" (see below), is to replace an adjacent three-level garage to the north of Market Square with a high-level consolidated garage with retail uses fronting 6^{th} Street, augmented by new garage parking (see Figure 16) incorporated within the Market Square development.

- **The Passage** – Current conditions under the freeway, recently enhanced by a palette of "complete street" improvements (see Figure 14), can further be improved through better top-lighting and the introduction of programmed fronting activities. Caltrans (the state transportation department) typically prohibits permanent enclosed development under its structures—however (in addition to storage and parking), temporal activating uses are possible, such as food trucks, farmer's markets, and varieties of "pop-up urbanism." The DSASP directs this approach under Policy MOB 3.2[6]: "Work with Caltrans to provide space for and permit pop-up retail, food, and performances in the underpasses at Fourth, Fifth, and Sixth Streets."

Figure 14 – 4^{th} Street passes under the US 101 freeway (Railroad Square is in the background).

[6] City of Santa Rosa (2020). *City of Santa Rosa Downtown Station Area Specific Plan*. p. 3-14

Connection 2 – The 6th Street / 7th Street Corridor

Railroad Square and the US 101 freeway are linked functionally to Downtown by two local streets, 3rd Street (see Connection 3, below) and 6th Street. To pass around the north end of the mall's parking garages, 6th Street traffic is routed north to 7th Street along a 1-block section of A Street (see Figure 15). Although functional, the 6th Street / 7th Street Corridor lacks amenity and distinction. We propose to transform this through a package of urban design, traffic engineering, and urban development concepts (see Figure 16). This package will pull double duty: improving vehicular access and "active transportation" (travel by bicycle and other forms of human-powered mobility) between Railroad Square and Downtown, while fueling the possibilities of Downtown north of the mall, a neighborhood of growing residential and cultural activity.

Figure 15 - Existing conditions: the 6th Street / 7th Street Corridor

- **6th Street / 7th Street Complete Street** – The idea of a "Complete Street" is to equally serve all modes of travel, from motor vehicles to people on foot. The idea is applied through the lens of "multimodality", which asserts that all modes have specific roles they are best suited for, no mode dominates at the expense of other modes, and all modes are interconnected. "Active transportation"—walking, bicycling, and other forms of human-powered mobility—is the foundation of the Complete Street, recognition that all urban journeys, however complex, begin and end "on-foot."

  Transforming the connected path of 6th Street, A Street, and 7th Street into a Complete Street (see Figure 16) begins with a "gateway" roundabout intersection with Mendocino Avenue, the primary north-south arterial street serving Downtown and Courthouse Square. As a distinctive tree-lined multimodal boulevard, the street continues west, around the north end of the mall, under the freeway, and through Railroad Square, connecting to the SMART train depot and future Railroad Square Transit Village. Standard features (see Figure 17) include right-sized traffic lanes, wide sidewalks, separated cycle tracks, and decorative streetlighting.

The DSASP pays similar attention to this corridor, recommending traffic-calming roundabouts at the A Street / 6th Street and A Street / 7th Street intersections[7], an expression of DSASP Goal MOB-1[8] which asserts "A well-connected street grid that optimizes multi-modal access, connectivity, and safety for all users."

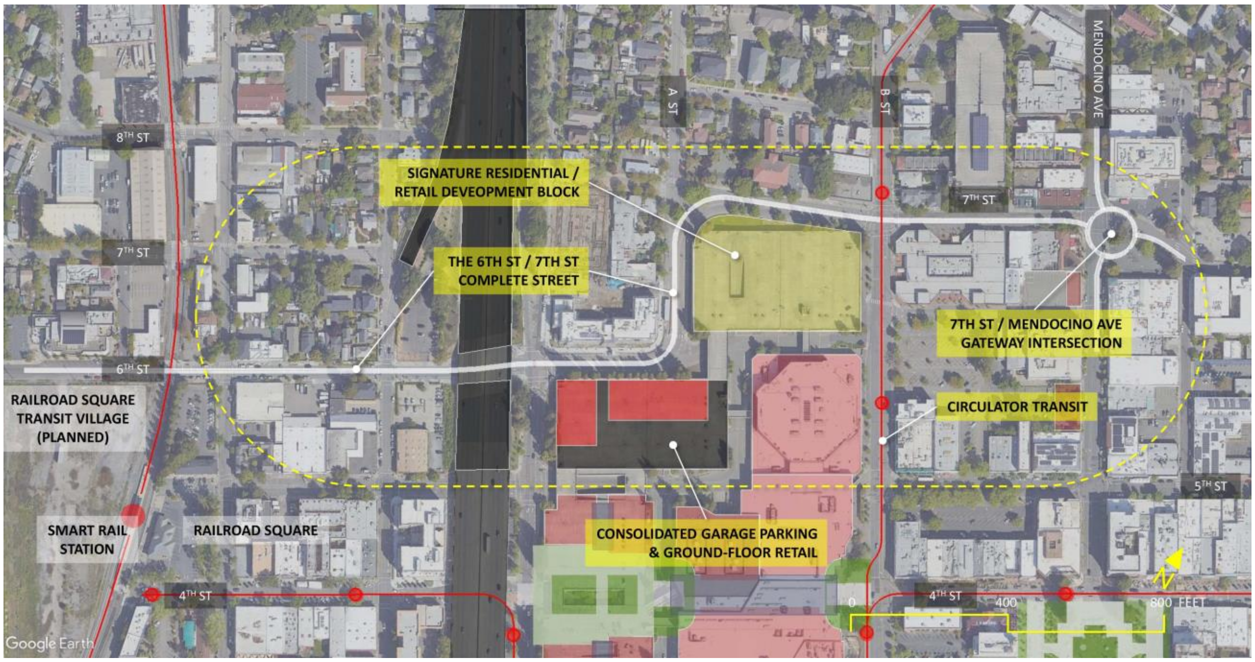

Figure 16 – Proposed key elements: the 6th Street / 7th Street Corridor

- **An Anchoring Residential / Retail Opportunity** – The Santa Rosa Plaza Mall sits within an area of downtown with a Floor Area Ratio of 8.0, the highest FAR assigned by the DSASP[9], incentivizing high density mixed use development. This creates an opportunity (see Figure 16) to replace the mall's northernmost 3-level parking garage with an iconic multistory residential mixed-use development with ground floor retail and services along its 7th Street, A Street, and B Street frontages. Below-ground parking could serve mall employees and customers as well as tenants, thus restoring some of the site's current parking capacity.

  In our first paper, we suggested a farm-to-table supermarket—perhaps modeled on Berkeley, California's famous "Berkeley Bowl West" (see Figure 17)— as a potential anchor tenant, among many possibilities of commercial, public, service, cultural, and recreational uses supporting the needs of Downtown's growing residential population.

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[7] City of Santa Rosa (2020). *City of Santa Rosa Downtown Station Area Specific Plan*. pp. 3-5, 3-6 (Map)

[8] City of Santa Rosa (2020). p. 3-4

[9] City of Santa Rosa (2020). p. 2-16 (Map)

Figure 17 – Left: a Complete Street in Carmel, Indiana, USA showing a separated bicycle track in the sidewalk, traffic-calmed roadway, landscaped buffers, trees, and street furniture. Right: the iconic Berkeley Bowl West.

- **Consolidated Parking / Retail Block** – As a key element in dramatically reducing the mall's parking footprint, the existing 3-level garage in the block between 5th and 6th Streets is replaced by a high-level garage (see Figure 16) absorbing much of the parking lost to other garage displacements (see "Market Square", above). The ground floor combines parking access ramps and mixed-use development: along its 6th Street and Morgan Street frontages, retail uses activate the sidewalks, leading south to Market Square and the Grand Arcade.

  6 levels of parking on this block (above the ground floor) will accommodate roughly 2/3 of the parking transferred from the Market Square blocks in addition to the block's current garage capacity, and the DSASP-assigned FAR of 8.0 allows significant vertical development.

Connection 3 – The 3rd Street Corridor / Prince Memorial Greenway

South of the 4th Street Corridor are two additional connections between Downtown and Railroad Square (see Figure 19). Passing under the Santa Rosa Plaza Mall in a shallow tunnel, 3rd Street is the major arterial connection between Downtown and the US 101 freeway. South of 1st Street is the iconic Prince Memorial Greenway (see Figure 18), a richly landscaped and detailed trail along historic Santa Rosa Creek, at the core of the City's network of pedestrian paths and bikeways.

Figure 18 – Images of Santa Rosa Creek, along the Prince Memorial Greenway.

Despite its vision and beauty, the Greenway's potential is underutilized due to widely held, legitimate concerns for safety and security. In contrast to successful urban river transformations such as San Antonio, Texas's world-famous *Paseo del Rio*, Santa Rosa backs-up to the Greenway with little visual oversight or activating public or private activities.

The area bounded by 3rd Street to the north, the US 101 freeway to the west, B Street to the east, and the Greenway to the south—approximately 9 acres—is considered a "Catalyst Site" in the DSASP[10], a key element in fulfilling Downtown's urban potential. The area currently embraces the south anchor of the Mall—a defunct Sears department store and automotive service center—and the Mall's southernmost 3-level parking garage.

Figure 19 – Existing conditions: the 3rd Street Corridor / Prince Memorial Greenway

Our proposals for this area (see Figure 20) combine public/private activation of the Greenway with a vision of a new Civic Center and community gathering place, expressing Policy LU-2.4[11] of DSASP to "Explore opportunities to consolidate City and County facilities in a new civic center complex Downtown." Targeting this site already has precedent in a recently considered (albeit now dormant) proposal by Sonoma County for a public-facing administration and service center.

- **Activating the Greenway** – The key to invigorating the Prince Memorial Greenway is a promenade of active uses—principally outdoor/indoor dining and entertainment venues—spaced along the north bank of Santa Rosa Creek, incorporating and overlooking the Greenway, and reinforced by active mixed-use urban development connecting city and creek.

[10] City of Santa Rosa (2020). *City of Santa Rosa Downtown Station Area Specific Plan*. p. 2-6 (Map)
[11] City of Santa Rosa (2020). p. 2-16

Key sites (see Figure 20) include the fronting Hyatt Regency Sonoma Wine Country hotel south of Railroad Square, and three creek-facing blocks along 1st Street in Downtown:

- US 101 to A Street – Former Sears Automotive Center, across 1st Street from the mall's southernmost parking garage.
- A Street to B Street – Office building and converted industrial building (currently occupied by a brew pub and appliance store), across 1st Street from the former Sears store.
- B Street to Santa Rosa Avenue – Office building and surface parking, across 1st Street from City parking garage, office building, and cinema.

All of these blocks have opportunities for Greenway activation through adaptive use of existing buildings and new infill development. The two blocks between US 101 and B are vital elements of our Civic Center vision, described below. Other opportunities include a creek-side café, restaurant, or bar at the Hyatt Regency hotel, creek-facing redevelopment of the Auto Center site, and infill development of a parking lot between B Street and Santa Rosa Avenue.

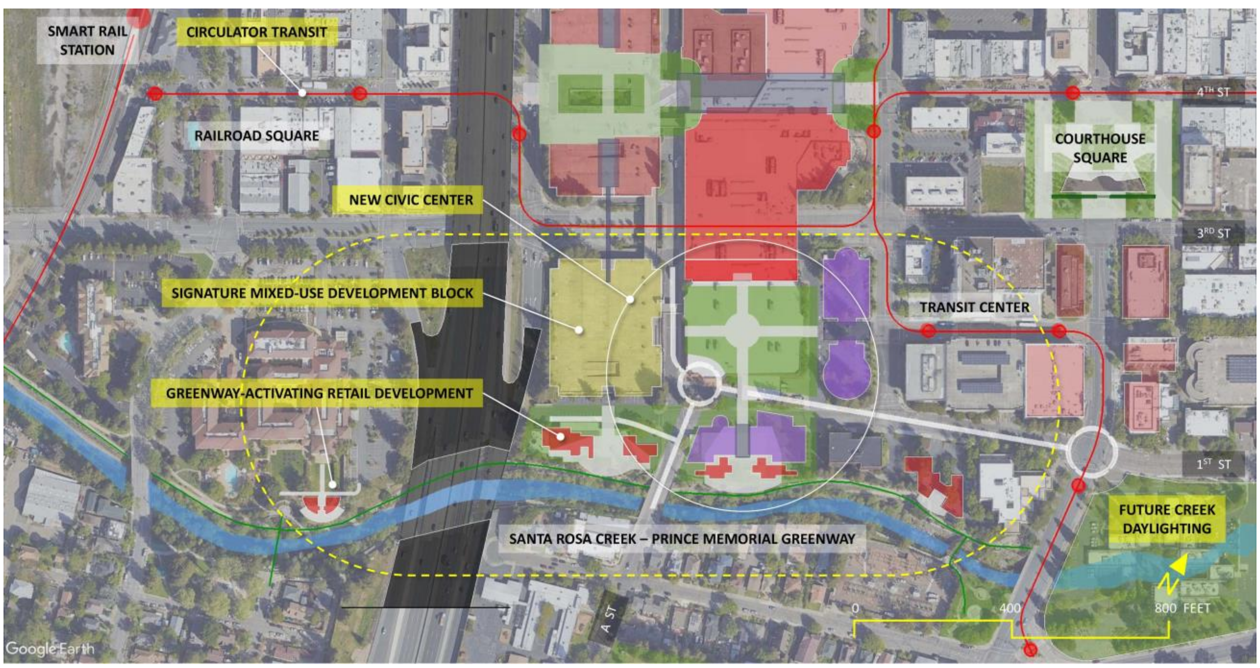

Figure 20 – Proposed key elements: the 3rd Street Corridor / Prince Memorial Greenway

- **A New Civic Center** – As the central and organizing element of Civic Center, the former Sears store is replaced by Civic Green (see Figures 20 and 21), a central plaza and gathering place dedicated to civil, political, ceremonial, and performance functions. The space consists of four quadrants at the intersection of two axes that weave the Center into Downtown's geometry:
  - North-South Axis – The axis of the north-south concourse through Santa Rosa Plaza Mall, crossing 1st Street and terminating at the Greenway.

- East-West Axis – The axis of 2nd Street, passing through the Downtown Transit Center, crossing B Street, and terminating at the US 101 freeway.

The Civic Center is formed by the following elements, framing the four sides of Civic Green:

- East: New City Hall – Featuring a glazed atrium astride the east-west axis leading into Civic Green, City Hall presents its formal public face to 2nd Street and the Downtown Transit Center. The building's iconic presence is visible along the north reach of B Street, including the 4th Street corridor and the entrance to the Grand Arcade.
- West: New mixed-use development block – An elegant building here could be many things—boutique hotel, multi-family housing, museum, market hall, mini-conference facility, school, even governmental or private offices—all supported by activating retail / commercial uses facing Civic Green.
- North: New south face of Santa Rosa Plaza Mall – With the former Sears store removed, the exposed south face of the mall is adapted to include new retail uses fronting Civic Green, while creating an attractive portal to the mall's north-south concourse.
- South: New Sonoma County Central Library – Fronting the south side of 1st Street, the new library interacts directly with Civic Green and the Prince Memorial Greenway, connected through the library's central concourse astride the north-south axis. The Greenway passes through a shaded patio and vista point, framed by indoor/outdoor dining opportunities.

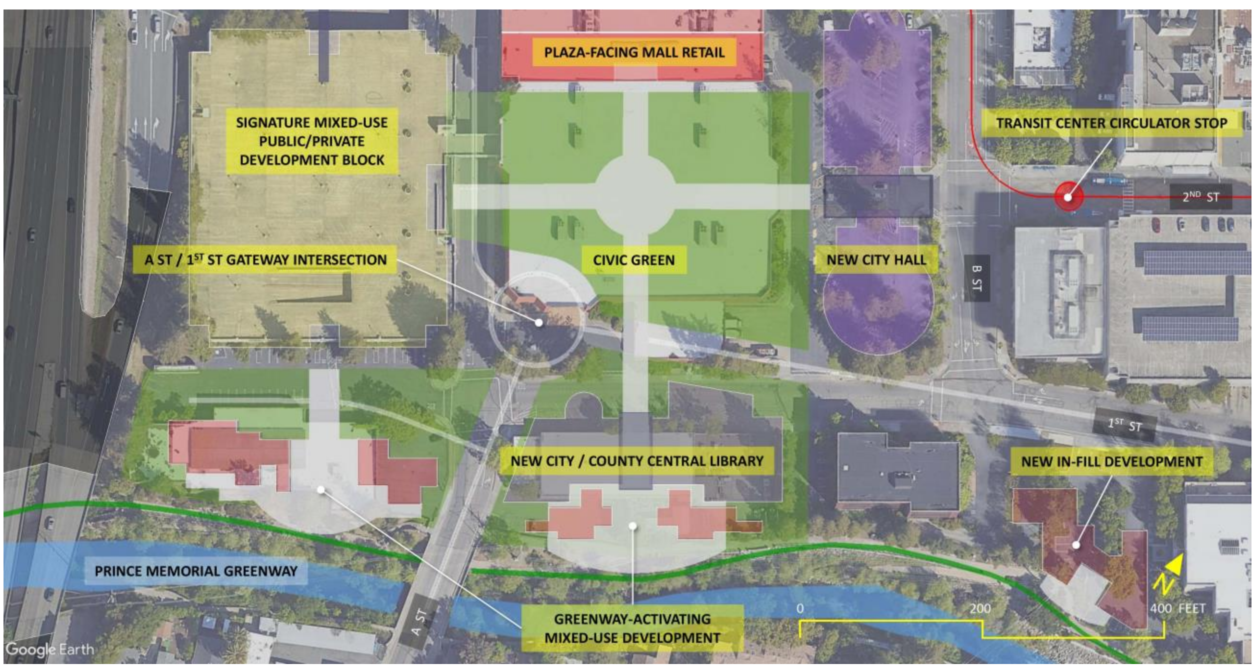

Figure 21 – Features of the proposed Civic Center.

- **Access, Circulation, and Parking** – Additional features (see Figure 21) that support the Civic Center vision and Greenway activation include:

  - Integrated development of Civic Green and its framing land uses opens up the possibility of generous subterranean parking and service access under much of the Catalyst Site. The primary access can be through a right-in / right out garage portal on eastbound 3rd Street where it dips down to pass under the mall between A Street and B Street.
  - A diagonal realignment of 1st Street between A Street and Santa Rosa Avenue opens up more space for the Central Library and creek-side development, while creating an improved intersection with A Street's approach from the south across Santa Rosa Creek.
  - Removal of the Sears store allows pedestrian traffic along the south side of 3rd Street to pass through Civic Green instead of following 3rd Street's dip under the mall.
  - Civic Center is accessed directly from the Downtown Transit Center along 2nd Street, and by future Railroad Square / Courthouse Square circulator transit, as advocated by the DSASP (Policy MOB-4.4)[12] and further explored in our original paper[13].

The Vision Expanded

Although the focus of this paper is on restoring the "Three Connections" between Railroad Square and Courthouse Square, our original paper, *A Downtown Reimagined…*, explored other ideas for downtown revitalization, all embedded in community conversations and as goals and policies in the DSASP and other plans. These ideas include (refer to original paper for details):

- Daylighting Santa Rosa Creek east of Santa Rosa Avenue, after City Hall is relocated.
- Completing Downtown's Living Room—new ideas for historic Courthouse Square.
- Activating Downtown streets through retail infill and new mixed-use development.
- Circulator transit between Railoard Square and Courthouse Square, linking Downtown with regional rail transportation while supporting walkability.

V. TAKING ACTION

Developing this paper and the prior paper on this subject delivered at the 58th IMCL conference in 2022, the authors reviewed previous work by and for the City of Santa Rosa, including the 1998 R/UDAT Report (see Page 8), and the 2020 *City of Santa Rosa Downtown Station Area Specific Plan.* The authors also interviewed key policy makers, staff members, consultants, and business members of the Santa Rosa community.

It is clear that the *Downtown Station Area Specific Plan* (or DSASP) is a supportive foundational framework for the interlinked strategies described in this paper for breaching the formidable barrier

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[12] City of Santa Rosa (2020). *City of Santa Rosa Downtown Station Area Specific Plan*. pp. 3-6, 3-17 (Map)
[13] D Woltering, R Phillips (2022). *A Downtown Reimagined…* . pp. 18, 19 (Map)

formed by the elevated freeway and shopping mall, substantially improving connections between Railroad Square and Courthouse Square. The DSASP provides support for ground floor activation, a compact mixed-use development pattern allowing for a broad range of land uses, and significant opportunity for adding new housing units in the downtown. The City offers incentives, including fee reductions, process streamlining measures, an infrastructure funding program, and formal advisory groups to address downtown economic development issues.

Progress is being made, but there is yet much to do for Downtown to reach its true urban development potential. Along with restoring the critical connections described in our papers, Santa Rosa's Downtown needs to address the "Wow" factor! As part of the interlinked strategies presented in both of our papers, it will be extremely important for there to be authentic "signature" attractions for residents and visitors alike in Downtown. These attractions are essential for true placemaking, for residents to enjoy and be proud of, and for visitors to spread the word and keep returning.

The authors assert that the City, in combination with our strategies and with the programmatic support of the DSASP and other City plans, can create that special place for residents and visitors alike. The 4th Street Pedestrian Corridor strategies are foundational in restoring the essential connection between Railroad Square and Courthouse Square, yet also clear the path for the equally iconic 3rd Street Corridor / Prince Memorial Greenway strategies with its new Civic Center, activation of the Greenway, and the further daylighting of Santa Rosa Creek. Indeed, each of these strategies can catalyze more strategies, all organized under a common commitment to long term visionary success.

Critical to successfully realizing this long-term vision is a durable alignment and commitment, both in terms of priority and continuity, by successive cohorts of City Council members, City Managers, City Staff, and community members. Champions are critical, as is the process of education and succession planning, both essential for Santa Rosa's Downtown to achieve its true urban potential.

Topics to be addressed in achieving this vision include the following:

- **Placemaking**
    - Facilitate creating places that have a diversity of uses, attracting a broad range of people at different times of the day.
    - Destinations that attract people are important like museums, parks, and shopping opportunities.
    - Include special destinations that give identity, a sense of place, and a sense of community pride.
    - Provide for the safety, comfort, and opportunities for social interaction for people visiting the places.
    - Create places where people want to be and are proud of.

- **Governance / Leadership**
  - Leadership should support community-based, inclusive public engagement processes to develop the place-making vision, implementation of the vision, and typical adjustments to that vision over time.
  - It is important for leadership to have a sustained commitment to implementing the adopted vision and appropriate adjustments to the vision over time.
  - This commitment to the vision and its implementation are important to ensuring support from various stakeholders, including property owners, investors, merchants, staff members, and community members, for realizing the vision. This is a long process and a sustained commitment beyond the terms of individual decision makers requires education, mentoring, and succession planning.
- **Planning Policy / Regulations**
  - As the vision is developed and adopted, it is important to have supporting policy documents and regulations to support the vision. In the case of Downtown Santa Rosa, the Downtown Station Area Specific Plan (DSASP), is a good example.
  - It is important for the staff and decision makers to support the vision through implementing policies and regulations on a consistent basis to give certainty to permitting processes that applicants can depend on so they are willing to invest the capital and time in supportive projects.
- **Public Participation**
  - Successful placemaking is about having inclusive, community-based engagement in developing the vision and its implementation.
  - With a successful community-based public engagement process, there will be community ownership and support for the implementation of the vision—the vision will reflect the desired community uses, activities, culture, and identity.
- **Equity**
  - An inclusive, equitable public engagement process will better assure that access, use, activities, and use of the place will be enjoyed by a full range of community members and visitors.
- **Accessibility / Mobility**
  - Successful placemaking requires understanding the population that is to be served and assuring that all ages and abilities have access whether walking, bicycling, using public transit, or driving, and must include special transit accommodations for those who have mobility challenges.
- **Infrastructure**
  - Public infrastructure should create not only a safe and comfortable place, but be beautiful and inspiring. Public infrastructure includes Complete Streets that accommodate all modes

of transportation safely, comfortably, and conveniently. Such streets include protected bike lanes, separated pathways, and sidewalks with places for people to sit comfortably. Beauty and inspiration arise from street trees, planted areas, public art, and a sense of connection to nature, culture, and community values and priorities.

- **Sustainability**
  - A compact mix of land uses, with complete streets that encourage walking, bicycling, and use of public transportation, should be encouraged to reduce vehicle trips, energy usage, and greenhouse gas emissions.
- **Development Financing**
  - Clarity and certainty in the processing of proposed development projects is critical in terms of containing the costs associated with land development.
  - As one example, cities can put into place special financing districts to assist with certain development costs like infrastructure development. Santa Rosa and Sonoma County have put in place an Enhanced Infrastructure Financing District (EIFD) to assist developers with constructing supportive infrastructure for their development projects.
  - Tax-credit programs for affordable housing are another example.
  - Reduced parking standards, first-time home-buyer low interest loan programs, and reduced development application fees are other examples of how cities, including Santa Rosa, are helping directly and indirectly to support development financing.
- **Stewardship**
  - Inclusive, community-based public engagement placemaking processes initially and ongoingly are extremely important in generating a sense of community ownership, use, and pride of a place. This is critical for the on-going stewardship of places.
- **Public / Private Partnerships**
  - It is important for public entities to understand the objectives and constraints of private sector entities when attempting to develop public / private partnerships to create and implement a vision for transformation. The many challenges include multiple property ownerships, tenant leases, parking leases and agreements, current revenues vs. projected costs for transformation, and financing. Clarity of commitment from the public sector is important for the private sector entity to move forward with a plan. It is often helpful to consider phasing, working with aspects of a current development that is not performing well and using that as a focus for an initial phase that may prove catalytic to move forward a more comprehensive plan for transformation.

All of these factors are at play on the long game of transforming the Santa Rosa Plaza Mall from an internalized building to a vibrant urban village, the foundational strategy in achieving this worthy vision for reconnecting Railroad Square and Courthouse Square.

IV. CONCLUSION

The authors hope the synthesis of ideas, strategies, and recommendations in this paper not only are beneficial to the City of Santa Rosa as it works towards achieving the true urban development and placemaking potential of its downtown, but also that representatives of other communities experiencing similar circumstances can benefit from our work as they work to make their communities more livable. In performing our work and crafting our recommendations, we continue to be inspired by the values of International Making Cities Livable, as captured succinctly in IMCL's "Four Principles of True Urbanism:"[14]

- Facilitate COMMUNITY SOCIAL LIFE
- Facilitate CONTACT WITH NATURE
- Facilitate INDEPENDENT MOBILITY
- Facilitate HEALTHY URBAN FABRIC

Finally, it must be emphasized that an inclusive and equitable process to develop and adopt this vision, and a sustained political will to support it over time, are both critical in the achievement of inspired, transformative, and enduring outcomes. The authors wish you much success in your efforts to identify, engage, overcome, and transform the challenges in your communities!

APPENDICES

A. Summarized Conversations (Interviews) Conducted in Support of this Paper

- Clare Hartman, Director, Planning and Economic Development Department, City of Santa Rosa, August 24, 2023:

    - Planning and Economic Development staff members have focused on providing the staff support to assure the necessary policy and regulatory documents are in place, e.g., *City of Santa Rosa Downtown Station Area Specific Plan* (October 2020), to guide the positive transformation of Santa Rosa's Downtown.
    - Department staff members have implemented City Council directives to reduce development fees and streamline development review processes and timelines with the objective of making development less costly and more predictable in the City of Santa Rosa. These requests were initiated by development community members to facilitate development in Santa Rosa.
    - While in agreement with better integrating the Santa Rosa Plaza mall into the overall downtown and creating stronger connections through and around the mall, she pointed out

[14] S Crowhurst Lennard (2019). *A Healthy City for All*. pp. 11, 16, 18, 22

the challenges that exist with the mall property being privately owned by multiple entities, with existing long term tenant and parking agreements.

- Clare Hartman, Director, Planning and Economic Development, and Raissa de la Rosa, Deputy Director, Economic Development Division, City of Santa Rosa, August 28, 2023:

    - The City of Santa Rosa has followed most of the recommendations in the Council of Infill Builders report, *Accelerating Infill in Santa Rosa & Sonoma County* (November 2018), to address the exacerbated housing shortage and rebuilding efforts following the 2017 wildfires in Santa Rosa and Sonoma County that caused the loss of approximately 5,000 housing units. The recommendations focused on expediting the review and permitting process and reducing developer fees.
    - Downtown, including Courthouse Square, the Santa Rosa Plaza Mall, and Railroad Square all have distinct "brands."
    - The Mall currently offers a strong revenue stream to the City of Santa Rosa.
    - Bundling of funding sources will be needed to realize the vision for transformation proposed by the authors for the Santa Rosa Plaza Mall and surrounding area: Real Estate Investment Trust (REIT), Qualified Opportunity Zone Funding, Renewal District, etc.
    - The extension of 4th Street through the Mall, while frequently discussed, is problematic. Issues include multiple private ownerships, sharing responsibilities in public/private partnership, transient and unhoused populations, etc. Also, no identified funding source from the city of Santa Rosa at this time.

- Paul Schwartz, Commercial Real Estate Broker, Corcoran Icon Properties, Santa Rosa, CA, September 1, 2023:

    - Noted the importance of the City of Santa Rosa as a regional major business, medical, technology, and service center.
    - Noted the challenging and adverse impacts on Courthouse Square's day-to-day activity levels, surveillance, etc., of the mid-rise, monotonous office and banking buildings surrounding portions of the Square.
    - Suggested a broader range of uses in the downtown including pre-school, performing arts, and convention/event center. Suggested these uses, including another hotel, east of Highway 101 in the Downtown District to further activate this area.
    - Suggested the former Sears Site at the southern end of the Santa Rosa Plaza Mall and the surrounding area further south to Santa Rosa Creek and the Prince Memorial Greenway as an opportunity site, given the site's vacancies and underutilization of properties, for moving forward with the authors' 3rd Street and Greenway strategies as a catalyst for transforming the Mall into the mixed-use "vibrant village" as the authors envision.

- Noted that there are existing organizations like the Downtown Action Organization (DAO) that are working towards improving safety, maintenance, and programming of activities in Santa Rosa's Downtown.

B. Cited References

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PURPLSOC

The Production of Cities: Christopher Alexander and the problem of “System A” at large scale.

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Abstract:

This paper sets out to respond to the question of whether, and how, can Alexander's system A of generating beauty and life in the world be implemented at the large scale. We show that the generation of beauty in cities is a question of time not scale, and that it is a product of morphological evolution, typified by what we call: informal participation. The mechanistic system codified and developed in the last 70 years for building the environment (system B) is not able to accommodate informal participation, and thus incapable of creating beauty or life. It is not planning per se that is the problem, but knowing what needs and can be planned, and what needs to be allowed to evolve. Thus, planning's role can be redefined as creating the structures, both physical and regulatory that will allow informal participation to occur freely and create life, beauty and wholeness in the built environment.

Keywords: *urban design; grid, building process; urban morphology; built environment;*

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1. Christopher Alexander and the large scale: re-framing the conflict between System A and System B.

Alexander's last book *"Battle"* (Alexander, Neis, & Moore-Alexander, 2012) describes how vital establishing a human system of construction is, as opposed to the current system dominated by image, power and money; Alexander names the former "System A" and the latter "System B". In the last chapter of the book, he leaps from the description of one complex project, the new Eishin campus in Tokyo, Japan, which he and the book's co-authors designed and built, to a vision of rebuilding a civilization. There is a gap, however, between the singular project, serving one client, for a single purpose, and the coordination and accommodation of multiple agents striving for different, often conflicting, purposes, typical of urban design. That this gap exists and is felt as an issue by the authors themselves, is confirmed by one of them, Hajo Neis: he describes how Chapter 24, entitled *"Large scale building production: Unification of the Human System and the Physical System"*, was ultimately cancelled before publication (Neis, 2014). This anecdote, as the authors confirmed in person, highlights how the problem of System A at large scale was felt by Alexander to be not resolved enough, at the date of "Battle"'s publication in 2012, to be included in the book.

This problem is of great importance to us for three reasons: first, because Alexander's approach has shown a considerable amount of success when applied at the small/medium scale, and bringing it up to the urban level would just expand its benefit; second, because his insistence on fine-grained community-driven and direct construction appears particularly aligned with the predominantly poor and informal character of urbanization in the Global South, which is where the fight for a sustainable future will be won or lost over the next two generations (Alexander, 2004; U.N.DESA, 2014); finally, because his profound attachment to the evolutionary principles of life in all aspects of building makes his life-long investigation increasingly central in the current debate on a new science of cities and city-planning (Mike Batty & Marshall, 2009). In order to approach the problem, in this paper we set out to explore the following: what is it exactly that prevents System A to be as explanatory and helpful in the large scale as it is in the small scale?

We start in Section 2 by reframing the question within an evolutionary understanding of urban form, by observing the way life occurs in small vs. large-scale, homogeneous vs. heterogeneous, and short vs. long-time building processes. In Section 3 we explore System A at work as a *beauty generating* system of production more than anything else; this leads us to conclude that the problem, which emerged as a *scale* issue, is rather in essence a *time* issue, in fact much more a long-term than a large-scale problem. We then go back to Alexander, in Section 4, reviewing his own attempts at defining the problem of System A at large scale, in the light of our new focus on time. In the Conclusions (Section 6) we sum up our findings and clarify that in order for System A to be viable at the large scale, and therefore capable of meeting the challenge of the mainstream, it must necessarily develop a closer comprehension of the specific dynamics involved when we want to build beauty *in the long term*.

2. Cities as products of cultural evolution: towards a discipline of the post-design.

At first glance, the problem of scale seems to relate to the difference between small and large "projects". That appears to come down to three essential dichotomies: small vs. large-scale, homogeneous vs. heterogeneous and shorter vs. longer projects. However, we should resist the temptation to link up too tightly the project's size, *per-se*, with its profound nature, for example its *complexity*. In other words, smaller projects are not necessarily simpler than larger projects. It is the architecture of the internal relationships between the components of a phenomenon that tells us about its complexity, not its sheer size. Weaver (Weaver, 1948), 1948, later quoted by J. Jacobs (Jacobs, 1961), notoriously distinguished in Nature three types of phenomenon: simple, complex/disorganized, and complex/organized. According to this distinction any process of construction, at any scale, is a problem of organized complexity, as it typically involves human systems of decision makers, environmental systems of spatially defined features and a cultural system of technology, language, images and habits, all of them entailing non-random patterns of mutual relationships between their internal components as well as between themselves as wholes. Projects that operate at the small scale of the building or the aggregate of buildings and those at the large scale of the neighborhood/city are certainly different in size, but the dynamics that govern them, the kind of actors and the system of control involved along with their fundamental mutual relationships are in fact similar.

One thing that we can see very clearly at the large scale, however, and tends to remain hidden at the small scale, is that change in cities does not happen only "by-design" through centralized "projects". In other words, dynamics of continuous modification of the built environment out of any central overarching control are normally clearly visible in the way the urban fabric of cities changes at a large scale (Whitehand, Gu, Conzen, & Whitehand, 2014). In such processes, the elements of the systems involved, human, regulatory, even cultural, typically change in a predominantly uncoordinated way, in a dynamic that is characterized by patterns of emergence and self-organization rather than central control and implementation. Far from being occasional, this type of change is ubiquitous in cities; it is the product of an *evolutionary* process which makes urban system similar, analogous in fact, to ecological systems at the structural level (Holling & Goldberg, 1971). On what basis then should we talk of evolution in cities in the context of the present discussion on System A at large scale?

Pretty much like beautiful cities, other products of human culture such as marvelous tales that make our life more significant to us all, majestic dreams which embed the essence of our feelings for things like death, birth, youth, courage and fear as a collectivity of human beings, incredibly intelligent skills that allow us to acknowledge each other, light a fire, fly in the air like birds at unbelievable speed or make others understand the most subtle nuances of our moods and thoughts, have never been designed as such by anybody. Though somebody at some point may have designed some of the intermediate steps that brought these things to their current configuration, overall they are what they are because they have *evolved*, and indeed they continue to do so. Obviously, when using the word "evolution" in the context of a study on urbanism we must be aware that we are practicing an analogy, that of the city as a living organism, which is seemingly as old as the human thought on cities and design (Marshall, 2008; Steadman, 2008). However, while biologic evolution increasingly seems to offer a fertile ground for the interpretation of phenomena that go well beyond the boundaries of life sciences, including cultural such as the human language (Pagel, 2009), a truly evolutionary approach to cities, as opposed to a conventional biomorphic or at best developmental, is still to be regarded as a matter of pioneering research (Michael Batty & Marshall, in print; Dibble et al., in print).

For the sake of this paper and the problem of System A at large scale, it will suffice to highlight that acknowledging the evolutionary nature of urban change means two things:

1) If we are to decipher why buildings and cities are what they look like today, we need to utilize a *structural* approach. That is: acknowledging that there is something in what we see that is permanent and ubiquitous – "patterns" of change, or *the structure* – around which endless diversity occurs by means of unforeseeable uncertainty. That is the way life takes shape on our planet from an evolutionary perspective, as well as the way other non-living realities work, like chemical or cultural. If city form is a cultural product, which in all evidence is the case, we need to understand how it evolves as such: an entire new branch of urban science has to be established and develop starting in the area of *urban morphology*.

2) We should, all of us, architects, planners, urban scholars, practitioners, make a big leap from a culture that is mostly preoccupied with the design phase (and the designer/author) to that of the *post-design*. Despite our widespread and undisputed obsession for the design phase, what happens to the urban realm after construction is much more important to us than what happens before it. If we design and plan cities under this new perspective, everything takes a different shape and seemingly established priorities get rapidly subverted: for example, the importance of what we do in the design phase is measured against the consequences that it generates in the post-design rather than *per-se,* like if "there was no tomorrow". In a nutshell, we find ourselves in a new territory: *designing for change*. This territory requires a whole set of different understandings and tools, or, in fact, *a different discipline*.

Most processes of change are of an evolutionary nature, and although they are more evident at the large scale, they regularly occur in fact at all scales (Brand, 1995; Moudon, 1986), interspersed as they are by designed projects. It seems that pre-planned, designed interventions are always followed by evolutionary change, which is made up of many, if smaller scale, designed projects. So our attempt to understand what makes the large scale of development particularly hostile to System A seems to reach a dead end, as there is nothing really, in the large scale per-se, that seem to make a real difference in the nature of the processes of urban change involved, being them centralized (projects) or emerging (evolution) (Fig.1). However, with the new focus on *time* that is central to the evolutionary approach mentioned above, we can capture two fundamental principles in urban change that would otherwise get lost: firstly, by definition project change always and solely occurs in the design phase, while evolution always and solely in the post-design; secondly, Project change occurs always and solely over a much shorter amount of time than Evolution. By "much shorter" we mean substantially shorter, in a way that involves an entirely different time-scale. If we compare the two types of change with the duration of a human generation, say about 25 years, we can assume that Project change certainly works at a sub-generational time-scale, whilst Evolutionary change usually happens at a super-generational time-scale[1].

[1] What we mean here by "time frame" is the generative time that it takes to decide, design and build the project, not necessarily its functional/structural/financial life-span, which may typically be much longer.

FIG. 1 ABOUT HERE

Left: spatial scale does not characterize either of the two different forms of urban change (project and evolution), which equally occur at small and large scale. Middle: time, on the contrary, effectively distinguishes the type of change: projects occur in the design phase only, while evolution in post-design only. Right: analogously, projects normally work over a sub-generational (five years) time-scale only, while evolution over a super-generational (five generations) only. Source: authors.

These two observations, as we will see in the rest of the paper, are of enormous importance, and key to resolve the problem of System A at large scale. Their importance comes through when we analyze System A as essentially a system of *beauty generation*. Under this light, the question is not only who generates beauty and how, but also and primarily: *when* is beauty generated?

3. West Dean, Piazza Santo Stefano and Athole Gardens: the problem of building beauty.

Our cities are very often, in all evidence, amazingly beautiful. Endlessly different manifestations of profoundly rewarding historical urban environments are before our eyes everywhere in old cities, and they emerge sometimes, often at smaller scale, certainly much more occasionally, in recent urban developments. We introduced this obvious observation in a personal conversation with Alexander, emphasizing the role that self-organization plays in generating beauty when large scale and heterogeneity are involved in the long term. We also dropped the word “evolution” by proposing that diversity and beauty emerges at the large scale, that of cities, in ways that may be entirely different from those that occur at the small scale. We argued that we don’t work for building something immediately beautiful, but something that may become beautiful, everything going well, in five generations. After a few seconds of silence, Alexander replied: *“No, I can do that in five years”*. To demonstrate that, the day after we were accompanied to visit the West Dean College’s Visitors Centre, built in 1994-95 near Chichester, West Sussex, UK, for the Edward James Foundation by Alexander and colleagues of the Center for Environmental Structure (CES). There we could test with our eyes the appropriateness of Alexander’s claim: yes, that timeless quality, the one that makes you sit and breath in peaceful respect and joy, the “quality without a name” (Alexander, 1979), or “wholeness”, or “beauty”, or simply “life” (Fig.2), was there in tangible, startling abundance. And it is true: he did that in five years.

FIG. 2 ABOUT HERE

Christopher Alexander’s “quality without a name” as a Wholeness/Life/Beauty circle. This diagram is our interpretation of part of hand-drawn sketch entitled “Chris’ learning curve”, created by Maggie Moore Alexander in 2014 and graciously donated to us. We use it here under her kind permission.

We were brought, on that occasion, before two apparently opposing realities: on the one hand, Alexander could actually generate beauty in five years (West Dean); on the other hand, the world is full of urban places which clearly exhibit the same quality without Alexander’s design, nor indeed anybody else’s. If we are to approach the problem of why System A has not become mainstream, we need to understand whether, and in what sense, Alexander himself was essential to creating beauty in West Dean, and how, on the other hand, the same beauty comes across without Alexander, or any other particular creator, in so many other cases that we can observe in the world, and does that *as a rule*.

We propose that in order to resolve this apparent contradiction, in line with the evolutionary orientation that we have assumed, we need to focus primarily on the element of *time*: it took five years to generate West Dean; however, it took centuries to generate the same beauty in Piazza Santo Stefano in Bologna, for example, or the Athole Gardens in Glasgow's west-end (Fig.3). To advance in this direction we need to elucidate the nature of the processes that were at work at West Dean, as compared to those that shaped our historical cities to a similar level of beauty, but in a much longer amount of time.

FIG. 3 ABOUT HERE

Above: West Dean Visitors Centre, Chichester, UK. Designed and constructed by Christopher Alexander and CES in a few years. Middle: Piazza Santo Stefano, Bologna, IT. Evolved in about two millennia from a bifurcation along the street that connects Bologna with Tuscany. Bottom: Athole Gardens, Glasgow, UK. Master planned in the second half of the XIXth Century. Beauty is clearly generated in all these three cases. Source: authors.

3.1. The West Dean's way: building beauty in five years

In a System A approach to design and building, the most important thing is the *content of life* that is brought into the process. The way it happens may take different forms, but it is always and mainly about bringing life into the practical everyday sequence of actions that constitutes the building process in all its phases. There are three ways by which life can be poured into the shaping of a place: *observation*, *interaction*, and *co-action*.

In "A Pattern Language" (Alexander, Ishikawa, & Silverstein, 1977) life is first of all *observed* at work. Here recurrent patterns of life expression are identified, recorded and linked up to both higher and lower scale configurations. The observation of how life occurs in the built environment is expected to inform our action of building. These observed manifestations of life in the land, as much as they are recurrent and reasonably ubiquitous, are "patterns"; they are, essentially, constituent parts of the structure of a place, in that they reveal simultaneously the nature of the land and that of the people who use and live in it. Importantly, as much as patterns are observed recurrent life/environment structures in the land, they cannot be turned into abstract formulations generated only through intellectual speculation. It is *the process* of pattern recognition that really counts. That has to be a living process, in order to bring life into the patterns themselves. Observation must happen by immersion into the occurrence of life in the land. Patterns emerge, for every project, from the physical, emotional and intellectual immersion of designers and the whole community of inhabitants and builders into a shared process of both speculative and emotional inquiry. This way of exploring patterns evidently requires skills that are normally alien to architectural education, very close to those typical of anthropology, sociology or even ethology.

In later formulations, however, Alexander himself has developed a more radically *interactive* orientation to the process of pattern recognition (Sergio Porta, Russell, Romice, & Vidoli, 2014). According to this approach, life must be carved out from the community of inhabitants and builders by a sensible operation of depth reaching that must be undertaken at the personal level on a one-to-one or one-to-few basis. The ground for that is the acknowledgement that people in our professionalized society grow-up along a path of increasing detachment from their own profound and authentic feelings and desires, such that as adults they do not live in that authentic part of themselves any longer, and they would normally be scared to do so. In Alexander's own words, *"It's immensely hard to help people tell you what they want. Even in the simple practical issue of a building, its entrance, its rooms, its gardens… people cannot* *easily formulate their vision or their desire.*" (Alexander et al., 2012, p. 115). Why then is getting there so important in a building process? Essentially, because that is the place where people share their foundations as human beings. Once interactively solicited at that level, and only at that level, people's desires, feelings and visions are surprisingly alike, and one's vision is, more or less, everybody's vision. There, at that level, is where personal feelings cease to be (individual, idiosyncratic) opinions, and start becoming (shared, objective) realities. This way to reach patterns is again only accessible through an intensively human, life-generating process, a form of interview/interaction that requires a set of skills and attitudes that are in fact close to psychotherapy (and, again, completely ignored in current architectural education). It is worth noting how all this resonates with the Jungian notion of the collective unconscious, as well as in experiential approaches to counseling.

Life, finally, can be brought into the process of building by the sheer act of building together, or *co-action*. By that, we mean primarily the actual process of making that involves directly the hands of all participants into the practical fact of constructing. Even though co-action predominantly operates in the construction phase, to the extent that it's meaning is expanded to the wider notion of "acting together" it may permeate in different forms the whole building process[2]. That enables a wide, extremely subtle and complex set of abilities that emerge both within and beyond the actual making of things, and are shared by all those who work and build, including for example discussing, trusting, arguing, celebrating, dancing, drinking, playing and respecting. Skills that are crucially relevant to co-action may be very practical at times, but they are by no means limited to technical abilities: they cover for example the ability to listen and speak, visualize ideas in quick sketches or gestures, cook, dance and play, have fun with others, suffer and endure challenges with others, support others under pressure in a generous and competent way; much of these skills are in fact related, at a higher level, to *small-group dynamics,* and are normally very marginally touched, if at all, in conventional architectural education.

Crucially, co-action implies the elimination of the barriers that separate, in conventional decision-making, those who take decisions from each other, places where decisions are taken from each other, and the moments in time when those decisions are taken from each other. Carpenters and inhabitants, architects and electric engineers, planning officers and plumbers, financial advisors and sash-window supplier, in a System A perspective are expected to make decisions together in the same moment and in the same place: *the building yard*. Co-action in fact fundamentally implies direct hands-on construction, though that may be pursued along sometimes significantly different forms. It is this particular aspect of co-action, much more than anything related to observation and interaction, which creates the strongest conflict between System A and System B: co-action challenges the heart of the established timeframe, culture and overall environment of conventional decision-making throughout the whole building process and that, of course, means challenging the extant forms of *power*. System A is, in this respect, essentially one single solid process of power transfer from established to new subjects, times and places of decision. As such, System A is inherently subversive of System B's conventional practices; in this respect, Alexander walks on the same ground of other giants, along the line that from Koenigsberger and Turner's "radical development" of the 1970s (Boano & Talocci, 2014; Turner, 1977; Windsor Liscombe, 2006), leads to the current "self-build", "right-to-buy" and "right-to-build" agendas in the UK (Parvin, Saxby, Cerulli, & Schneider, 2011;

[2] The three modes of bringing life into the building process, *observation*, *interaction* and *co-action*, which are here illustrated separately for the sake of clarity, never occur in complete separation in real building processes.

Wilson, 2013), through various streams of informal, DIY or tactical urbanism (Finn, 2014; Lydon & Garcia, 2015; Sawhney, de Klerk, & Malhotra, 2015).

If we look at the stream of experiences of progressive planning, participatory or community design that have come up in the last half century or so, elements of observation and interaction have well made their way into the conventional planning framework and even, in cases like the Congress of New Urbanism "design charrette" or the Prince's Foundation for Building Communities "Enquiry-by-Design" (McGlynn & Murrain, 1994), managed to become themselves mainstream in some particularly advanced areas of the planning world-system. However, the same can't be said for co-action, which has always been practiced in "protected reserves" of the system, mainly academic, or in fact in geographic areas characterized by weak if not essentially absent planning systems, like in the case of informal settlements. Alexander himself, his personal career and his intensive and continuous practice as a builder, notwithstanding his extraordinary gifts of leadership and scientific penetration, has not escaped this fate: his is a story of a permanent conflict with System B particularly because of the co-action element of it, which System B has, as of now, certainly won. All attempts that have been made to shorten the distance between System A and System B have always come, sooner or later, to the point where either a compromise had to be reached to significantly reduce the co-action element, if not actually exclude it from the process, or to stop the process altogether. If the opposition between System A and System B is a battle, co-action is certainly the battlefield.

After a life on the battlefield, CA is very clear in not just accepting, but even defending the idea that the conflict between the two Systems is irreconcilable not just in practice, but in nature. System B *is* the established intricate network of powers that System A's co-action *is* the subversion of. If that is the case the only ground on which System A can operate is one where System B is, in some way, "paused". That effectively means creating an "ecological niche" for System A to survive in a System B dominated world. However, System B is by its same nature pervasive and capillary, it permeates all areas of the building system and it controls all channels that need to be utilized in a process of construction. Pausing it is not easy by any means. It includes managing differently, for example, the whole planning authorization process, countering design regulations at least to some degree and changing the way suppliers and professionals work. It is about challenging preconceptions and established assumptions first of all in the mind of those involved in the process, which are all very likely to be System B-orientated, if not by anything else just because System B is the normal way of doing things.

In all evidence, pausing System B in a project at the building scale is difficult, often extremely difficult, but what about pausing it in a project at the building cluster scale, or that of a masterplan? In this latter case it has to be deemed nearly impossible, as the number of parties involved is normally much higher, and, crucially, because their *size* is much larger. In urban-scale decision-making, "parties" mostly means large organizations, be they governmental, non-governmental or private sector. Changing the way people think, feel and operate is hard enough, but doing the same to large organizations is ways more difficult, requires different practices and, crucially, a completely different timeframe, which is incompatible with a five-year perspective. We observe, in fact, that System B has been paused in some form in many instances in the last half century, allowing for System A to operate and demonstrate its undisputable value, West Dean being one of these cases. But we also observe that the same thing has never occurred at a large scale: no one single example of successful System A-driven large scale project is on record apart from the Eishin Campus in Japan. The Eishin project, the story of which is the subject of "Battle", probably sets the upper limit of what a System A project can achieve in a System B dominated context.

In conclusion, if we want to deliver a large scale project through a System A human process in a System B dominated world, seeking some form of sub-optimal compromise between System A and System B is not the way forward because such compromise is impossible *in nature* (because of the co-action discriminant). Analogously, pausing System B in a project at the urban scale is not the way forward because it is just impossible *in practice*: System B is ways more "effective" than System A in getting the job done in a large-scale project, provided that it is in fact a project, i.e. it is centrally managed and engineered to be confined to a sub-generational timeframe. That may not generate beauty, in fact it inhibits life altogether and creates places that are anti-human as a rule, but does nevertheless generate outcomes that are reasonably predictable and profitable for the industry, the technical and legal bureaucracies and the financial investors that created System B. The only way to put System A to work at large scale, and give it a chance to be mainstream, necessarily involves re-conceptualizing our understanding of the way beauty emerges *in the long-term, as well as* how System A works in that temporal perspective. In short, we need to shift our focus from a System A at *large scale* to a System A at a *long time scale*.

3.2. Our cities' way: building beauty in five generations

If it is evidently true, as recalled at the beginning of this chapter, that our old cities are very often beautiful in the most profound sense of the word, never do those urban neighbourhoods or districts that work best and we love most, those that all of us feel closest to our heart, appear to be the products of the organized System A process of development that we have seen at work at West Dean. Not at first glance at least. Beauty in the ordinary parts of our historical cities is very rarely the direct outcome of a "design" (neither one of the product nor of the process), or the coordinated efforts of any group of builders (neither a community nor a company), or the investigation of anybody's self; nor did their generation in time normally include the on-purpose production of patterns whatsoever. In the history of beautiful urban places we never find the radical forms of co-action described above, with ordinary people building together in the building yard, testing materials and making decisions in due course. Nevertheless, as we experience marvelous ordinary places such as Piazza Santo Stefano in Bologna or the Athole Gardens in Glasgow, we feel ourselves pervaded by the same sense of deep joy, quietness and harmony that we experienced at West Dean; certainly though we can find in those places beautiful patterns that have nevertheless emerged. Quite clearly, a remarkable amount of life had filtered into the making of these places over a long period of time in ways that are hard to define in the first place, but certainly are not the same that generated West Dean or the Eishin Campus over a much shorter amount of time. Therefore the question is: if life was not brought into the generating processes of so many of our best urban places by a consciously designed System A sequence, what was it exactly that eventually did that? What different ways life took to penetrate the generative process at that scale, and by that we mean primarily at that *time* scale?

If we observe the way our beautiful cities have come to their current configuration in time, we can easily distinguish recursive spatial patterns at work in the most different environmental, cultural, social and economic contexts. For example, we notice that cities have always emerged around central places, higher centrality tends to go with higher density, higher density is linked to a movement-based agglomeration economy, the plot is the smallest unit of change, dynamics of plot merger and split tend to follow local and global economic cycles, building types are effectively linked to the geometric character of plots, blocks tend to respond in different ways to the different centrality of their four (or three) street-fronts, and this whole universal complex and organic mechanism of city building is based on two basic principles: 1) plots are relatively small and are developed independently from each other, such that control is distributed, and exerted on any individual adjacent plot by different parties (Akbar, 1988; Habraken & Teicher, 2000); 2) centrality emerges in the street network at a reasonably human scale (main streets crossing each other at about 400 meters or less) (S. Porta, Romice, Maxwell, Russell, & Baird, 2014).

This structure may emerge "spontaneously" or develop from an initial planning determination or, in most cases, by a certain grade of mix of the two. What is important here is that "spontaneous" modifications of the environment are the way life takes place in cities, they tend to occur both with and without the existence of a planned initial state of development, and they are the force that builds beauty in cities. We name this force, i.e. the combination of all the complex and uncoordinated efforts that human beings put into the modification of the environment for their own direct spiritual or practical benefit, *informal participation*. In this sense, the way the "initial state" of the evolutionary process was determined, whether through authoritarian top down planning, coordinated community-action or spontaneous fine grained development, is not really important, as long as it did not inhibit the full occurrence of informal participation. The urban fabric of Piazza Santo Stefano, actually a bifurcation along the ancient road from Bologna to Tuscany, has never been planned as a whole, and has evolved to its current state since at least the Vth century A.D., while Athole Gardens was a market-driven planned development designed from the top down without any form of community participation. Again, from an evolutionary perspective the design phase is not the point. As long as it produces a *structure* which is fit to solidly bear and foster change in time, the design phase has delivered its task: it is society at large, through continuous informal participation occurring over the following centuries, that brings life into the process and therefore beauty into existence.

3.3. Manufacturing in the mystery of nascence.

At a first glance, Alexander's *"I can do that in five years"* sounded like a narcissistic statement, but it was not: clearly that "I" had no *personal* connotation in the most obvious sense of the word. It actually identified, with his person, the life-enhancing process of construction that he later named "System A", as applied in West Dean. Moreover, and most importantly, CA drove our attention away from a simplistic consideration of the opposition between the small and the large scale. The organized complexity that Weaver was alluding to applies to all human building endeavors largely independently from their size and even from the apparent grade of homogeneity of the decisional "arena". It would be irremediably ingenuous, simplistic in fact, to underestimate the endless levels of inner conflicts and the incredible variety of themes and matters that even one individual human being has to tackle when putting his hands into even the smallest process of making, if s/he does that *authentically*. When we understood that, we finally captured the hidden level of truth that Alexander's words brought to light for us: the reason why only System A could deliver beauty at West Dean is not that West Dean is smaller in scale, and therefore less complex than building a block or a quarter: it is that *West Dean had to be built in five years*. The West Dean process, pretty much as those in Mexicali, Oregon, San Josè, like in all other built works of Alexander, and even like the complex of dozens buildings erected in the Eishin Campus, are all ultimately the application of a System A protocol applied to a centralized, sub-generational *project*, one that in fact operates mostly in the design phase (Fig.4).

FIG. 4 ABOUT HERE

System B is a process of construction that seeks the elimination of uncertainty for maximizing security of investment in the short term; its nature is mechanistic-centralized. Its time-scale is the five years, i.e. the sub-generational. System A is a process of construction that seeks the expansion of life and is, therefore, based on unpredictability; its nature is evolutionary and its time-scale is the five-generations, i.e. the super-generational. However, as a protocol for action System A has been expressed so far in a project form only, and as a consequence in a five years timescale only. The formation of a suitable System A protocol that expresses itself in the five generations timescale will also naturally fit the large scale of development.

This is, in fact, the profound nature of Alexander's life-long effort: he has penetrated like few others in history the subtle phenomena of building, being and living as one whole; he has profoundly understood the deep form of beauty generating processes in Nature as well as in construction, as processes that step by step expand and enhance the forms of life in the land over a long, definitely super-generational timescale; he then has moved on to conceive, test and validate a protocol of action that allows to generate beauty through a truly evolutionary process, but — remarkably — *over the tightly compressed, definitely sub-generational timescale of a project*.

What we have in front of us at West Dean is a tangible manifestation of the success of his endeavor: a nearly super-human achievement that emerges from a radical compression of time, where beauty/wholeness/life could be created in five years that should otherwise have taken centuries, ending up in the same genuine, crystalline, dynamic perfection. Effectively, he created an artifact that reached the quiet harmony of pure life in a timescale, that of developmental morphogenesis, which is normally only accessible to living organisms during the mystery of nascence.

By doing that, Alexander "invaded" the camp of System B: the focus on the design phase, the sub-generational timescale, the project setting, are all features that are home to System B. Altogether, they constitute the environment that tireless efforts of innumerable committed and talented people created with System B over decades. Public officers, management engineers, urban planners, artists, finance and law professionals, scholars in all fields of the built environment, have collaborated to the formation of the impressive construction that Alexander termed System B, with the only scope of taming the process of construction and steering it to its own benefit. System B is incapable of dealing with the long term and cannot cope with the post-design phase: they are too risky, too unpredictable, and too resistant to all its various forms of centralized control and management. All that which creates life in places through time, especially informal participation that is the primary and by far the most important beauty generator in cities, is intolerable to System B. That is why System B since its full explication beginning after WWII has dramatically failed to create beauty on Earth in a way that has never been paralleled in the past, a failure that reaches its peak everywhere the large scale and the long term are involved. System B is incompatible with anything else than the design phase. That is where its obsession for the "iconic" and "artistic" comes from: an attitude that excludes any possibility for the user to act on the environment and change it as s/he sees fit after the project's completion, and does that *in principle*.

If what identifies System A in all circumstances is its ability to generate beauty in places, it goes without saying that in all cases where beauty comes about through the self-organized expression of a multitude of uncoordinated factors and actors, there we witness System A in action. It is that "version" of System A, the one that only emerges over a super-generational timescale, which planners need to translate into a protocol for action. This System A though, as all evolutionary processes of urban change, occurs in the post-design phase only. Hence the objective of the design phase in this context, and with it our role as urban designers, must be radically reconsidered: rather than struggling for building beauty ourselves, we should aim at setting in place the right structure for beauty to emerge over many generations *after* the completion of our project, where by "project" we primarily mean that action of setting in place. This positions us firmly in an ecological urbanism perspective as unsuccessfully advocated since the early 1970s: *"The suggestions for change are analogous to ecological control schemes and basically state that the system can cure itself if given a chance. The chance is provided if our interventions give credence to the basic complexity and resilience of our urban systems. […]. The idea is to let the system do it, while our interventions are aimed at juggling internal system parameters without simplifying the interactions of parameters and components"* (Holling & Goldberg, 1971, p. 229). The evolutionary perspective that we have assumed in this paper entails the entire reconfiguration of our role: *from beauty builders, we have now become structure enhancers*.

Identifying that structure, what it should include and especially what it should not, what needs to be matter of urban planning and design (the former) and what especially should not (the latter), is the subject of the new science of cities and city planning that we set out to seek with a System A at large scale. What is this structure exactly? What are its components, how do they come together and support each other, what are the rules that we must establish so that informal participation can flourish over that structure and continue flourishing in time? Apart from Alexander since the 1960s, all that has been explored in the past by scholars in urban morphology, as well as a new wave of studies from space analysis to the physics of networks (Barthelemy, 2011; Michael Batty, 2007; Michael Batty & Longley, 1994; Bettencourt & West, 2010; Boccaletti, Latora, Moreno, Chavez, & Hwang, 2006; Hillier, 1996; Sergio Porta, Latora, & Strano, 2010). This programme of research in urbanism is primarily a life science, and as such it needs to cross the boundaries with the established disciplines of life sciences. By looking at the dynamics of beauty generation in processes of evolutionary change, we have identified *informal participation* as a primary evolutionary force, like mutation in the evolution of life[3], while other important forces such as space centrality and building density are equally part of the structure of urban change (Sergio Porta & Romice, 2014).

When action takes place in the long term and evolutionary change comes to the stage, this reframed notion of System A at large scale is the only positive available. Moreover, as an evolutionary process in nature, System A is a natural fit for that scenario: *that is System A's home*. The challenge in front of us, when talking of large scale "design", is that of fully embracing the super-generational time-scale of beauty generation. For the sake of clarity, that does not mean that *a design* in the System A at large scale perspective could only be delivered

[3] Even though analyzing the ethical implications of an evolutionary approach to cities goes beyond the scope of this paper, it needs to be clarified that with "informal participation" we want to capture the essential, fundamental energy that moves human beings in making their environment fit directly their own individual needs and that of those towards which they hold a direct individual responsibility, first of all their closest relatives. This must be distinguished from change imposed to the environment by large private or public organizations for reasons of corporate gain (be it private/speculative or public/regulative), i.e. a gain that goes directly to their organization and only indirectly to their officers and employees as persons along the chain of command.

in generations. It means that in order to truly express System A, a large scale design must set in place a structure which supports and enhances urban change by informal participation, which *then* will occur over the coming generations. In essence: a System A design at large scale is a protocol for the post-design phase. In order to do that, we first need to get back to Alexander, and review his work on the large scale under this new perspective.

3.4. Building beauty at large scale: a review of Christopher Alexander's work and ideas at the urban scale.

Indeed, throughout his career, Alexander has struggled to define how beauty could emerge at the large scale, distinguishing between “generated” as opposed to “fabricated” structure (Alexander, 2003, pp. 182-185). In this section we look first at his indications with regards to how shall we build beauty at the neighborhoods and city scale. That means focusing on his planning approach in the first place. This comes across mainly in: a) the “Summary of the Language” section of the introduction to “A Pattern Language” (Alexander et al., 1977, pp. xviii-xxxiv) and within this framework, the master plan for the University of Oregon's Eugene campus (Alexander, Silverstein, Angel, Ishikawa, & Abrams, 1975); b) “A New theory of Urban Design” (Alexander, 1987); c) “The Masterplan and Process for Harbour Peak” (Alexander, Schmidt, & Buchanan, 2005) and d) Chapter 3 of “Battle” (Alexander et al., 2012, pp. 49, 58-60). Also, we discuss smaller scale examples of planning in his work as presented in e) “The Production of Houses” (Mexicali) (Alexander, Davis, Martinez, & Corner, 1985). Finally, we discuss f) three parts of “Nature of Order”: Chapter 15 of Book 2, up to section 6 (Alexander, 2003, pp. 202-220), Chapter 9 of Book 3 (Alexander, 2005, pp. 283-310) and Chapter 15 of Book 3, up to section 6 (Alexander, 2005, pp. 334-351).

The driving question here is: to what extent are Alexander’s planning principles oriented to creating beauty within the short term perspective of the design action (five years time scale) as opposed to *after* it, in the successive continuous process of evolutionary change (five generations time scale)? No doubts, Alexander understands fully the evolutionary principles of life; he integrates these principles in everything he talks about, from the “unfolding” structure of design and building to patterns. However, if we focus on the time span of the *action* that he proposes, it seems to be still confined by a project’s timeframe, the five years sub-generational perspective. That is obviously true of his works at the small scale of the building, where his System A process manages to compress the inherently super-generational timescale of beauty generation into the sub-generational timeframe of a project. But is it true for his larger scale works?

Talking of larger designs for multiple buildings urban areas or complex facilities like educational campuses, for Alexander the unfolding structure of beauty must come out from each individual project helping to create a larger whole that is unknowable in advance. That is the proposal of “A Pattern language”, where it is recommended that the "Towns" patterns are built up from small scale individual project interventions. That is the uniqueness of the University of Oregon's “master plan without a master plan”, where the initiative of user groups is supposed to be the driving force of the evolution of the campus. While there is an overall vision of the whole of the campus, it is given by the patterns as an abstract list and by the diagnosis map of the state of the environment: there is no physical master plan. This view of planning is brought full circle in "A New Theory", where the experiment is to create such wholeness, step by step, from individual building projects, under the guidance of a "planning commission" made up of

Alexander and his fellow instructors, able to judge and guide the evolving wholeness. A process, that by Alexander's own admission, was not fully successful (ibid. pp. 235-249). The structure that was developing was too loose, too idiosyncratic, lacking the simple order of streets and plots that is typical of an American city like San Francisco, and strangely enough completely at odds with the surrounding area.

Perhaps even more important though than Alexander's insistence of building large scale structures, neighborhoods, towns, cities and even regions, from small scale projects, is his insistence on the project being always connected to a human group, be it a land owner/developer, an association of people or a community building its own neighborhood. This is the principle of *interaction* discussed above, and is obviously a prerequisite of any *co-action*. That, and his inherent suspicion of large impersonal (System B) organizations and governments with their bureaucracy, abstract rules and regulations, which do not allow for personal adaptation or exception to the rule where the land needs it, is perhaps the origin of his anti-masterplan stance. This criticism of master planning is not unique to Alexander, it is shared by critics of planning such as Jane Jacobs, and others in the 1960's who saw in comprehensive master planning a form of 'physical determinism', representing the power of the elite. Martin argues that the opposition to conventional planning came forth in the early 1960s from a "city as living organism" standpoint, which privileges "spontaneous growth" against mechanistic top-down planning, and includes as main figures in this camp Jane Jacobs and Alexander himself (Martin, 1972). The same decade saw the beginning of planning as advocacy (Davidoff, 1965), and the rise in power of neighborhoods which insisted on participatory planning. Under these waves of criticism, planning lost much of its previous assurance in its ability to rationally prepare a city for the future, using scientific methods, and became much more preoccupied with process, communication, and politics.

Lost in the shuffle, by all critics of modern comprehensive city planning, are the many historical cases which clearly demonstrate the ability of a master plan to structure the growth of a city, as well as allow enough flexibility and autonomy to different subjects in the city to adapt the plans to their needs in such a way that creates beautiful, living structures; Manhattan, Amsterdam, Barcelona, Paris: the examples are many, varied and at different scales. As a rule, these were speculative developments created for financial profit, and under all forms of government, and yet today they clearly exhibit the substrate canvas that has allowed immense beauty to emerge in time by the self-organized efforts of individuals, groups and organizations, what we called above "informal participation". Indeed, the street and plot structure of a city often outlives its particular foundational circumstances, and outlasts most social and political upheavals. It allows and expresses much more fundamental structures of urban life that go beyond culture, society or politics. That is, in fact, Martin's argument in "The Grid as a Generator" mentioned above, in defense of griddy or however geometrically shaped places proposed as structures for change rather than rigid blueprints of envisioned final states.

Martin addresses this point in open juxtaposition to Alexander's advocacy for complexity in cities as proposed a few years earlier in his notorious "A city is not a Tree" (Alexander, 1965). In all evidence, however, Alexander has fully acknowledged the emergence of very complex living realities over geometrically rigid spatial structures since his very early years. In particular, that comes through quite neatly in "A City is not a Tree", where a list of "natural" cities includes numerous griddy layouts like Manhattan, Liverpool and Kyoto, while conversely curvilinear and seemingly "organically designed" cities like Columbia and Greenbelt in Maryland are labeled as "artificial" (Alexander, 1965). This point returns many times in his further works: for example in "A New Theory" at some point a grid street layout is imposed quite forcefully over part of the project site in an otherwise loosely defined step-by-step design process. But it is in "Nature of Order" that the "brutal" imposition of a formal geometric structure over the complex reality of the land is thoroughly addressed and proposed as a fundamental passage of any beauty-generating design process, seemingly at any scale (Alexander, 2003, pp. 401-412): here Alexander reiterates as a general rule that at some point there needs to be a focus on the structural geometrical order of the building itself, ignoring for a while all other considerations of program, land and context (ibid. 408). The same principle applies at the larger scale of the town in the Masterplan for Harbour Peak at Brookings, in Oregon, delivered in its draft form to local public authorities in 2005. In essence, this draft proposal expresses thoroughly the attempt on the one hand to exert control on the overall structure of the future settlement (natural reserves; streets and public spaces; built fabric location, density, rough position and alignment, landmark public buildings) while relaxing it progressively as decision-making goes down to the scale of neighbourhoods, plots and buildings. That was expected to enable *"a multitude of processes, acting individually, yet geared towards the evolution of a coherent whole"* (Alexander et al., 2005, p. 12). The small scale of such individual processes comes increasingly to the stage from the neighborhood level down, but requires a certain level of control from the neighborhood level up in order to preserve and enhance the structure of the whole.

In the same way, when the problem is the foundation of a new city, the extension of a city to allow for rapid growth, the reconstruction of cities after natural or human made disaster, or the re-organization of cities which have outgrown their movement channels, as has happened again and again in the last two hundred years of accelerated urbanization, there is a need to think of the city as a whole, to provide it with its basic street structure, which will probably last for the duration of its history, to divide the land according to some socially acceptable rule, and to safeguard important natural and symbolic resources. This is essentially what master plans have done throughout urban history. In particular, the "long" 19th century — to paraphrase Hobsbawm (2010), lasting in this case almost until the middle of the 20th century, has left us a legacy of planning for growth that has created urban textures of lasting value, able to adapt to change and to allow for the emergence of beauty and life. In contrast, the legacy of 20th century planning has left us an overly prescriptive and essentially anti-urban and anti-street planning legacy. That is a system tending to create closed and isolated neighborhoods and projects, to zone uses separately from each other, to separate through from local movement, to limit density and to over-supply public open space, often, in order to pre-determine the economic level of the inhabitants, preferring few large projects (either public or private) to many small and individual ones; and in recent years, in response to criticism of the physical planning of the post-war period, and under the pressure from neo-liberal doctrines to abdicate planning completely (Koolhaas, 1995), to abandon any attempt at a holistic vision of the city and the well-being of its citizens, and to allow large private projects to determine public plans.

So the issue is not between master planning and organic growth; it is about *the appropriate amount of planning* in the appropriate time, at the appropriate scale, to hit just the right balance between structural control and super-structural self-organization. In their overall trajectory of evolution cities are certainly capable of organic growth while at some point needing planning interventions on a large scale, or they may go across periods where parts of them need to be planned at a single moment. Organic growth continues un-abated after more planning intensive periods, or even in parallel with them, working to change and adapt spaces with time. The appropriate amount of planning is one that is enough to create structure and protect essential public resources, but leaves as much freedom to individuals and groups to build and create their own spaces and bring life into the evolution of the city. The existence of the structure of the larger whole is necessary to allow the beginning of the process of unfolding of the smaller structures, and those in turn of the further smaller structures, in a process that is continuous in time and space and is absolutely essential to achieve the quality of a truly "generated" structure": *"that is the secret of the whole thing"* (Alexander, 2003, p. 195). But part of this secret is that the sequential nature of the process is respected so that structures at different levels are shaped autonomously on the basis of those already completed. Any attempt to "skip" this step-by-step form of action and determine structures at many different levels in one shot results in inhibiting the system's capacity to generate beauty by, in fact, overruling the process. In this perspective, planners should consider what they should *not* plan with equal attention, if not even more, than that they normally devote to what they should.

In conclusion, System A at large scale is not an anti-planning agenda: rather, it is about *planning less, and better*: difficult as it is, a problem of a pure *disciplinary* nature, not one of a larger reorganization of society across its various aspects, social, political, or economic. That leaves us in a quite comfortable, if not overoptimistic, position: System A at large scale *can* be made mainstream.[4]

4. Conclusions. Invitation for a reformed Master Planning practice: towards a System A at large scale.

The evolutionary framework that we have outlined so far answers the question: when is beauty generated? At the large scale, in the long term, it is only generated *after* the design phase by a process of continuous evolutionary adaptation. That is essentially enabled by dynamics of *informal participation*. This process as a whole falls, largely and in principle, within the control and the responsibility of planners and the planning system. In order for it to occur in a way that enhances life, urban evolution requires the establishment of a structure that is both spatial and regulatory. *This structure* is the responsibility of planners and the planning system.

Both Piazza Santo Stefano in Bologna and Athole Gardens in Glasgow are examples of evolutionary developments that have reached beauty in a super-generational time frame. Bologna used to be a colonial military camp built by the Romans in 189 BC. Since then, the historical core of the city developed in what is now considered an example of dense, compact and diverse medieval urban fabric, now the thriving home of the Alma Mater, the most ancient university of the world, as well as innumerable commercial, residential and cultural facilities. Piazza Santo Stefano grew at the bifurcation of the ancient road from Bologna to Arezzo and Tuscany, along the same route that led to one of the two original axis of the ancient Roman camp. Not part of the first grid, the Piazza is therefore more appropriately a street junction, gracefully surrounded by palaces, ordinary housing and beautifully adorned porticoes all around. On one edge of the square, some seven different places of worship have been layered

[4] A similar proposal is made by Shlomo Angel in his proposal for planning for the future growth of cities in the Global South in this century (Angel, 2012). He advocates the creation of a grid of main streets that will carry major infrastructure and public transportation, and conserve those open space resources necessary for insuring water supplies and environmental health. He makes the point that since political and economic resources for safeguarding these public spaces are lacking – planners should not be maximal but minimal in determining the public infrastructure.

on top of each other since the V Century AD, by destroying or substantially altering the previous.

Glasgow was not much more than a village until the mid of the XVIII Century AD. One century later it reached over one million inhabitants and was the second city of the Empire after London, with a booming economy based on shipyards, industry and trade around the fluvial harbor over the river Clyde. Nowadays, Glasgow has abandoned the industrial economy and made its way into the post-industrial, with a flourishing tertiary economic base mainly relying on culture, education, tourism and the professions. All these enormous changes have taken place between two city centers: the Merchant City, home of administration and commerce offices, theatres and clubs, and the West End, where respectable middle to upper class residential estates are graciously mixed with services, urban parks and retail. Both the Merchant City and the West End of Glasgow have been planned on a rigid grid system of Victorian streets and blocks which were destined to be completely demolished in the immediate post-war period to be replaced by a Corbusian scheme of highways and high-rises, laid out by municipal planners: the Bruce Plan. After the Bruce Plan was fortunately abandoned in the late 1970s, the two centers have continued to serve the city, the region and the nation up to our days, across countless adaptations and developments. Athole Gardens is a residential development in the West End, planned and realized in the 1860s for the industrious middle class of the times around a beautiful residential pocket park. It is now a quiet, beloved part of the lively district around Byres Road, the main street and certainly one of the most popular commercial strips in town.

Evolution has taken place in Piazza Santo Stefano and the Athole Gardens starting off in different ways and changing differently along different historical cycles. Life has flourished gloriously over both the rigid grids of the original military camp in Bologna and the Victorian planning schemes in Glasgow, making these two places among the most beautiful and successful on Earth. The diversity of these environments is simply inconceivable by a single human mind; nevertheless everything continues to change and adapt over a *structure* that remains mostly in place, which actually favors and disciplines the occurrence of endless variations in time. Most significantly, by no means are these two stories exceptions; in fact they are the rule: once backed up by reasonably accurate and simple planning structures, both spatial and regulatory, evolution occurs spontaneously by the uncountable and completely self-organized contributions of all, what we have called *informal participation*. Hundreds of cities in Europe and Africa have grown from the initial seeds of Roman camps, or from other grid layouts that are in fact typical of all cities of foundation, anywhere at any time in history (Fig.5a,b).

FIG. 5 ABOUT HERE

Panel A. *Rigidly griddy military camps of the classic roman age have been cradle to hundreds of cities that are now regarded as jewels of urban living. Here we see Pavia (left), Turin (middle) and Verona (right), in Italy. Source: (Conventi, 2004):* ***Panel B.*** *Urban evolution at work on previously rigid geometries. (A) From left to right: the progressive transformation of an ancient roman grid into an Arabic layout; (B) Campo Marzio, in Rome, Italy, in the classic roman age and nowadays; (C) Baghdad (Iraq), in the VIII and the IX Century. Source: (Donato & Lucchi Basili, 1996).*

As Martin points out, in cities of foundation *"the best use of land meant an orderly use, hence the grid plan. In siting it and building it estimates had to be made about its future, about its trade, its population, and the size and number of its building plots. This contributes a highly artificial procedure. But it is of course by no means uncommon. Indeed it is the method by* *which towns have been created in any rapidly developing or colonial situation."* (Martin, 1972, p. 8).

Evolution does not apply only to grids. It does apply to all planned cities, in all cultures and climates, it is the way cities develop as long as their site and location are fortuitous (Vance 1990), enough time is given for them to develop and flourish, and — critically important — no rules are set in place to specifically prevent it, for example by inhibiting informal participation. What Alexander terms "System B", or the conventional planning system which is dominant in the most "advanced" areas of the Global North of the Planet, is in fact, essentially, a gigantic and capillary set of organizations, powers, rules and procedures precisely aimed at countering and inhibiting informal participation in any form. Not by chance, the fortune of processes of formal participation begun to grow exactly with the historical crisis of all the traditional forms of informal participation, after WWII, when professionalization, bureaucratization and, later on, globalization, have taken control of mainstream building production. And not by chance, the *modus operandi* of System B at the large scale is essentially the same that it exerts at the small scale, the mechanistic and centralized one that is typical of the project. System B cannot cope with evolution, in nature. It cannot deal with the risks of uncertainties that are inherent in the long term and informal participation. It must occupy all spaces of action, all moments of decision, it must control all and everything.

What created both Piazza Santo Stefano and Athole Gardens is in all evidence a different process. It is, essentially, a System A at large scale. If we are to recreate beauty in cities, we need to understand and re-enable the *underlining principles* which drove those processes, which were both evolutionary *and* planned, to generate beauty in our future cities at a large scale, and in the long term. That quality, the quality without a name, does not come by design, it comes through evolution in the post-design. However, the way we lay out the design is crucial to enable evolution in the post-design; it is entirely our responsibility as scholars, professionals, decision-makers, stakeholders and lay citizens, to make sure that the right conditions are set in place for that to occur, first of all by distinguishing large scale speculative deployment of common resources from the right-to-buy and the right-to-build of the ordinary people. Without this fundamental distinction, informal participation gets banned by-law from our world, together with change and ultimately with beauty, while — as we can easily see on the ground — speculation and exploitation flourishes as never before. In a mechanistic environment, the biggest, the most powerful, the most insatiable, is undoubtedly the fittest.

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DUCHY of CORNWALL

POUNDBURY

FACTSHEET

JUNE 2019

CONTENTS

OVERVIEW

Poundbury is an urban extension to the Dorset county town of Dorchester, built on Duchy of Cornwall land, according to principles of architecture and urban planning as advocated by HRH The Prince of Wales in his book 'A Vision of Britain'.

Poundbury is an integrated rather than zoned development, planned to challenge the town planning trends and policies of the 20th century which led to isolated housing estates and shopping centres far from places of work and leisure, forcing ever greater reliance on the car.

In particular there are four key principles which have been pioneered at Poundbury:

- Architecture of place: creating beauty and reflecting local character and identity.
- Integrated Affordable Housing, integrated with and indistinguishable from private housing.
- A walkable community, designed around the pedestrian rather than the car.
- A mix of uses, integrating homes with retail and other business uses and public amenities.

It is currently home to some 3,800 people in a mix of private and affordable housing, as well as providing employment for some 2,306 people working in the 207 shops, cafés, offices and factories. A further 557 are employed in construction across the site and many more are self employed and occasionally work from home.

Begun in 1993, Poundbury is based on some of the timeless principles that have enabled many places around Britain to endure and thrive over the centuries. The result is an attractive and pleasing place, in which people live, work, shop and play.

Poundbury was planned to challenge some of the zonal planning assumptions of the latter part of the 20th Century which led to ghettoised housing estates and out of town shopping centres, forcing ever greater reliance on the car. Affordable housing (provided at 35%) and private housing share a public realm with the many businesses.

As Poundbury has developed, it has demonstrated that there is a genuine alternative to the way in which we establish new high density communities in this country. Poundbury is approximately two thirds built and is planned to grow to around 2,700 homes by 2025.

As the promoter and master developer of Poundbury, The Duchy of Cornwall engages with the local community to help guide the design and delivery of community facilities. Recent consultation events have included landscaping, play areas and proposals for the community benefits of the Jubilee Hall.

In 2018, Dorset County Council completed an economic impact assessment of Poundbury, which concluded that as at 2018, the Poundbury development had permanently increased the local GVA (Gross Value Added) by £98 million per annum (predicted to be £105m per annum when completed in c2025) and established 1,630 full time equivalent jobs (1,760). In addition, by 2025 the construction phases will have delivered an increased GVA of some £236 million and 4,950 person-years of employment.

The success of Poundbury has now been recognised beyond Dorset and many of the founding principles have been incorporated into national and local planning policy. Poundbury is also proving to be increasingly influential with an international audience, attracting interest and generating many organised tours every year from architects, town planners, academics and developers across the globe.

HRH THE PRINCE OF WALES AT THE FIRST SITE MEETING IN 1993

ILLUSTRATED MAP OF THE POUNDBURY VISION

LEON KRIER AND ANDREW HAMILTON WITH THE PRINCE OF WALES

SIMON CONIBEAR AT THE START OF CONSTRUCTION

HISTORY: THE MASTERPLAN

In 1987 the local planning authority, West Dorset District Council, selected Duchy of Cornwall land to the west of Dorchester for future expansion of the town. As Duke of Cornwall, The Prince of Wales – who re-examined many of the precepts of urban and rural planning in his book 'A Vision of Britain' – took the opportunity to work with the council to create a model urban extension to this ancient market town.

In 1988, The Prince of Wales appointed the well-known architect and urban planner, Leon Krier, to work on an overall concept for 400 acres of land of what would become Poundbury. Krier's challenge was to create an autonomous new extension to the town within the context of traditional Dorset architecture, using the urban design principles described in 'A Vision of Britain'.

In 1989, the Poundbury Masterplan was exhibited in Dorchester at a Planning Weekend attended by The Prince of Wales. Local residents and interested parties were invited to share their opinions and the feedback was reflected in the scheme designs before planning consent was sought.

The resulting Masterplan divided Poundbury into four distinctive quarters, with the design being implemented by specifically selected architects. The overriding principles have been maintained throughout the scheme, whilst reflecting the evolving requirements of urban planning and design.

Construction work on the first phase commenced in October 1993. Design of the final section, the North West Quadrant, is being prepared with construction anticipated to be completed by c2025. Poundbury will have increased the population of Dorchester by about one quarter, with an eventual community of approximately 5,800 people.

POUNDBURY MASTERPLAN

WOODLAND CRESCENT

POUNDBURY - ARCHITECTURE, URBAN DESIGN & CRAFTSMANSHIP

Poundbury is designed to create a sustainable community which achieves an attractive, modern and pleasing place in which people can live, work, shop and play. Particular emphasis is placed on the quality of place making through time honoured principles, urban design, landscaping and the selection of materials.

The Prince of Wales believes that one of our country's greatest strengths is the regional variation of its towns and villages, built with locally distinctive materials. The architecture at Poundbury fits this pattern, respecting local styles, drawing on the rich heritage of Dorset, and in particular, the streets of Dorchester.

The architects working at Poundbury, several of whom are based in Dorset, adhere to the building code which promotes the use of traditional materials and regulates building form and street scenes. The Duchy's Poundbury team work closely with the developers to control design and build quality. The relationship is upheld through legally-binding Building Agreements with each developer before the freehold is received.

Parking is generally provided in landscaped courtyards to the rear of properties, which also incorporate housing including coach houses above parking spaces and ancillary spaces for playrooms and workshops. Provision for these extra spaces recognises the increasing demands for flexible living arrangements and allows people to work from home. Larger commercial buildings are generally sited for better vehicular access, but are designed similarly to frame their sites and create a sense of enclosure.

The resounding success of Poundbury demonstrates that it is possible to build high-quality, traditional housing at affordable prices, whilst providing new factories and offices on competitive terms all within the context of refreshingly different urban design.

POUNDBURY IS DELIVERING 35% AFFORDABLE HOUSING INTERSPERSED ACROSS THE DEVELOPMENT

INTEGRATED HOUSING

One of the innovative ideas championed by The Prince of Wales in 'A Vision of Britain' in 1989, was to integrate private and affordable housing alongside one another to encourage vibrant and diverse communities.

In Poundbury 35% of homes being built are affordable housing for rent, shared ownership or discounted sales.

Affordable homes are integrated with private homes and built to the same high specification which makes Poundbury "tenure blind". This helps social cohesion and creates a well balanced, mixed income community.

The Duchy continues to explore innovative ways in which the local housing need can be met. Housing providers report that Poundbury has the lowest rate of rent arrears and void rates.

According to The Guinness Partnership – which provides much of the affordable housing – Poundbury is its most successful and trouble-free site with residents reporting a higher level of satisfaction than elsewhere. The partnership has used principles learnt in Poundbury across the UK. In 2019 the partnership completed its 272nd home in Poundbury.

"Providing housing of this quality really can improve people's lives and open up a lot of opportunities that would otherwise not be afforded to them."

The Guinness Partnership

The Duchy has been pioneering Discount to Open Market Homes with ZeroC in Poundbury. This allows first time buyers to purchase properties with a 25-30% discount. The buyer retains 100% ownership of the property but must sell the home with the same discount. The difference between this and other Government schemes is that the homes will remain discounted in perpetuity to benefit future first time buyers. To be eligible for the scheme applicants must be on the Dorset Council's Housing List and have a combined income below £60,000 per annum.

POUNDBURY IS DESIGNED SO MOST DAILY NEEDS CAN BE MET ON FOOT

A WALKABLE COMMUNITY

In Poundbury, the public realm is designed around people rather than cars to help create a pleasant environment and a series of well connected streets and squares. The principles of Poundbury's streets and squares have inspired town planners all over the world.

The irregular design of streets constrain car speeds, and by minimising road signs, the motorist and pedestrian are required to think about how to interact with each other.

• • • •

"At Poundbury the entire Masterplan was based upon placing the pedestrian, and not the car, at the centre of the design."

The Prince of Wales

• • • •

MIXED USE

Poundbury integrates residential, retail and business uses with public amenities, so many people are able to live and work without the reliance on motor vehicles.

Most daily needs can be met on foot, but there is nevertheless ample provision for car parking with very little restrictions, which business surveys suggest is one of the strongest reasons for locating to Poundbury.

Parking is generally provided in landscaped courtyards at the rear of properties which also incorporate housing and coach houses with ancillary spaces for playrooms and workshops. Provision for these extra spaces recognises the increasing demands for flexible living arrangements and allows people to work from home.

Integrating small workshop and retail spaces into larger blocks has encouraged a lot of small independent, artisan businesses to start up and thrive in Poundbury alongside more established professional services and industrial businesses.



"I am deeply grateful to their teams of talented craftsmen, many of whom are Dorset men through and through.

For me one of the most essential features of Poundbury has been its mixed use, mixed income composition - a dangerously revolutionary move 25 years ago. So particular thanks goes to the social-housing providers, notably The Guinness Partnership of which I am patron."

The Prince of Wales



BUSINESSES IN POUNDBURY

As an urban extension to Dorchester, Poundbury is significantly contributing to the local economy. By the time of completion in 2025, the development is predicted to increase the local GVA (gross value added) by £105m per year.

The latest business survey in 2019 found that over 2,306 people are working in 207 businesses. Integrating small workshop and retail spaces into larger blocks has encouraged a range of small independent, artisan businesses to start up and thrive in Poundbury alongside more established professional services and industrial businesses. Half of the businesses operating in Poundbury launched their businesses here and new ventures continue to open each year.

INTERNATIONAL SUCCESS

An example of an international business integrated within the community is Charbonnel Et Walker (formally House of Dorchester) based in Poundbury and now have a global following. The once-small Dorchester-based factory was expanded after being bought by Charbonnel et Walker, who then moved all production for the world-renowned company to the Poundbury site. The chocolates are now stocked all around the world, from the shelves of John Lewis, Waitrose, Selfridges, Liberty and Harrods to Olives Et Al in Poundbury, and as far as Macy's in the United States.

The pioneering design and urban-planning of Poundbury has resulted in residents and businesses located in close proximity to one another. Some have started at the business incubator hub at Prospect House and then moved to bigger premises in Poundbury.

FEMALE ENTREPRENEURS

More than a third of the businesses are owned by female entrepreneurs. These businesswomen cite the quality of place and space available, affordable rates, ease of parking and the friendly nature of the community as reasons for choosing Poundbury. Many are working mums who have been inspired to set up their own business from scratch and relocate to Poundbury. An eco-friendly shop, which launched in Poundbury selling reloved bridal dresses has now been franchised all over the UK and the owner continues her valuable contribution to the business community.

FAMILY BUSINESSES

Family businesses have been the backbone of the UK economy for generations and Poundbury is no exception. A large number of the artisan and niche shops are run by mothers and daughters, or husband and wife teams and contribute richly to the business environment. A successful award winning duo of mother and daughter run the Café on the Green, which trains adults with learning disabilities and provides an inclusive environment for all.

PROJECTED BENEFITS FOR THE ECONOMY FROM THE DEVELOPMENT INCLUDE:

- Increased the local GVA (Gross Value Added) of £98 million per annum (predicted to be £105m per annum when completed in c2025).
- Established 1,630 full time equivalent jobs (1,760).
- In addition, by 2025 the construction phases will have delivered an increased GVA of some £236 million and 4,950 person-years of employment.


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TRY


on the green


PICCOLO
CORTADO
FLAT WHITE
CAPPUCCINO
LATTE
HOT CHOCOLATE
MOCHA
EXTRA SHOT
SOYA

DAMERS FIRST SCHOOL CHILDREN

THE TEAM AT CAFE ON THE GREEN

GARDENERS AT POUNDBURY ALLOTMENT GROUP

DAMERS FIRST SCHOOL OPENING

COMMUNITY

Nearly a quarter of a century into the build, there are now more than 3,800 people living and 2,306 people working in Poundbury. There are various community groups such as drama clubs, a choir, hobby clubs, WI, a popular weekly toddler playgroup, gardening and walking groups.

There are two different allotments with their own societies and a thriving business community, who often arrange events for local residents such as Christmas markets, Easter egg hunts and community picnics.

Every August the Dorset Food & Arts Festival is held in Queen Mother Square, which attracts thousands of people to this popular event promoting local artisan food and drink. The early involvement of the local businesses and residents has helped to create a place with a strong community spirit, which meets people's needs, desires and aspirations, and engenders civic pride.

A popular Christian community church relocated to Poundbury in 2018 and provides space for community groups as well as worship. Another community space open for reflection is The Quiet Space, set up by the local Christian churches and available to the community.

EDUCATION

Poundbury is surrounded by a range of state schools, all of which are either rated Outstanding or Good by Ofsted. This includes two first schools, a middle school and Thomas Hardye School & Sixth Form, which is the biggest and one of the highest performing in the UK. Poundbury is served by two schools, The Prince of Wales First School and Damers First School, which relocated into a new building designed to meet their specific needs in 2017. The move to Poundbury enabled the school to improve its environmental credentials, from growing its own food to reducing waste and increasing rates of walking, cycling and scooting to school.

FAMILIES PLAYING ON THE PÉTANQUE AREA

COMMUNITY EVENT IN PUMMERY SQUARE

VOLUNTEER MUMS FROM CHEEKY MONKEYS PLAYGROUP

ESTATE MANAGEMENT COMPANIES

- There are three Estate Management Companies (MANCOs 1,2,3) covering various phases of development.
- The MANCOs are responsible for the upkeep of the unadopted areas of Poundbury i.e. those areas not adopted and maintained by the local authorities.
- Residential and commercial occupiers are issued with shares and voting rights for their respective MANCO areas (1 per household and 1 per 4,000ft.^{2} gross internal floor space for commercial/retail).
- An annual estate charge is levied (currently £225 for MANCO 1, £170 for MANCO 2 and £168 for MANCO 3). Invoices & accounts are administered with independent verification.
- AGMs cover appointment of new directors, approval of accounts, and issues affecting MANCO areas e.g. street lighting, road cleaning, tree maintenance etc.
- The Affordable Housing providers are encouraged to represent their Poundbury tenants at meetings.

POUNDBURY RESIDENTS ASSOCIATION

The Association is non-political and is for all residents of Poundbury; owners, tenants and the community generally. The PRA is managed by an elected committee of local residents and business owners who are passionate about the community spirit in Poundbury and want to work with the residents to make Poundbury a remarkable place to live, work and play.

Open meetings are held quarterly in the Brownsword Hall, Pummery Square, and usually feature an external speaker.

Agendas cover a spectrum of topical interest central to the development of the community, including environmental matters and contribution to planning decisions.

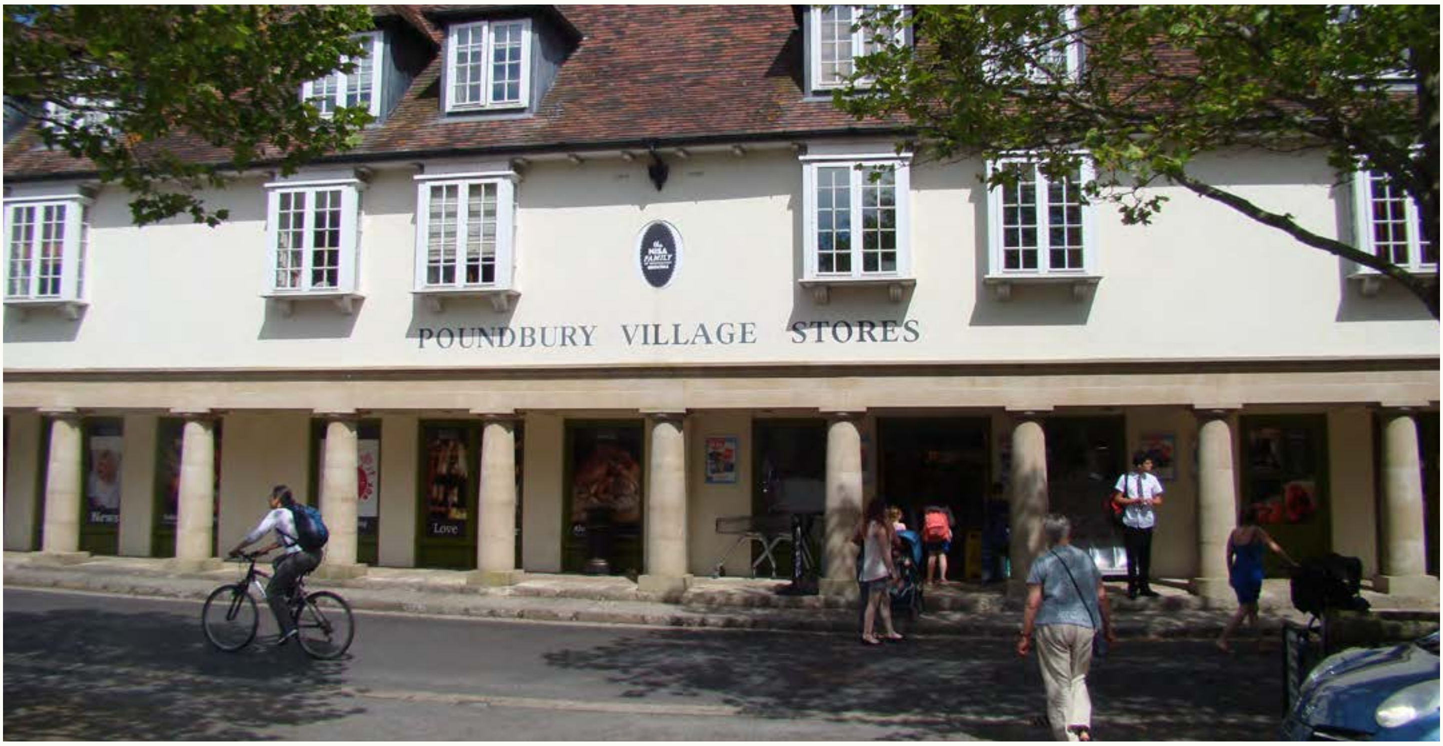
DESIGN AND COMMUNITY CODE

The Design and Community Code provides guidance to Poundbury residents and businesses as to the original design approach and long term architectural principles. The purpose is to:

- Explain the principles underlying the development
- Give confidence to owners and occupiers that high standards will be maintained for the benefit of all
- Steer the way in which maintenance is undertaken
- Encourage any proposed extensions or alterations to complement the existing fabric

All parties are expected to comply with the Code, with further advice and clarification being provided by the Regulator (the Duchy of Cornwall, or in some instances the MANCO). The document is updated to reflect evolving issues (such as emerging environmental technology) and to provide additional clarity where required.

The Design and Community Code can be downloaded from https://duchyofcornwall.org/poundbury.html



POUNDBURY VILLAGE STORES, AN INDEPENDENTLY RUN SHOP IN PUMMERY SQUARE


HOLMEAD WALK


WOODLAND CRESCENT PLAY AREA


PEVERELL AVENUE EAST

POUNDBURY PHASE ONE INCLUDING PUMMERY SQUARE

Pummery Square forms the 'hub' of Phase 1, also linking through to the Victoria Park development to the east. The permeable network of roads, alleyways and parking courtyards in Phase 1 fan out from the hub to give immediacy to the facilities within the Square.

The dominant building is the Brownsword Hall, designed by John Simpson, in the idiom of a traditional West Country market hall. The upper chamber is effectively Poundbury's community hall, managed by the Poundbury Village Hall Trust and available for community, private and commercial events.

The surface of the Square belongs to the Brownsword Hall and is used for occasional public and theatrical events as well as a car park.

The other buildings fronting the Square are commercial on the ground floor and residential above. Significant buildings are The Poet Laureate Public House, Poundbury Village Stores, Café Octagon, The Poundbury Clinic, and a number of small boutique shops and services.

Architects: John Simpson, Leigh Brooks, David Oliver, Ben Pentreath, Philip Storey, Andy Kunz.

POUNDBURY PHASE 2

The second phase of the development was granted outline planning permission in October 1999, providing approx. 900 dwellings and 6ha of employment space over a 10 year development period. Middle Farm Way, relieving Bridport Road, was constructed in 2006. As from 2005 the Duchy has provided 35% affordable housing in Phase 2. The focus of Phase 2 is Queen Mother Square, formally opened by Her Majesty The Queen in October 2016.

AERIAL PHOTOGRAPH OF POUNDBURY MAY 2018

WIDCOMBE MEWS

INGLESCOMBE STREET

STONEMASONRY APPRENTICE

SOUTH WEST QUADRANT

This 4 ha site forming the remainder of Phase 2, is situated between Bridport Road and Middle Farm Way with views towards historic Maiden Castle. Planning approval was granted in 2006 for 190 homes including a mixture of shared ownership and rented accommodation, shops, offices and restaurants. The focal point of the development is the Buttermarket with small retail units and workshops lining the square to provide an artisan flavour. Regular community events take place in the Buttermarket including Christmas markets and Easter egg hunts, mainly organised by local businesses.

The development was built by CG Fry & Son Ltd & Morrish Builders.

Architects: Ben Pentreath, Jonathan Holland, Craig Hamilton, George Saumarez-Smith

PARKWAY FARM

Parkway Farm is a 2ha site south of Middle Farm Way. This site is being developed for heavier industrial uses (B2), which are ideally separated from residential areas.

Weymouth College moved its Centre of Vocational Excellence in Stonemasonry Skills to Parkway Farm in 2008. Here, in addition to stone masonry, students learn traditional craft skills such as conventional construction techniques including plastering, wall tiling and plumbing. Stonemasonry students from all over Europe travel to attend the school.

In 2016 the Dorset Centre for Creative Arts opened, offering short art courses and specialising in traditional skills such as Viking jewellery and bronze casting, as well as creative writing and film making classes.

Architects: David Oliver and Lionel Gregory Architects

VIEW OF QUEEN MOTHER SQUARE TOWARDS ROYAL PAVILION

QUEEN MOTHER SQUARE

WAITROSE

DUCHESS OF CORNWALL INN

QUEEN MOTHER SQUARE

This square is the central hub and heart of Poundbury. Built to commemorate Her Majesty Queen Elizabeth, The Queen Mother, it features a statue of her by sculptor Philip Jackson. The buildings have been designed by Quinlan and Francis Terry and Ben Pentreath.

In 2010 construction started on the buildings at the west side of the square (Kings Point House), incorporating a Waitrose supermarket, other retail and restaurant space, 20,000ft.² of offices and 11 flats. There are also over 100 underground car parking spaces.

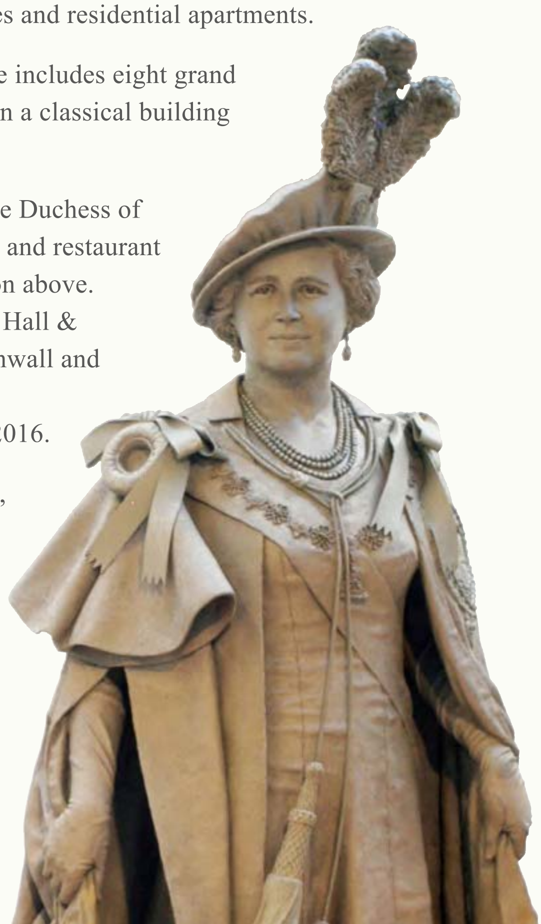
In 2011, Newborough House on the south side of the square was completed, providing a café, offices and residential apartments.

On the east side, Strathmore House includes eight grand apartments above two retail units in a classical building designed by Quinlan Terry.

On the south east corner stands The Duchess of Cornwall Inn, a large public house and restaurant with boutique hotel accommodation above. The Inn is a joint venture between Hall & Woodhouse and the Duchy of Cornwall and was formally opened by HRH The Duchess of Cornwall, in October 2016.

Bowes Lyon Court sits behind this, as the flagship retirement scheme for McCarthy & Stone.

The final building, due to be completed in 2019, is the Royal Pavilion, which comprises of 20 luxury apartments with a health spa on the ground floor.



DORSET FOOD & ARTS FESTIVAL HELD EVERY AUGUST IN QUEEN MOTHER SQUARE

NORTH EAST QUADRANT, MAY 2019

POUNDBURY PHASES 3 AND 4

Outline planning permission was granted by West Dorset District Council in September 2011 for this part of Poundbury (44 hectares), which covers the northern and western perimeters. This includes 1,200 dwellings, a new four-form, 20 classroom entry first school to replace Damers First School premises in Dorchester, and alterations to the Monkey's Jump Roundabout (Dorchester Bypass).

THE NORTH EAST QUADRANT

On completion in 2020, this quadrant will have delivered 550 homes (generating an average density of 33 dwellings/ha) ranging from five-bedroom houses to one-bedroom apartments. 35% of the homes are built for affordable rent, shared ownership and discounted homes for first time buyers.

The site covers 15.8ha of which 0.65ha are green space within the development boundary. This includes 5,000m² of employment space.

The North East Quadrant follows the principles set out in previous phases of the development and taken up in the Poundbury Development Brief (published by West Dorset District Council in 2006 and available to view at www.dorsetforyou.com).

The homes in Poundbury's newest square Crown Square opened in April 2018.

In 2017 Damers First School relocated to its new home in the North East Quadrant, on the edge of The Great Field. The school now has the space required to grow into a four form entry first school for 600 pupils.
The school was designed by Dorset County Council in accordance with baseline principles, but features many innovative spaces such as an eco space for children to grow plants, outdoor reading areas and access onto Dorchester's largest green space, The Great Field.

HAYWARD SQUARE WITH A BUILT IN BIRD BOX ON THE TOP RIGHT OF YELLOW BUILDING

PROPOSED CROWN AND MARKET SQUARE

PROPOSED VIEW OF THE NORTH WEST QUADRANT

FUTURE DEVELOPMENT OF THE NORTHERN QUADRANTS

Outline planning permission was granted by West Dorset District Council in December 2011 for the remainder of Poundbury (4ha), which will cover the northern and western perimeters.

In the Northern Quadrant construction of the 350 homes has commenced. The North West Quadrant is the last phase of construction in Poundbury which is planned to start in 2022. By completion in around 2025 it is expected that Poundbury will have increased Dorchester's population by a quarter, some 5,800 residents, and created 3,500 jobs.

....

"When I set out on this venture, I was determined that Poundbury would break the mould of conventional housing development in this country, and create an attractive place for people to live, work and play. Many people said that it could never succeed but I am happy to say that the sceptics were wrong and it is now a thriving urban settlement alongside Dorchester."

HRH The Prince of Wales, 2016

....

Aerial Map of Poundbury

May 2019

IOTHER SQUARE
DAMERS FIRST SCHOOL
NORTH EAST QUADRANT - PHASE 3
THE GREAT FIELD
PHASE 1

DUCHY PROJECT MANAGER PETER JAMES AT RAINBARROW FARM

SUSTAINABILITY

The concept of sustainability has been at the heart of the Poundbury masterplan from the outset. Many different methods of improving and advancing carbon reductions have also been explored.

ANAEROBIC DIGESTATE – RAINBARROW FARM

Rainbarrow Farm is the UK's first commercial biomethane-to-grid plant, currently generating enough gas to flow to 5,320 houses mid winter and 59,150 houses mid summer. A significant upgrading process in 2019 means the output is expected to increase to power 7,250 houses in winter and 80,600 houses in summer by the end of 2019.

Biogas produced at Rainbarrow Farm was first cleaned and injected as biomethane into the National Grid on 11 October 2012. A joint venture partnership was formed (JV Energen LLP) between the Duchy of Cornwall, a local farmer who needed more sustainable break crops and fertiliser sources, and Active Business Partnerships. JV Energen, The Duchy of Cornwall were presented with the UK's first ever Green Gas Certificates. A recent development at Rainbarrow Farm means that the digestate - the material left at the end of the AD process - can be sold and used as a nutrient rich bio-fertiliser, which helps farmers and gardeners to reduce reliance on more costly, oil derived fertilisers.

ELECTRIC CAR CHARGING POINTS

There are two public car charging points in Queen Mother Square. The unit is a Rolec Sercuricharge and tokens can be purchased in the garden centre and restaurant for £1, with more planned across the site.

BUILT IN BIRD BOXES

Bird boxes are being incorporated in the build programme with the aim of providing one box per house on the remaining phases of development. The boxes attract swifts and are comprised of Schwegler swift boxes on rendered buildings and Cambridge swift boxes in masonry walls of stone and brick. The RSPB is auditing the boxes with hopes to inform future government policy regarding incorporating bird boxes into future development in the UK.

AN ART EXHIBITION AT THE RESTORED JUBILEE HALL

PLASTIC FREE MOVEMENT

In 2018 the independent butcher shop the Brace of Butchers opened an extension called Naked Brace. The plastic free shop invites customers to bring their own containers and buy fresh market vegetables, grocery staples, local honey and milk supplied by local farmers. The latest scheme is boomerang bags, where the community is invited to make the bags and continually reuse. Damers First School's Eco Crew have been helping the community to start a Refill Poundbury scheme alongside Litter Free Dorset, which allows people to fill up water bottles in a number of businesses around Poundbury, reducing plastic waste. The eco-campaigners have also led a movement to inspire Dorchester to become Plastic Free after making passionate requests to councillors, businesses and the wider community.

INNOVATIVE TECHNOLOGY

A Poundbury based eco-company has been working on a range of sustainable energy solutions for residents. This includes power walls that can help homeowners become more sustainable by generating electricity by sunlight in the day and powering the home in the evening. Other homeowners have had electric car and bike charging points installed. A popular e-bike shop in Poundbury champions the benefits of e-bikes in the community. A Poundbury based eco-energy company offers a solar slate product that has an aesthetic appeal, a wall battery and even an external solar office design, which also powers the home.

RESTORING THE JUBILEE HALL

In Queen Mother Square, the Jubilee Hall incorporates structural elements of The Royal Jubilee Hall from the nearby town of Weymouth.

The original Jubilee Hall was erected in 1887 with much local pride to commemorate the 50 year reign of HM Queen Victoria. Having served as a music hall and theatre and despite a spirited campaign from local environmentalist Dr Geoffrey Poole, it was demolished in 1989 to make way for a town centre retail development in Weymouth. The Duchy of Cornwall and Woodpecker Properties recovered the historic cast iron columns and brackets and incorporated them in the modern Jubilee Hall in Kings Point House.

HRH THE PRINCE OF WALES BEING SHOWN DAMERS FIRST SCHOOL'S ECO GARDEN BY SCHOOLCHILDREN

WHAT OTHER PEOPLE HAVE SAID ABOUT POUNDBURY

"The real point of Poundbury is not how it looks but how it works. For it is now difficult to remember how revolutionary Poundbury has been. Before Poundbury, it was axiomatic that cars came first."
Clive Aslet, The Times, 2016

"Poundbury is arguably the most famous example of successful master-planning in the country."
Matthew Taylor MP July 2008, from 'Living Working Countryside. The Taylor Review of Rural Economy and Affordable Housing."

"Why shouldn't this be the average housing estate? What is being done here is very important work for this country's urban future"
John Prescott, Former Deputy Prime Minister

"We hate to say it, but Charles was right."
Martin Spring, Building Magazine

"I think Poundbury is fascinating. What's interesting is that it's not just about housing, there is a sense of community. The strongest lesson is that if you listen to local people and you allow them to have a strong voice in creating the kind of communities they want to live in, that's how you'll get lasting success. What's most impressive was that it's pedestrian-friendly…"
The Rt. Hon Hazel Blears MP,
Secretary of State for Communities & Local Government

"In Poundbury, the masterplan for the overall scheme delivers higher densities within a walkable neighbourhood, which promotes healthier lifestyles, helps support the local shops and increases land value… New build values are up to 29% higher than on other new build schemes in the area on a type for type basis in the past year".
Richard Rees, Savills Research on The Value of Placemaking, 2016

"It's phenomenally successful, popular and has risen in value. Having seen for myself its beautiful homes and huge sense of community, it's clear to me this experiment is a real success.

What I love about Poundbury is the fact it's thrown out the rulebook. It certainly takes inspiration from the past but I think it could be a blueprint for the future"
Phil Spencer, History of Britain in 100 Homes for Channel 4, 2019

"For a long time the butt of criticism from the fashionable architectural commissars, it is now a point of pilgrimage for planners"
Anne Spackman, Financial Times

"As I saw for myself last November, Poundbury is a great example of a truly mixed community, combining affordable and open market housing and all built to excellent design standards. It's places like Poundbury that drive me to want to push up not just building the new homes we need, but the look and quality of them, so people everywhere in the country can benefit from high quality housing."
Brandon Lewis MP, Housing & Planning Minister, 2015

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F: 01308 482249
Sales: 01305 259 600
E: sales@cgfry.co.uk
www.cgfry.co.uk

Morrish Builders
Unit 5, Upton Industrial Estate
Upton, Poole
Dorset BH16 5SL
T: 01202 623 420
F: 01202 632 448
Sales: 01305 213 745
Commercial Enquiries: T: 01202 661 177
www.morrish-builders.co.uk

ZeroC Holdings Limited
Suite B, Kings Point House, 5 Queen Mother Square,
Poundbury, Dorchester DT1 3BW
T: 01305 250 427
E: enquiries@zerocholdings.co.uk
www.zeroc.co.uk

Woodpecker Properties
Derek Newell
Linen Hill Farm
Bachelors Lane
Holtwood
Wimborne, Dorset, BH21 7DS
T: 01258 841155

Dorset Council
Dorset Council
South Walks House
South Walks Road
Dorchester, Dorset, DT1 1UZ
T: 01305 251 010

AFFORDABLE HOUSING PROVIDERS

Aster Housing Association
T: 0333 400 8222
www.aster.co.uk

The Guinness Partnership
T: 01392 822 902
www.guinnesspartnership.com

East Boro Housing
T: 01202 883 503
www.ebht.org.uk

Hastoe Housing Association
T: 01305 250 103
www.hastoe.com

Stonewater
T: 01202 319 119
www.stonewater.org

Magna Housing Association
T: 01305 216 000
www.magnaha.org.uk

Yarlington Housing Group
T: 01935 404500
www.yhg.co.uk

Chairman, Poundbury Resident's Association
William Gibbons
T: 01305 341 415
E: enquiries@poundburyresidentsassociation.uk
W: www.poundburyresidentsassociation.uk

The Brownsword Hall, Poundbury
A meeting hall and community space available for hire and capable of seating approximately 100 people. For bookings:
T: 01305 753867
Email: brownswordhall@aol.com

For further information, you may find it helpful to refer to the following Websites:

www.duchyofcornwall.org
www.princeofwales.gov.uk
www.princes-foundation.org
www.youtube.com/theroyalchannel

DUCHY *of* CORNWALL

POUNDBURY

WEBSITE COMING SOON

www.poundbury.co.uk

Poundbury Business Friends: An informal group of Poundbury Businesses working together to promote each other organically, through word of mouth and by reputation. A map and business details are available in all Poundbury shops and businesses. For enquiries or to participate in the map scheme, please contact:
E: join@discoverpoundbury.co.uk

DUCHY *of* CORNWALL

POUNDBURY

Jenny Quillien
Sustasis Foundation

Alexander on MISS-TAKES

What is a city?

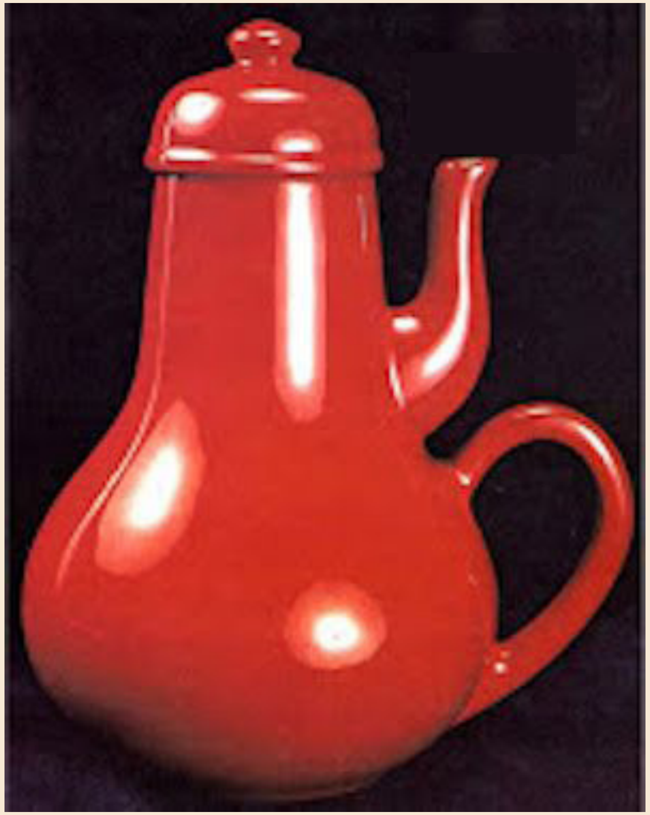
organized complexity = relationships over time

Complexity

The primary way in which complexity of structure reveals itself is in the internal density of significant relationships which exist when adaptation occurs successfully.

Each element is created so as to avoid its possible mistakes. It does this by creating meaningful relationships in every direction.

Each element is created so as to avoid its possible mistakes. It does this by creating meaningful relationships in every direction.



Generated Structure
More Complexity
Fewer Mistakes

WHY?

Fabricated Structure
Less Complexity
More Mistakes

Generated

sequential (easier)

follow steps by which the paper is folded

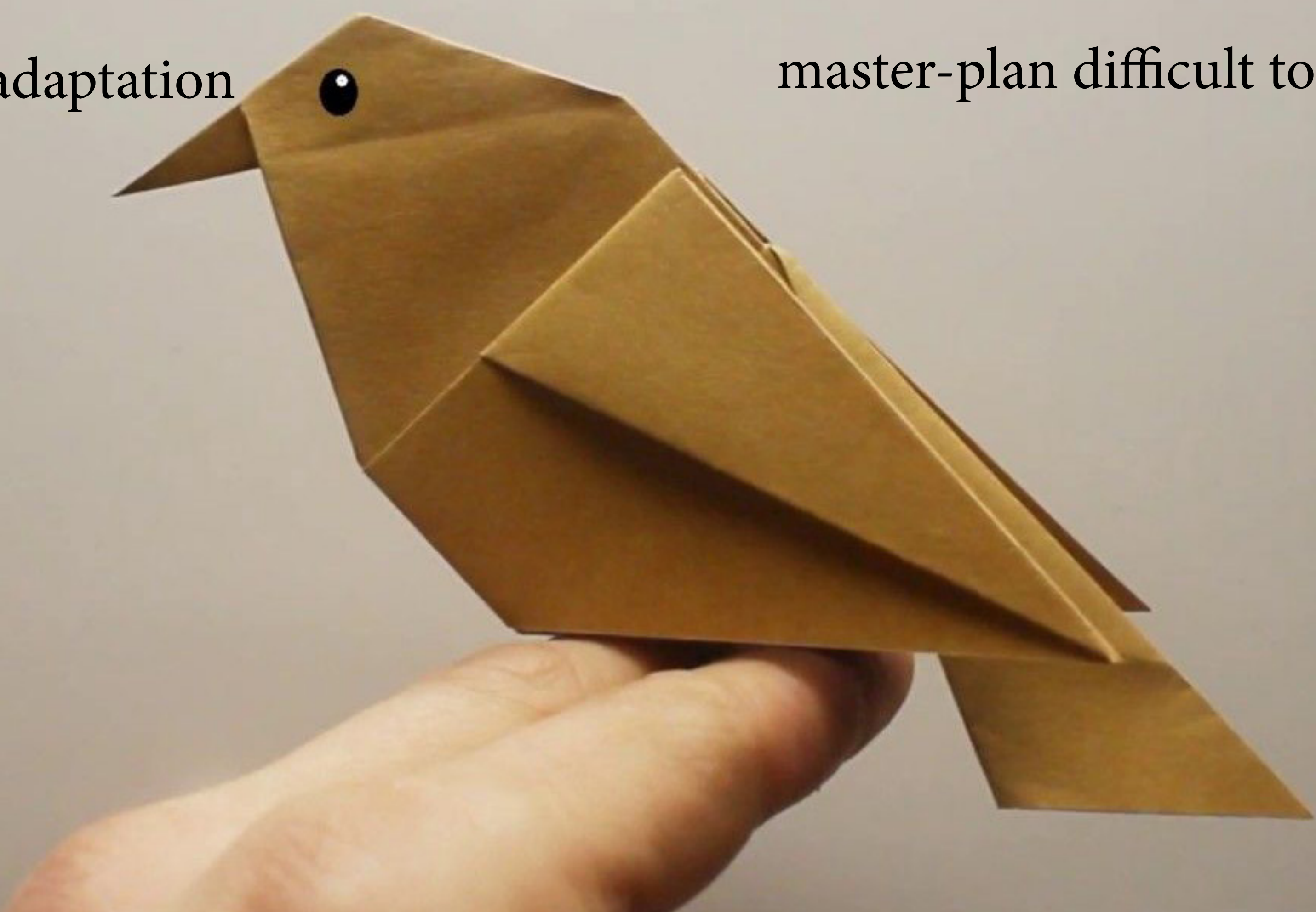
feedback, adaptation

Fabricated

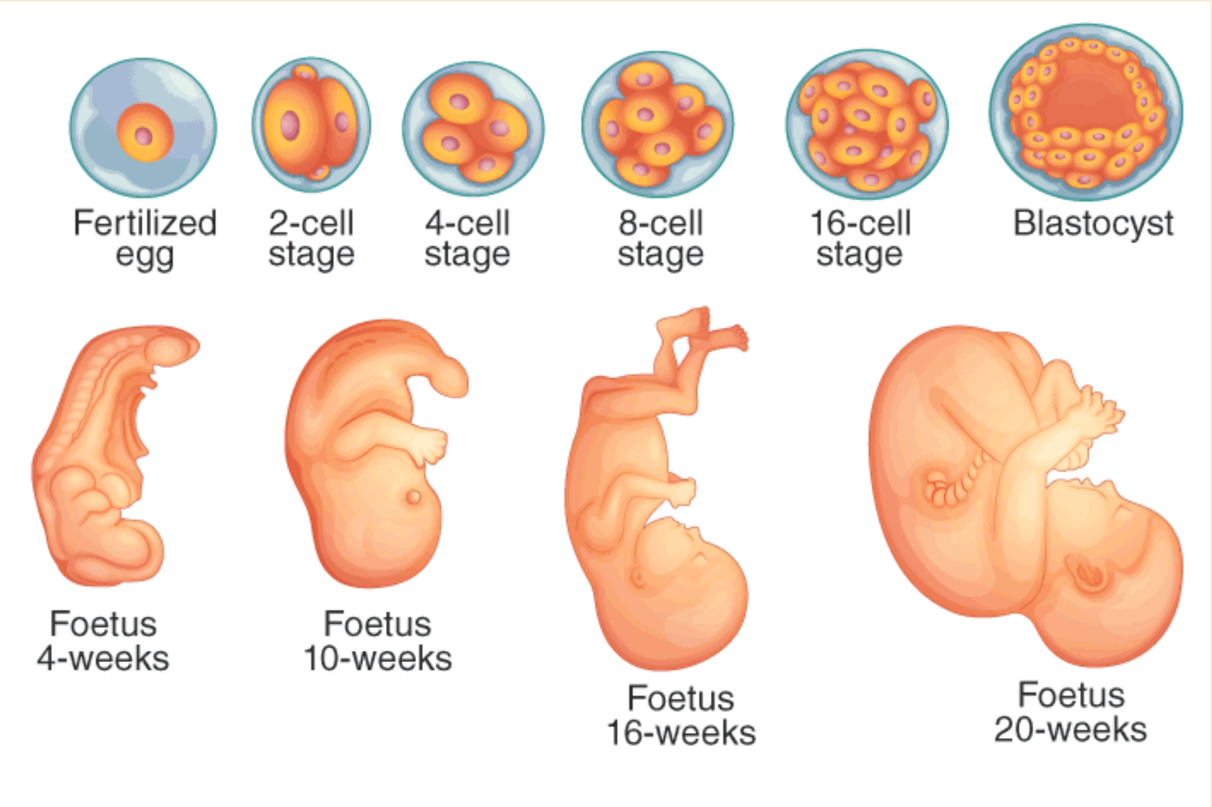
all at once (too difficult)

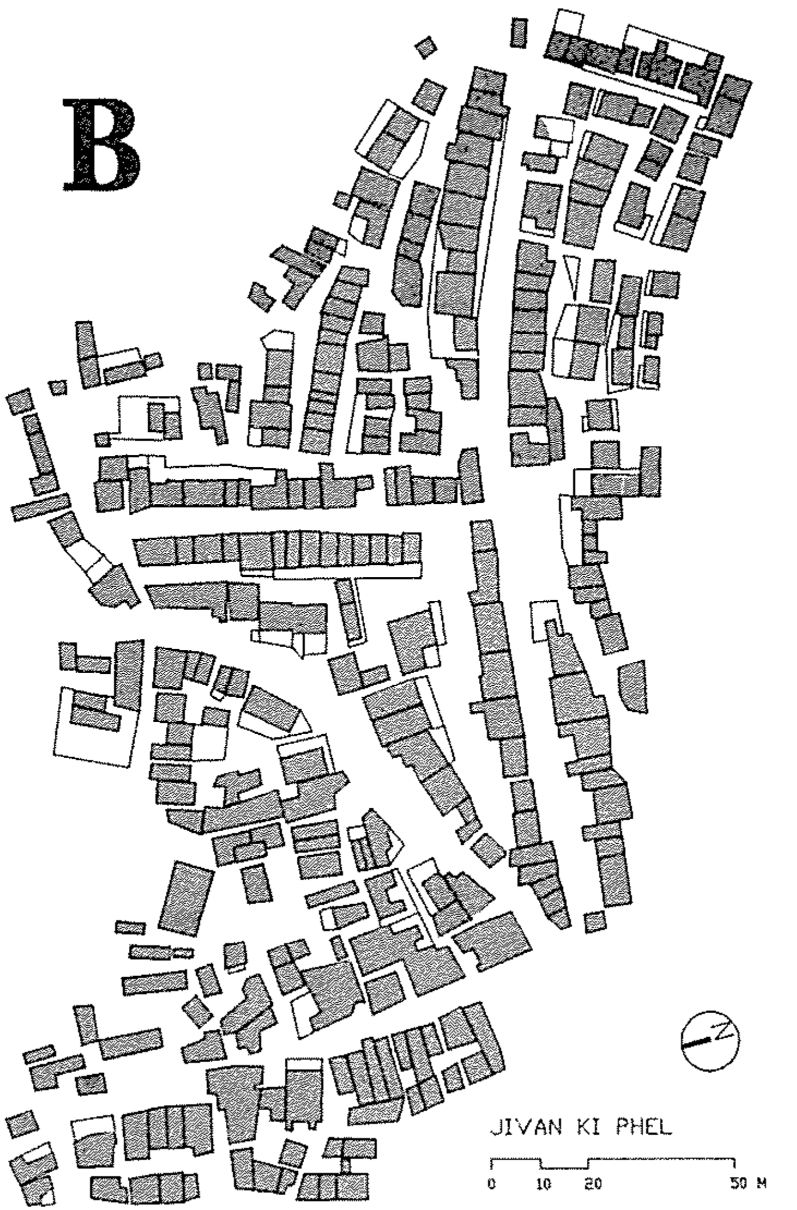
start from description of final shape.

master-plan difficult to change

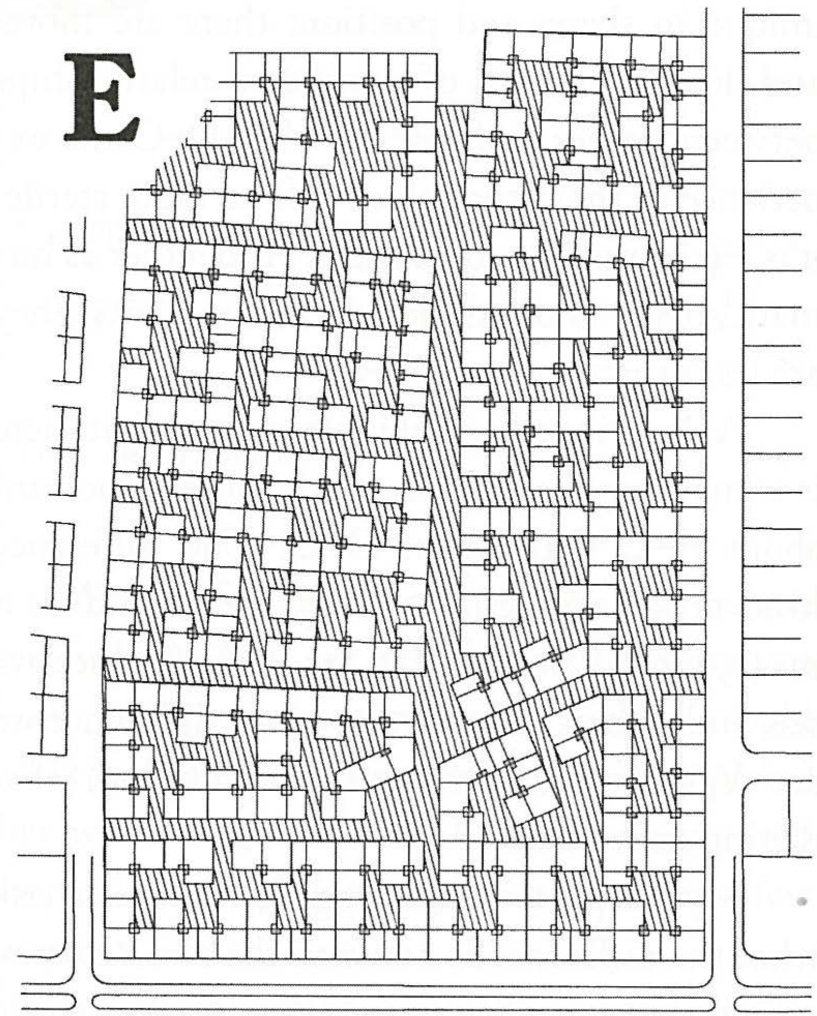


Structure preserving adaptations



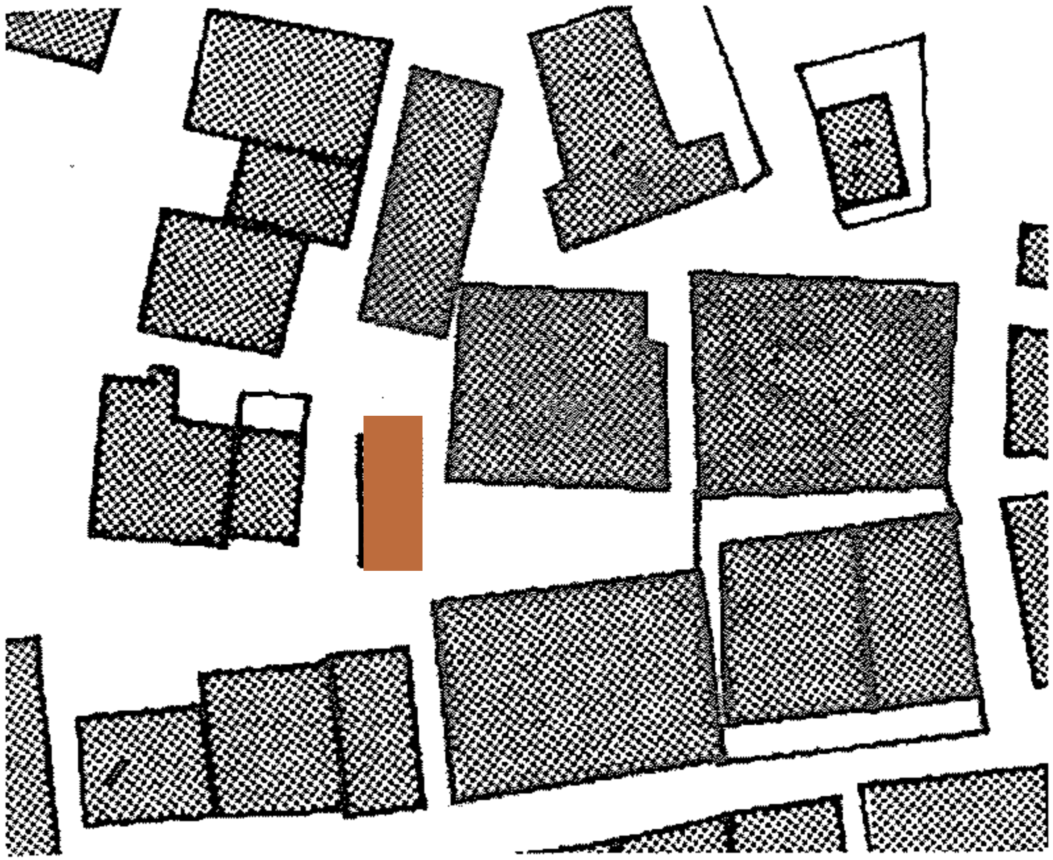


: A generated structure: Jivan Ki Phel, Indore, India.



E: A fabricated structure: designed by Carlos Barquin, a theoretical study for Indore, India.

Complex relationships of overlapping centers built over time. Done by inhabitants in accord with how they live socially and emotionally:



A detail of the settlement at Shilnath. Here we see the profound complexity of overlapping relationships that is typical in every generated structure.

Creates a semi private area to the right

Connectedness to the long house above it

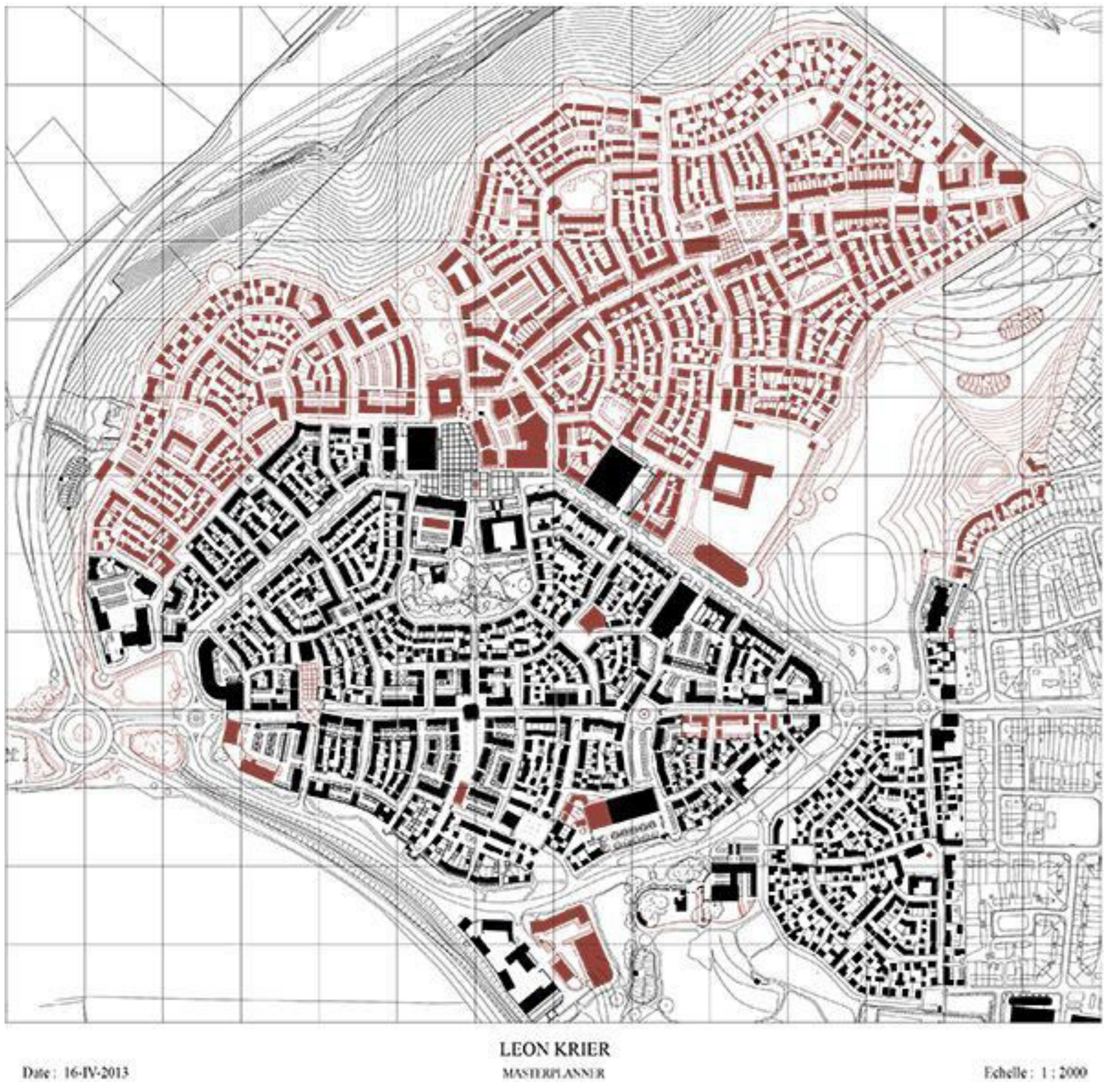
A shared space between the coaxial houses comfortable for play and interaction

Allows informal processions (marriage, funeral)

Gives another square space and opening to narrow path

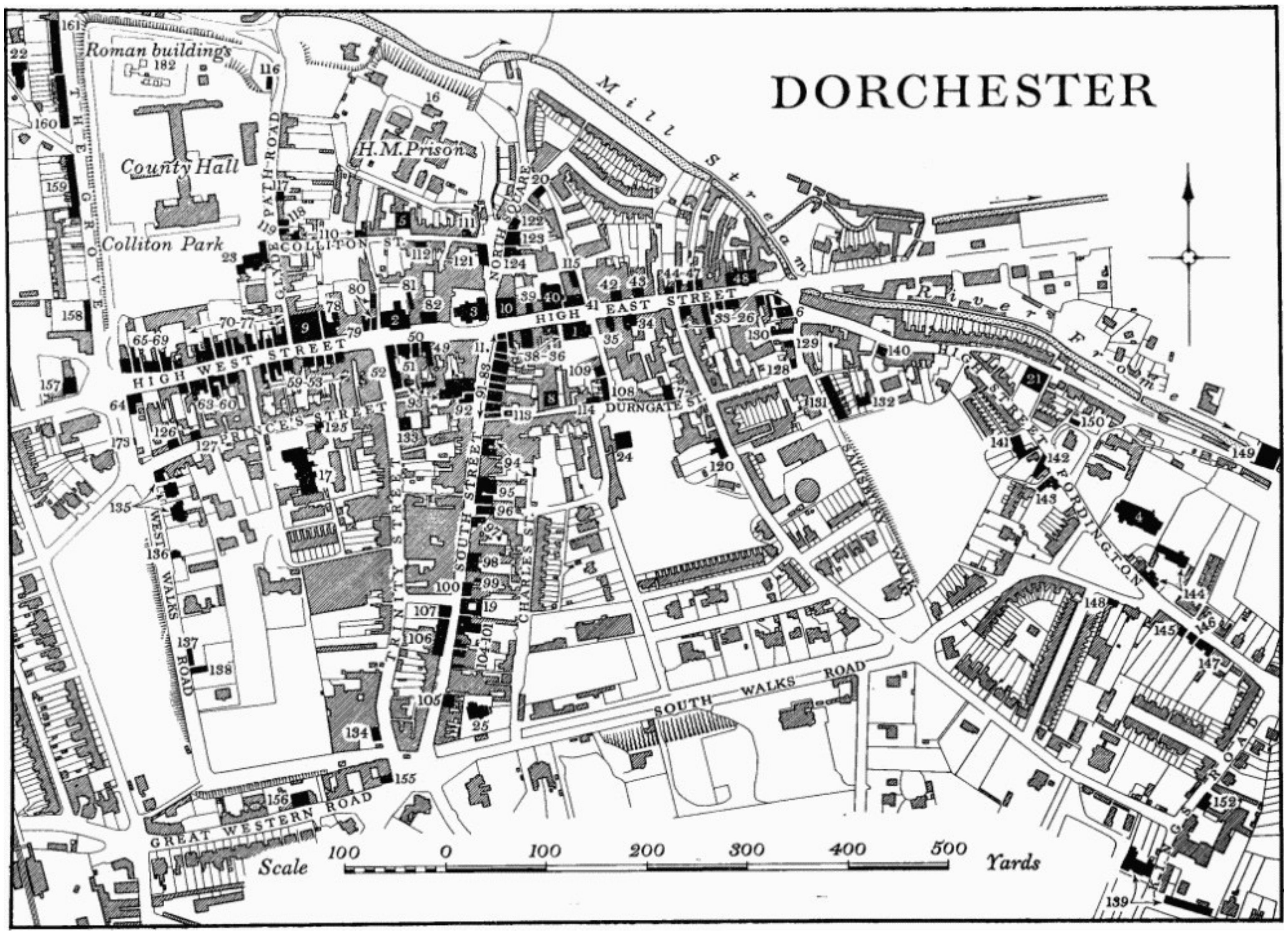
Forms, along with adjacent houses an edge, a definition of space

FABRICATED
Predictable, Fast Centralized implementation,
maximum security of financial investment



GENERATED

Unpredictable. Multiple actors with different social , financial,and emotional motivations



Dorchester in 1611


THE BUTT


WHITFIELD ROAD


Opticians
hearingcare
No vehicles
Except for loading 4.30 pm - 9.30 am
At any time
Shire Hall Museum
Tutankhamun Exhibition
Keep Military Museum
Teddy Bear Museum
Terracotta Warriors Exhibition
Nature Reserve
CARNA
SQUARE


WG19 LXH

Mission Impossible

You can't get there from here.

The idea that a living environment can be invented is outmoded: environment must be cultivated. . . while remaining faithful to the relations of their constituent parts.

John Habraken, T*he Structure of the Ordinary*

Name the significant relationships as the building code

It is not planning per se that is the problem, but knowing what needs and can be planned, and what needs to be allowed to evolve. Thus, planning's role can be redefined as creating the structures, both physical and regulatory that will allow informal participation to occur freely and create life, beauty and wholeness in the built environment.

Sergio Porta, Yodan Rolfe, Mariapia Vidoli

Valletta, Malta 1566

The Ecology of Place: From Understanding to Action

Wednesday, October 11, 4:15pm.
Meet at Jubilee Hall, Poundbury
Dr. Jenny Quillien, Sustasis Foundation

POUNDBURY/ DORCHESTER WALKABOUTS
Christopher Alexander on Miss-Takes
Assessing Fabricated versus Generated Structure

Short Preparatory Discussion

The Nature of the Problem. Jane Jacobs classic scolding of urban planners for misunderstanding the nature of their task. (Background handout available).

The Nature of Organized Complexity. Christopher Alexander, "*The primary way in which complexity of structure reveals itself is in the internal density of significant relationships which exist when adaptation occurs successfully".* In these successful cases "*each element is created in such a way as to avoid its possible mistakes. It does this by creating meaningful relationships in every direction."*

Examples of Mistakes.

Fabricated (Poundbury) versus Generated (Dorchester) Structures. For a one sentence summary: Take an origami bird from folded paper. If you try and make it from a description of the final shape you are working in a fabricated way (standard masterplan). If you follow the rules by which the paper is folded, you are proceeding in a generative way (traditional built environments). (Background handout available.)

Can we move from Fabricated to Generated? (Background handout available)

Walkabout. Poundbury as a best-in-class example of a fabricated structure and Dorchester as an average example of a generated environment. Looking at miss-takes and successful adaptations.

Post Walkabout. Share a pre-dinner drink and compare observations.

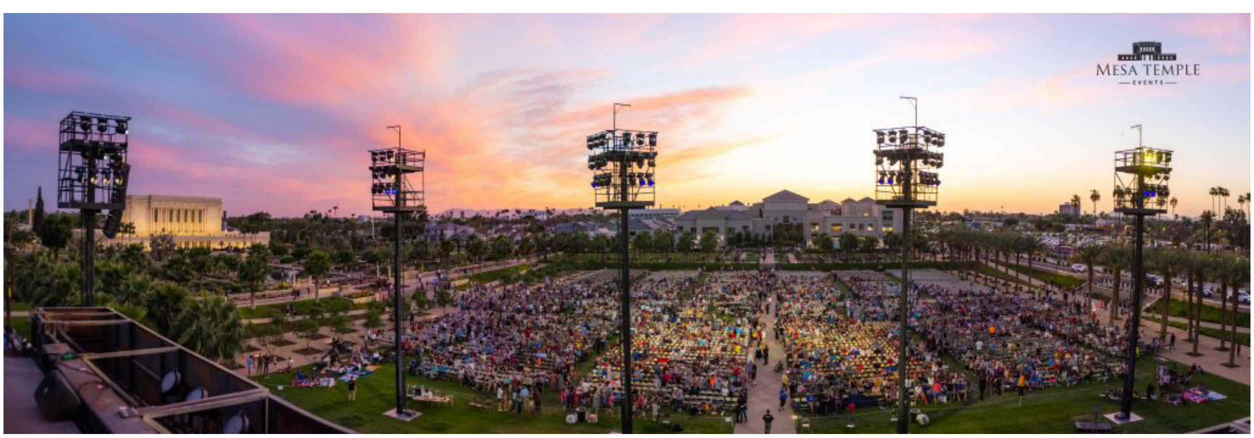
Modern Religious Influence and the Public Square

Joshua M. Stewart

Introduction

When twelve-year-old Barbara Hoyt participated in the Mesa Arizona Easter Pageant, a yearly open-air production of the Easter story attended by tens of thousands of people, she was so excited that she invited 28 people, including classmates, teachers, aides, therapists, friends and bus drivers. Barbara has cerebral palsy and uses a wheelchair. She participated in scenes where Jesus taught and healed the multitudes and where Jesus rode triumphantly into Jerusalem. Barbara's father Andrew carried his daughter onto stage and held her in his arms during the scenes. Barbara said the pageant had given

Barbara Hoyt, 12, performs with her father, Andrew (right), and grandfather, Norman King (left). From *The Mesa Easter Pageant - 80 years of Sharing the Story of Jesus the Christ* by Jill Bishop Adair & Cecily Markland Condie Photo Credit: Steve Porter



Mesa Temple Easter Pageant. Credit: Kary Ann Hoopes MesaTemple.org her a special opportunity to share the spirit of this event with those she cares about.[1]

For more than 80 years, the Mesa Arizona Easter Pageant has been a community tradition. People from all over the Phoenix Metropolitan Area as well as around the world attend this multi-night event held during the beautiful Arizona desert's springtime. The pageant takes place on the grounds of the Mesa Arizona Temple of The Church of Jesus Christ of Latter-day Saints. The pageant stage sits next to this stunning 1927 terracotta temple and temporary seating is placed on the lawn bordering Mesa's Main Street. The pageant is presented in both English and Spanish.

In 1996, the Congress for New Urbanism wrote in its charter,

> The development and redevelopment of towns and cities should respect historical patterns, precedents, and boundaries.[2]

New Urbanists recognized that patterns and traditions have been instrumental to shaping villages, cities, and urban places for a very long time. Religious events, celebrations, and traditions have influenced many shared spaces around the world. Whether the faithful are celebrating Easter, Nativity, Vesak, Purim, Eid-al-Fitr, or Diwali; lawns, squares, plazas, courtyards, and streets provide spaces for these large and small religious gatherings.

Some of these religious events have been taking place for over a thousand years. For example, records indicate Diwali, an Indian religious celebration, took place over 1,500 years ago. Today, millions continue to celebrate Diwali, a festival of lights that symbolizes the triumph of good over evil and light over darkness. From sweet treats to intricate henna designs, to exciting firework displays, this five-day celebration enchants revelers young and old.

Many spaces that are used for religious events share space with markets, government events, activities, and celebrations and are often part of the public square. Generally, public square means a space common to all. A flourishing public square should not be limited to government owned spaces. A religious public square can also be open to all but may have certain standards of conduct that a government-controlled space may not have.

Like the Mesa Pageant, the Greek Orthodox Church of Salt Lake City holds an annual Greek Festival where the whole community is invited to participate. The festival sees regular attendance of 50,000 people. The Church transforms a parking lot adjacent to its lovely Greek Orthodox Cathedral into a vibrant public square. The festival is a fundraiser as well as a way for the community to discover more about faith, share hospitality, and enjoy Hellenic food and culture.

Not only does religious tradition help animate the public square, but religious traditions can help bring meaning, values, and vibrancy to the public square. It can also strengthen community and build unity with face-to-face interaction. Recent research has shown that in-person, face-to-face human interaction improves communication, problem solving, and cultivates greater empathy.[3,4] Around the world, religious communities of various faiths are striving to bring people together in positive ways and help with loneliness.

Conflicts, greed, disagreements, arguments, and contentions can also happen in the public square. Modern city planning and zoning, which helps establish the rules of the public square, must also face the challenges of these conflicts.

Values based planning can help neighbors live in peace and love one another. The Old Testament book of Leviticus 19:18 says, "Thou shalt love thy neighbor as thyself". And Jesus taught in his Parable of the Good Samaritan,

> "Which now of these three, thinkest thou, was neighbour unto him that fell among the thieves? And he said, He that shewed mercy on him. Then said Jesus unto him, Go, and do thou likewise." — Luke 10:36-37

When positive religious values and ideas are cultivated in the public square, they can be more powerful in healing and helping a community than legal punishment or physical coercion.[5] Planning and zoning can invite and reinforce these types of values in the public square. It can become a peacemaking effort where neighbors can live together safely and happily in towns, the country, or in cities.

Russell Nelson, president of The Church of Jesus Christ of Latter-day Saints said recently in his address entitled, "Peacemakers Needed,":

> …We can literally change the world—one person and one interaction at a time. How? By modeling how to manage honest differences of opinion with mutual respect and dignified dialogue.[6]

Humanity needs shared physical space where people can live, work, learn, play, celebrate, protest, and worship together in harmonious and dignified ways. Religious communities have recognized this need for centuries.

Writer and popular BBC radio performer G. K. Chesterton said,

> Men did not love Rome because she was great. She was great because they had loved her.[7]

Chesterton reminds us that values help shape our physical surroundings. The love, sacrifice, and familial regard that a community can have for one another can result in the most beautiful and remarkable places. Places like Rome, Jerusalem, Samarkand, Isfahan, Kyoto, and Angkor Wat express the profound architectural beauty that a community can achieve together. Beyond the built environment, majestic natural spaces, places like Yosemite, Ethiopian Highlands, and the Australian Rainforest have been preserved due to religious efforts to protect them as sacred space.[8]

Striving for space where meaningful, peaceful interaction can take place has been an aspirational vision of religious people for millennia. In his book, *The Sacred and Profane,* religious historian Mircea Eliade, describes the relationship between religious man and place,

> To settle in a territory is, in the last analysis, equivalent to consecrating it. When settlement is not temporary, as among the nomads, but permanent, as among sedentary peoples, it implies a vital decision that involves the existence of the entire community. Establishment in a particular place, organizing it, inhabiting it, are acts that presuppose an existential choice. A choice of the universe that one is prepared to assume by "creating" it. Now, this universe is always the replica of the paradigmatic universe created and inhabited by the gods; hence it shares in the sanctity of the gods' work.[9]

Brigham Young, second president of The Church of Jesus Christ of Latter-day Saints, sought to establish this type of community when he led the Mormon pioneers from Nauvoo Illinois to the Salt Lake Valley in Utah, where he founded Salt Lake City in 1847. Young affectionately called this land Zion.

> I have Zion in my view constantly. We are not going to wait for angels… but we are going to build it. We will raise our wheat, build our houses, fence our farms, plant our vineyards and orchards, and produce everything that will make our bodies comfortable and happy, and in this manner we intend to build up Zion on the earth and purify it and cleanse it from all pollutions. Let there be an hallowed influence go from us over all things over which we have any power; over the soil we cultivate, over the houses we build, and over everything we possess; and if we cease to hold fellowship with that which is corrupt and establish the Zion of God in our hearts, in our own houses, in our cities, and throughout our country, we shall ultimately overcome the earth, for we are the lords of the earth; and, instead of thorns and thistles, every useful plant that is good for the food of man and to beautify and adorn will spring from its bosom.[10]

Even in Young's nineteenth century language, one can recognize a call for global stewardship, environmental preservation and the need for healthy communities. Personal responsibility for home and community helped found a city with deeply interwoven religious roots. He recognized the connection between belief and a flourishing community. Having proselyted in the industrialized cities of 1840's England, Young was personally familiar with urban pollution and crowding, and their impacts on public health.

As a public preacher, Brigham Young also benefitted from the lively interaction that took place in the urban public squares of England. Young and other preachers found great success communicating their message in the busy urban spaces of Dickensian England.

William Whyte, renowned social scientist concluded in his book *The Social Life of Small Urban Spaces*, "What attracts people most, it would appear, is other people."[11] Whyte goes on to describe the "characters" of urban spaces: the exuberant, the flamboyant, the lovers, the conversationalists, the undesirables, the observers, the lack of vandals, the plaza "mayors", as well as the street actors. All of which can interact to create what can be vibrant, flourishing, and interesting places.

While, as Whyte noted, the public square generally acts peacefully, contention and conflict are also inevitably part of the human condition. Brigham Young said, "To live with Saints in Heaven is bliss and glory, To live with Saints on Earth is another story."

Conflicts and damage have resulted in legal frameworks designed to both limit and protect people in the public square. Legal protections, processes, and procedures have value, but their imperfect frameworks have presented challenges for communities of faith to participate fully in building successful public squares. Three challenges facing religious participation in the public square today include: Euclidean zoning, the American notion of "separation of church and state," and broad secularism.

Euclidean Zoning

Euclidean zoning, or zoning that only allows one kind of land use, has been a standard since the US Supreme Court ruled in the 1926 Euclid vs. Ambler Realty case. In America, Euclidean zoning grew in popularity because it was easy to implement, had a strong legal precedent, and was simple for architects and developers to design. Early zoning efforts to separate industrial uses from residential or commercial uses were seen as clearly beneficial.

Unfortunately, planners and developers have used Euclidean zoning to create broad swaths of autocentric single family neighborhoods and isolated retail centers, churches, schools, and office parks. At its worst, single use zoning has been manipulated as a tool of racial segregation and has led to vast environmental damage.[12]

For church goers, instead of their churches being zoned into a neighborhood where they can walk to church, they often find their houses of worship out on busy arterials. Even when a church is integrated into a residential zone, parking codes have required vast single-use parking lots around them. Churches have been encircled in walls and fences, essentially isolated. Even if a residential neighborhood does not take issue with a church building, a resident is more likely just to not want the large asphalt parking lot that sits vacant most of the week next to their home. Dividing churches from their neighbors with little to no sharing of space or connection to their neighbors has left churches caged or boxed-in compared to their historic European counterparts, which were at the center of communities sharing space with markets, retail stores, residential buildings, and businesses.

Similar to parking requirements for retail centers and office parks, Euclidean zoning has required minimum parking counts for churches and reinforced a culture of driving. In Utah alone, parking lots for chapels of the Church of Jesus Christ would add up to several square miles of asphalt. Even if church members and visitors could safely walk from their nearby homes, large parking lots are still generally mandated by city code or cities have

1936 Chapel of The Church of Jesus Christ of Latter-day Saints nestled in a walkable part of Salt Lake City, Utah on 1.55 acres with 27 onsite parking spaces. Image: Bing Maps

2000 Church of Jesus Christ of Latter-day Saint Chapel located in Daybreak, Utah on 4.3 acres with 247 onsite parking spaces despite community's walkability. Image: Bing Maps

allowed parking lots to be larger than needed.

Prior to the stand alone single-use approach to parking and zoning, local Latter-day Saint congregations were able to minimize on-site parking and share on-street parking. Historically, neighbors were willing to share the street with church goers for a few hours once a week in exchange for larger church lawns or creek side parks or native landscapes that the whole community could use and benefit from, rather than have a large asphalt heat island.

Separation of Church and State

The First Amendment of the U.S. Constitution stated in 1791 that "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof." American Thomas Jefferson used the metaphor of separation of Church and State in 1802. In the beginning this concept and law proscribed the establishment of a state religion. Over time, however, because of fervid actors promoting separation of Church and State, religion has been pushed further and further from the public square. Many see the extreme separation of church influence from the public square as detrimental to society in terms of community dialogue and unity.

A recent editorial article by The Church of Jesus Christ of Latter-days Saints asks,

> Where does religion happen? In church, some might say, or a synagogue, mosque or monastery. Others will say it happens at home or even in the solitude of one's heart. People of faith pray, listen to sermons, study scripture and perform rituals in their own houses of worship. But religion does not end there. The religious life carries over into the bustle and noise of society. Religion, therefore, happens wherever people are.[13]

Religious faith can be expressed in our urban places but can be sometimes stifled legally by those that want religion out of the public square. Many are afraid to discuss religion in fear of offending someone. This legal wrangling of religion has caused many church buildings to turn inward architecturally. Rather than shared outdoor spaces such as traditional church plazas or squares, modern churches have become more opaque, fenced, and inward facing. Consequently, religious celebrations or shared community events that could have taken place at a church plaza, courtyard or square now have fewer spaces to accommodate them.

The Church of Jesus Christ has expressed,

> Religious values cannot be dismissed from the public square any more than the vast array of other positive values can be. Efforts to do so ignore the deeply embedded religious antecedents that give shape to the common heritage and identity of peoples across the globe.[14]

In addition, unintentional or intentional neglect or lack of government/church partnerships or dialogue can lead to a weakening of the quality and vitality of spaces around church sites. For example, inadequate maintenance and disinvestment in historic city cores that are often anchored by traditional religious structures impacts the beauty, charm, and character of these spaces. Government's lack of action to preserve historic church sites can lead to the erosion of the urban fabric and community character.

Broad Secularism

Secularism seeks to interpret life based on principles derived solely from the material world, without recourse to religion. It shifts the focus from religion towards "temporal" and material concerns.

Church attendance in the U.S. has seen a decline in recent years. In Western Europe, traditional religious Christianity has declined significantly. One exception in Europe has been growth in the Muslim faith as North African and Turkish immigrant populations have immigrated to Europe.[15]

Europe and America, while culturally distinct, have shared some similar secularist approaches. Professor of Sociology and Theology at Boston University, Peter Berger said,

> … in America we do have an increasingly Europeanized intelligentsia. The history of this is very interesting; it goes back several decades, and as long as you move in what I've called the "faculty club culture" in the U.S., you may as well be in Europe. And that is very different from most of the population, and I think many of the political problems in the United States over the last 40 years or so have been a result of a strongly religious population rebelling against the secularity of an intelligentsia which is relatively small in numbers but very influential in the society.[16]

While America and many non-Western European areas still have strong religious beliefs, Western European secularism is having a strong influence on the cultural make up of our shared spaces.

Religious participation in the public square does not need to be a renunciation of the secular or a suggestion that one must choose between religion on the one hand and the whole body of secular learning on the other. That is a false dichotomy. The very idea of the public square is a space where pluralism can thrive and a multitude of ideas, events, celebrations, and even protests can occur.

In fact, secular humanists recognize the challenges to the public square just as religious institutions are seeking to heal some of the damages of modernity. Modernist architect Richard Rogers lamented in 2000,

> Public areas have become dangerous and fragmented, citizens flee city centres in alarming numbers and the essence of a city – its human vitality – is being sucked out, leaving behind ghost towns offering only physical dereliction and social exclusion.[17]

Unfortunately, secularists can ignore or forget about the vitality that religious worship, celebration, and activism can bring to the public square. Jan Gehl's early 2000's book *New City Spaces*, which highlighted modern public squares around the world, showed just how few religious institutional players have been participants in many of the new public squares.

Two recent revitalization projects in the US, one in Salt Lake City, Utah and the other in Mesa, Arizona, show that significant religious investment can strengthen and enliven the public square.

Salt Lake City, Utah

In 1847, religious refugees of The Church of Jesus Christ of Latter-day Saints traveled more than 1,000 miles west to the valley of the Great Salt Lake. These refugees, generally referred to as the Mormon pioneers, were a mix of Church converts from the eastern United States, England, Wales and other continental locations. Nearly all were relatively new converts to the recently organized Church of Jesus Christ of Latter-day Saints (established in 1830). Members of the church, referred to as Latter-day Saints, had just completed constructing churches and towns in Kirtland Ohio (1836) and then in Nauvoo Illinois (1841-1846) when they were driven out of both locations. They took their new faith and established Salt Lake City.

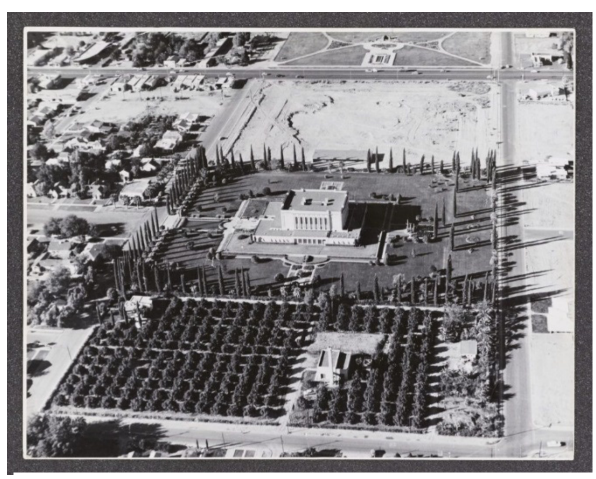
The layout of Salt Lake City and subsequent Latter-day Saint towns in the mountain valleys of Utah and the desert southwest was primarily a simple grid with a center block reserved for church functions and several other scattered blocks reserved for public use.

Nine of 12 key leaders of the Church in Salt Lake, including Brigham Young, had recently returned from missionary work in England. In many ways their experience in industrializing England greatly influenced the design and vision for the cities they would establish throughout the west. While the city grid was common in the US, the scale of the blocks and the width of the streets that they built in Salt Lake City and other towns was not common. Streets were 8 rods wide (132 feet) and the blocks were 40 rods square (10 acres). Church leaders wanted to avoid the poor living conditions they had seen in England. They wanted to avoid diseases such as cholera and tuberculosis and polluted rivers, creeks, and air.[18] Wide streets would provide room for clean air and vital irrigation ditches and canals. Large lots would provide plenty of room for home gardens, orchards, livestock, and fowl.

During those early years of development, the streets were lined with abundant trees and street cars were readily embraced across the city. But the city's salubrious streets quickly turned from healthful air and active transportation to vast expanses of asphalt when automobile culture took over in the '40s and '50s. By the '90's and '00's suburban flight had left Salt Lake City with some of the worst air pollution in the US and in need of an urban refresh.

Mesa, Arizona

The first pioneers sent by Brigham Young arrived in the Mesa Arizona area in 1877. Mesa is part of the Salt River Valley. This fertile valley had been home to Native American Hohokam tribes centuries earlier. The Hohokam had dug some irrigation canals for their desert farming, but by the time the Mormon Pioneers began digging their own canals the Hohokam had been gone for centuries. Early settlers of Mesa, including Mormon Pioneers, built similarly sized blocks and



View Mesa Temple 1950s. Image: Church News roads as Salt Lake City. At the turn of the century, Mesa's population began to grow as the irrigation water supply was stabilized with the completion of the Roosevelt Dam in 1911. In 1915 it was described as a city of wide streets, beautiful homes, and luxuriant foliage.[19] Although founded by Mormon pioneers, the city grew ethnically and religiously diverse.[20] The Mesa Arizona Temple, an important place of worship for the Latter-day Saint community, was located at the east end of Downtown Mesa. It provided a beautiful axial termination to 132 foot wide 1st Avenue. The temple and its grounds were completed in 1927. It was initially surrounded by fields and citrus orchards. Over time, the area went through the same auto-oriented growth as the rest of the US. Poor quality growth occurred immediately around the Mesa temple. As car traffic and hot expanses of asphalt eroded the quality of life in central Mesa, families began moving further away from the center of Mesa into the outer suburbs. Downtown Mesa also needed renewal.

City Creek Center

Light rail transit was added to Main Street Salt Lake in 1999 with the hope of revitalizing Main Street, but a new retail center built prior to the 2002 Winter Olympics pulled away a number of retail tenants from Salt Lake City's Main Street. City Creek Center, built by the Church of Jesus Christ, was started as a way to revitalize the Downtown district and protect the area around historic Temple Square. As the headquarters of the Church of Jesus Christ was near the center of downtown Salt Lake City, the city was fortunate to find a partner who cared about the long-term quality of the environment downtown.

The City Creek project included two and a half blocks of the Downtown (about 23 acres) as well as major rework of adjoining streets. The project team included the for-profit real estate group of the church, Property Reserve Inc. (later City Creek Reserve Inc.), retail partner Taubman Company, and numerous other local retail tenants and office tenants.

The City Creek Center included a two-story pedestrian retail arcade with retractable roof, a recirculating creek or stream that was fed by the well water that flowed from nearby City Creek Canyon (and included a

View of one of City Creek's plazas. Image: Church News


View of City Creek residential and galleria with Salt Lake Temple in background. Image: Visit Salt Lake

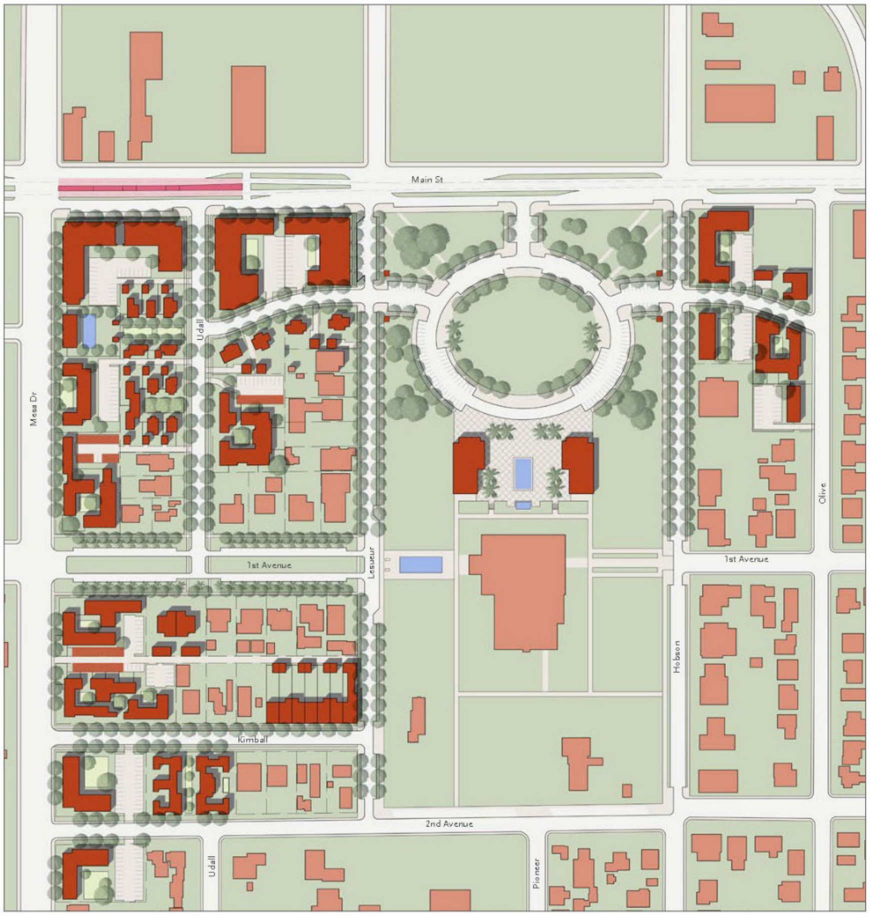
portion with trout), and two plaza spaces with water features that terminated the two ends of the retail path. The project also included three large condominium towers (425 units), 111 for-rent apartments, a sports club, new and existing office towers, a 70,000 square-foot grocery store and 5,000 underground parking spaces. The light rail on Main Street connected the Center's residents and visitors to the university, south valley, and airport. The project was recognized as a LEED Silver Neighborhood Development.

The City Creek project, built during the recession years of 2008-2012, was a tremendous financial benefit to the community as it provided thousands of local construction related jobs at a time when work was drying up in other parts of the state. Ultimately, however, the goal of the project was to strengthen the sense of community and inspire other investments in the downtown area. Shortly after completion, a large publicly funded theater was added on Main Street and additional office and residential towers were also completed. One office tower designed by SOM would even include a large multi-congregational meetinghouse at the base of it. Sculpture, artwork, and historical interpretation were also included in the projects, not as city mandated, but as part of the larger vision for creating a more beautiful public square. The Church's 2012 World Report stated,

> It's designed to reflect the historic European example of an international city, wherein the economic center of city life is in close proximity to the worship centers of its people.

Mesa Temple Redevelopment

By 2010, the Mesa Temple of the Church of Jesus Christ of Latter-day Saints had



Moule Polyzoides 2013 Mesa Strategic Plan

been a community gathering place for many decades. Besides regular temple attendance, as many as 100,000 people would gather during the two weeks of the Mesa Arizona Easter Pageant, and in the winter, thousands enjoyed the seasonal Christmas lights.

When the City of Mesa began efforts to revitalize Main Street and build on the new light rail line, they approached the Church of Jesus Christ of Latter-day Saints about participating in their revitalization efforts. City officials and staff were big supporters of redevelopment of the area. They invested in city park improvements in a park just north of the Temple and also made improvements to Main Street.

Real estate that the Church had purchased around the temple over the past decade provided the first 4.5 acres of land next to the temple and was light-rail ready for redevelopment. Significantly, at the start of their planning process, the Church helped pay for a new form-based code overlay written by the planning firm Opticos. This form-based code was crucial in allowing for redevelopment that focused on architectural place making, was pedestrian friendly and allowed for a mix of uses and densities.

An initial strategic plan for the areas around the temple was made in 2013 by Stephanos Polyzoides and Vinayak Bharne of Moule Polyzoides. Streetscape design was provided by Design Workshop. These New Urbanist experts were pivotal in shaping pro-social housing types and more walkable streets. Neighborhood redevelopment coincided with the renovation work on the neoclassical temple and began in 2018. Arizona planners and architects, David Davis and Dale Gardon, of Dale Gardon Design, provided final design and planning for much of the mixed-use development around the temple. Principal planner, David Davis applied

View of redevelopment next to light rail tracks on Main Street – Photo Credit: LDS Church (Church of Jesus Christ)

lessons he learned from his team's beautiful New Urbanist community Verrado to the Mesa project. In addition, the Church design teams visited and applied design principles from 1920's walkable neighborhoods in Phoenix like the Roosevelt District.

The Moule Polyzoides' 2013 strategic plan stated,

> Build permanently and beautifully for long term value. Everything that is built within this neighborhood should be designed with permanence in mind. Permanence is the highest order of sustainability. There are two significant dimensions to it: One is durability of construction. For a neighborhood to have long-term value, its buildings must endure. The other is beauty. People will decide to buy, invest and live in buildings for a long time, only when they feel emotionally connected to them.

In concert with their aspirational language, the Moule Polyzoides team also illustrated several beautiful residential types including bungalow courts, cottages and granny flats, two over one residential/retail and showed the team successful courtyard residential and Rosewalk townhouse typologies. Their brilliant work set a high standard for building around the temple.

The 2018-2021 Mesa neighborhood redevelopment included 240 apartments, 12 townhomes, 70,000 square feet of landscaped open space, ground floor retail space and underground parking. It also included: major rework of the streets

Before and After Concepts for Mesa 1st Avenue improvements

reducing the amount of asphalt; new shade trees and sidewalks, new landscaped medians, a new visitor center, as well as renovation of several historic homes. The temple renovation included a complete rework of 20 acres of grounds, reflecting pools, and gardens. The overall results of the combined projects were beautifully transformative both architecturally and in terms of strengthening community spirit.

When the project was complete, Mesa Mayor John Giles expressed,

> The Church's invitation to invite the community in for Christmas lights and Easter pageants, and just the very welcoming attitude that the Church has always had here, has created a tremendous amount of goodwill… We're very fortunate as a city that the Church was willing to come and invest in our community, create something that's going to last generations — and it's top quality.[21]

The Church's commitment was "huge," said Mayor Giles, because,

> …some legitimate organization that has resources has got to say, 'You know what? We see the value in this location. We're going to maybe take a risk. But we think it's a great, well-calculated and intelligent risk because we see the potential, and we're going to take advantage of the public infrastructure that's in place.' [The Church's] decision to invest in our downtown sent a great signal to the rest of the smart investors that said, 'Well, gee, that if they're doing it, that's a sign that it's got potential [and] can be a reality.[22]

Activities in the Public Square

The best public squares thrive when they can attract people with food, fun, and meaningful events. The Church of Jesus Christ temples are typically active throughout the week and often include wedding parties that can spill out into the

Mesa Temple Visitor Center and FamilySearch Center Image: Church News

surrounding grounds. Salt Lake City and Mesa City benefit from religiously sponsored events for children and youth groups as well as family events, public concerts, and lectures that help activate the areas. In both locations, FamilySearch family history research centers also draw people to the area. Many residents and visitors also enjoy walking around the temple gardens or seeing the seasonal Christmas lights.

Stephen West, the Mesa Temple Pageant president, talked about the influence that he hoped the pageant would have on the 86,000 people that attended, (roughly half of whom had never seen the production before). He said, "Over time, I think we can probably continue to generate that interest so a greater portion of the Valley can actually see it and be lifted up and inspired…" Steve said,

> Whether they are inspired to seek the missionaries, inspired to go back to their own church, or inspired to do a good deed or to mend a fence with their family members - whatever that might be - I think we have accomplished a great objective of lifting them… [23]

Conclusion

Religious institutions and churches can and want to be significant participants in existing public squares and help in the creation of new public squares. They want to help activate them not only with pageants, ceremony, and parades, but also with smaller picnics, performances, and worship. Governments, professional organizations, and non-profits can synergize efforts with churches to revitalize and enlarge public squares and public spaces as they recognize and discuss more openly the sacred and spiritual purposes or roles a space may be for a religious community. Collective hopes and aspirations for the public square are strengthened with a spiritual component. While vibrant religious festivals and ceremonies can and do rise from simple parking lots surrounded by cold chain-link fences, planning and design professionals can encourage and invite clergy to incrementally improve these spaces as an endowment for future generations.

Urban sociologist and planner William Whyte entitled his first book, *Is Anybody Listening?: How and why United States Business Fumbles when it Talks with Human Beings*, highlights a principle that also applies to people's faith. We must do more listening to better understand religious beliefs and be more respectful of what people hold sacred. More listening can help participants in the public square avoid proverbially dropping the ball when it comes to neighborly virtues of charitable giving, volunteerism and altruism, trust, and higher civic involvement.

Bishop David A. Burton, who provided institutional oversight and leadership for the City Creek project said, "we've been striving to do our part to make this city, in a mountain valley, a beautiful, vibrant place that warmly welcomes anyone who wants to make their home here". Burton recognized religion was part of a unified community. He said,

> No matter our differences, we can reach across them and build our city. Together we can continue to make this a great place, a beautiful place, a caring place, a place to worship according to the dictates of our own conscience, a place of mutual respect and, indeed, the right place! The true "giant in our city" is all of us, hand-in-hand, arm-in-arm, shoulder-to-shoulder, coming together to do good things, to do hard things, and do them in a way that blesses this community and its residents and its wonderful institutions.[24]

Barriers to religious participation should be removed. States, cities, city business alliances and other organizations would be wise to encourage and invite their participation. Better zoning, such as Form-based zoning and eliminating parking minimums can also help. City officials and staff can actively reach out to religious communities and put them in touch with the best urban designers and architects and even pair them up with other development partners.

Our best public squares are cherished spaces because they embrace tradition, people love them and beautify them, and they want to share them with their neighbors. Everyone in the public square can benefit when common religious values such as love, brotherly kindness, patience and charity help elevate behavior in the square.

In the film, *Napoleon Dynamite*, the character Pedro, a recent Mexican immigrant to rural Idaho, says the following in his campaign for high school student body president,

> Hello. I don't have much to say. But I think it would be good to have some holy santos brought to the high school…to guard the hallway and to bring us good luck. El Santo Niño de Atocha is a good one. My Aunt Concha has seen him…

Pedro is on the right track. A little more sacred in the high school hallways would be a good thing. And a little more sacred participation in the public square can be a good thing too.

About the author: Josh Stewart is an architect and urban designer living in Salt Lake City, Utah. He is a past board member of CNU Utah chapter and current board member of the ICAA Utah chapter. He worked on both the City Creek and Mesa Temple Redevelopment projects and currently works with the Special Projects Department at the Church of Jesus Christ of Latter-day Saints.

Notes:

1. *The Mesa Easter Pageant - 80 years of Sharing the Story of Jesus the Christ.* Jill Bishop Adair & Cecily Markland Condie
2. *Charter of the New Urbanism,* CNU.org
3. Ravi Gajendran, the FIU Business associate professor of global leadership and management said, "Negotiating or working together to solve a problem is more difficult over email or instant messenger than working in person because text-based communication limits visual, vocal and nonverbal cues." He continues "The absence of these cues means that text-based communication takes longer and requires more thought to arrive at a shared understanding. You have to think about what you're writing, to make sure it's not misinterpreted." In the study, *Hidden costs of text-based electronic communication on complex reasoning tasks: Motivation maintenance and impaired downstream performance* published in the March 2022 issue of *Organizational Behavior and Human Decision Processes*, researchers conducted tests looking at the relationships between the communication type – electronic versus in-person – on motivation maintenance and performance on complex reasoning tasks, such as negotiating and coordinating.
4. See Lauren E. Sherman, Minas Michikyan, Patricia M. Greenfield, *The effects of text, audio, video, and in-person communication on bonding between friends.* Journal of Psychosocial Research on Cyberspace, Cyberpsychology. They found, "bonding, as measured by both self-report and affiliation cues, differed significantly across conditions, with the greatest bonding during in-person interaction, followed by video chat, audio chat, and IM in that order."
5. *Book of Mormon*, Alma 31: 5 states, "…the preaching of the word had a great tendency to lead the people to do that which was just—yea, it had had more powerful effect upon the minds of the people than the sword, or anything else, which had happened unto them—therefore Alma thought it was expedient that they should try the virtue of the word of God." Healthy public discourse is described by Dallin H. Oaks, Church of Jesus Christ of Latter-day Saints General Conference Speech 2014 entitled *Loving Others and Living with Differences.* From experience as a former Utah Supreme Court justice and religious leader, he said, "On the subject of public discourse, we should all follow the gospel teachings to love our neighbor and avoid contention. Followers of Christ should be examples of civility. We should love all people, be good listeners, and show concern for their sincere beliefs. Though we may disagree, we should not be disagreeable. Our stands and communications on controversial topics should not be contentious. We should be wise in explaining and pursuing our positions and in exercising our influence. In doing so, we ask that others not be offended by our sincere religious beliefs

and the free exercise of our religion. We encourage all of us to practice the Savior's Golden Rule: "Whatsoever ye would that men should do to you, do ye even so to them" (Matthew 7:12)."
6. Russel M. Nelson. April 2023 General Conference of the Church of Jesus Christ of Latter-day Saints.
7. G.K. Chesterton in *Orthodoxy: The Flag of the World*. Chesterton argues that physical space was a crucial part of moral codes. He wrote, "Morality did not begin by one man saying to another, "I will not hit you if you do not hit me"; there is no trace of such a transaction. There IS a trace of both men having said, "We must not hit each other in the holy place." They gained their morality by guarding their religion. They did not cultivate courage. They fought for the shrine, and found they had become courageous."
8. Yale Environment 360 *Sacred Groves: How the Spiritual Connection Helps Protect Nature* by Fred Pearce https://e360.yale.edu/features/sacred-groves-religion-forests Mircea Eliade *The Sacred and the Profane*
9. Mircea Eliade, *The Sacred and the Profane, p*g. 34. Eliade argues that profane space gives man no pattern for his behavior and is homogenous and neutral (a lament that James Howard Kunstler makes in his book *Geography of Nowhere* that there is placeless-ness – or "no place" in American man-made landscape where every place is like no place in particular). In contrast to profane space, Eliade explains that sacred space may include the site of a hierophany (a manifestation of the sacred) and has a sacred structure to which religious man conforms himself.
10. Discourses of Brigham Young. Selected by John A. Widtsoe. 1941.
11. See William Whyte *The Social Life of Small Urban Spaces* pg. 19. Whyte explains, "I am, in sum, bespeaking busy places. Too busy? Too crowded? I think not. As we have seen, people have a nice sense of the number that is right for a place, and it is they who determine how many is too many. They do not, furthermore, seek to get away from it all. If they did, they would go to the lonely empty places where there are few people. But they do not. They go to the lively places where there are many people. And they go there by choice—not to escape the city, but to partake of it."
12. For a summary of the impacts of single use zoning, See Andres Duany, Elizabeth Plater-Zyberk, and Jeff Speck's *Suburban Nation.*
13. *Civil Society: Faith in the Public Square.* Third in a three-part series on the practice of civic life. Published in 2016 https://newsroom.churchofjesuschrist.org/article/civil-society-faith-public-square
14. *Religious Values in the Public Square.* December 2010. https://newsroom.churchofjesuschrist.org/article/religious-values-in-the-public-square
15. For religious demographics sew the Pew Research studies. https://www.pewresearch.org/religion/2015/04/02/europe
16. *Secular Europe and Religious America: Implications for Transatlantic Relations.*

https://www.pewresearch.org/religion/2005/04/21/secular-europe-and-religious-america-implications-for-transatlantic-relations/

17. Richard Rogers quote in *New City Spaces.* Jan Gehl, Lars Gemzoe. Published in 2000.
18. *Deseret News* Aug 9, 1865 editorial describes the type of places that Mormon pioneers were leaving, "What has brought many happy thousands who dwell here, from the abodes of sin and wretchedness in the old countries—from the dark and unhealthy alleys and filthy streets of those immense hot-beds of crime and disease known as cities, from the body and soul-corrupting influences of factories, or from the dark and dangerous mines where thousands never see the sun rise or set? What has brought these individuals here…and placed them where they can enjoy the bright sunlight and breathe the pure air of heaven, where they can own and cultivate the soil, build their own habitations and rear up their families without the constantly harassing fear that they may starve for the lack of that bread that the speculators hold, but which the poor often cannot get?"
19. *Mesa (Images of America: Arizona)* Lisa A. Anderson, Alice C. Jung, Jared A. Smith, Thomas H. Wilson. Published in 2008
20. Ibid
21. *The Church's Redevelopment Project in Mesa Is Complete.* September 29, 2021 https://newsroom.churchofjesuschrist.org/article/church-mesa-arizona-redevelopment-project
22. Ibid
23. *The Mesa Easter Pageant - 80 years of Sharing the Story of Jesus the Christ.* Jill Bishop Adair & Cecily Markland Condie. Page 251
24. H. David Burton speech in receiving the "Giant In Our City" award in 2011.

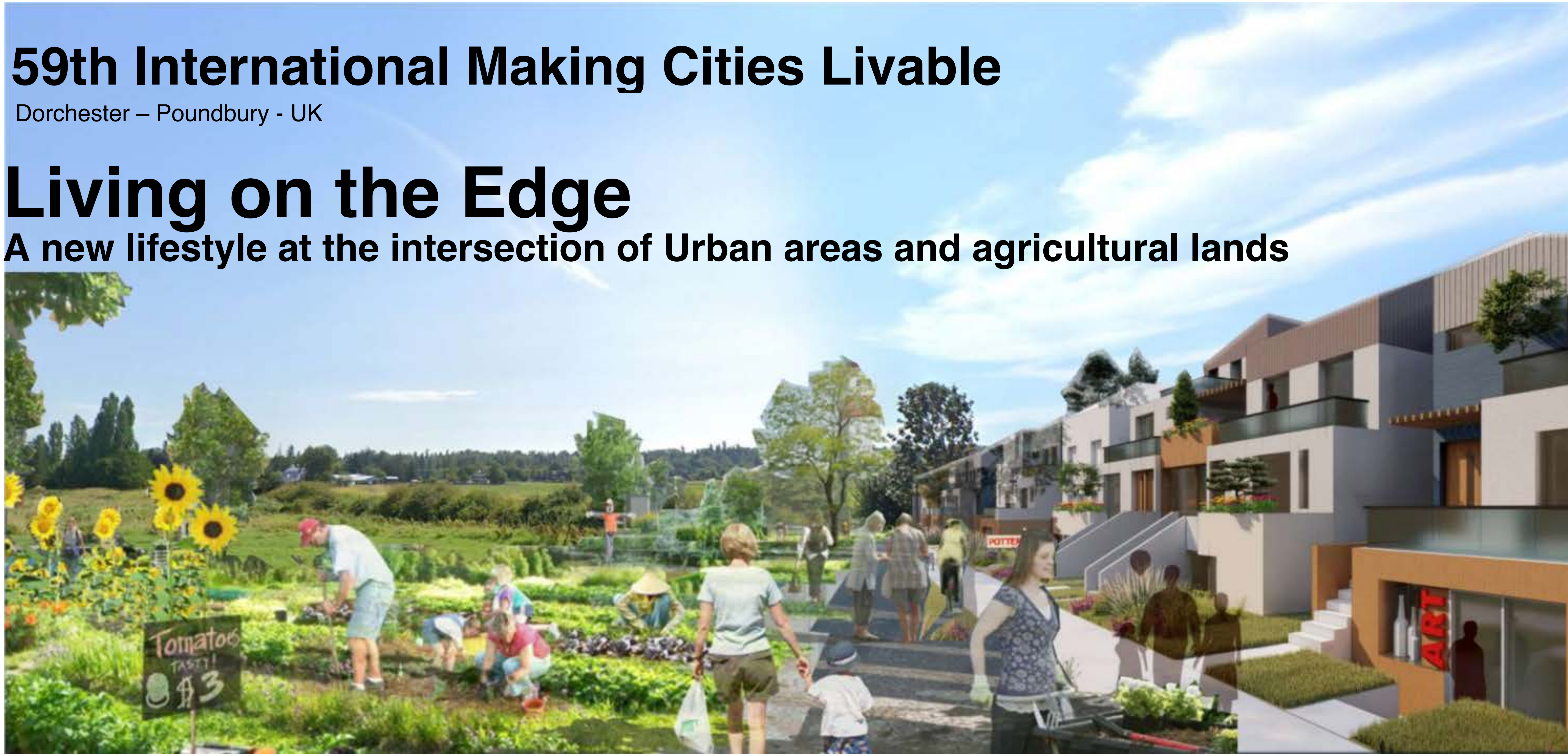
LIVING ON THE EDGE

59th International Making Cities Livable

Dorchester – Poundbury - UK

Living on the Edge

A new lifestyle at the intersection of Urban areas and agricultural lands



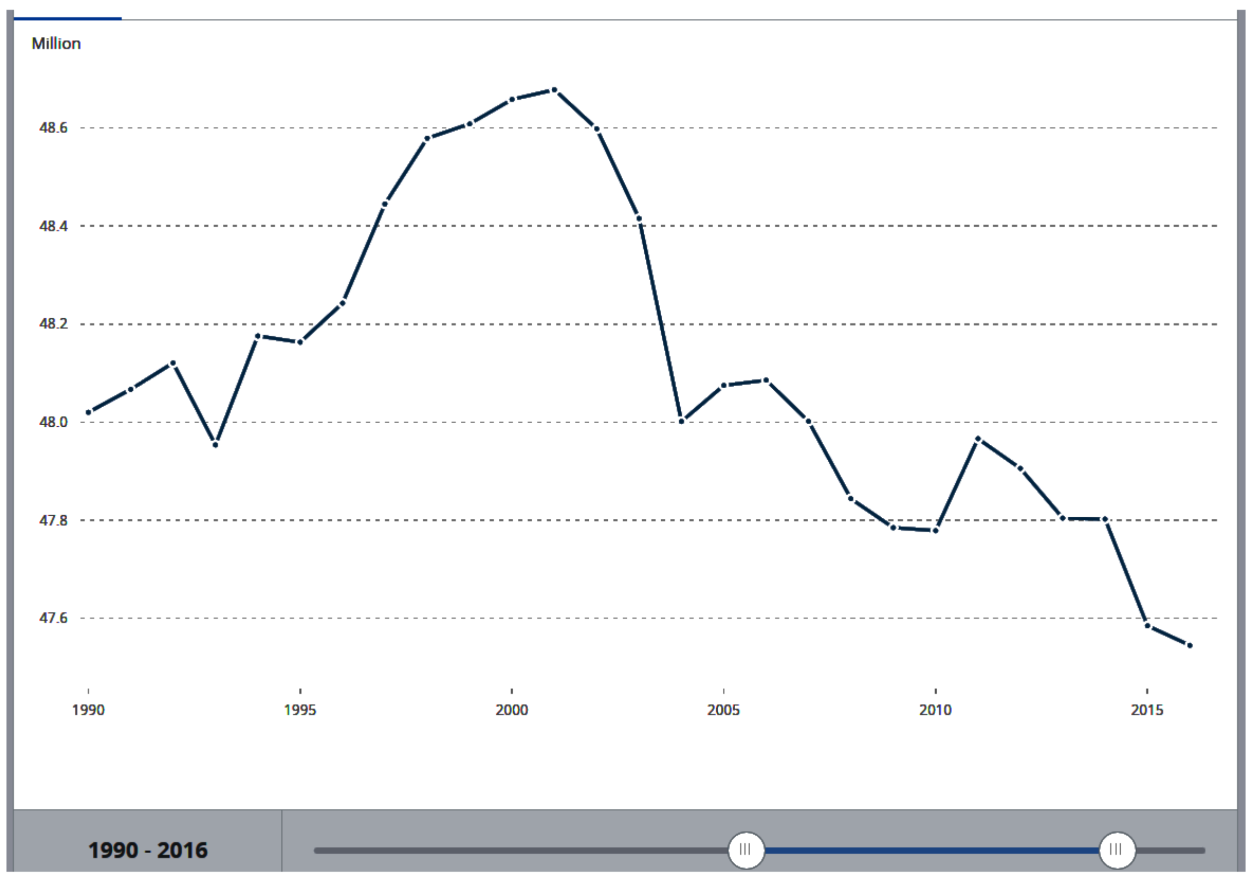
Mahdi Tavanpour - Development Planner at City of Vancouver
October 14th - 2023

LIVING ON THE EDGE

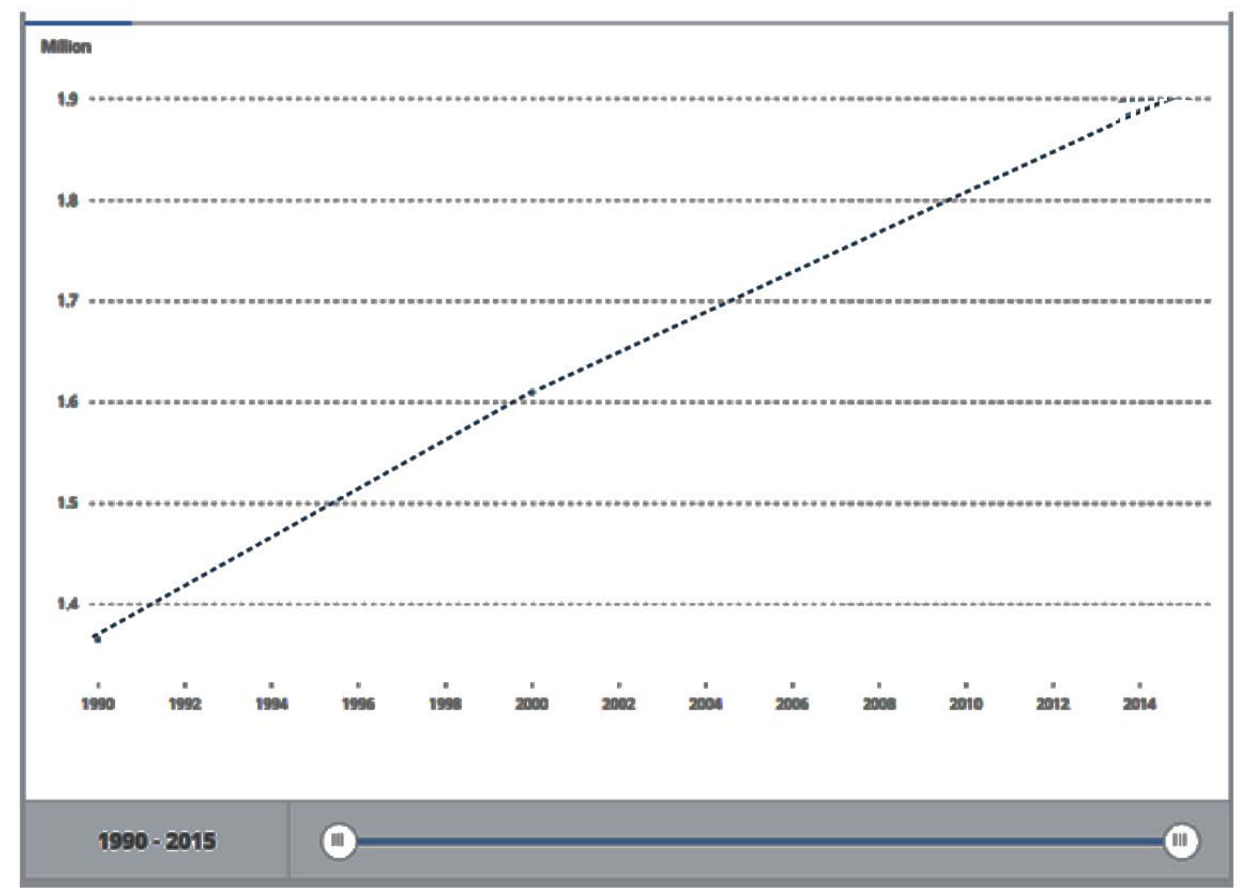
LIVING ON THE EDGE

Today, 55% of the world's population lives in urban areas, a proportion that is expected to increase to 68% by 2050.

In other words, the vast majority of people have little or no meaningful connection to their agri-food system as a consequence of 20th-century industrialization and economic globalization.



Agricultural land (sq. km) - UN



Urban land area (sq. km) - UN

LIVING ON THE EDGE

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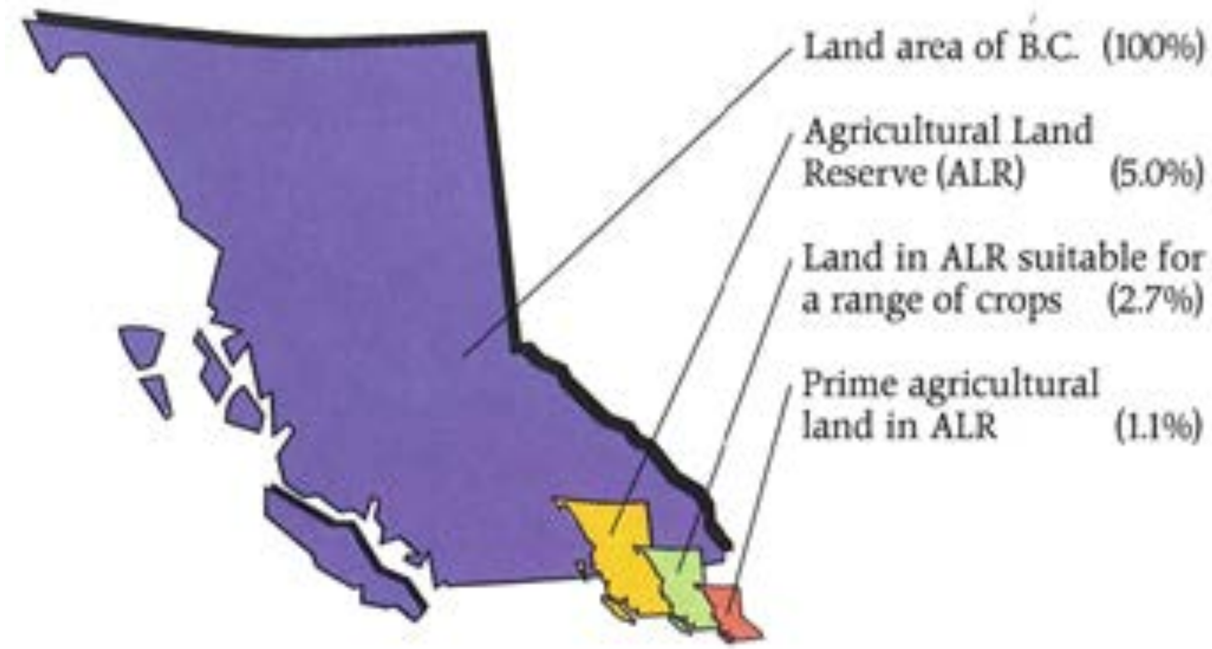
Urban and peri-urban agriculture (UPA) can be defined as practices that yield food and other outputs through agricultural production and related processes (transformation, distribution, marketing, recycling…), taking place on land and other spaces within cities and surrounding regions. (FAO)

Source : https://www.fao.org/urban-peri-urban-agriculture/en

The Agricultural Land Reserve and BC Agriculture



Over the past 100 years, BC’s population has increased about 12 times, growing from a little over 392 thousand to over 4.6 million people today!

It is estimated that by 2040, BC’s population will reach more than 6 million people.

As BC’s population grew, prime agricultural land was being lost to urban development. So, in 1973, the **Agricultural land reserve** was established to permanently protect BC’s valuable agricultural land.

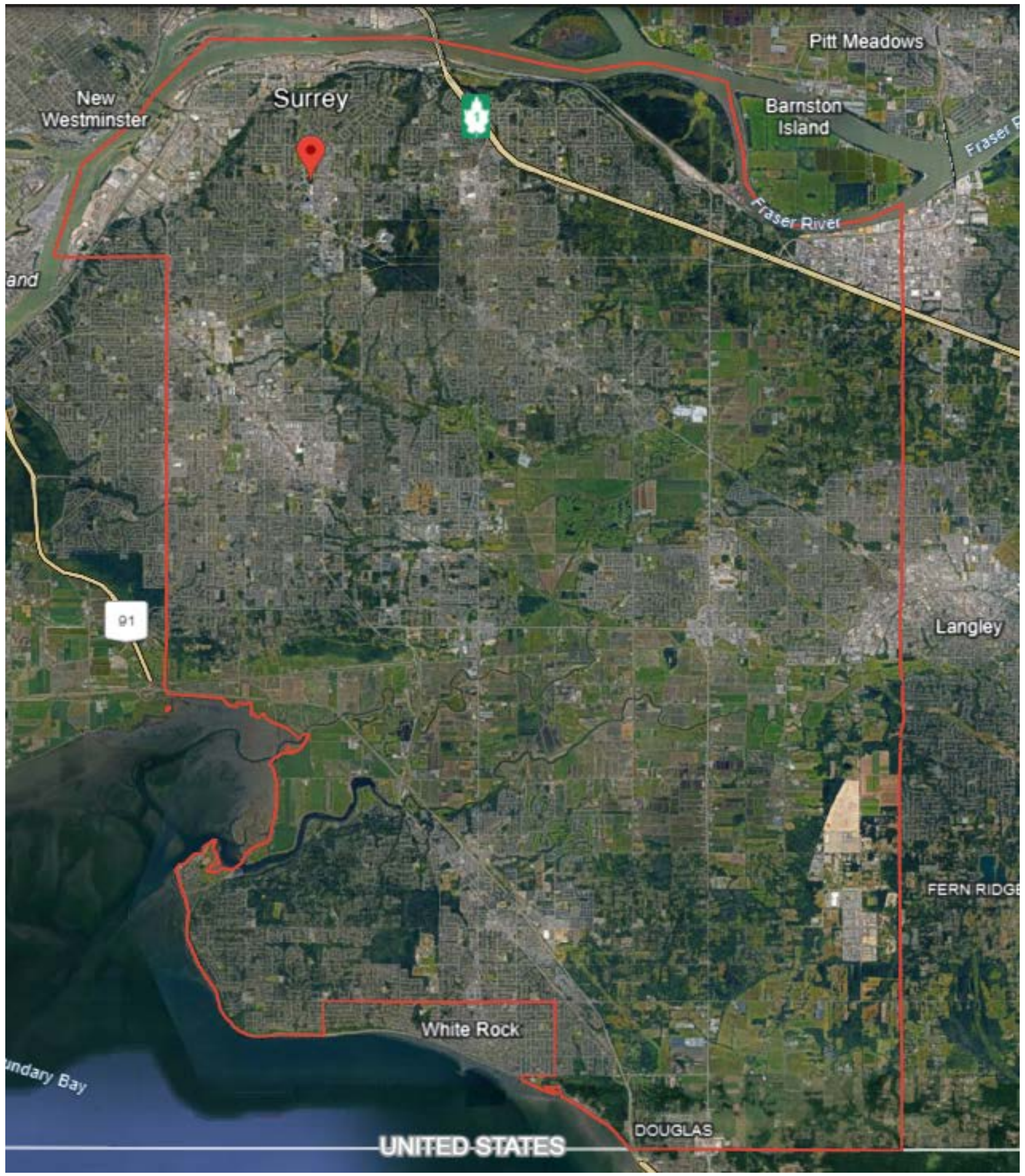
The Agricultural Land Reserve in BC was created to reduce the loss of prime agricultural land and to try and restrict where cities can grow.

The Agricultural land reserve protects about 5% of the land, but only about 3% is used for farming. Crops are grown on about 0.6%, while the rest is used for pasture or grazing.

LIVING ON THE EDGE

LIVING ON THE EDGE

Surrey is the largest city, in terms of size, in the Metro Vancouver regional district and ranked third in terms of population among the cities and municipalities.



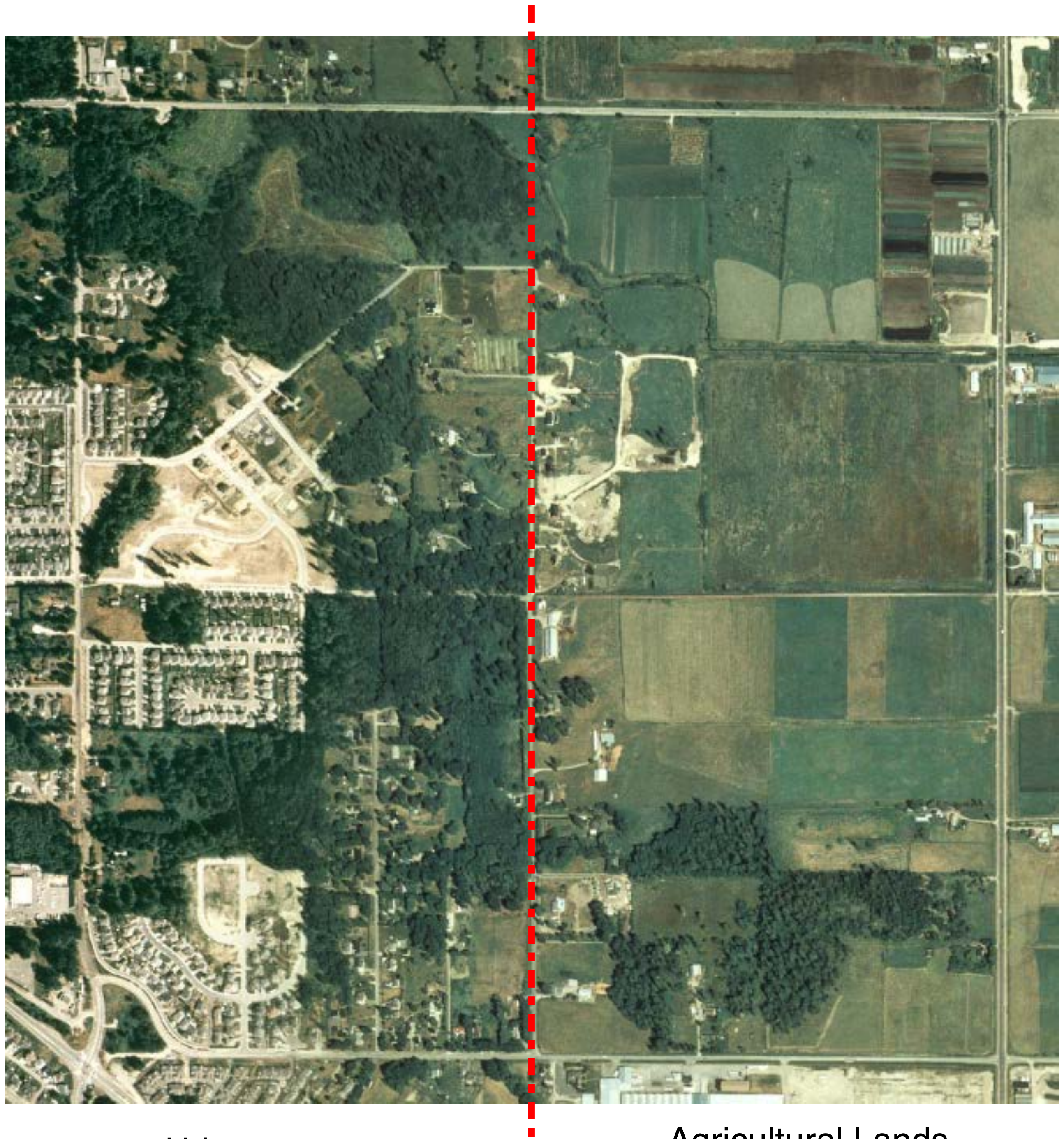
Surrey (BC, Canada) is the case study for this proposal.

The Agricultural Land Reserve (ALR) area and floodplains cover a third of Surrey, and provide habitat for salmon and other fish.

LIVING ON THE EDGE

LIVING ON THE EDGE

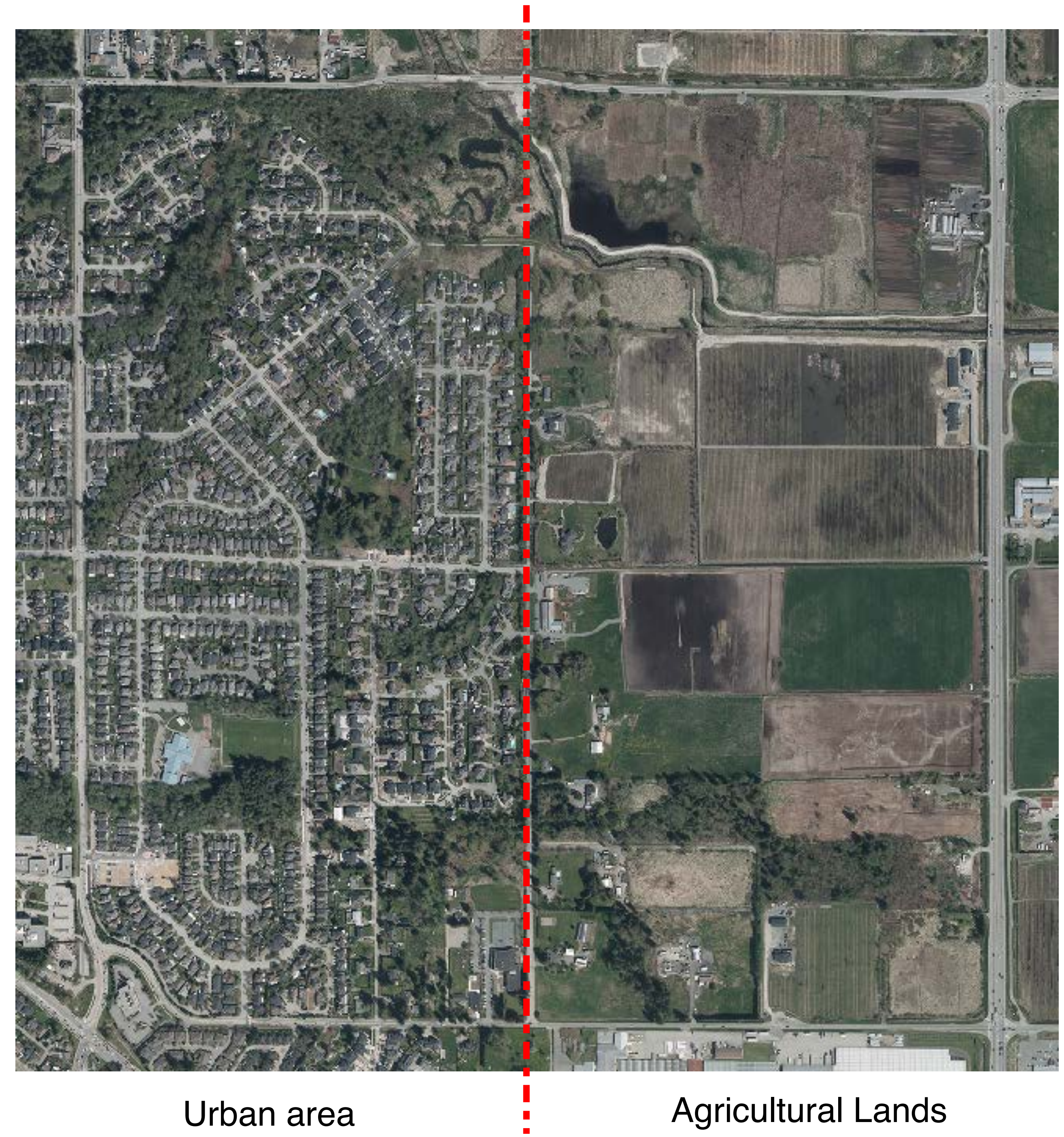
Building typology at the intersection of Agricultural lands and Urban area (Surrey, BC, Canada)



Urban area

Agricultural Lands

1980



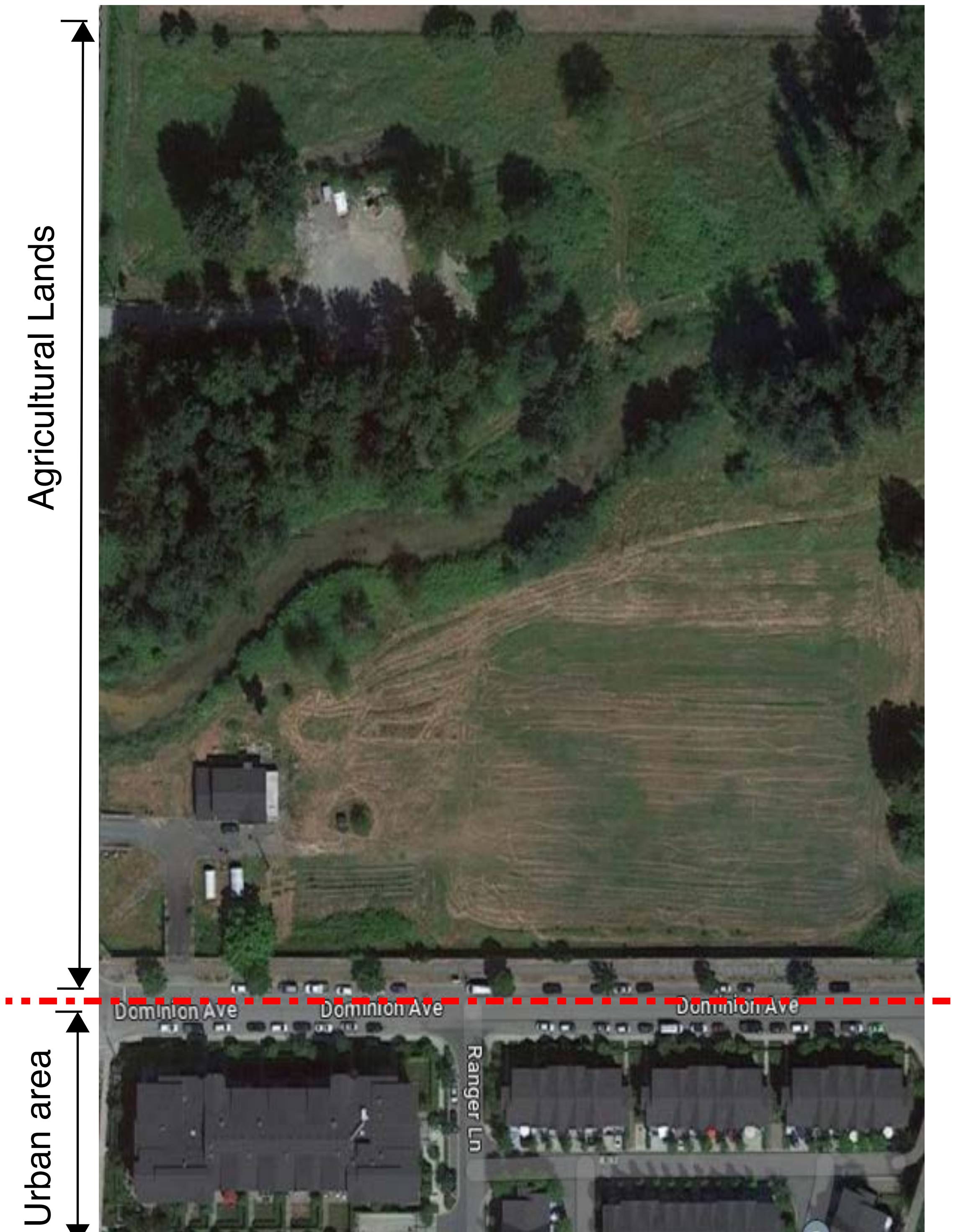
Urban area

Agricultural Lands

2023

LIVING ON THE EDGE

Building typology at the intersection of Agricultural lands and Urban area (Surrey, BC, Canada)



2023

1980

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Vast extensive wide infinite continuous broad unlimited

LIVING ON THE EDGE

Two major resources that influenced this study:

This article examines the effect of 35 years of strict agricultural zoning on the price of agricultural land at the urban-rural fringe.It identifies the zoning effect by comparing the prices of restricted land versus similar properties not under such restrictions.

Farmland Protection and Agricultural Land Values at the Urban-Rural Fringe: British Columbia's Agricultural Land Reserve

Article *in* American Journal of Agricultural Economics · November 2014
DOI: 10.1093/ajae/aau098

4 authors, including:

Alison J Eagle
Environmental Defense Fund

David E Eagle
Duke University

Gerrit Cornelis van Kooten
University of Victoria

Their concept paper included a provocative suggestion that a **500m zone** of agricultural land at the interface of the urban and agricultural lands could be considered for an innovative approach to creating enhanced agriculture. The proposal is to capture the 'value lift' on a 200m corridor of the land after it had been rezoned to allow urban development, and use the monies derived from this 'lift' to stimulate and finance enhanced agriculture through a form of community 'trust farming'.

Agriculture on the edge: Strategies to abate urban encroachment onto agricultural lands by promoting viable human-scale agriculture as an integral element of urbanization

Article *in* International Journal of Agricultural Sustainability · February 2010
DOI: 10.3763/ijas.2009.0465

4 authors, including:

Patrick M Condon
University of British Columbia - Vancouver

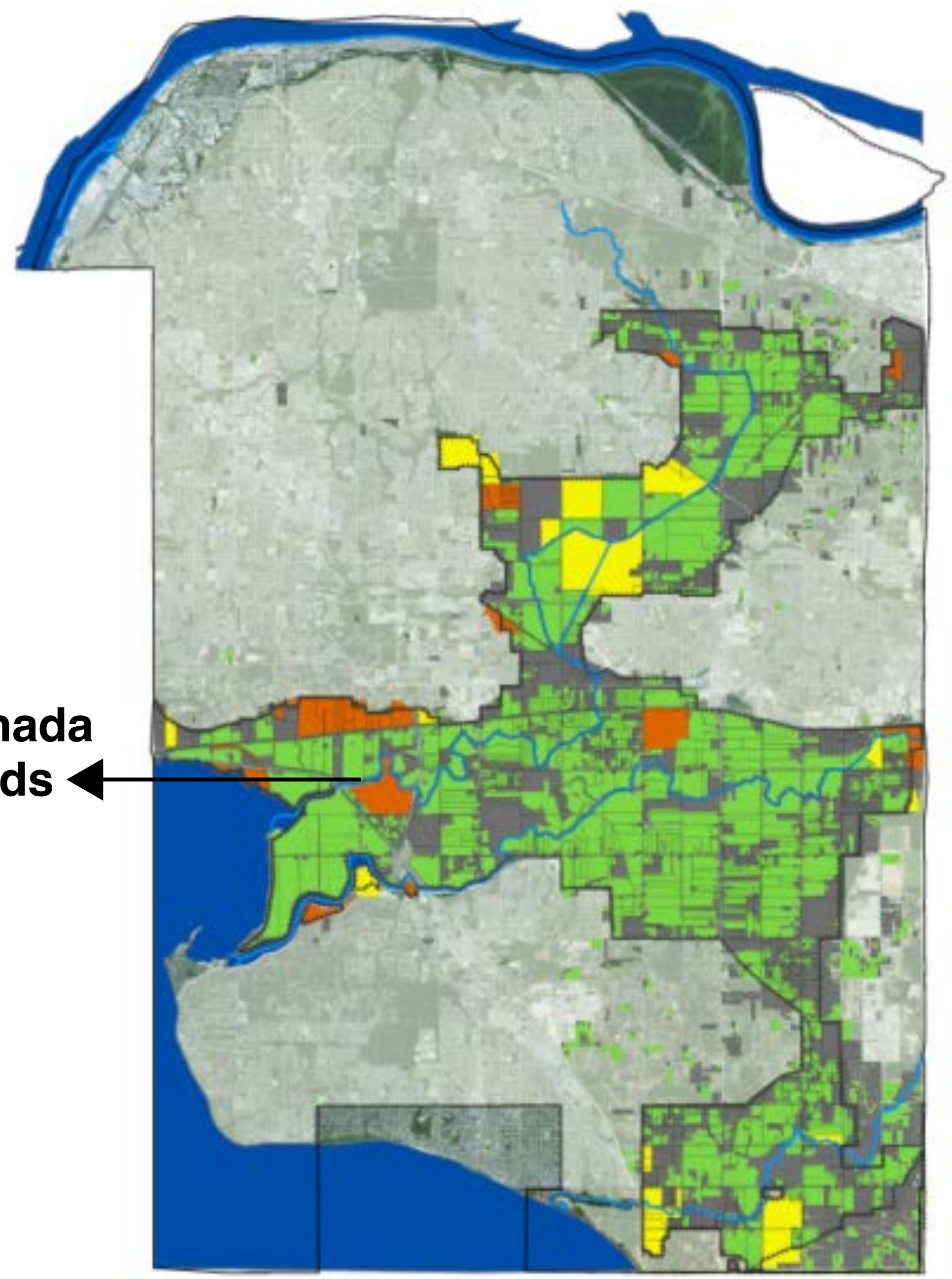
Kent Mullinix
Kwantlen Polytechnic University

Arthur Fallick
Kwantlen Polytechnic University

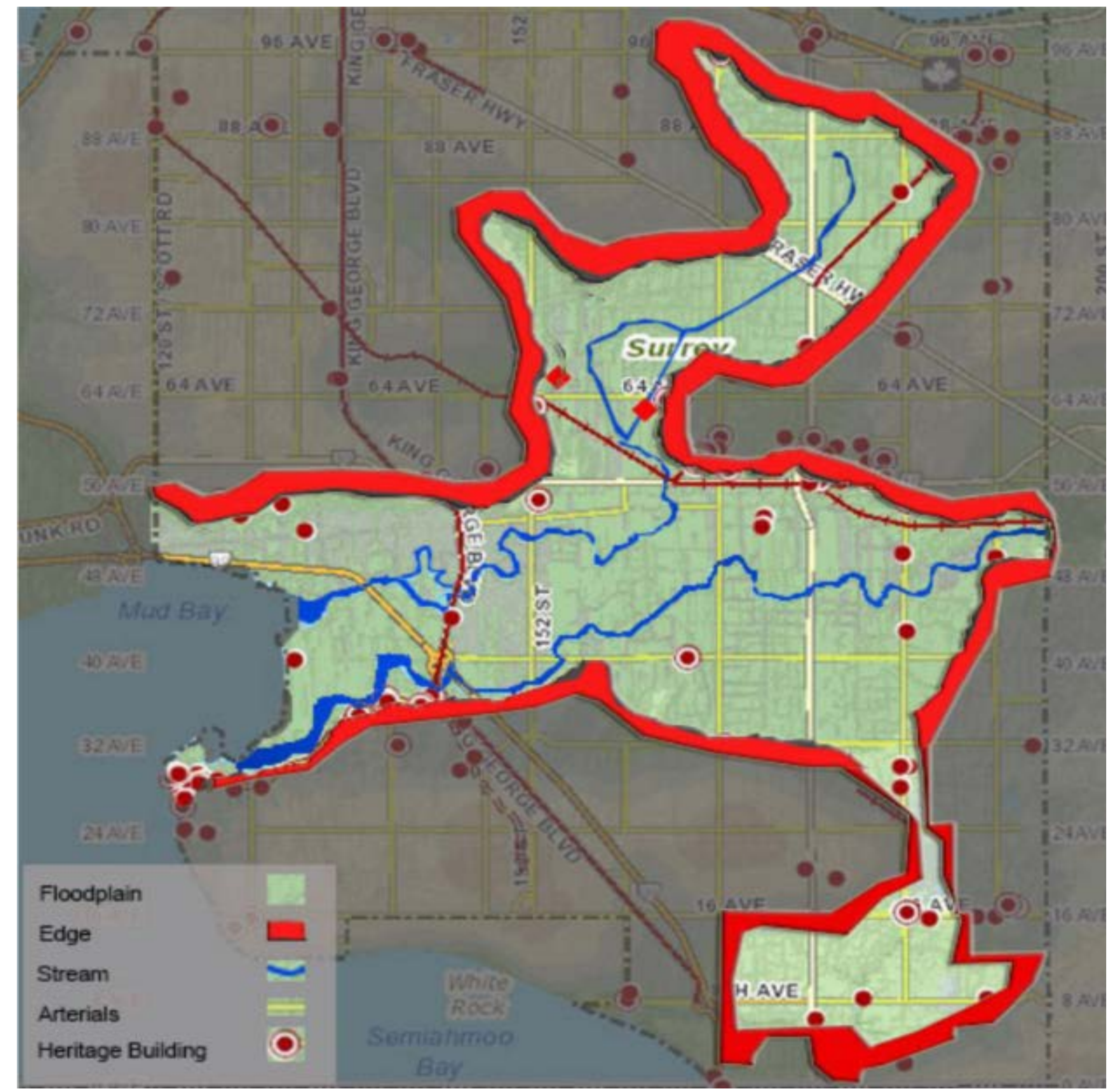
LIVING ON THE EDGE

LIVING ON THE EDGE

Surrey, BC, Canada
Agricultural lands

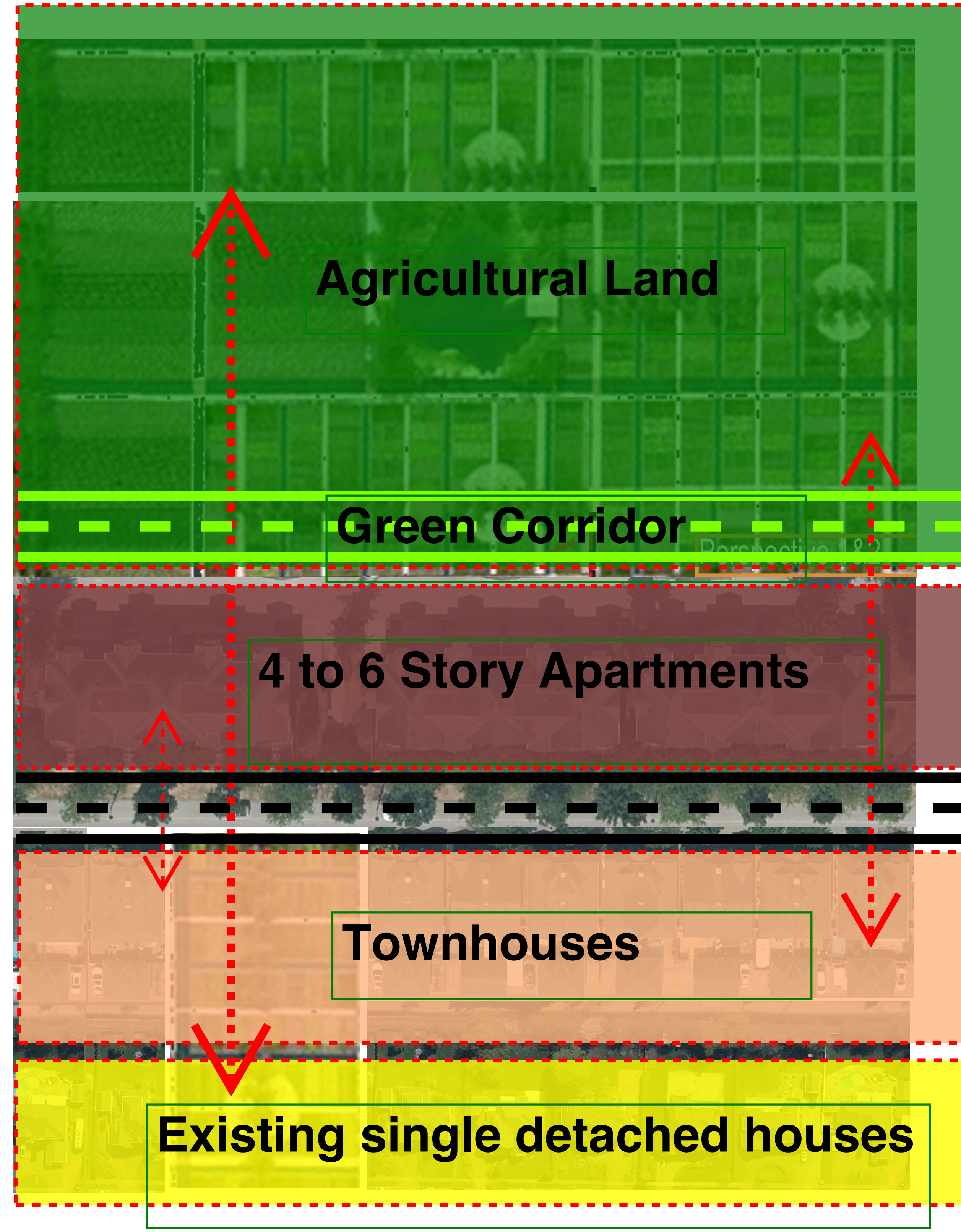


The first two blocks of detached houses adjacent to Agricultural lands to be rezoned to Medium density residential uses.



Proposal: The first two blocks of the residential area at the interface of urban and agricultural lands could be considered for an innovative approach to enhance urban life. A new zoning category should be added to the zoning bylaw, allowing for multiple-family buildings up to 6 story for the first block and townhouses for the second block along the boundary of agricultural lands. The proposal aims to capture the 'value lift' resulting from the rezoning on the residential side to purchase the adjacent agricultural lands and **allocate a 500 sqm garden** (managed under the same strata council) to each unit developed on the urban side.

LIVING ON THE EDGE



LIVING ON THE EDGE

Testing the feasibility of the proposal:

- Total 236 units(Apartment and Townhouse) are proposed.
- Each unit is assigned to a 500sqm garden parcel in the adjacent Agricultural Lands (ALR).

236 * 500 sqm = 118,000 sqm = 12 Ha (ALR to be purchased)

135m * 290m = 39,150 sqm = 4 Ha (residential block to be purchased)

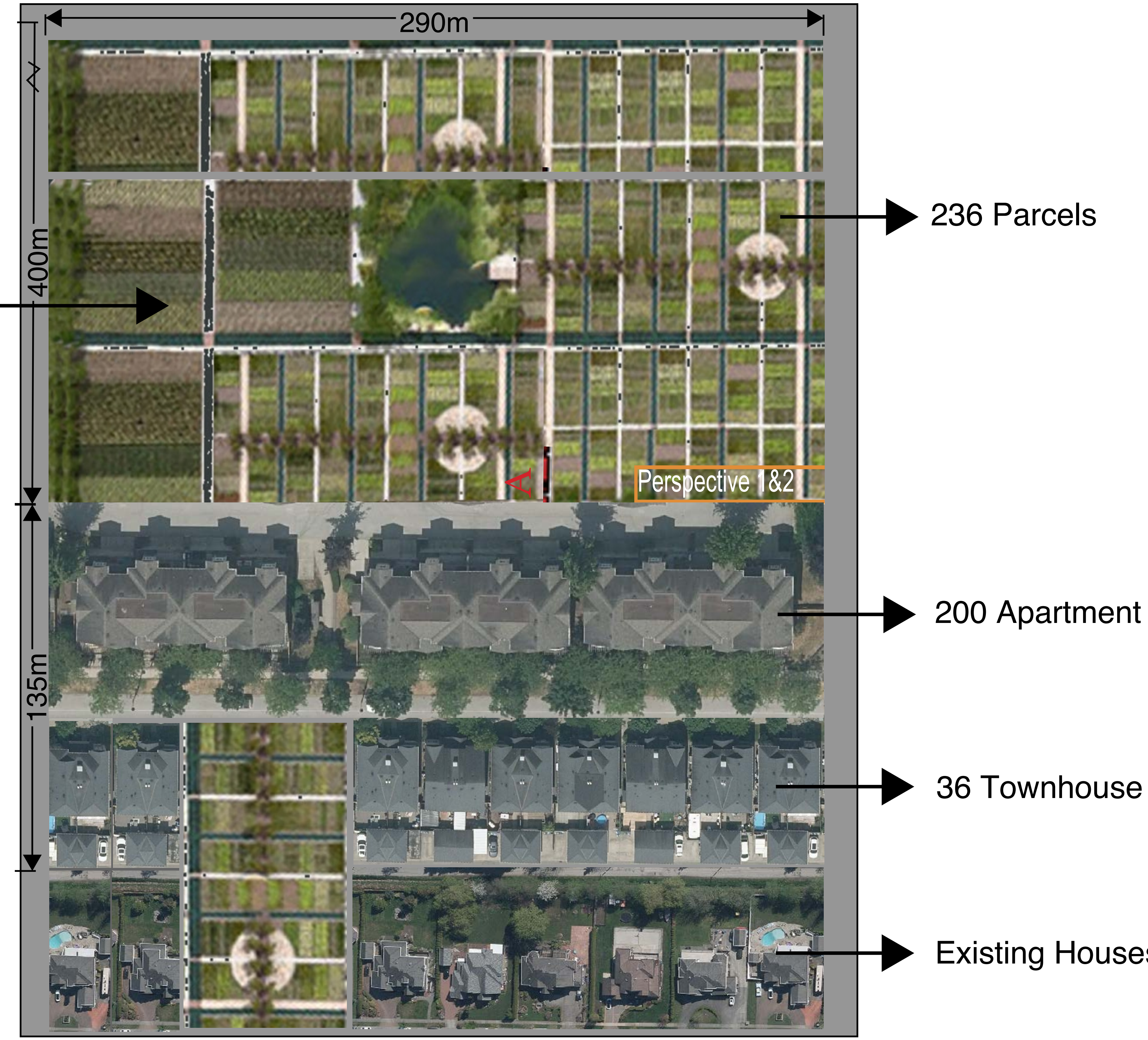
(200 * 80m)+(36 *150m) = 21,400 sqm Floor area

21,400 sqm * $2500 = $ 53,300,000 Construction cost

Construction cost	$ 53,300,000
land purchase (R-Zone)	$ 15,200,000
land purchase (ALR)	$ 4,560,000
Interest	$ 8,240,000
Other (Permit,...)	$ 5,500,000
Total Cost	$ 86,000,000

21,400 * 5,000 = $ 107,000,000 Gross Revenue

$107,000,000 - $ 86,000,000 = $ 21,000,000 Project Profit



- Price per ha of Residential zoned is $3,800,000
- Price per ha of ALR land is $380,000
- Price per sqm of construction cost is $2,500
- Selling price per sqm of Residential unit is $5,000

LIVING ON THE EDGE

LIVING ON THE EDGE

Driving a paradigm shift in planning and decision-making processes:

Case Kaarina (St Karins), Finland

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ABSTRACT

This presentation focuses on a planned project and masterplan in Kaarina, Finland. The region is characterized by a long history of settlements, with many historic manor houses and estates. One of them is Rauhalinna (engl. Castle of Peace), which, with a considerable land property, was acquired by the city of Kaarina some years ago. The objective was to develop it as a residential area. The planning started as any other project. However, at the same time, the civic movement Architectural Uprising (Arkkitehtuurikapina) was bringing up new ideas on planned and developed projects and masterplans, with new understanding of better human settlements, based on traditional architecture and urbanism. This new information was brought up in the political decision makers' discussions, which led to achieving political consensus to apply new traditional architecture and urbanism principles in Kaarina.

The first attempts to drive this change, which at first glance would seem to be just a matter of slightly different facades, were not successful. Since then, with stronger verbalising and also visualising, the plans are currently proceeding.

The presentation will discuss the currently ongoing change, with Rauhalinna as a case example. The presentation will further reflect both local and national conditions to enable new traditional architecture and urbanism, and the lessons learned so far. The aim is also to connect with and learn from similar projects in other countries.

Main questions to be discussed are:

How to bring new ideas to an institutionalised process in land-use and planning? What are the identified success factors? Where are the major risks of failure? Are the examples of change a tip of an iceberg, preceding a paradigm shift?

HISTORY OF THE CITY OF KAARINA (ST KARINS)

The first surviving document mentioning Kaarina dates back to 1309, when Kaarina was a parish next to Turku, with a medieval church named after Saint Catherine of Alexandria. Hence, Kaarina, St Karins in Swedish. Kaarina as a parish had existed already long before that.

The headquarters of the medieval catholic church were founded on the island of Kuusisto at the end of 1200s. The site of the ruins of the castle is currently part of Kaarina.

Significant prehistoric stone and iron age settlements are found in the area. A historic road, "the King's Road" runs across Kaarina, connecting Stockholm in the west, via Turku, with Vyborg in the east.

The current city centre, however, has developed around the crossroads of two main roads, from the 1960s onwards. The buildings and planning traditions are predominantly from the last 50 years. (See aerial view.)

The Rauhalinna district is situated adjacently to the east from the current city centre. It is a historic area which used to belong to the Rauhalinna manor (corps de logis still exists). The planned new neighbourhood is situated in the former fields of the manor.

Currently, Kaarina has ca 36.000 inhabitants, and it has been one of the fastest growing cities in Finland for the past few years.

There are two on-going planning processes to develop two neighbourhoods in Kaarina. One aiming at improving the city centre, and the other focusing on developing an untouched field in the Rauhalinna district.

Picture: City of Kaarina (St Karins) in Finland on the map.

DEVELOPMENT OF THE CITY CENTRE

Picture: Aerial view of the current Kaarina city centre.

There is a currently ongoing idea and architectural competition, about new ideas to improve the rather dull city centre. The competition is conducted in collaboration with SAFA, the Finnish Association of Architects. Ca. 40 applicants have submitted their proposals to improve the city centre.

Before launching the competition, the city of Kaarina organised comprehensive workshops with local stakeholders, such as citizens and companies, to draft the most important requirements for a better city centre. Based on them, the city is looking for proposals that would enable creating a comfortable and attractive city centre, where people would like to live, do business and work. Further, the proposals should show spaces, materials and scale which create humane residential and working environments.

The scope of the competition is the centre of Kaarina, altogether 39 hectares.

The applicants were requested to create a vision of the future evolution from an area next to main roads towards a city centre with a positive spirit of the place, genius loci. The aim is to drive the change towards a more sustainable and beautiful built environment, with public spaces that support human well-being. At the same time, the city centre should remain accessible with all modes of transport, and offer a diversity of services to citizens.

DEVELOPMENT OF THE RAUHALINNA DISTRICT

The city of Kaarina has acquired a large piece of land, in order to develop it as a residential area adjacent to the city centre. The area has historically belonged to the Rauhalinna manor. The development of the area started predominantly with detached houses. The idea is that the areas closer to city centre would be denser.

In 2018, I posted in social media a 3D rendering animation of a new, planned district in Sweden. The rendering visualised a new traditional neighbourhood. The architect of the project was Erika Wörman (architect known for her work in the city of Vantaa, Kartanonkoski district, built in the late 1990s with new urbanist and garden city ideas). As a result, the Chair of the city government showed the rendering animation to the members of Kaarina city government. They liked what they saw, and the next question was, how to enable something like that in Kaarina. Subsequently, a study trip to Sweden was organised, including a meeting with Erika Wörman. After the trip, the city government authorized the urban development committee to promote these ideas in Kaarina, especially in the Rauhalinna development.

A first attempt was to organise a tender for land allocation, with requirements to apply the principles of traditional architectural languages such as 1920s classicism or jugend. The city got only very few applicants, and none of them was considered to fulfil the hopes and requirements of the city. However, planning of the district continued, and 23rd November, 2022, the Urban Development Committee accepted the new draft plan. The new draft plan was prepared by Kaarina's city planning architect, Ville Aaltonen. Further, based on that plan, a 3D rendering video was prepared by him, and published on 31st May, 2023. https://youtu.be/1RaV9tyyhNY

This plan is a major break from the currently prevailing planning and architectural traditions, which are predominantly based on the modernist ideals. In terms of townscape, the most significant difference is that the new plan connects with pre-modernist architectural and urban traditions. The requirements in the plan, concerning the architecture, are that modern(ist) or post-modern(ist) features should be avoided in the design. Further, the plan strictly forbids certain fashionable contemporary features, such as chaotic fenestration. And further, balanced, harmonious symmetry is encouraged in all facade composition. Professional expertise and understanding of stylistic features of the architectural traditions is required.

Picture: Aerial view of the 3D rendering of future Rauhalinna district, city of Kaarina

Pictures: 3D renderings of Rauhalinna district in the future

EMERGING PARADIGM SHIFT

Bloomberg CityLab recently published a large article on Architectural Uprising, a movement which started as Facebook groups in the Nordic countries around 2014-15, and is now exploding across the globe, giving a voice to a large and growing number of people, who are (and have been for quite a while) fed up with the uglification of built environments everywhere.

What has been mainstream, mainly developer driven neo-modern(ist) revival architecture and urbanism for decades, has shown its failures all over the world. Critical voices have existed all along, protesting its dogmatic credo, but remained in the margins of professional discourse.

But what is different now, is the Social Media Era. It is possible to reach thousands of people in a blink of an eye, find like-minded networks across countries and cultures. And it is not possible for the architecture profession to stay in the ivory towers anymore.

In the beginning of the Architectural Uprising, reactions from architects were basically two-fold. There were those who refused to have any discussion with non-architects about architecture. The condescending message was, that only an architect is (and should be) allowed and able to have a worthy opinion on architecture.

On the other hand, there were architects who, in private discussions, admitted that they agree with the Architectural Uprising, but they felt that to design anything other than the currently accepted dogma, would be a professional suicide. In this respect a lot has happened already: now there is a growing number of architects joining and openly supporting the Movement.

All along, there have also been architects that have managed to gain education and looked for resources on traditional/classical traditions of architecture and urbanism on their own, and made a career of it. Their work has been published in the Movement's groups - spreading in different social media platforms. Work that seemed to be ignored by the modern(ist) architectural establishment & media.

It has became clear that although the disappointment towards modern(ist) architecture and its contemporary revival styles was vast, there seemed to be a solution: the new classical architects were on the same side as the Movement. Publishing their work has reached tremendous positive reactions.

The Movement has already changed the discourse on architecture and urbanism in the Nordic countries.

New countries are joining and also more and more local groups are being founded. Currently, +30 countries and +300.000 members in different social media platforms have joined the Movement.

Architecture students are increasingly concerned about the sustainability issues arising during our fossil era, and requesting better tools to tackle them. Traditional architecture and urbanism offer sources of wisdom, applicable pre- and post-fossil era.

In the future, the challenge and opportunity will be to win as many architects and people in building companies, as well as civil servants in the planning occupations, to choose the Movement's side. Also, changes in the educational systems are needed, no less than a paradigm shift. That's how outdated belief systems are replaced when new information is found, at least in scientific communities.

CONCLUSIONS

As the developments in Kaarina, described in this paper, are currently in the process, the outcomes are not yet achieved.

However, it is clear that a major paradigm shift is happening in architecture and city planning. The citizen movements are a vocal component in driving the change. The politicians from all political parties have the mandate from the citizens as elected members in their city councils and planning committees. Some of them have already taken the initiative to require a more humane, more beautiful architecture and urban planning, based on traditional architectural languages. Studies show a strong support for that.

The current legislation in Finland, the Land-use and Building Act's Section 117, states that "**a building must fit into the built environment and landscape and *must fulfil the requirements of beauty and proportion***."

Our legislation should not be a dead letter anymore.

SOURCES

Finnish Land-use and Planning Act:

https://www.finlex.fi/fi/laki/kaannokset/1999/en19990132_20030222.pdf

The Critical Role of the Town Architect in Successful Communities (DRAFT)

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Abstract

The Town Architect bridges the gap between planners, who operate at “30,000 feet,” and building designers, who value context in widely varying degrees. The Town Architect weaves the priorities of multiple disciplines into sustainable, thriving communities. A Town Architect prepares and refines the masterplan, integrates the architecture with the masterplan, and refines the architecture. The role of the Town Architect will be explained using examples and illustrations from various built communities, but primarily Norton Commons in Louisville, Ky. Among the responsibilities of the Town Architect are the following:

- Design development of the master plan
- Review of infrastructure construction documents
- Prepare detailed regulating plans
- Review landscape plans for civic spaces
- Review site plans for civic buildings
- Review of architecture for conformance to design standards
- Review of property owners’ association documents
- Recommend architects, landscape architects and other consultants
- Field inspection of civic space construction for consistency with the design intent
- Field inspection of buildings for aesthetic conformance to the approved drawings.
- Prepare presentation and marketing documents
- Education/marketing presentations

Keywords: Town Architect; Norton Commons; Kentlands; Michael Watkins; Mike Watkins

The Critical Role of the Town Architect in Successful Communities

Typically, "planners" concern themselves primarily with the plan and often at a very high level. Architects concern themselves primarily with the building. Urban designers tend to operate mostly in plan but with the third dimension also in mind, though seldom with knowledge of specific building designs. The Town Architect "minds the gap" between planners and architects and serves as the advocate for the public realm—the space *between* the buildings.

> So long as each architect and each client thinks only of his own building—how individual and how noticeable he can make it, little progress in the total effect can be expected. Architects should be trained to think first of how their building will take its place in the picture already existing. The harmony, the unity which binds the buildings together and welds the whole into a picture is so much the most important consideration that it should take precedence. Within the limits of this enclosing unity there is plenty of scope for variety without resorting to that type which destroys all harmony by its blatant shouting. (Unwin, p. 363)

While this may sound like someone speaking out against our current state of affairs, this is in fact, Raymond Unwin in his 1909 book *Town Planning in Practice.* Imagine the difference in the quality of our public realm had architects been trained, as Unwin recommended, "to think first of how their building will take its place in the picture already existing."

The increasingly widespread role of Town Architect weaves the priorities of multiple disciplines into sustainable, thriving communities with a variety of civic spaces, thoroughfares, and architecture that plays a supporting role in creating place. Town Architects may prepare master plans, often refine master plans, prepare codes and regulating plans to guide architects and designers, and work with architects and designers to integrate buildings with "the whole," the public realm, the picture already existing, and work with designers and architects to refine the design of the building.

The work of refining a masterplan requires appreciation and respect for the original intent, attention to detail, and the ability to direct the many consultants involved.

Integrating architecture with the masterplan requires finesse with the building designers—many of whom are not architects—in order to realize the potential contribution of each building to the public realm anticipated in the masterplan. Refining the architecture is most necessary and beneficial when designs are prepared by architects or designers not trained in the design principles and/or styles prescribed for the community. When handled well both typically appreciate the design review by the Town Architect and are proud of the built results.

Ideally the Town Architect would contribute to the creation of the master plan and vision of a place. The Town Architect may lead public design charrettes or enquiries by design. The public design charrette has become a popular tool for preparing masterplans.

The Town Architect is well-suited to writing the zoning ordinances and design codes that will set the parameters for the building designs prepared by others. Codes establish parameters within which designers are free to operate.

Designing and building places for community to flourish requires considerable detailed refinement of large-scale master plans. It requires that individual buildings be embedded in the plan and woven together to create the urban fabric that supports community. Sometimes buildings play background roles forming the urban fabric, while at other times they perform foreground roles.

Defining the Role of the Town Architect

If every building was designed by a well-trained architect working hand-in-hand with their client, there would be little need for a Town Architect, design codes, design review boards, and the like. However, many buildings are not designed by architects—much less well-trained ones. Furthermore, the "franchise" architecture of many commercial establishments often encountered when making efforts to make the world a better place, while reflecting a clear "brand," typically ignores regional architectural tradition, response to local climate or urban responsibilities suggested by the context of the building. Most homes built in the United States, for example, whether single-family detached, townhouse, or multifamily buildings, are built by production builders who refer to them as "product" or "units." Single-family housing in particular has become a commodity that is mass-produced and sold to consumers as opposed to clients. In new communities, these consumers simply say, "I'll have this model on that lot" and the builder or developer salutes, builds it, and moves on. In new communities, architects and designers may have little information about the context of their building, so it often matters little which house sits on which lot anyway. As a result, the design of the whole place can suffer. With an understanding of the goals of a publicly traded builder or the "branded box" of a franchise tenant, the Town Architect looks for the overlap with the clients' demands and what it would take to shape a beautiful public realm. Sharing the potential of a thoughtfully design public realm in which individual building contribute to the whole, is often, but sadly not always, enough to persuade the designer, architect, builder, and/or developer of the merits of the proposed architectural refinements. In doing so, the Town Architect raises banal, commodified "architecture" to a higher standard, to that of a "contributing building."

One of the greatest challenges of developing a successful community is maintaining coherence while utilizing the work of many hands, much as the conductor does with an orchestra.

"The Town Architect," according to David Tomes, town founder of Norton Commons, "creates a harmonious ensemble out of the disparate abilities of our local and national designers and builders, many of whom have never before been asked to follow principled guidelines for building in a compact, traditional neighborhood" (Tomes, personal communication, 2013). More specifically the Town Architect assumes responsibilities, which include the following:

Refining the Masterplan. Design development of the masterplan (whether prepared by him or her or by others) to verify a correct interpretation of the original design by the civil engineers; identify and address issues that may arise when building a compact place; comment on the "buildability" of each lot with regard to size, shape, slope, etc.; and refine the plan to respond to new issues such as changes in the market, program, site conditions (loss of a previously saved tree, revised wetland mapping, etc.), as well as successes and failures of prior phases.

Reviewing Infrastructure Construction Documents. Reviewing construction documents for thoroughfare details, grading, drainage and infrastructure elements and the selection and placement of such elements as utility equipment (transformers, telephone pedestals, cable boxes, etc.), storm drains, fire hydrants, crosswalk detailing, lane striping and signage, bike racks, streetlights, street trees, and street furniture. The mindless placement of a fire hydrant midblock on a main street can knock-out two or three parking spaces removing the protection parked cars offer pedestrians, frustrating customers who think they've found a parking place but haven't and eliminating a crucial contribution to the success of the adjacent business in the form of those parking spaces, which, according to Bob Gibbs, are worth $150,000 in annual sales to nearby merchants (Gibbs, personal communication, 2023).

Reviewing and/or Directing the Conceptual Design of Civic Spaces. Reviewing the design of civic spaces, including landscaping and furnishings. The careful design of civic spaces is important to creating the setting where community can form.

Integrating the Architecture with the Masterplan. The preparation of Detailed Regulating Plans to provide lot-specific urban design recommendations for private lots is essential to the success of the whole. This document explains to the designer the anticipated ways in which a building can contribute to the whole—to take its place in the picture already existing—or the one that soon will.

Preparing a Design Code or Pattern Book. These are prepared in widely varying degrees of detail depending largely on the Founder's vision of the place. Design Codes tend to specify only the tectonic principles, which form the basis of the architectural designs, while Pattern Books frequently include explanation, illustrative diagrams, and photographs, and, at times, even styles.

Reviewing and Refining the Architecture. As the keeper of the architectural vision of a place, the Town Architect provides direction and inspiration to owners, architects and designers, landscape architects, and builders. The Town Architect may also participate in the design of buildings, particularly commercial and civic buildings that are likely to have a more important role in creating a space or place.

Additional Responsibilities. In addition, the Town Architect will:

- Inform and review the work of related consultants, such as branding consultants, marketing consultants, ad agencies, sales staff, etc., to help them understand and appreciate the differences, merits, and values of a new traditional neighborhood.

- Review property owners' association documents, not from a legal perspective, but from the perspective of the one charged with designing the place, the place between buildings where community will take place.
- Perform field inspections of infrastructure, civic spaces, and buildings for conformance to the design intentions expressed in the Regulating Plan and Design Code.
- Educate team members through lectures, field trips, tours, and the like.
- Provide research regarding construction materials and construction techniques.

Examples of the Town Architect's responsibilities at the scale of the master plan follow.

Figure 1

A regulating plan.

The Regulating Plan is one of the most important tools used by the master planner to translate their intentions to the Town Architect. In it, transect zones (character zones) are identified, "terminated vistas" identified, corner/midblock/end lots noted, common lawn and commercial frontages specified, and so forth.

The detailed design of the thoroughfares offers numerous opportunities to reinforce community.

Figure 2

Transect-based allocation of light fixtures.

Lighting plays a critical role in creating a walkable community. The Town Architect should assist in selecting fixtures and choosing their location. In the States this often falls to the local utility company with disappointing results. The choice of the fixture can reinforce the character of the neighborhood, while it's placement can aide in illuminating stop signs, street signs, and, most importantly, pedestrians.

Figure 3

Street types and naming plan.

Figure 4

Street naming options based on the National Emergency Number Association.

Thoroughfare names are an opportunity to add to the character of a neighborhood. A common theme for the thoroughfare names associates the community with that theme, and with multiple neighborhoods, there could be multiple themes, ideally related. The theme can be derived from the local culture or geography, recall the community's heritage, or express its principles and aspirations. If the theme is too obvious, visitors may have the uneasy sense of a marketing campaign. Better to be subtle; a good theme can be an opportunity to "tell the story" initially and have residents putting the pieces together after years of living in the neighborhood - and can teach them a bit of history too.

United States Postal Service Thoroughfare Abbreviations

www.USPS.com

The United States Postal Service (USPS) uses the same abbreviations as those used by NENA.

National Emergency Number Association (NENA) Recommended Abbreviations for Thoroughfares

www.NENA.org

Street Type	Abbreviation	Street Type	Abbreviation
Alley	Aly	Ridge	Rdg
Arcade	Arc	Road	Rd
Avenue	Ave	Row	Row
Boulevard	Blvd	Run	Rn
Bypass	Byp	Square	Sq
Center	Ctr	Street	St
Circle	Cir	Terrace	Ter
Court	Ct	Trace	Trce
Cove	Cv	Trail	Trl
Drive	Dr	Turnpike	Tpke
Expressway	Expy	Village	Vlg
Fork	Frk	Walk	Walk
Freeway	Fwy	Way	Way
Harbor	Hbr		
Highway	Hwy		
Hill	Hl		
Hollow	Holw		
Landing	Lndg		
Lane	Ln		
Loop	Loop		
Park	Park		
Parkway	Pky		
Pass	Pass		
Path	Path		
Pike	Pike		
Place	Pl		
Plaza	Plz		
Point	Pt		

The Lexicon of New Urbanism
Common Thoroughfares Names

Highway. (HWY) A long-distance, speed-movement thoroughfare traversing open countryside. A highway should be relatively free of intersections, driveways, and adjacent buildings.

Road. (RD) A local, slow-movement thoroughfare suitable for edge and rural areas. A road tends to be rural in character without curbs or on-street parking; it may have clustered plantings and paths instead of sidewalks.

Boulevard. (BLVD) A long-distance, free movement thoroughfare traversing an urbanized area. A boulevard is flanked by parking, sidewalks, and planters buffering the buildings along the sides.

Street. (ST) A local, slow movement thoroughfare suitable for general, center, and core zones. A street is urban in character, with raised curbs, closed drainage, wide sidewalks, parallel parking, and trees in individual planting areas.

Drive. (DR) A thoroughfare along the boundary between urbanized and natural condition, usually along a waterfront, a park, or a promontory.

Avenue. (AVE) A limited distance, free movement thoroughfare connecting civic locations within an urbanized area. Unlike a boulevard, its length is finite and its axis is terminated. An avenue may be conceived as an elongated square.

Square. (SQ) Although not a type of thoroughfare, "Square" is commonly used as a suffix for thoroughfares that pass through a square.

Close. A small green area surrounded by a driveway providing vehicular access to several buildings, performing the same function as a cul-de-sac but creating a socially useful space. The width of the close must correspond to the standard turning radius requirements. A close may be built to economical driveway standards. [*Note that "Close" is not on NENA's recommended list. If rejected, an alternative to consider is "Court" (CT).*]

The naming of thoroughfares has an important role to play in making a community intuitively navigable. Most importantly, the name of each thoroughfare should reflect its type, which is to say, call a street a street, a road a road, and so on. Of course, thoroughfares in the States must pass a gauntlet of hurdles such as the United States Postal Service, the National Emergency Number Association, and the local jurisdiction to confirm the name, or one that sounds similar to it, has not already been used.

Figure 5

Accessible design for sidewalk curb cut.

Not only must the slope of streets be considered, but also the slope of sidewalks—and not only to meet Americans with Disabilities Act standards—but also accommodate outdoor cafes where appropriate. The outdoor cafe is one of the greatest gifts to a walkable neighborhood. They need to be given every opportunity for success.

Figure 6

Street tree species plan.

The allocation of street tree types and planting pattern should fall to the landscape architect, but in their absence the Town Architect must give direction to the civil engineer or landscape contractor.

Figure 7

Storm drain inlets.

Storm drain inlets can interrupt the beauty of the streetscape, or, as in the case of the inlet with brick instead of concrete, be custom designed by the Town Architect to match the material of the pedestrian sidewalk.

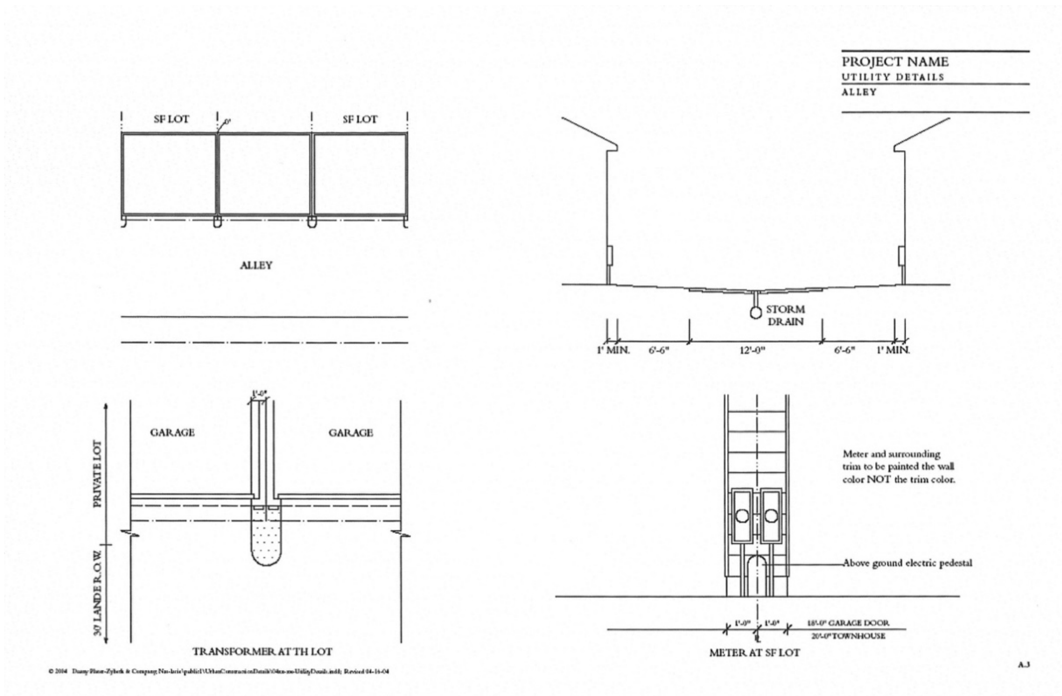
Figure 8

Fire hydrant placement.

Even the placement of the fire department's lowly fire hydrant can be placed to better foster community—or not. When they knock out parallel parking, the erode the safety cushion felt by the adjacent pedestrians. On a main street the erode the potential success of the adjacent merchant by removing parking where it is most valued. The experience of thinking you've found a spot right in front of your favorite coffeeshop only to find that the fire hydrant beat you to it is a disappointment that we've all had. Retail consultant Bob Gibbs places the value of that fire hydrant to the adjacent merchants at $150,000/year. The vigilant Town Architect will see that, whenever possible, they are placed at intersections (where hoses can be dragged in multiple directions) rather than midblock.

Figure 9

Alley utility details.



The tidy orchestration of the many unsightly necessities found in our thoroughfares is another task that falls, by default, to the Town Architect. This true for both streets and alleys.

Figure 10

Transect of mail delivery.

The means of mail delivery is a great opportunity to foster community. Absent an advocate, the Town Architect can step in and offer transect-appropriate solutions. An obscure provision in the United States Postal Regulations manual scored Kentlands what may be the last mail carrier on foot in the country. When the Town Architect of Celebration called to get the chapter and verse of that regulation, it was faxed to him, and he called a couple of days later to report that it had been removed.

Examples of the Work of a Town Architect

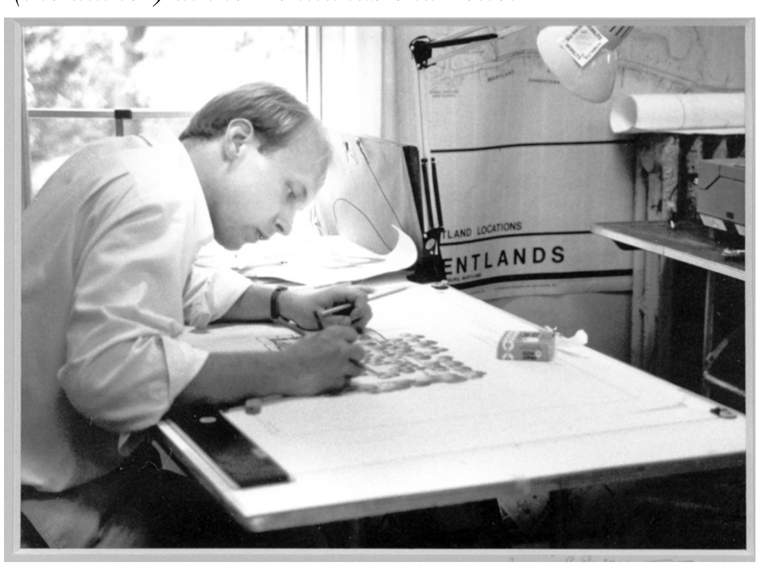
The following are some specific examples of a Town Architect's work drawn from specific communities, primarily Kentlands and Norton Commons.

Kentlands

In June of 1988, the Miami-based architecture and town planning firm, Duany Plater-Zyberk & Company (DPZ) held one of its first public design charrettes to prepare the masterplan for the 352-acre Kentlands walkable neighborhood. Today Kentlands includes over 2,000 residential units, nearly one million square feet of commercial space and numerous civic buildings.

Figure 11

Mike Watkins (the author) at the Kentlands charrette.



The author served as the resident Town Architect during the development of the community. The work included extensive masterplan design development and coordination of the various disciplines in the rethinking of their work to reinforce the intent of this revolutionary "pre-New Urbanism" masterplan for a new traditional neighborhood. It also included the review of architectural designs for compliance with the Design Code. In this case, the Town Architect also served as the "vision-keeper" for the community for growing number of residents and the local municipality in the absence of the original developer—the reasons for this are best left to a longer presentation.

Despite support from political leadership, municipal staff, in particular, the public works department, often required convincing that things like narrow streets, on-street parking, small lots, lots with no frontage on public rights-of-way, alleys, or a mix of uses on the same street or in the same building could actually work. It fell to the Town Architect to show them how. The local civil engineering firm, Rogers Consulting, was a great ally in this effort. Although the entire team was inexperienced at designing infrastructure for a new, walkable neighborhood (everyone at that time was), the Town Architect secured a desk in the engineer's office and worked out the solutions with the engineer side-by-side.

Working with builders who had only ever built in suburban sprawl was fraught with challenges. Tight front yards, generous front porches, alleys, and garage apartments were all, not surprisingly, unfamiliar. When negotiating these important elements with them, urban design was prioritized, and compromises were often made with the architecture. Merely acceptable traditional architecture was the hard-fought result. Uncommon building types were among the greatest victories: garage apartments, homes fronting pedestrian walks rather than streets, live/work units—all are now widely accepted.

Figure 12

Kentlands, Gaithersburg, MD Charrette Plan, DPZ, 1988 (left) and Aerial Photograph, 2006, showing changes and refinements (right).

Refinements to the masterplan prepared at the charrette were precipitated by changes to national wetland laws, the collapse of the shopping mall industry, the recession of the early 1990s, and less dramatic factors, such as detailed surveys of existing trees and topography, negotiations with the local municipality, and, as they began to move in, early residents.

Figure 13

Old Farm neighborhood (from left to right) as shown in the charrette plan, with Watkins' improvements, and as built.

The Old Farm neighborhood originally clustered many small lots on tiny streets around the original farm buildings, but buyers wanted large homes. As Town Architect, the author refined the design of this area, incorporating a mix of unit types was met with initial skepticism from realtors, but great enthusiasm from buyers.

Figure 14

Wooded ridge (from left to right) as shown in the charrette plan, with Watkins' improvements, and as built.

The Town Architect refined the plan for this wooded ridge between two wetland fingers to capture a magnificent stand of trees in the center and maximize the number of large "premium" lots that backed up to the wetlands.

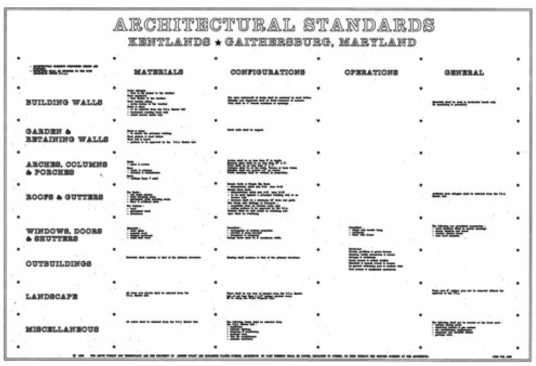
Figure 15

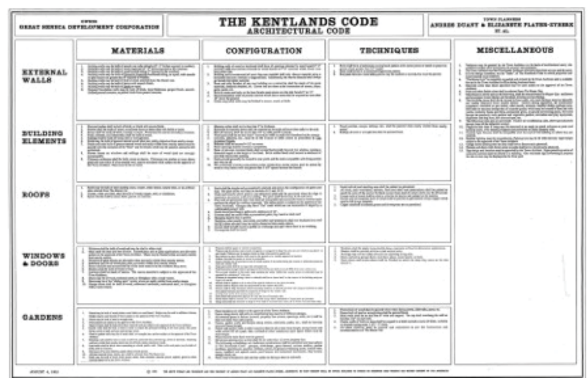
A steep cross street (from left to right) as shown in the charrette plan, as a path in Watkins' refinements, and as built.

At this block, the municipal engineer found the grade of the cross street between the long, parallel streets too steep. Instead, the Town Architect proposed small lots fronting a path traversing the grade and addressing market demand for lower-priced houses. This was so successful that two more such groups were added.

Figure 16

The original Kentlands Code (left) and the Revised Kentlands Code (right).





Refining the Architecture. The original Kentlands Code included such requirements as "real wood muntins" which, though labeled as such on the construction documents, could, the Town Architect quickly learned from builders, easily be "snapped in," defying the intention that the windows be "true divided light." The Town Architect worked to tighten such loopholes by crafting succinct but precise language for the code.

Figure 17

Leon Krier sketch from Marianne Cusato's Get Your House Right.

The correct use of the traditional language of architecture escapes most architects and designers simply because it is no longer taught in most architecture schools. The Town Architect works, sometimes painstakingly, with architects, designers, builders, and contractors to improve the quality of the architectural details. One contractor, embarrassed by his incorrect work when shown examples of the correct details, willingly worked to improve them.

1. The exposed brick between the trim and the opening exposes the glue-on trim for what it is in the first group of townhouses.
2. The field superintendent was persuaded to paint this brick in the second group.
3. The field superintendent was persuaded to place pilasters correctly (next to the opening) and install a head that does not cantilever.
4. The missing entablature shown in this illustration from Cusato's Get Your House Right was an expense denied the contractor by the home office.

Figure 18

Progression of door surround details through subsequent interventions of the Town Architect.

Figure 19

Images of Kentlands.

Kentlands has had a significant impact on the lives of those who live, work, learn, and play in the neighborhood. Kentlands received an award from the American Institute of Architecture, Maryland and the jury commented:

> New urbanism becomes cartoonish in some designers' hands. This is a project that is beautifully done, it is genuine, it is a real town, it is convincing, and the idea of community seems to be supported by the architecture rather than overcome by the architecture. This submission really stood out among the master planning submissions. The key word here is authentic. This does not look like a stage set. The key is that

people will want to live here. The new concepts of living patterns are executed in a way that people are going to be attracted to now and in the future. (AIA Maryland, 2006)

Norton Commons

Norton Commons, a 600-acre new community in Louisville, Kentucky, was also master-planned by DPZ. It is zoned for 2,880 residential units and 500,000 square feet of commercial space, with a recreational greenbelt enveloping the neighborhoods and the hamlet in the manner of Frederick Olmsted, who did extensive work in Louisville. Its neighborhoods include a full range of housing types, from single-family detached homes to apartments, a central square surrounded by mixed-use buildings and live/work units, and civic buildings such as a fire station, a child-care center, a church, a school, and a YMCA.

Figure 20

Images of Norton Commons.

Unlike Kentlands, where the author served as the resident Town Architect, he served as the itinerant Town Architect for Norton Commons from 2002, when it began construction, to the present. Regular visits were mixed with various means of remote communications. Today the responsibilities are fulfilled almost entire through Zoom and e-mail. Like Kentlands, the Town Architect provides urban design development services, conceptual architectural designs, and reviews proposed designs for private buildings, civic buildings, and civic spaces prepared by others for compliance with the Design Code and Pattern Book.

Norton Commons' town founders, David Tomes and Charles Osborn, III, place a much higher emphasis on architectural review than was the case in Kentlands. In fact, after adopting the Norton Commons Design Code, the Planning Commission made the Town Architect's signature a requirement for builders to pull a construction permit with the City. The Town Architects' instructional reviews led to traditional architecture of a much higher quality which is even more remarkable when one considers that over half of the buildings in the community were not designed by architects.

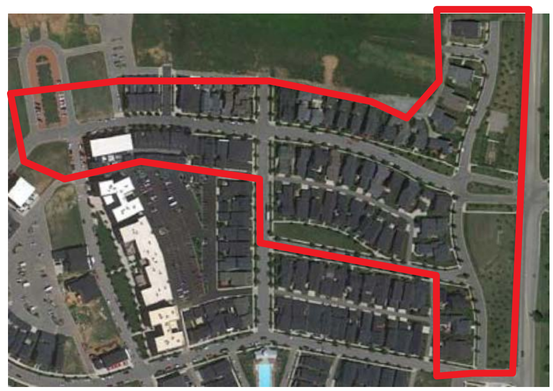
Figure 21

Norton Commons Charrette Plan, DPZ (left) and Aerial (right).

Norton Commons is one of DPZ’s most archetypal masterplans and thus refinements were inevitable as more detailed work is done to prepare the master plan for construction and as changes in the market occur over time. Several examples follow.

Figure 22

Refinements to phase 1 from charrette plan to aerial photograph.



The first phase was refined to face homes on the perimeter road, bowing the street to provide spatial definition and make the facades more visible from the entrance and the initial sales office. A slight bend in the perpendicular street was added and a Victorian house with its turret and wraparound porch placed on a corner lot so the house would terminate the initial view on entering the neighborhood. The three-block-long street was platted to include the full range of residential building types, live/work units, and a mixed-use building. The broad mix of types and uses exposed the market to the principles on which the neighborhood was designed in the first street.

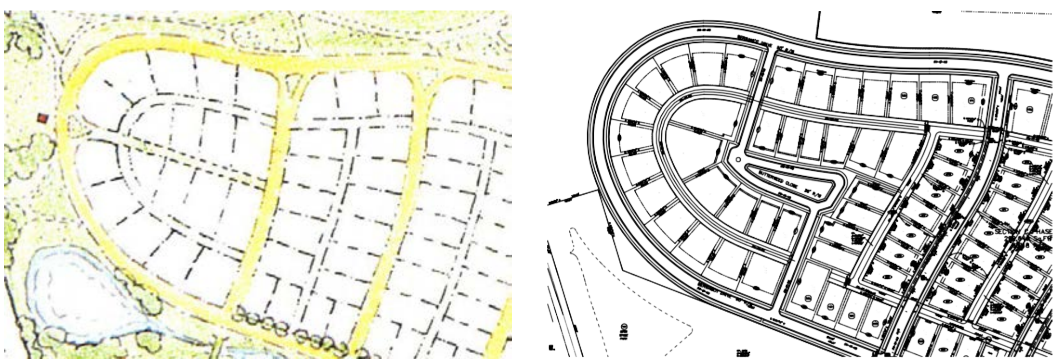
Figure 23

Examples of terminated vistas.

Builders were persuaded to properly terminate a vista, and thus add value to their lots by creating special, unique places within the home or porch for their buyers.

Figure 24

Refinements to plan introducing Butterweed Court.



In Butterweed Court, which was built in 2014, an ordinary street was modified to create a unique identity for these residents centered around a quiet internal park—thus commanding premiums for these otherwise typical lots. Early proposals included limiting the architectural styles to Arts & Crafts with the park landscaped and furnished accordingly.

Figure 25

A detailed regulating plan for Norton Commons.

One of the advancements in the role of Town Architect that has been implemented at Norton Commons was the preparation of a “Detailed Regulating Plan.” A Regulating Plan addresses typical conditions while the Detailed Regulating Plan identifies specific opportunities for specific lots on a phase-by-phase basis. Porches may be required or recommended on lots where they would contribute most to community life. The placement of garage doors on alley-corner lots may be dictated for the convenience of the homebuyer. Trees may be required on certain lots to screen a rear elevation if a bend in the street makes that elevation conspicuous.

Figure 26

Homearama 2011.

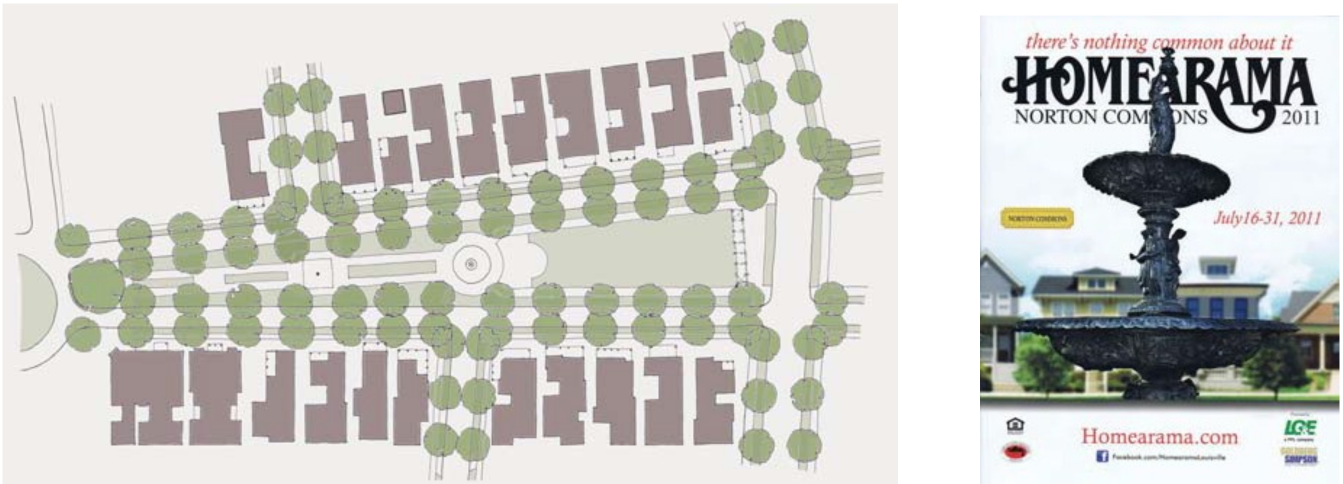
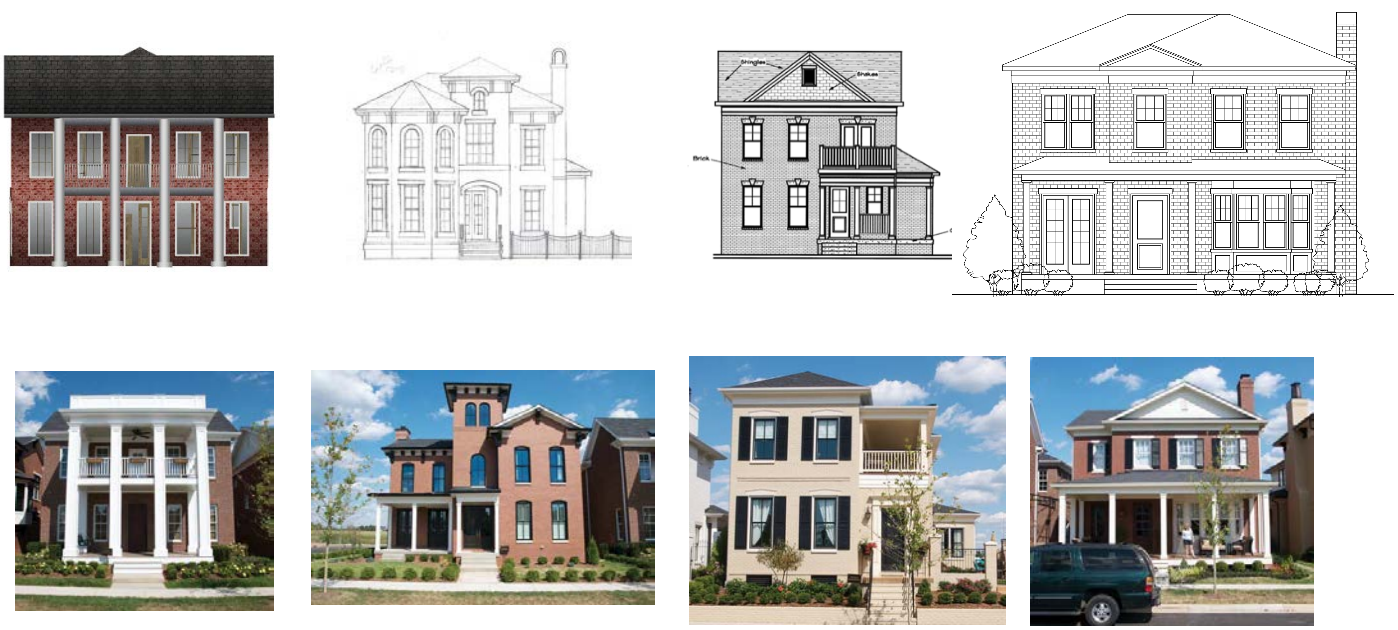


Figure 27

Refinement to building designs for Homearama 2011.



This example of how the architecture was refined is from the two-block-long park that was the site of the 2011 Homearama, the showcase event for the Home Builders Association of Louisville. The Town Architect worked with the builders and their designers to refine their original proposals to more authentic traditional designs and craft a more beautiful public realm. This work was often done quickly and in one sitting, sometimes with a follow-up review.

During the construction of the first phase of Norton Commons Steve Mouzon led a construction workshop. The only requirement was that the sub-contractors and their help were required to attend. Attendance by everyone else was optional. In near 100-degree heat and humidity to match, Steve demonstrated the construction of three different eave details. These contractors were amazed to learn they had been doing “it” wrong for years. It seems no one told them or showed them. Steve was transforming contractors into craftsmen.

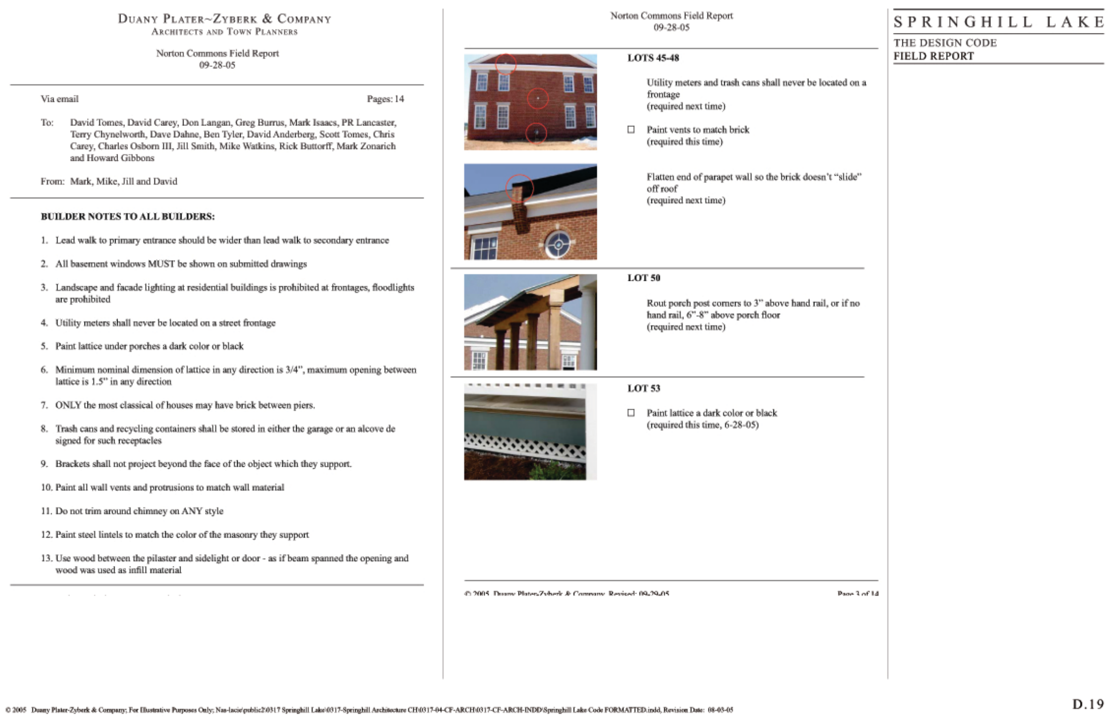
Figure 28

Workshop with Steve Mouzon and builders.

Another useful tool developed at Norton Commons was the “Field Report.” For a visiting Town Architect this is a great way to comment on the good, the bad, and, when necessary, the ugly and share this across all of the builders in a format that they can post on the job site.

Figure 29

Page from a Norton Commons Field Report.



DUANY PLATER~ZYBERK & COMPANY
ARCHITECTS AND TOWN PLANNERS

Norton Commons Field Report
09-28-05

Via email — Pages: 14

To: David Tomes, David Carey, Don Langan, Greg Burrus, Mark Isaacs, PR Lancaster, Terry Chynelworth, Dave Dahne, Ben Tyler, David Anderberg, Scott Tomes, Chris Carey, Charles Osborn III, Jill Smith, Mike Watkins, Rick Buttorff, Mark Zonarich and Howard Gibbons

From: Mark, Mike, Jill and David

BUILDER NOTES TO ALL BUILDERS:

1. Lead walk to primary entrance should be wider than lead walk to secondary entrance
2. All basement windows MUST be shown on submitted drawings
3. Landscape and facade lighting at residential buildings is prohibited at frontages, floodlights are prohibited
4. Utility meters shall never be located on a street frontage
5. Paint lattice under porches a dark color or black
6. Minimum nominal dimension of lattice in any direction is 3/4", maximum opening between lattice is 1.5" in any direction
7. ONLY the most classical of houses may have brick between piers.
8. Trash cans and recycling containers shall be stored in either the garage or an alcove de signed for such receptacles
9. Brackets shall not project beyond the face of the object which they support.
10. Paint all wall vents and protrusions to match wall material
11. Do not trim around chimney on ANY style
12. Paint steel lintels to match the color of the masonry they support
13. Use wood between the pilaster and sidelight or door - as if beam spanned the opening and wood was used as infill material

Norton Commons Field Report
09-28-05

LOTS 45-48

Utility meters and trash cans shall never be located on a frontage
(required next time)

☐ Paint vents to match brick
(required this time)

Flatten end of parapet wall so the brick doesn't "slide" off roof
(required next time)

LOT 50

Rout porch post corners to 3" above hand rail, or if no hand rail, 6"-8" above porch floor
(required next time)

LOT 53

☐ Paint lattice a dark color or black
(required this time, 6-28-05)

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SPRINGHILL LAKE
THE DESIGN CODE
FIELD REPORT

© 2005 Duany Plater-Zyberk & Company; For Illustrative Purposes Only; Nas-lacie\public2\0317 Springhill Lake\0317-Springhill Architecture CH\0317-04-CF-ARCH\0317-CF-ARCH-INDD\Springhill Lake Code FORMATTED.indd, Revision Date: 08-03-05

D.19

The Design Review Policies and Procedure was honed and honed at Norton Commons until the entire process fit on a single 11x17 page. This includes the process, the documents to be submitted (include the required scale and content), as well as a disclaimer and a place for the Town Architect to sign ("permitting" not "approving") the submission.

Figure 30

Images of Norton Commons.

Like Kentlands, Norton Commons serves as a model new, walkable community but in a different region of the country. Although not yet complete, Norton Commons has already impacted the lives of those who live, work, learn and play in the neighborhood by mixing residential types and a variety of uses within a compact, walkable community. Mixing residential types has allowed multiple generations of the same family to live within walking distance of one another. Mixing uses allows residents to meet daily needs within the neighborhood. Enjoying a greater attention to architectural detail than Kentlands did, it is quickly becoming known as an example in this regard to those pursuing similar designs in their communities.

Conclusion

A degree of finesse is required to gauge and implement the appropriate level of guidance and control when building a community. Too little of either can yield sloppy, ineffective, and disappointing results; too much can strangle the very community one seeks to facilitate. Navigating the desired course is the Town Architect's challenge.

References

AIA Maryland. (2006). *Honor Award for Kentlands.*

Unwin, R. (1909). *Town Planning in Practice: An Introduction to the Art of Designing Cities and Suburbs*. Princeton Architectural Press.