

THE HEART OF THE CITY

A NECESSARY BINDING FORCE THAT
CREATES THE CORE OF EVERY CITY

Christopher Alexander

The Heart of the City

The Necessary Binding Force That Creates The Core
Of Every City

Christopher Alexander
with Maggie Moore Alexander (editor)

Fifty Years On From The 1956 Harvard Conference.

This essay invites taking a journey of non-traditional thought about architecture and urban design, and proposes a science of context-sensitive, harmony-seeking, shape-forming process focused on generating and shaping positive space in all public places, so that the overall urban process will be able, in the hands of thousands of professionals and users – to generate inspiring, useful space throughout the city and throughout the region.

CONTENTS

Preface	CIAM 1956-2005	2
---------	----------------	---

-o0o-

I	Non-Awareness of Positive Space in the Period 1956-2005	4
II	Definition of Positive Space	7
III	The Tapestry of Pedestrians and Cars: A Citywide Tapestry of Positive Pedestrian Space And Linear Vehicular Space	25
IV	The Generic Process of Creating Positive Space	32
V	The Detailed Process of Creating the Heart of the City, Step by Step	36
VI	Money for Positive Space: City Budgets, and Re-allocation of Line Items in The City Budget	49
VII	Review Of Yesterday's Architecture	50
VIII	Epigraph: Six Billion People	56

PREFACE: CIAM 1956-2005

1956: The Congrès International de l'Architecture Moderne (CIAM), and the Vision of the Harvard conference

The vision conjured up by the participants of the 1956 conference is (like CIAM itself, from which it came) seductive when one only glances at it. It sounds visionary, clean, full of light and air and the beautiful future that was contemplated.

The flaws in the vision became clear only during the fifty years that followed. And these flaws, are, in my view and in the view of many contemporary architects, planners, thinkers and writers, immense. So much so, that one might say the brutal landscape of modern urban design and modern city-building, was largely caused by the kind of thinking which was articulated at the 1956 conference.

I think that looking back on the actual design results of urban design that followed in the fifty years since 1956, one might say that its primary flaws in the executed projects are these:

- Lack of positive urban space
- Failure to resolve the car
- Lack of variation
- Gigantism
- A view of the city as a machine, not as an organism
- Lack of attention on the suburbs
- Lack of attention on the 90% of the Earth which is in a state of poverty
- Failure in the economy of cities
- Failures in class and social divisions

These flaws are highly visible. They have been discussed by many writers, yet the contemporary mythology of 20th century architecture persists even now, in apparent disregard of them in, especially in the mythology of money-driven, glossy architecture magazines, which in turn drive other architects to emulate them, and so to destroy the city further.

All these flaws originate, I believe, with the era of the 1956 conference, even though one cannot blame this one conference for all our woes. In any case, it would be churlish to dwell on them at length. The men and women who participated in the conference were sincere and devoted professionals, facing an enormous task, and doing their best. I knew many of them, and some of them were my teachers. It does little good to excoriate them for their mistakes. The problem for us, is to solve the problem which they did not solve.

At bottom, we may summarize the 1956 conference, and the fifty years which followed it, like this: Although the word “space” was more and more often bandied about by architects and planners, and even adopted as one of the hallmark concepts supposed to characterize the modern era, in fact the 1956 conference, and the fifty

years which followed it, are remarkable chiefly because there was no significant invention of new structure in the realm of urban space. It was precisely this which was lacking during the whole fifty-year period, and it is because such a structure was lacking, that the city of the late 20th century became such an unholy mess. The spatial structure of the modern city, was virtually unaffected in any creative or inventive way by the work of this era, and what minor innovations did occur were almost uniformly negative. Yet the technical and cultural conditions of the 20th century absolutely required something new!

It therefore remains to us, the old people and children of the 21st century, to work to achieve a significant, modern space scheme for a modern city, one which really benefits the people who live in cities and which transforms the ways that modern cities work.

My main focus, therefore, in this essay, will be to describe, what might be a more adequate vision, and a vision on which we might—this time, and from now on forward — build a successful urban future, an urban environment truly able to provide for people, for their feelings, for their needs and their emotional life – places and channels of movement in which we might now begin to build a vessel for society, an environment in which the fabric of society can be nurtured.

This paper draws [heavily] on material in Books 1 and 2 of *The Nature of Order*, in particular on the fifteen properties.¹

I NON-AWARENESS OF POSITIVE SPACE IN THE PERIOD 1956 TO 2005

Nearly Complete Lack Of Attention To This Vital Core Of Every Human Settlement

I would say the most devastating mistake of the 1956 conference, and of the thinkers who put their vision forward back then, was an almost complete unawareness of the importance of positive space in the environment.² The idea that a city is largely formed by its public space, and by the shape, character, and meaning of this space, was virtually absent from the 1956 thinking. Therefore, the absence of an accepted model of coherent, positive urban space has resulted in the unintended creation of devastatingly bad city space. This is a mistake of such enormous proportion that it is hard to understand how it could have come about.

The problem is that space, as presently conceived, is not understood as a “thing,” as a “something”. A building is well understood as a thing. So, giving shape to a building is a do-able and understandable task. The work of the CIAM movement in the early 20th century began focusing attention on the shape of the buildings, and in doing so, created a blindness to the space.

Yet it is the **space**, not the buildings, which **forms** a city. The buildings form the **space** (or should do so); and the **space** can then give us the **receptacle** for living. This insight, this knowledge, was commonplace for centuries, in most parts of the world. But it became twisted and misunderstood, and then ultimately forgotten. And indeed, all this was misunderstood by the participants in the Harvard conference.

This very great omission inevitably led to the destruction of social and communal fabric. The positive space of a city is the body of its public existence, and carrier of its sentiment, the origin of its spirit and its soul. If positive space is absent from a human habitat, or if the effort to make space positive is not present in the fiber of every action taken in the ongoing construction and reconstruction of the city, that city will surely fail as a humane and valuable human thing, as vessel for human events, and as a sustaining social system.

Thus it is the geometrical, three-dimensional configuration of space, which forms the core of every city, and matters most. That is the canvas, the palette, that is the arena where our work must take place. It was largely ignored in 1956. It did not arise as a result of the efforts made in 1956, nor as a result of the direction of those efforts. I suspect it was invisible or unknown to Jose Luis Sert, and many others at that conference. Certainly no one at that conference mentioned it explicitly, and it is not, to my eye, present in the work of any of the “heroes” of that period. For example:



Jose Luis Sert model for an urban design (is it Bogota?)

This project is almost exclusively concerned with the building masses, their shape, their integrity. The shape of the *space* itself is nowhere visible, and is hardly considered.



Le Corbusier, the space created by the Carpenter Center, Cambridge

In the Carpenter Center, once again, for all the discussion of flowing space in Le Corbusier's works, the actual urban space created by this building is lamentable.

Equally, the current most admired adventurers in space, heroes of recent and present-day magazine architecture, have gone still further in this direction, and have (one must guess) intentionally destroyed urban space to an extent not even dreamed of in 1956.



Rem Koolhaas, latest project for Beijing

This design pays no attention to the actual space formed on the ground. It is worse by far than the Cité Radieuse, the “radian” city of Le Corbusier which destroyed city

space and made way for a city peopled by semi-habitable freestanding blocks. This design by Koolhaas is more pretentious, yet does even less.



Frank Gehry, Boston

Once again, a famous architect playing with shapes and achieving nothing next to the building, and no usable space: what little bits of space exist are rendered unusable by the mannerist sloping surfaces so you cannot even stand there.

The coterie of respected AIA architects and their disregard for positive and useful space is astonishing. Yet mentioning positive space, seeing it, thinking of it, attending to it constantly, these are the powers and faculties which ultimately bring life into a city. If this positiveness of space is not seen, felt and heard as primary, it will not then become the topic of people's thoughts, and will not then **be** primary in people's experience, and it will not genuinely shape the city or the chief product of urban design: the environmental fabric in which we live.

II DEFINITION OF POSITIVE SPACE: THE NECESSARY BINDING FORCE

Positive space, one of the fifteen properties described in depth in TNNO, is coherent space which has the attribute that people want to be there, choose to be there. It has the quality that people feel well in themselves when they are there, and they are capable of experiencing their own life when they are there.

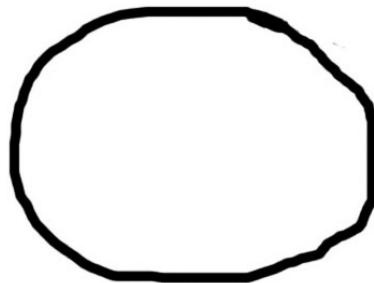
Space which has these capabilities, also has a certain signature geometry. It is complex, but not elusive.

- 1 It is essentially the idea that the space is a container.
- 2 And it is a container of life – in visible and felt form.
- 3 It includes a degree of enclosure – not too enclosed, not too open.
- 4 It includes relationship to other, nearby, positive space, including views to such space, and a hint of possible walks to such space.
- 5 It is based on activities, not shape alone, with the activities given shape.

- 6 It is based on natural access to well-used pathways.
- 7 It is based on views and openings.
- 8 It is based on buildings directly fronting and forming the space.
- 9 It must have good shape, and nearly always includes important symmetries -- local symmetries and subsymmetries which give its character.
- 10 Yet it is also based on a certain roughness, which arises from careful adaptation to unpredicted events and places and from the respect given to them.

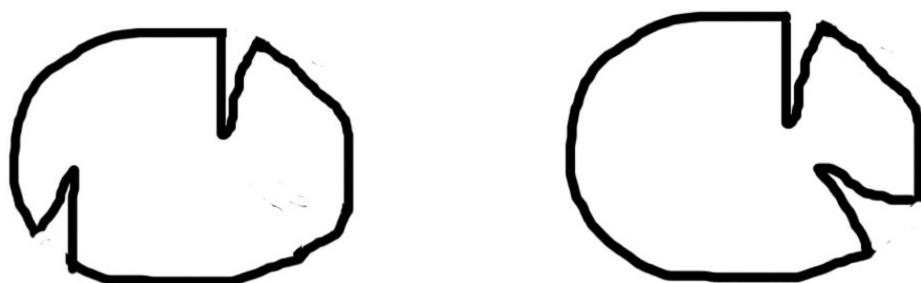
1 It Is Essentially The Idea That The Space Is A Container Convexity and Quasi-convexity

In mathematics, a convex body is shape that is roughly egg-shaped. More precisely, it is a geometric shape that has the following property. If we draw a straight line connecting any two points, A and B, in the convex body, then all the points on that line between A and B, also lie inside the convex body.



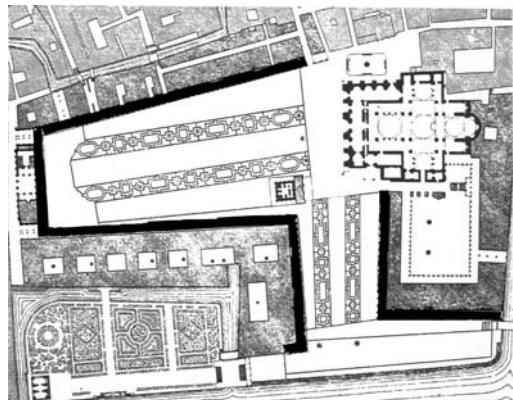
An egg-shape, the archetype of positive space

Positive space is not always convex, in this strict mathematical sense, but it does slightly resemble what we define as a convex shape. It is roughly convex, bowl-shaped, a “container.” It is not a shape with many re-entrant angles.

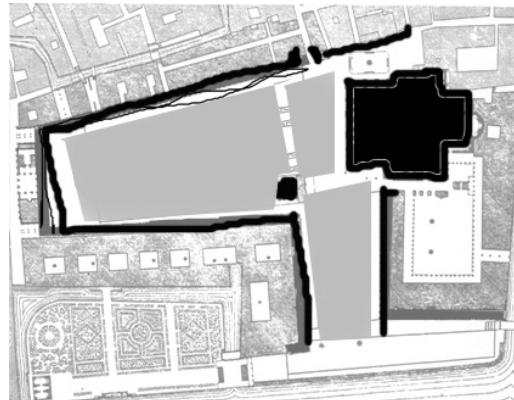


*On the left: An egg shape with two indents cut into it. This is **not** positive space.
On the right: An egg shape with two indents. Because they are cut symmetrically two distinctive bowl-like container shapes are made. Both containers are positive As a result the compound shape is also positive. This is positive space.*

However, it is more subtle than that. Let us consider St Mark's Square. It is not a convex body. Clearly, it has a kind of L shape or hammerhead shape, and is composed of three "containers." Yet we also experience it as one container. How then, does this manage to be positive? It is, I think, because of the Campanile, built before the main space was shaped, and shown as a small black square in the right-hand plan. The campanile forms a virtual center³ at the corner that has the effect of generating three independent spaces, each with good shape (shown gray), rather than being a single space with bad shape.



St Mark's Square



Three positive spaces (gray shaded areas), formed by the building edges and the campanile



St Mark's Square seen from the water

2 And It Is A Container Of Life – In Visible And Felt Form



*The positive space at the core of a Zulu farm
Thembani Mhlongo*

The Mhlongo family is a traditional Zulu family that lives on a small farm located midway between the townships of Esikhawini and Port Dunford near Richard's Bay, South Africa. Their home is located about one kilometer off the paved road. Access is via a sandy pot holed road that winds out through a grove of eucalyptus trees across a pasture and then through a sugar cane field. Benard(pronounced ben-urd not "ben-ard"), the father, works as a gardener for a housing complex in Richards Bay where he earns 605 Rand (\$81) per month after transport costs. Since he doesn't have a car he takes a bus to work and back. He also grows a hectare(abt 2.5 acres) of sugarcane to supplement his income. They raise chickens, grow bananas, mangos, papayas, and tangerines, and have a small garden.



Additional view of the Mhlongo farm. Here the positive space is made positive by a variety of elements, including fence, bushes, tree, woodpile -- all useful, and all accumulated over time.

3 It Includes A Degree Of Enclosure – Not Too Enclosed, Not Too Open.

Enclosed Or Partly Enclosed

Space also becomes positive in part because of the degree of enclosure it has, that means the percent of its perimeter that is surrounded, and the depth of the BOUNDARIES around the perimeter.⁴



Binsted Lane, a tiny main street of a farming village in Sussex

This part of Binsted lane, has two layers of BOUNDARIES, the grass and the hedge. Thus it is comfortably enclosed. At the same time the space is not fully enclosed, leaving openings towards other STRONG CENTERS⁵ in the distance, even focusing the eye on them.



A corner of Cheery Street, Dublin, enclosed and comfortable

In the next example, from Dublin, the enclosure is provided by living stuff – shaped by the generations who have owned it, lived there, worked there – and it is this which generates a sensation of enclosure and positiveness. It has been worked through from the human essentials.

4 It Includes Relationship To Other, Nearby, Positive Space, Including Views To Such Space, And A Hint Of Possible Walks To Such Space.

5 It Is Based On Activities, Not Shape Alone, With The Activities Given Shape.

6 Good Shape

Positive urban space has recognizable form – GOOD SHAPE -- clear simple form, not pretentious, not made to impress, but rather the simplest shaped space that is consistent with the place, the view, and its connections.⁶



GOOD SHAPE AND LOCAL SYMMETRIES⁷: *The Berkeley Pier*

The Berkeley pier, rebuilt two decades ago by city engineers, is a magnificent public space, with simplicity of space, and shape, grandeur, and complete lack of pretension. Generations of people now use it for walks, and for fishing.

Space Shaped by Buildings

In many cases, though not all, to be positive, positive space should be enclosed at least in part by buildings. More carefully stated: All buildings have the job of enclosing positive space. The space has to be shaped, and the buildings have to be shaped, each surrounding the other, and enclosing the other, each habitable in its own way, and each above all positive in character. This is a little like the game of GO, where every stone that is placed has the job of enclosing space on at least two sides, but it needs to join forces with other stones to form an interlocking pattern of enclosure.⁸

Useful and Constructive And Magnificent in Shape



BOUNDARIES AND BOUNDARIES OF BOUNDARIES.: *The River Liffey, Dublin.* A beautiful symmetrical, curving structure, including bridges, promenade along both sides, roads, cafes and shops beyond.

Partly Enclosed Around The Perimeter



STRONG ENCLOSURE: *The Wailing Wall, Jerusalem,*

reconstruction of the wall and plaza by Hillel Schocken and Moshe Safdie

Pedestrian Dominated



PEDESTRIAN DOMINATED: *The sea front at Blackpool*

Animated by Spirit

Animated by a View or Natural Landform



FOCUS ON NATURAL VIEW AND ENHANCING THE LAND FORM: *Copacabana beach, Rio de Janeiro*

I do believe that the practitioners of urban design know all this. I am sure that the majority of people who call themselves urban designers today, would embrace much of what I have said, and would consider themselves on the same side of the “fight.”

Why then is the urban design we find in cities today – often shaped in part by urban designers themselves, who are trying to follow this kind of thinking? I think there is a little devil in the soul, which prevents them from doing, in a pure and simple fashion, what they know and what they themselves aspire to.

They have to provide that even though, using some traditional ideas, they also have to show something weird, or humorous, to show that they are still in the club of cute, professional architecture. For instance:

Charles Moore's Piazza d'Italia in New Orleans.

This example is campy and quirky, and is not really positive in the human sense or encouraging and succeeding in encouraging human interaction. But for all its humor and campy quirkiness, it does also represent a serious (if flawed) attempt to create positive space. That is why it is a useful example, in spite of its errors.



HIERARCHY OF LEVELS OF SCALE: *Charles Moore's Piazza d'Italia in New Orleans*

DPZ's A Small Green Space



APPROPRIATE RATIO OF BUILDING SIZE TO SPACE DIAMETER: *A small green surrounded on one side by single houses, Andres Duany and Elizabeth Plater Zyberk*

This green lawn on the street, with the low fence and the row of houses, partly encloses the space to make it POSITIVE SPACE. It could be more positive if there were a low hedge or wall on the street side, and if there were, perhaps a very small hard stone

flagged area, making it less forbidding for those who want to approach and use it. The project is a serious and valuable attempt in this direction.

Further Examples Of Positive Space From Other Recently Built Work

If we take it seriously, see that it is the essence of the job, we shall then have a relatively easy task: to describe, in principle, the configurational aspects of these spaces, the rules of the game. That can form a backbone for the economic and human transfusions which are needed, and which have been beautifully documented by Jane Jacobs, and others.⁹ This can only take place with the spatial backbone to allow it, which includes:

- Participation of buildings and building owners in the making of the space
- Growth of each space from the wholeness that was there before
- Hierarchy of spatial sizes rather than gigantism
- Connection of spaces in a hierarchical sequence to one another
- Enclosure of space
- Dimensions of space
- Boundaries of space
- Comfort of space
- Views from the space
- Access for vehicles near to the space



Geoffrey Bawa, garden of the Parliament building, Sri Lanka



Christopher Alexander, Arcade and Lake and Classroom buildings on the Eishin Campus, Tokyo



Ghiradelli Square, San Francisco

This approach to the square (which is upstairs) is pleasant and useful. But the square itself, at the top of the steps, is less successful, not a really pleasant place to be.



Darat al Funun, Amman, Jordan



The outdoor space between the faculty building and the college classrooms and the judo hall, on the Eishin campus. Seedlings in wooden trays and an informal table, give a sense of the very natural and everyday life that accumulates in this space – and it is largely this that makes it positive.



One of the pedestrian streets of the Eishin Campus my colleagues and I built in Tokyo



Hundertwasser apartments, Vienna. Here the space under the columns, coupled with the garden on the left and the sidewalk along the street, all cooperate to make a positive space which, in this particular instance, is not strongly enclosed.



Jack London Square. Not very good, but does illustrate the benefit of things around the edges.

A meeting spot in Soweto, modest, but effective



Stellenbosch, South Africa

III THE TAPESTRY OF PEDESTRIANS AND CARS: A CITYWIDE TAPESTRY OF POSITIVE PEDESTRIAN SPACE AND LINEAR VEHICULAR SPACE : A 21ST-CENTURY VEHICULAR SYSTEM

What is to be done about the car?

Of course, the creation of the city's heart, as a system of positive pedestrian space, cannot merely be solved by locally shaping individual bits of positive space, or by creating pedestrian precincts. The entire problem was created in the first place, by the advent of the car, and to solve the problem, the global role, position, and structure of car movement in a city, must be modified or reinvented. For positive space to work once more, and to work deeply, in the context of modern transportation, **it requires a wholesale re-organization of the structure of space, throughout the city – a genuinely new concept requiring the remaking of space.**

This is precisely what the CIAM-inspired 20th-century architects promised but did not deliver, and what we 21st-century architects, now must deliver.

How can we conceive a city, efficient for cars and trucks, yet with powerful, connected, and heartfelt positive pedestrian space, when the car, trucks, buses, rush hour, massive transportation as the foundation of the urban economy, have taken over the space of every city, and have destroyed the human character of public space, and its capacity for gathering and interacting, almost altogether?

I shall now try to set out the essentials of such a solution.

In my view, the key points are these.

1. The pedestrian spaces have priority (in the sequence of decision making), and it is their beauty and emotional impact which **must** take precedence in all urban decision making and planning.
2. The vehicular spaces (streets) come second, and can even afford to be somewhat roundabout, while the pedestrian system is a network of direct and beautiful links.
3. The pedestrian system of positive space must be organized around key physical centers – buildings, parks, views, or spaces -- which stand either for their historic importance, or for their psychic immediacy, as the major places of the city.

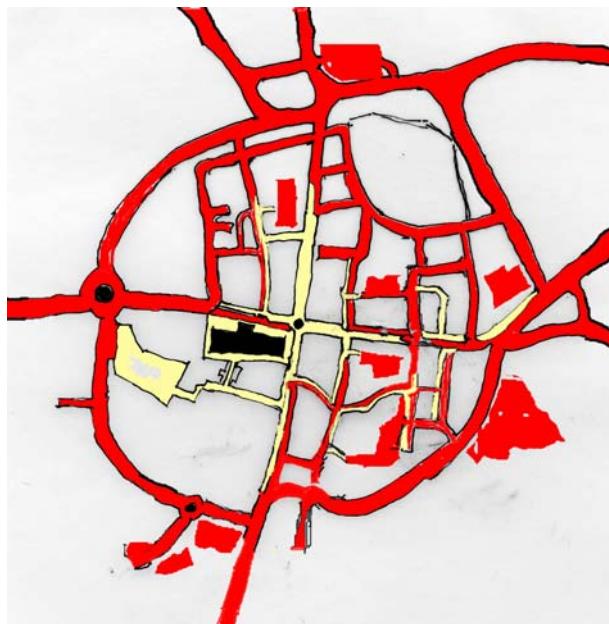
4. Though often separate, cars and pedestrians must be very closely interwoven and very close to each other, to protect and stimulate the economic life of the fabric as a whole.
5. Parking must always be placed with great care in relation to the pedestrian centers, not next to them (NOT next to them), but rather strategically placed so that they generate flows of pedestrian movement from them towards to the major pedestrian centers.

The Idea Of Braids

Network of Paths and Cars¹⁰

Allan Jacobs.^{11 12}

Chichester



*Plan of Chichester, Sussex, UK
The red represents roads and vehicular streets
The yellow represents pedestrian paths and ways*

Chichester is one of many towns all over Europe which have been modified to include a pedestrian precinct, in the last twenty years. It is, however, one of the most successful.



Chichester: The 13th century Cross at the intersection of North and South, East and West streets.

THE HEART OF THE CITY



Soweto



Soweto taxi rank

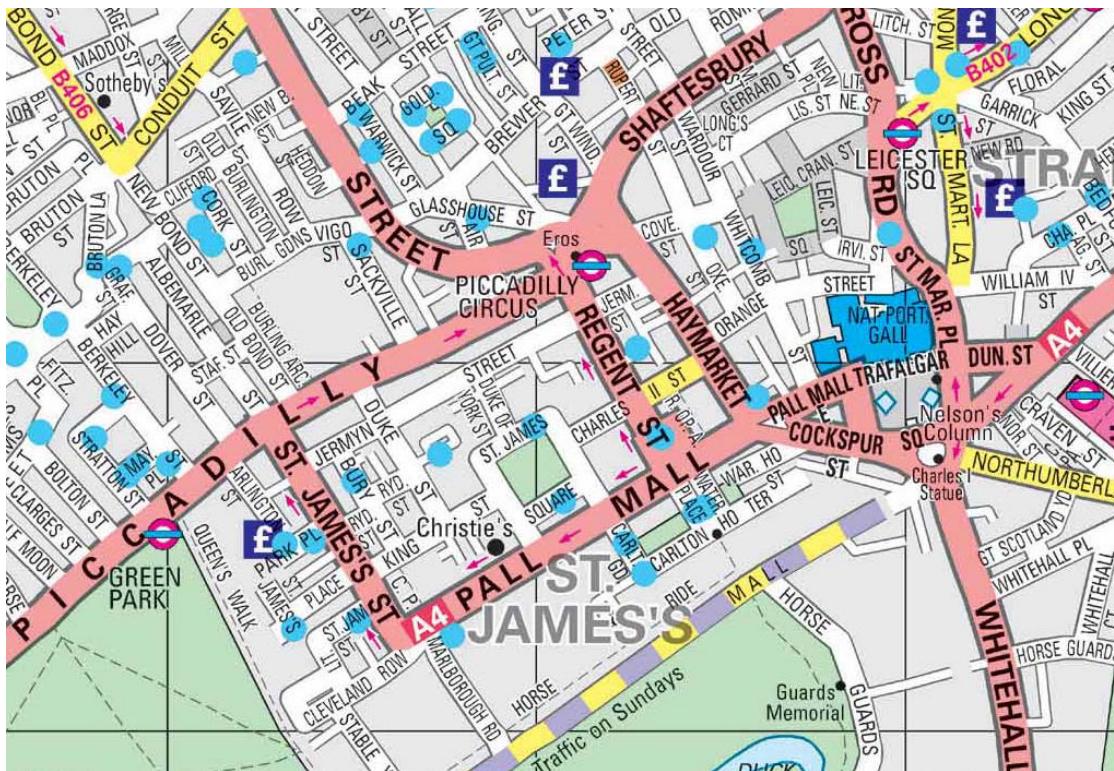
London



London, as transformed to form a pedestrian braid

THE HEART OF THE CITY





A detail of Central London

I hope I have now given a reasonably clear account of the necessary spatial structure, for a modern city; and above all for a city which has, throughout, an actively human core that has, more or less, been missing or weakened by development activities of the last eighty years. The needed structure is a tapestry or braid composed of stretches of positive space (for pedestrians) and forming a distinct continuous network, while this network is interlocked with a carefully composed system of vehicular streets and parking.

It is a very specific structure, in which these components are fitted together and interdependent in straightforward but surprising ways, to create the energy and appropriate pattern for an era in which people all have personal vehicles, yet allowing us also to be attached to place and community as walking individuals.

In this pattern the system of positive pedestrian space is local, while surrounded by a denser network of fine streets, that are surrounded by high volume streets further out. The high volume streets carry the traffic, while allowing approaches to networks of positive space that approach each core.

Further, the system of positive space has a very well marked center, the historic core of the neighborhood, and the recognizable and felt place: parking lots are placed in small groups at the interface of the vehicular network (the finer strands), and the pedestrian positive space, but so place, that the path to the center lead along the pedestrian streets, thus generating dense pedestrian traffic in the vibrant places that give economic and human life. This careful placing the parking lots at the interface of the two systems, and leading towards the neighborhood center, is the key to its success.



The Thames Neighborhood, London

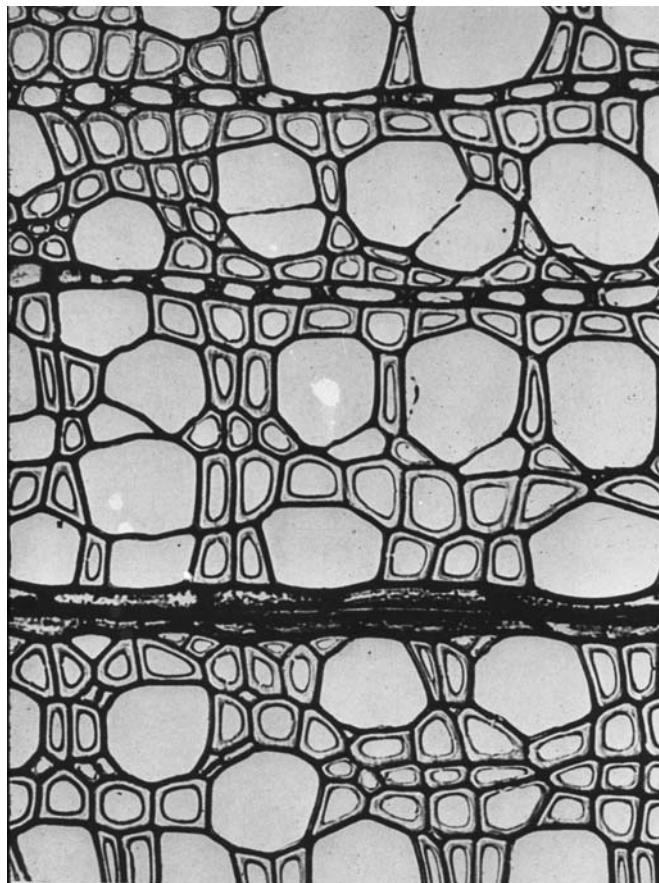


The Tower Neighborhood, London

All that together, forms what I call the tapestry. But, when it comes to generating this structure successfully, it is the generation of positive space, above all, which must play the dominant role.

IV GENERIC PROCESS OF CREATING POSITIVE SPACE

I shall therefore now give an evocative image of positive space, as it occurs in a natural wood tissue structure, with a description of the kind of process which is going on, and which we must, undoubtedly, contemplate, and make practical, in order to produce a comparable structure in our cities.



Positive Space in the cell structure of wood tissue

It is not impossible to see this image of cells in wood tissue, as an image of a city, which , in conjunction with the text below, describes the process which can produce an endless system of positive space at many scales. It is clear, as the following text shows, that the structure, so beautifully organized, comes about in a rather straightforward fashion:

Quoted from *TNNO*, Book 2, p. 69.

“Consider a small zone of empty space somewhere in a system that is currently not inhabited with strong center. By virtue of its geometry, at least some regions of this empty space will have a weak latent quality as centers. Like the empty space between two adjacent blobs, they will be center-like but undeveloped. Sooner or later, by moving material to make the shape of this “empty” space more coherent, structure-preserving transformations make these latent centers in the space more and more center-like. As they become centers they become more positive in shape. They will gather themselves together and differentiations will occur around the edge to intensify the shape and make it still more center-like.

“Look at the packing of kernels in a bit of wood tissue. While the tissue is growing, the wood cells press against one another, deforming their shapes, much as bubbles in a mass of bubbles keep their coherence under their own internal pressure, balanced against the pressure of nearby bubbles. Just so with the cells in the wood tissue, until each bit of space is made positive.

"Under structure-preserving transformations, such a process will occur quite generally in any system. Gradually, each bit of space that has any latency to be center-like gets formed more and more strongly as a center. As the empty space is filled, pushed, pulled, connected, each bit of it becomes a center, and slowly becomes more positive. The property positive space slowly makes its appearance throughout the space."

Dynamic, Step-by-Step Creation of a System of Positive Space Through SP-Transformations and Local Symmetries

In order to understand the meaning of positive space, it may be helpful to start by discussing the way that a system of positive space can be constructed, step by step, and the progressive step-by-step transformations which will slowly bring it into being.

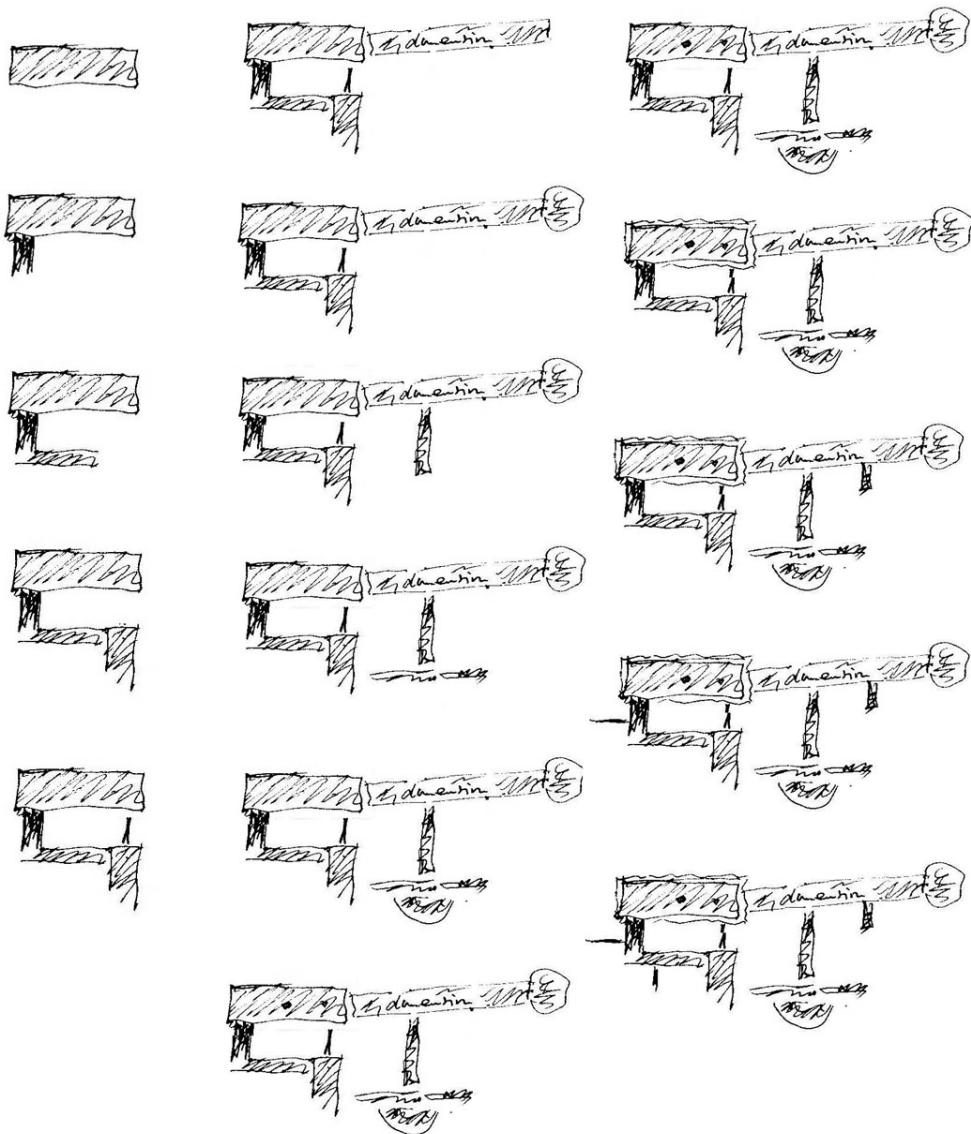
First I want to insist that good space can only be built gradually, by progressive constructions. In the following sequence of 16 steps, at each step a new positive space, well shaped in itself, and adding to the coherence of the system, is shown. What happens from this very simple sequence, is that each newly created area has good shape, in itself. The odd-shaped, random and pentagonal, shapeless, creations left over from typical contemporary building construction, are entirely missing from this sequence, **because it is the SPACES (not the buildings) which are being shaped, and because each increment of space is given GOOD SHAPE.**

In the following diagrams, the dark shaded areas represent open space; the white areas represent undifferentiated space and will ultimately become buildings or groups of buildings. At all events, the system of the city, the urban design of the city, depends on the construction of the positive space, and on the idea that this generative process for coherent , pedestrian, positive space takes precedence over all other generative activity.

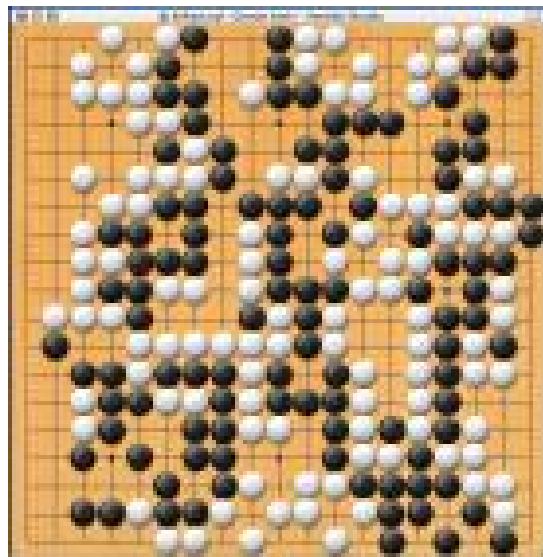
Let me illustrate the process of adding one coherent positive space, at a time, more abstractly, with the following sequence of diagrams shown on the next page.

This is an imaginary sequence, made only to show the idea that every act, generates a single positive space, and that the aggregate of positive spaces, individually well shaped, is made coherent by the sequence. At step 1, a rectangular space, potentially coherent and contained, perhaps 150 feet long and 45 feet wide. At these dimensions, this could be positive, and have some valuable meaning. It is positive in space, potentially bounded, and a place where life can, in principle, occur. At step 2, the most obvious need, now, is a transformation which introduces levels of scale. The bland rectangle, if not differentiated, will be difficult to animate. We therefore make a smaller space, opening from, or into, the larger one. The second space is again potentially coherent, and positive. If does have the effect of creating levels of scale. And now, what is important, is the placing of the second space with respect to the first. The smaller one enters the larger in a corner, leaving the main core space of the larger one intact, not divided. At step 3, the configuration is now far from closed. It has a lack of a center, and to make the centers stronger, further, intermediate sized entities need to be introduced. The third bit of space, a continuation of the second, has

two useful effects in this direction. The space itself is larger, by its length; and the white space (potential building mass) created between this new space and the first large rectangle of space, is also intermediate in size, thus creating a coherent system of parts which fit together. The process goes on in this fashion. By the 14th step something coherent begins to be achieved.



The Game Of "Go": A Mental Model For The Two-Sided Process Of Generating Positive Urban Space



What is missing from our present consciousness of space, is the awareness that space must be viewed as a solid substance. It is not the absence of buildings, the left-over. Rather it is a solid material, with its own shape, as powerful and as much in need of shape, order and substance, as any building. Thus in creating positive space in the city, we must simultaneously, create three living structures, each encircling the others, each asserting its powerful form and shape.:

The process of this kind is embodied in the game of GO, or go-ban, the ancient Japanese game, in which black and white stones are placed, in turn by two players, and each player is trying to encircle his opponent, and capture more space on the board. It is as if two living, growing snakes were intertwining, and each simultaneously trying to surround each other.

We need a model of urban space creation which works like this – except that it is more complicated. However, in essence it is like the incremental moves of GO. You cannot undo the moves. You can only place the stones, one at a time, so that they build a living structure. The intricacy that develops from this process will not be planned. It is generated step by step.

V THE DETAILED PROCESS OF CREATING THE HEART OF THE CITY, STEP BY STEP

Positive Space Is Fractal – So Space, to be Positive, Must Be Positive At A Great Variety Of Levels Of Scale, All Nested And Overlapping.

The title of this paper (*The Heart Of The City*) could give the false impression that a city needs just one principle positive space. Of course this is not the meaning of my phrase. The point is that *all* spaces, at all levels of scale, must be positive – the

smallest space outside a front door, the corner of the garden where the daffodils grow, the bend in the road, the meeting point of two paths, the path, the small park on the corner, the urban paved area where people gather for coffee or lunch, the greater spaces of the city, and the greatest space where a million people can gather or celebrate, the small spaces on every block, the sidewalk, where it is built.

It can only be created piecemeal

It must be generated from inside – that means that the pressure to shape the space, comes from real feelings, activities and necessities experienced in that place.

It must have involvement by people and piecemeal adaptation based on their wishes and adaptations



The xxx garden in Berkeley, by Karl Linn and Carl Anthony and friends



Further part of the work done by Karl Linn and Carl Anthony in Berkeley

Buildings must cooperate to form the space

Each building has as its primary responsibility the responsibility for creating positive space (inside it and around it in the city). Structure-preserving transformations as the guiding force in the formation of public good in a city.

In the Fall of 1996, Hajo Neis, Ingrid King, and I gave a most interesting class to a group of some twenty Berkeley graduate students.¹³ The premise was simple. We chose a vacant lot in Berkeley, on an important vacant lot at Telegraph and Haste a few blocks from campus at Telegraph Avenue and Haste.

The intent was to have each student make a project for the same site, and then to compare the results. In order to do the work of evaluation, the students first built a large-scale base model of the blocks immediately surrounding the site. We then asked each student to make his/her design in model form, at the same scale as the base model, and in a fashion that allowed each individual model physically to be set in place and removed.

The entire group, students and professors, then together evaluated the extent to which, on the evidence of our own eyes as we looked at the model, each of the alternative models inserted into it helped and made coherent and healed, the space in that part of the city.

Further, as a backbone to the work, the students had been given the following eleven rules of thumb to work to.¹⁴ The projects they made using these eleven rules of thumb were quite beautiful. The cooperative sense of doing what ever possible to heal that small part of the city affected most students profoundly. And, from the point of view of this essay one factor stood out. When the students were asked, on the last day of

class, which of the rules had played the greatest role in making their projects beautiful, they said it was the first rule (the project must help to heal the surroundings) and the third rule(POSITIVE SPACE). POSITIVE SPACE was geometrically the most powerful of the eleven rules, and for everyone in the class, had the most significant impact on the quality of the projects they designed (both inside and outside the project itself).

Above all, the pedestrian space, its formation, its generation, comes first, before the car not after it, and the car, the vehicular aspects of the space system come second, not first, after the pedestrian system, not before it.
This establishes the decision making order for every step.¹⁵

Positive Space And Pedestrian Space

Jan Gehl in Copenhagen,



Stroget in Copenhagen, first inspired and planned by Jan Gehl

Alan Jacobs
Vienna, Chichester, Cambridge. Cottbus
Kichijoji
Harvard Yard
Karl Linn

Positive Space Can Be Created Gradually, On Brown Field Sites, And In Existing Damaged Urban Structures

Kennedy Plan

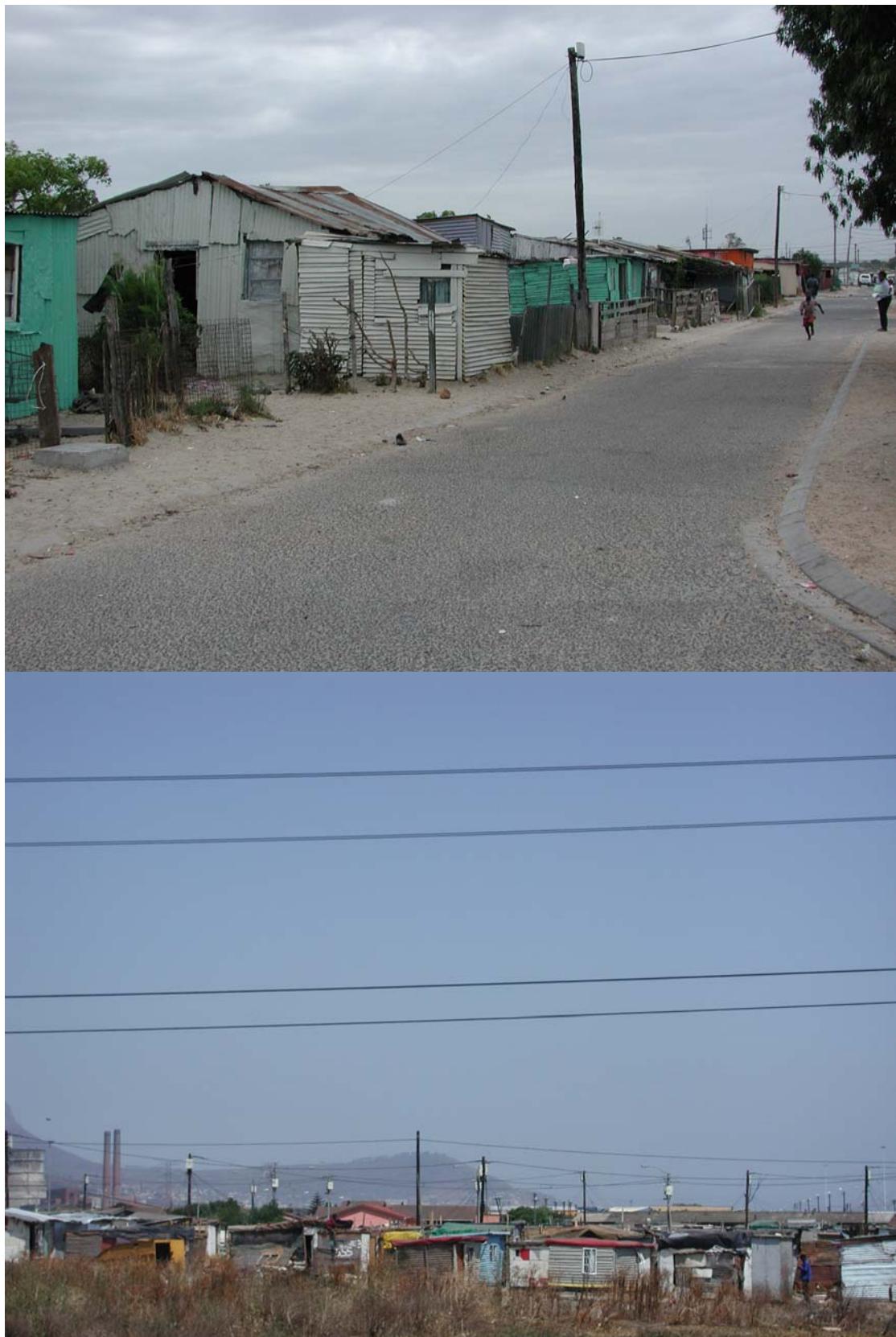
The key features of this plan.

- Almost every single part of the space is for the benefit of all.
- Private outdoor space
- Virtually no cars except for emergency access
- Cars are inexpensively garaged under the buildings
- Above all, the positiveness of the space.
- The key feature is the sense that every part is unique, because it has its own qualities, without any Mickey mouse effort in that direction.

Efforts Being Made All Over the World, Many Not Yet Recognized as Models

CNU is not usually one of them
Hundertwasser





Geoffrey Bawa
Jordan Housing

Soweto

The Master Plan for Harbor Peak

What may be, I believe, the first example of this kind of plan, is the Brookings Plan, for Harbor Peak, Oregon, a community of one square mile in hilly terrain, for about 1200 households. In this plan I specifically set in motion a process where decisions about forming coherent pedestrian space have operational priority over all other decision-making as the town unfolds.¹⁶ Yellow shows pedestrian areas, green shows natural areas, red shows vehicular paths, blue shows parking.



A new neighborhood of 15 houses generated by the pedestrian, positive-space oriented priorities of the Brookings Plan

Now Put in the People

Same steps, but now we see how at each point, people themselves are contributing to it, and inhabiting it, living it.

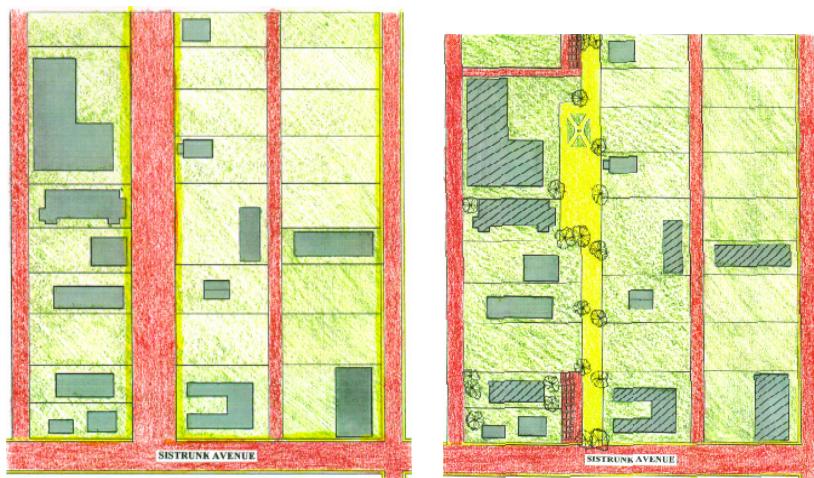
How Do We Achieve Such a Thing, Practically?

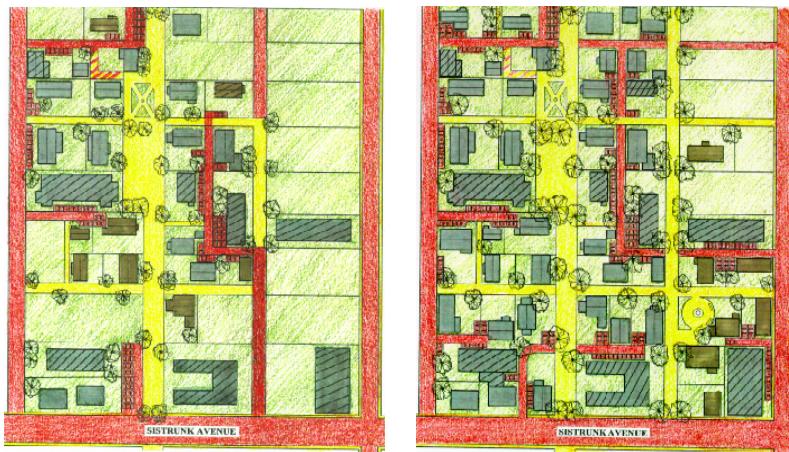
How Can This Be Made To Work?

What practical steps are necessary to making this approach to the creation of public space, actually happen?

Gradual Piece-By-Piece Generation Of A Positive Space Structure In Fort Lauderdale

In the modern city we need a four-fold process of this kind, with four colors instead of two: pedestrian space (yellow), garden space and nature (green); buildings (gray); and car space, roads and parking (red). The dynamic interplay of these four colors, and their relative quantities, as they may be conducted through time, is visible in the drawing below, which shows a block of the Progesso District in Fort Lauderdale, generated by such a process. Discussion of this kind of process with detailed examples, is given in *The Nature of Order*.¹⁷



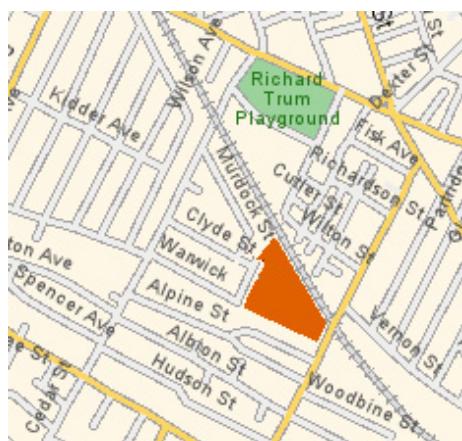


Part of the Progresso neighborhood in Fort Lauderdale

A small part of the Progresso neighborhood in Fort Lauderdale is shown here growing and transforming, under the impetus of transformation rules which play the role of “GO,” in making positive space, gardens, buildings, and cars, intertwine in a necessary order.

The Somerville Housing Neighborhood for Stephen Smith

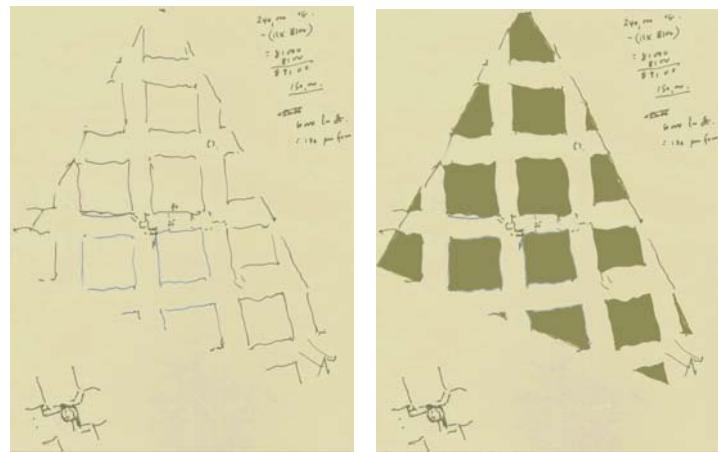
Let us now look at an example of the process by which positive space may be forged in the context of a conventional urban plan. Here, working for the Kennedy family, we had the task of placing some 200 dwellings on 5 acres, while making a place that would enhance the nearby neighborhood, not damage its friendly residential character.



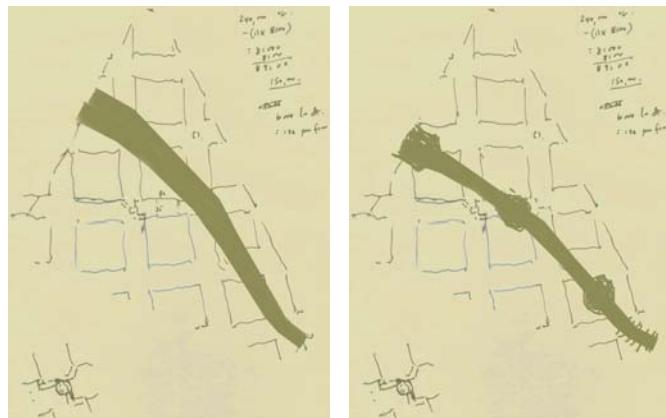
The site location in Somerville



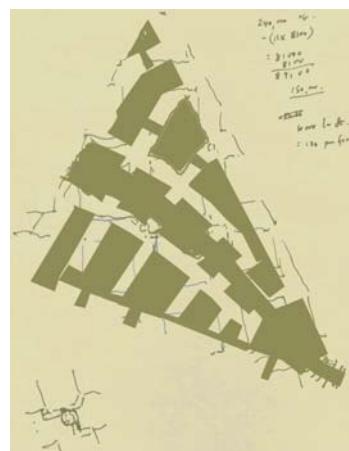
Aerial photo of the site itself



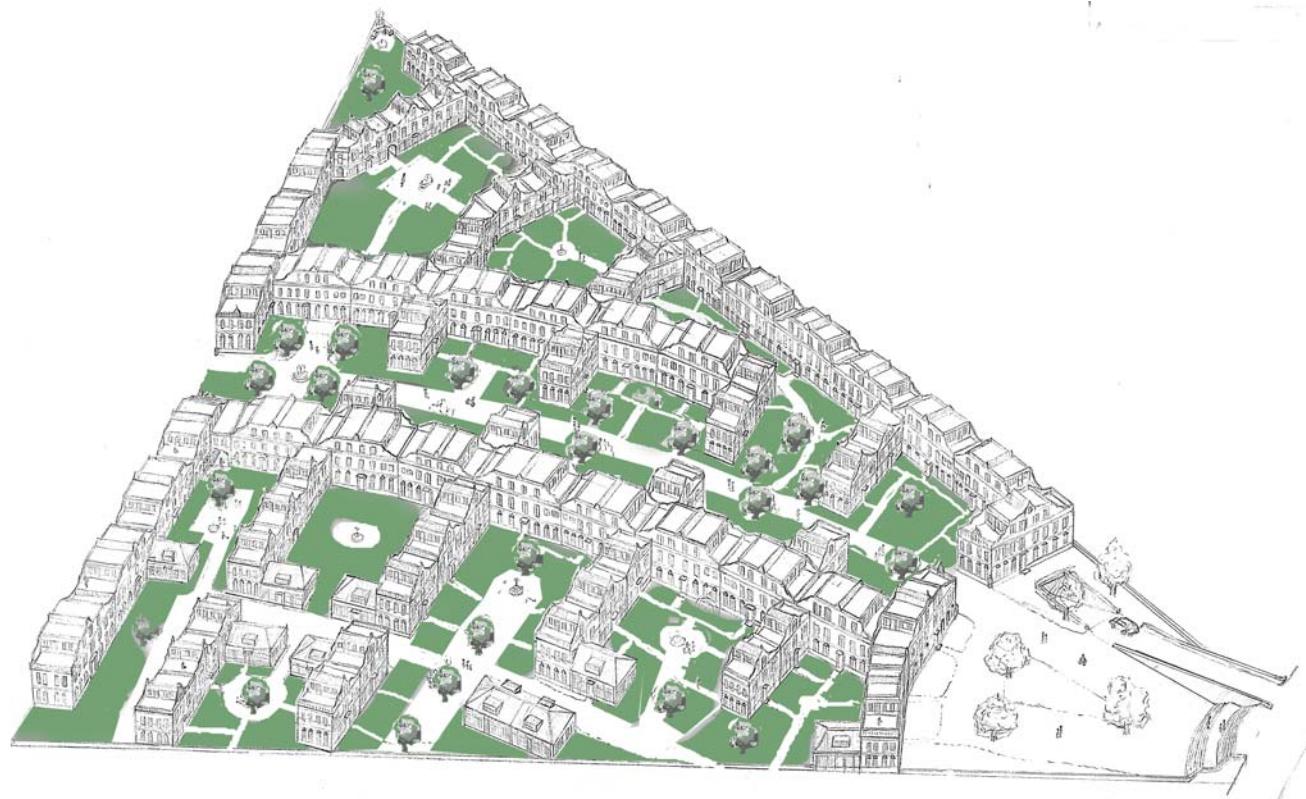
*Exploratory sketches of possible positive space to fill the site, creating well-shaped buildings.
Gardens are shown solid brown to emphasize and sense their positive character.*



Rough position of the pedestrian main promenade, leading from Clyde street in the old neighborhood (to the northwest), to the lower right hand corner where there is a grand stair to lead up the Lowell Street.



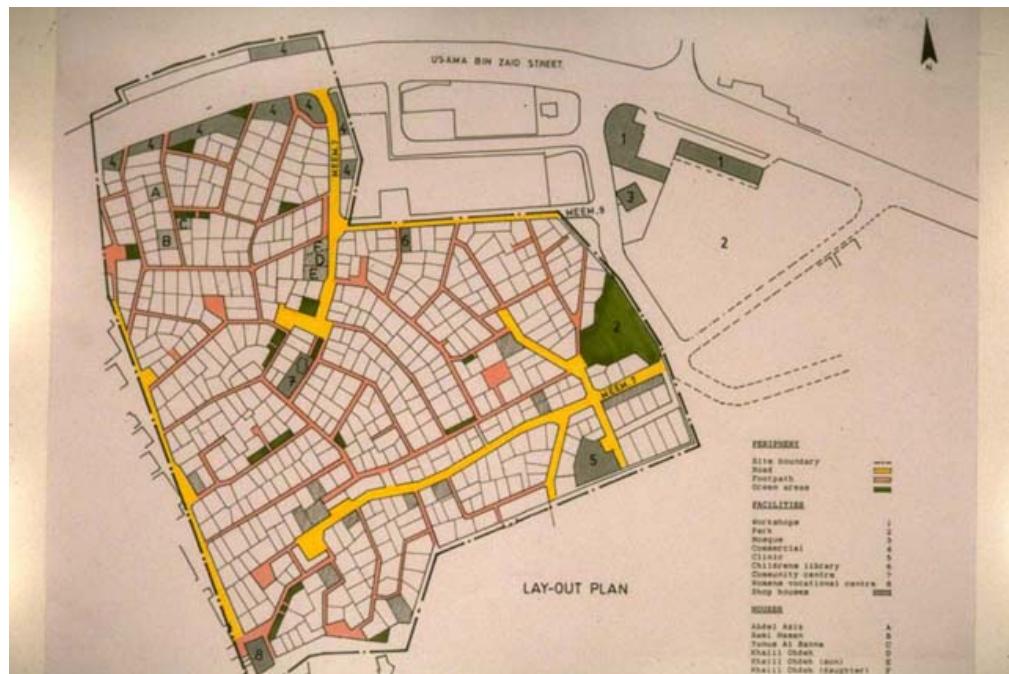
A transformation of the original courtyard plan, now adapted to the curved main drag, now making all the spaces, pedestrian promenade and individual gardens, into positive space, and shown the buildings as the residue of the positive urban space.



A birds eye view of the 200+ apartments, with extensive gardens and squares for the use of the residents and the neighbors living on nearby blocks.

The resulting project is unusual in that it is almost all positive space: made possible by the fact that parking can be accommodated in a single parking garage under two main rows of houses.

East Wadhat, Jordan





Dramatically Changing The Role Of The Developer

The failure to build positive space in modern cities, comes about as a direct result of the emergence of the modern developer, and the developer's activities.

A developer's primary interest is in making money from land. The popular idea of this activity, is that he creates viable communities with streets, services, houses ... lays it out, and creates the opportunity for people to build and or buy within the framework he creates – and in exchange for this very positive service, he makes a profit on the land, and so earns a living. Simple. And not unreasonable – **in theory!**

However, the nature of this activity, as currently configured in the majority of cases, has aspects which work against – directly against – our capacity to have cities in which positive space can be created.

Of course the first and foremost reason is that the very notion of development, focuses on the private land of the developer. On the other hand, the positive space that binds a city, coherently, is by nature shared and joint. A self-interested developer, will have difficulty paying attention to the city as a shared agglomeration of space which exists as a whole, because he is focused on his contribution, on his ability to satisfy the city

so that they will let him get on with his job (a perfunctory role, once again, by definition).

Positive space is something which overlaps the rigid separation of private lots and “properties” – and is therefore, from the outset, somewhat at odds with the developer’s underlying mindset.

VI MONEY FOR POSITIVE SPACE: CITY BUDGETS, AND RE-ALLOCATION OF LINE ITEMS IN THE CITY BUDGET

Comparative Costs Of Different Community Services¹⁸

The Pedestrian Positive-Space Structure, Has Not Yet Been Recognized As A Major Budget Line-Item Among Other Urban Services in the City Budget

What are the costs of the main recognized public goods that are typically present in a modern town? (These costs are based on analysis of Duncanville, Texas, a small city of 36,000 people near Dallas.)

The street system	replacement cost	\$ 269 million
The sewer system	replacement cost	\$ 645 million
The high school	replacement cost	\$ 25 million
Five major retail stores	replacement cost	\$ 50 million
The land	market value	\$ 461 million
Houses and apartments (13,000)	replacement cost	\$ 1807 million
Commercial buildings	replacement cost	\$ 804 million
City hall and library	replacement cost	\$ 30 million
Traffic lights	replacement cost	\$ 11 million
Street lighting	replacement cost	\$ 34 million
Freeways (5 miles)	replacement cost	\$ 325 million
Heart (Core pedestrian vehicle tapestry)	not presently funded	\$ 60 million

With one exception, the first eleven items of cost are more or less comprehensive, and are typical (in ratio of expenditures) of cities throughout the world. But there is one vital item missing: the twelfth. The heart of the city, its positive urban, pedestrian space, which is arguably the most important thing for the cultural life of the city after houses, commercial buildings, and roads, since it provides the binding force for society, is not included on this typical list. It does not appear on the list, because to a large extent it is so far missing from people's awareness that there is no budget for it, no consciousness that the community will die without it, the pedestrian structure of positive space.

At a very rough guess, based on preliminary estimates, a pedestrian vehicle tapestry, covering about 3 miles of length and forming a coherent center for this population, would have a construction cost of perhaps \$60 million. This could be spent gradually, over time, building the positive space piecemeal. But the money has to be spent, and the space has to be created.

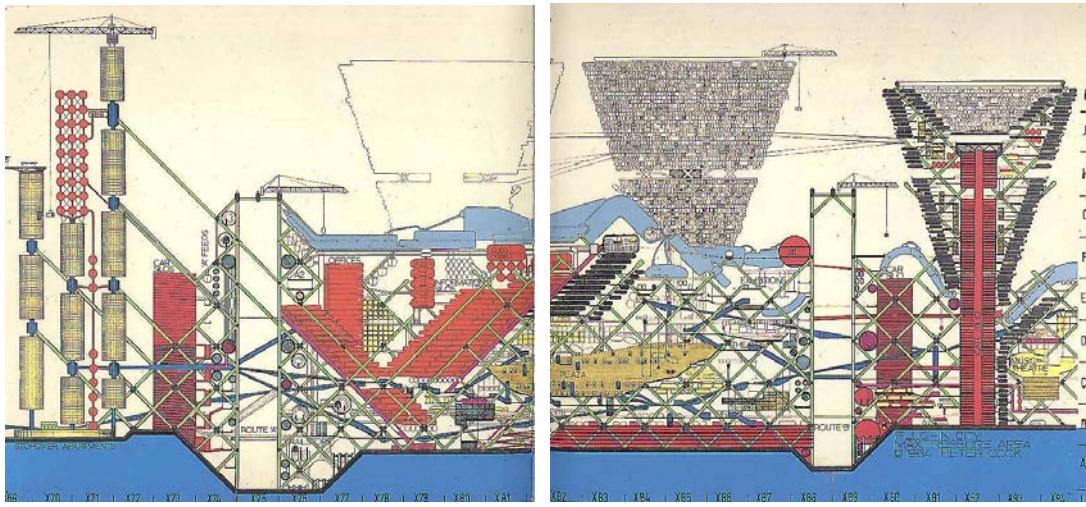
This gives you a different perspective, doesn't it? Here are the eleven commonplace and necessary elements of a city. In Duncanville, the present value of these eleven items is \$4,461 million, with an average of \$405 million **per item**. By comparison, paying \$60 million for the heart of the city, the twelfth item, would seem modest, attainable, even extremely low, and would be one of the **lesser** costs.

This is remarkable, given that, from a functional point of view and from the point of view of the city's well being, it is , after the houses, and workplaces and roads, the **most** important element.

But to make a program of positive space work, feasible, and to go on year after year, building that structure piecemeal, this item would have to be budgeted every year as a major line item. **Until that happens, genuine rebirth of the city is really not possible.**

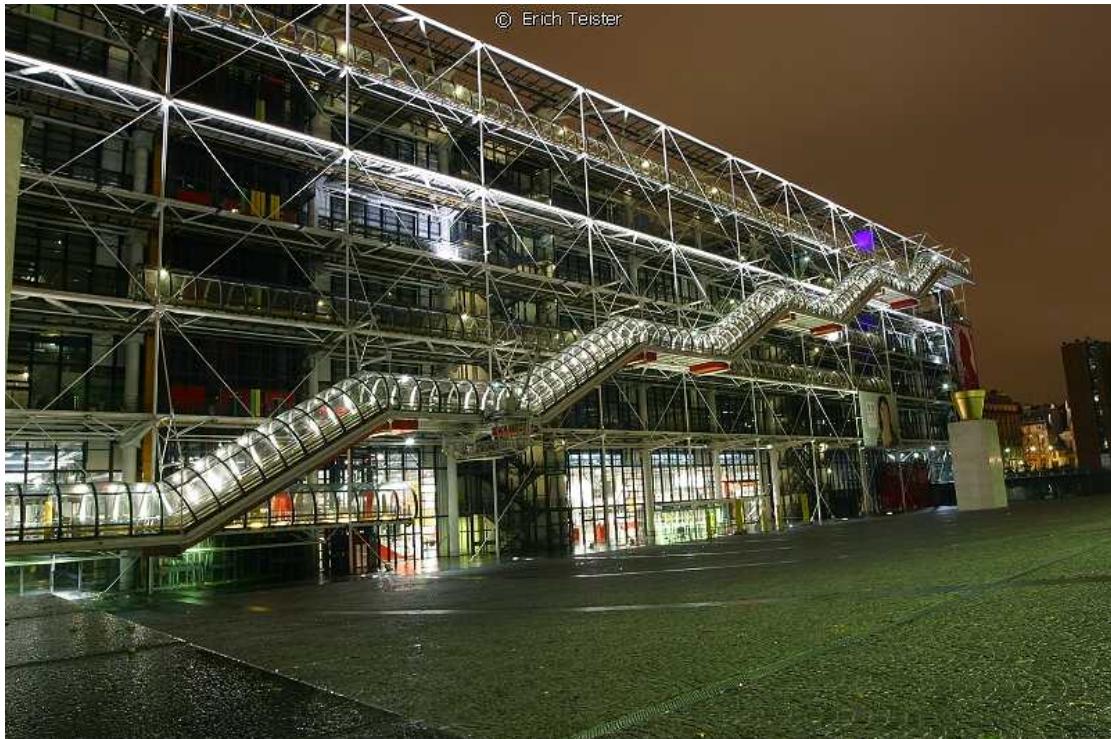
VII REVIEW OF YESTERDAY'S ARCHITECTURE

If the argument I have put forward is correct, we can now see what a devastating wrong turn was taken world-wide about the time of the 1950s, and then embodied in the Harvard colloquium of 1956 (and in many other places at about the same time). What was set in place at that time, was a nearly congenital world-wide blindness to the actual space which forms the fabric of a living city. Architects, obsessed by the image qualities of their own buildings, saw space only as the left-over from the buildings: it was most often formless, and rarely useful. Yet the architectural rhetoric meanwhile trumpeted the importance of a "new vision of space", as for example in Giedeon's *Space Time and Architecture*, and in many other articles, books, and urban projects, self styled by their authors as *avantgarde*.¹⁹

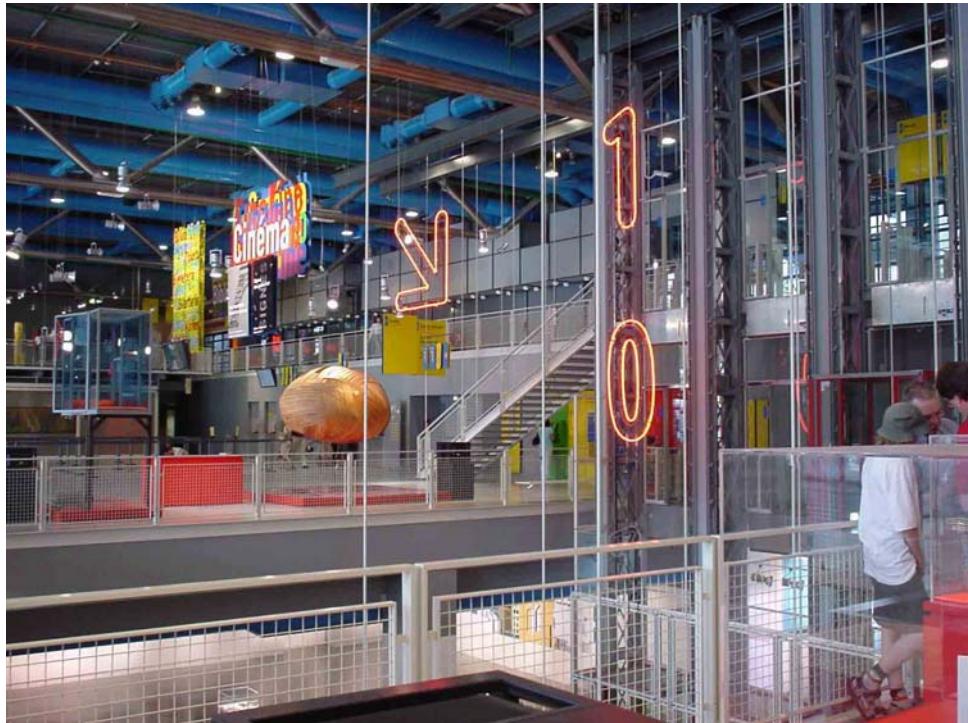


Plug in City, by Archigram, 1964

This drawing of the Archigram group, inspiring as a drawing because of its relation with Captain Marvel comics, and because it is seductive and beautiful to look at, turns into **this (Pompidou)**, and **this (Libeskind)**, when actually implemented:



*Pompidou: In the distance it looks like fun, but the space does little for you, if you want to BE there.
Look what it has done to the city of Paris just around it!!!*



Inside of the Pompidou Center, again a similarity to the Archigram drawing. However, it is manifest in the actual place, seen here, that very little structure in the space has been created so that it might sustain human beings in their feeling.



Berlin Museum

Unfortunately, all this interest in “space” was a sham. It was an interest in space in word only, not in the actual substance of the space, nor in its actual form. It was based on cartoons in Superman comics, as in Archigram’s work, not in the realities of actual

space as we experience it and live in it. It was not paying attention to what it means to be a person: only what it means to be a character in a superman comic. And this heritage has stayed with us.

This interest in “space-time” was a silly kind of metaphor taken from physics, but having nothing whatsoever to do with space-time as the term is used in physics, and nothing, either, to do with any serious concern with architectural space. It is merely inflated, self absorbed, and destructive.²⁰ A short essay by Ivan Chtchegloff from the very same period (1958) goes in a similar direction.²¹ Yet these devoted but ill-informed essays and metaphors formed the basis of the last fifty years of urban design, which led to the destruction of cities.

If – instead of doing that – we now begin to focus on the truly difficult problem, of understanding, and generating positive space in cities and other human settlements, and also face the considerable, and challenging 21st century questions of implementing real political and technical processes which can actually accomplish the piecemeal creation of positive space in our cities, every day, we shall then have a chance of accomplishing what the 20th century never did accomplish – **the definition, and imagining, of beautiful new, useful and inspiring space – AND HENCE our newfound ability to imagine our cities themselves -- OUR CITIES THEMSELVES -- based on our own needs and our own humanness.**

If we succeed in that, at that point it may then be said, *perhaps*, that we have learned how to give our cities their hearts.

It cannot be done without the appropriation of the needed funds, at a rough guess say each year 10% of the annual public works budget.

And until certain changes are made in the way that development, developers, planning office are run, the negative results are bound to continue. Awareness is not enough, The conditions must be created which will encourage the creation of public, owner, and cared-for space, which is understood as the haven of the people.

It is not sufficient for this space to be a sop to conscience, extracted from the hungry developer, and viewed as a mechanical public space quota, which allows developers to get away with murder so long as they pay this quotient in the current stylistic lingo of the architectural profession. It needs good will, good intention, not only on the part of the mayors and city managers, but the permission and trust needs to be created so that people of a city are entrusted with decisions about public space, and the cities are trusting enough to build what is deeply held in affection, not merely as an emblem, but as an eternal and deeply felt tribute to our existence.

The most dramatic failure of the era which started about 1950 and ended about 2000, was the absence of true art; the absence of real structures which had integrity as art, which appeals to the ordinary, the everyman, and which consolidates our ability to be human and live as human beings, in the city of today and of tomorrow.

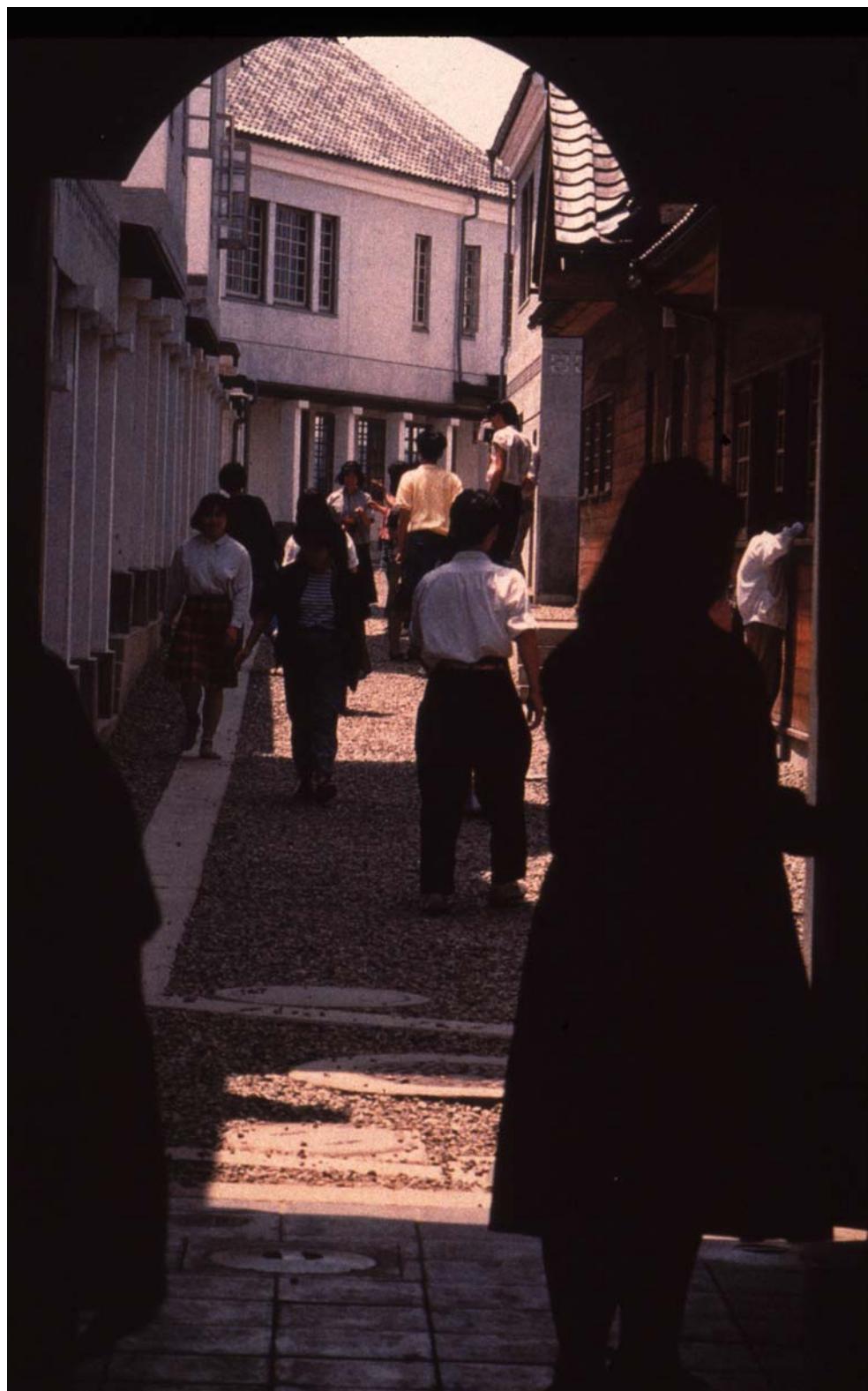
Jose Luis Sert, Rem Koolhaas, Le Corbusier -- one was worse than the next. None created a feeling of liberty; of freedom; spontaneity; an urban place which is a place we would genuinely like to be.



*Guggenheim Museum, Bilbao, Frank Gehry
This is too close to death: Let's not build this kind of space again*



*Garden of the Parliament Building, Colombo, Sri Lanka, Geoffrey Bawa
This is closer to life: Rather, instead, let's build this kind of space*



*This too, this kind of space where people like to walk
Christopher Alexander and colleagues, Another interior street from the new Eishin campus, Tokyo*

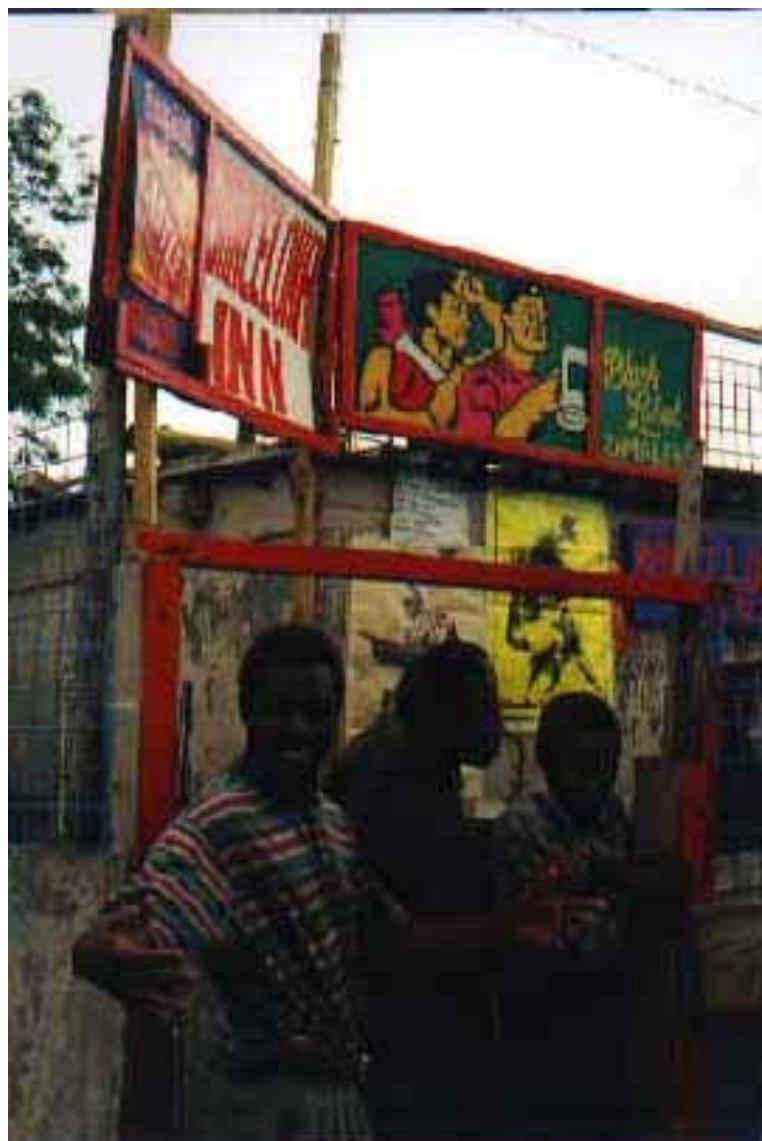
VIII EPIGRAPH: SIX BILLION PEOPLE

The analysis of the last fifty pages has referred from time to time to the situation in various countries throughout the world. The tradition of the Harvard conference, and the tradition of much professional architecture, world wide, has been to focus on the one billion people (roughly) who have money, and to ignore the (roughly) five billion who do not.

ATTENTION TO URBAN STRUCTURE IN LOW INCOME AREAS AND CARE FOR THE 5 BILLION PEOPLE WHO HAVE LESS MONEY THAN THE 1 BILLION

The Fundamental World Wide Problems

- Millions of people, 4 billion urbanized
- Many cultures and differences
- An average of x dollars per person world-wide
- Small scale construction suitable of being a real habitat
- Removal of the self interested corporate power from our lives
- Reconstruction of the role of planning and architecture
- Lack of any believable vision of what would be good
- Difference between theory and self interest



Soweto



Community in one of the slums of Calcutta (Kolkata)



The Prince of Wales, during a visit to a Mumbai slum.

On his return to England he remarked that the community organisation, streets and public places were more vibrant than in many major city centers.



Sevabharathi, in Hyderabad



Sevabharathi, in Hyderabad



Sevabharathi, in Hyderabad

Two day Training program (3rd, 4th May'03) for the Community volunteers working / interested in working with the slum children and slum development has been Organised at the KESHAVA MEMORIAL HIGH SCHOOL, Narayanaguda, Hyderabad. Participants represented from 72 slums in the twin cities have been trained in skill development, Personality development, Abinaya geyas, Shlokas, Story telling, Health and hygiene, and Cultural activities with a social cause. The female volunteers outnumbered the Male (92 female-35male) and were leading the training program by all means.

Sevabharathi has its presence in the 120 slums of the twin cities and runs various activities from Samskara kendras, Ekal Vidyalayas to the destitute homes, thrift societies and Vocational training camps. The volunteers were anxious enough and curious to learn and go back to implement the same in their own places.

O

¹ Christopher Alexander, *The Nature of Order*, CES Publications, Berkeley, Four volumes, 2001-2005, distributed by Consortium in the US and by Taylor and Francis in the UK and rest of the world. In subsequent notes this book will be abbreviated to *TNNO*.

² This topic is discussed at length in *A Pattern Language*, pattern # 106, pages 517-23 , and in Book 1 of *TNNO*, *The Phenomenon of Life*, pages 173-78.

³ A virtual center is a field of spatial influence going outwards as if from a point, and is usually induced by some distinctive structure at the central point. *TNNO*, Book 1, *The Phenomenon of Life*, pages 151-57 and 251-53.

⁴ A boundary as defined in *TNNO* is a thick element which surrounds another center, giving it more strength; and this boundary is itself made of other centers, alternating and repeating along the perimeter. *TNNO*, Book 1, *The Phenomenon of Life*, pages 158-64 and 254-56.

⁵ See note 3.

⁶ Good shape is somewhat enigmatic. It refers to simplicity of shape, but this “simplicity” hides a system of powerfully strong centers that actually *form* the shape. See *TNNO*, Book 1, *The Phenomenon of Life*, pages 179-85 and 264-65.

⁷ For discussion of local symmetries see *TNNO*, Book 1, *The Phenomenon of Life*, pages 186-94 and 266-69 and Book 2, *The Process of Creating Life*, page 70.

⁸ See illustrations and text on page 32.

⁹ Jane Jacobs, *Death And Life Of Great American Cities*,

¹⁰ Alexander et al, *A Pattern Language*, Oxford University Press, 1977, Pattern # 52, pp 270-275.

¹¹ Allan Jacobs, Elizabeth Montgomery, Yodan Rofe, *The Boulevard Book*, MIT Press, 2003.

¹² Allan Jacobs, *Great Streets*,

¹³ Structure preserving transformations or SP-transformations are defined in *TNNO*, Book 2, *The Process of Creating Life*, chapters 1-7, especially chapter 2.

¹⁴ These eleven rules are listed and discussed in *TNNO*. See Book 2, *The Process of Creating Life*, page 460, footnote 17.

¹⁵ This idea of pedestrian space being given priority in the generative sequences of urban planning and conception, is dealt with very concretely and explicitly on page xxx. See also endnote XX.

¹⁶ Christopher Alexander and Randall Schmidt, *The Brookings Plan – A Master Process For Creation And Unfolding Of Public Space, Neighborhoods And Subdivisions In A New Community In Oregon*, CES Publishing, 2005.

¹⁷ *TNNO*, Book 3, *A Vision of a Living World*, chapter 9, description of a medium density neighborhood in Fort Lauderdale, growing in this fashion.

¹⁸ These figures are based on a study undertaken for the city of Duncanville, in 2003, by the Center for Environmental Structure, Berkeley. Unpublished report.

¹⁹ Siegfried Gideon, *Space, Time, and Architecture*,

²⁰ Moholy-Nagy, "The New Bauhaus and Space Relationships" in Richard Kostelanetz's *Moholy-Nagy: An Anthology*.

²¹ Ivan Chtchegloff (Gilles Ivain), "Formulary for a new urbanism" in *International Situationniste*, 1, June, 1958, pp.15-20.