

**Configuring Urban Flows:  
Space syntax, the market/plaza and the foundation of a  
sustainable city in Portland, OR.**

By

Andrew Sheie

A practicum submitted to the Faculty of Graduate Studies in partial fulfillment of the  
requirements of the Degree of

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture

University of Manitoba

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CONFIGURING URBAN FLOWS:  
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CITY IN PORTLAND, OR.

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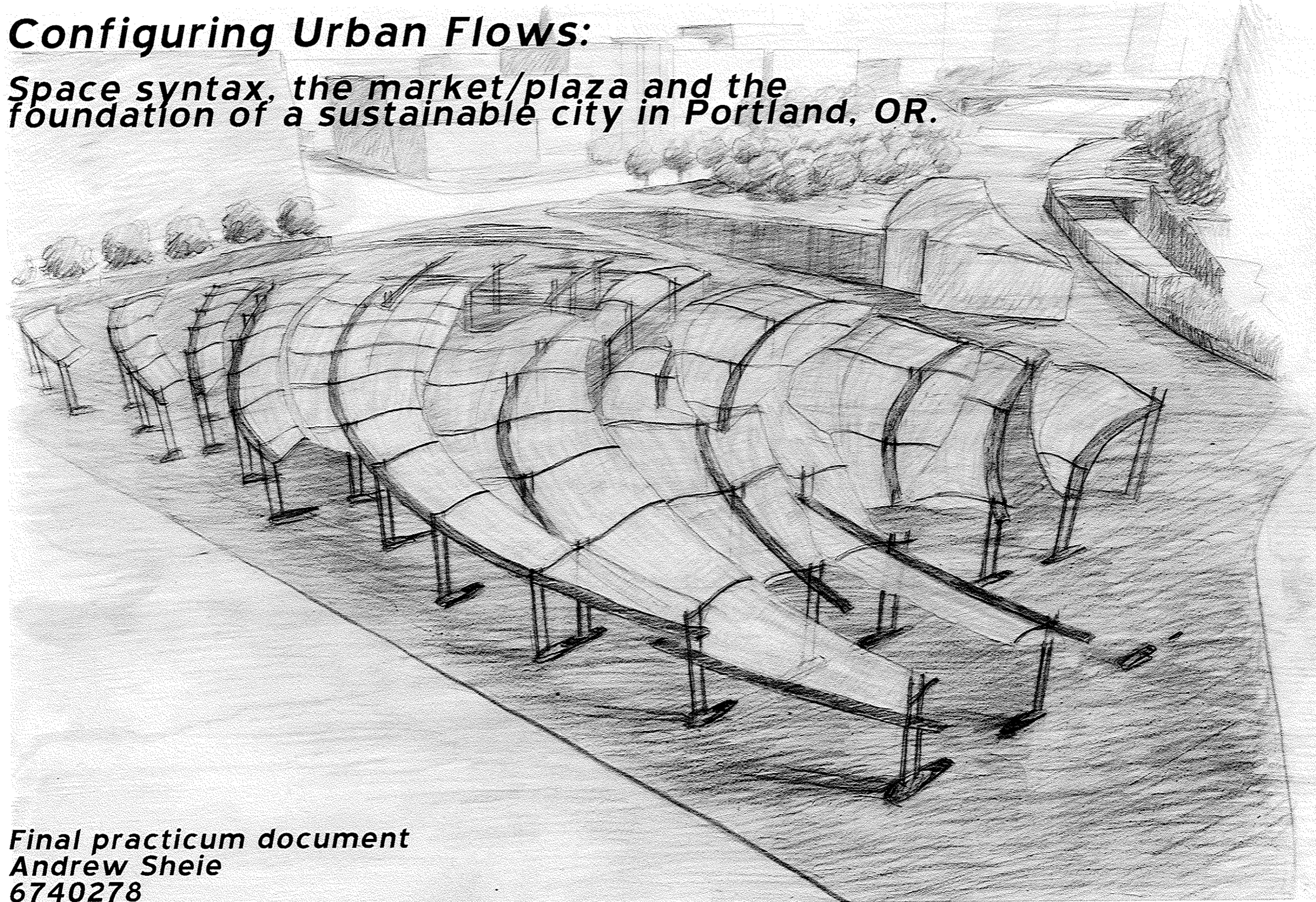
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## **Configuring Urban Flows:**

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This project is dedicated in the memory of Professor Carl Nelson. Thank you, Carl.

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*To make a sustainable city, one must begin somehow and I think the beginning must be small and economic. A beginning could be made, for example, by increasing the amount of food bought from farmers in the local countryside by consumers in the city. As the food economy became more local, local farming would become more diverse; the farms would become smaller, more complex in structure, more productive; and some city people would be needed to work on the farms. Sooner or later, as a means of reducing expenses both ways, organic wastes from the city would go out to fertilize the farms of the supporting region; thus, city people would have to assume an agricultural responsibility and would be properly motivated to do so both by the wish to have a dependable supply of excellent food and by the fear of contaminating that supply. The increase of economic activity between a city and its sources would change minds (assuming, of course, that the minds in question would stay put long enough to be changed). It would improve minds. The locality, by becoming partly sustainable, would produce the thought it would need to become more sustainable.<sup>1</sup>*

*-Wendell Berry*

*We need to envisage a new cultural project that encompasses democracy, sociability, adaptations of time and space and the body, life beyond the commodity, and the slow transformation of everyday life. Human activity must therefore be directed at new forms of content, seeking not just to symbolize but also to transform life as a kind of generalized artistic practice. 'Let everyday life become a work of art!'<sup>2</sup>*

*- the Strangely Familiar editing team*

## **Introduction/ abstract**

The configuration of space in the city is a fundamental aspect of the social, cultural, economic, and political functioning of our societies. Far from being an inert element in which events take place and daily exchanges occur, space has a subtle but powerful effect on the structure of society itself. Indeed, to a great extent space is the means by which a society propagates, reproduces, and evolves itself over time. Edward Soja calls this a "socio-spatial dialectic":<sup>3</sup> as space creates society, so society creates space. The space created by urban societies, however, does not stop at the edge of urbanization (if such an edge can be identified); it encompasses and impacts vast areas of land outside cities. Agriculture in particular is of critical importance, for cities cannot exist without a stable and reliable food supply. And yet food is usually treated in urban design and spatial theory as a constant, an element of urbanization which we take for granted. If urban societies are to maintain themselves in the long term, the relationship between urban and rural must be addressed. More specifically, the relationship between urban space and urban society must be examined in relation to agriculture and the food supply.

This project addresses these issues in two ways: through an examination of agricultural criticism, postmodern spatial and urban theory, and space syntax theory in particular; and in the application of this theory to, and design of, a farmers' market and public plaza in the air development rights above interstate highway 405 in Portland, Oregon.

## the Site

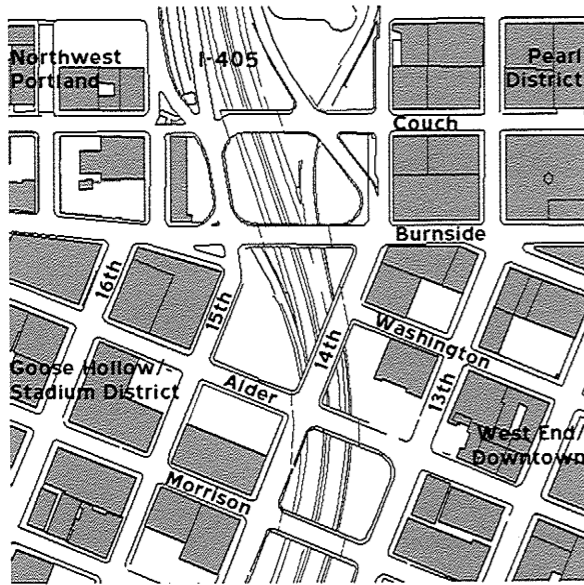


Figure 1. Site context map



Figure 2. View of site, looking northeast across I-405 from Alder towards Burnside; 14th St. bridge on left.



Figure 3. View of site, looking west along Burnside at the intersection of Burnside and 14th; site on right.

This project is focused on a site over Interstate Highway 405, between West Burnside and SW Alder Streets at the western edge of downtown Portland. I-405 enters downtown Portland from the north, spanning the Willamette River on the Fremont Bridge, and drops into a sunken expressway which forms the effective western and southern limits to downtown Portland. I-405 was constructed in the mid-1960s, sundering the neighborhoods of Northwest Portland and Goose Hollow from downtown Portland. At present, the intersection of I-405 and West Burnside marks the boundaries of four relatively distinct neighborhoods: to the southeast, the west end of downtown Portland; to the northeast, the Pearl District; to the Northwest, Northwest Portland; and to the southwest, Goose Hollow and the Stadium District (Figure 1). While there are elements and characteristics common to all four neighborhoods, each has its own distinct qualities. The placement of a plaza/market space at the nexus of these neighborhoods enables the development of a design program which can weave together some of the threads common to each.

The idea of capping the interstate – constructing a lid over the highway to allow for development of buildings and open space – has been around since the construction of the freeway, but was not officially adopted by the city until the 1988 Central City Plan.<sup>4</sup> In 1998, the City of Portland, in cooperation with the American Society of Landscape Architects and the Landscape Architecture Foundation, completed a vision study to explore the possibilities for capping the freeway. This was followed in 1999 by a more detailed report summarizing the engineering and financial requirements.

The vision study document was published in late 1998, marking the culmination of six months of extensive public outreach and research into precedents. Drawing on this information, the project team recommended capping about two-thirds of the blocks in the I-405 corridor, with development focused in five key locations.<sup>5</sup> Two locations in particular were given the highest priority for development: the blocks adjacent to the MAX light-rail lines and the blocks adjacent to West Burnside. Development of the MAX blocks was seen as a means of tying together a number of projects and plans on which the city was working: a redevelopment plan for the West End, continued development related to the west-side light rail line (which opened in September, 1998), and forging stronger connections to the cultural district and central library. This priority was reinforced with the 1999 release of the Strategy Team Final Report, which recommended development in the MAX blocks in large part because of the low cost of development relative to other sites in the I-405 corridor.<sup>6</sup> The “Bright Lights District”, centered on West Burnside, was envisioned as an extension of the burgeoning theater and club scene in the so-called “Burnside Triangle,” and was recommended as the second priority for development.

This project expands on the idea of developing a public plaza and a farmer’s market between Burnside and Alder. The concept for a public plaza at Burnside as a “landmark element”<sup>7</sup> was a key component of the 1998 Vision Study. The idea to include a farmer’s market in addition to the public plaza was introduced as part of the I-405 Strategy Team Final Report of 2000; this coincided with an effort by the City of Portland to locate a permanent farmer’s market in either downtown Portland or the near East Side of Portland.<sup>8</sup> Because this space is uniquely located to take advantage of the residential populations of four different neighborhoods, there is great potential in the development of a farmer’s market in this location. The excellent location is further enhanced by its unique syntactic profile (discussed later in the document); this endows the space with a natural pattern of pedestrian movement unmatched by any other available open space in downtown Portland or near East Side. In addition, the integration of the farmer’s market program with the entertainment and late-night populations of the “Bright Lights District” allow the establishment of a well-disposed program in the same vein as the field operations described by Corner: “a good disposition demonstrates a precision of structure and enablement and yet extends little restraint on how events then unfold.”<sup>9</sup>

Portland, of course, has a precedence for the removal of a highway. Harbor Drive, a busy six-lane road which ran along the Willamette River, was removed in the 1970s in favor of what became Tom McCall Waterfront Park. While the capping of an interstate highway runs along the same lines as the establishment of the Waterfront Park, it is more significant in many ways than simply replacing a freeway with open space. The city government views the capping of I-405 not only as a means to reconnect long-separated neighborhoods but as a opportunity to address the complex set of planning and development guidelines set out by both the State of Oregon and the City itself. Portland Mayor Vera Katz, in the introduction to the Vision Study, wrote: "Capping the urban freeway will provide Portland with the opportunity to preserve neighborhood livability and protect the urban growth boundary by focusing growth in the existing downtown area."<sup>10</sup> Inherent in this statement, however, are decades of planning policy, public involvement and political battles won and lost. The site is imbedded in a much larger political and economic pattern within the city of Portland, to say nothing of the larger global networks of which Portland is a part. At the outset, therefore, we need to understand the site as a part of the city of Portland. Hillier argues:

*The current preoccupation with 'place' seems no more than the most recent version of the urban designer's preference for the local and apparently tractable at the expense of the global and intractable in cities. However, both practical experience and research suggest that the preoccupation with local place gets priorities in the wrong order. Places are not local things. They are moments in large-scale things, the large-scale things we call cities. Places do not make cities. It is cities that make places. The distinction is vital. We cannot make places without understanding cities.<sup>11</sup>*

We cannot look at Portland as an autonomous city, however, for it exists (as all cities do) within a larger global system. Thus we must also understand Portland as a contemporary, globalized city. Portland is unique in many ways – particularly in North American terms – but it also holds characteristics in common with most other cities. But the very question of what a city *is* – how it evolves, what gives it form – has undergone significant changes over the last 40 years. Edmund Bacon contended in 1967 that "human will can be exercised on our cities... so that the form they take will be a true expression of the highest aspirations of our civilization."<sup>12</sup> While urban designers, planners, and politicians may still aspire to create great cities, at the turn of the millennium there seems to be a tacit understanding amongst the majority of urban theorists that the processes which create the city cannot be controlled in their entirety by human will. The *Strangely Familiar* editing team issues the following warning at the outset of *The Unknown City*:

*First... the city is not confined to the spatial scale of the building, or indeed even that of the city itself, but encompasses the whole, multiscale landscape produced by human activity: from the corporeal to the global, the worldly to the intimate. Second, the city cannot be reduced to either form or representation: it is neither a collection of object-buildings nor the equivalent of models, schemas, drawings, and projections of all kinds. Third, the city is not the product of planners and architects. While urban professionals such as planners and architects might believe themselves to be in turn democratic negotiators, community advocates, neutral social scientists, exponents of the beautiful, and masterful shapers of space, they act only as part of much broader, much deeper systems of power, economics, and signification.<sup>13</sup>*

Indeed, Lars Lerup argues (after Tafuri) that the city has a "will to formlessness" – development which is driven almost entirely by market forces – and that this has "almost obliterated architecture here as it had been understood historically: 'a stable structure,

which gives form to permanent values and consolidates urban morphology.’ Our ‘permanent values’ have lost their permanence and their manifestation in the city fabric.”<sup>14</sup> Lerup also dismisses traditional urban design as a European import which is incompatible with North American cities:

*It is ironic, at the end of a century characterized by the most dizzying urban transformations in human history, that academic readings (apart from writers like Banham and Koolhaas) and projects of the city (particularly in postwar cities like Houston) remain haunted by the irrelevant ghost of the historically outdated European city center. A distinctly European view of our cities makes them look embattled, ridiculed, and flat – too often conceived of as mere Monopoly games. The hegemony of the pedestrian, the plaza, the street, and the perimeter block must be challenged not because the values they embody are no longer valid, but because they are suffused with a set of fundamental misconceptions about the nature of contemporary civilization and its outside, leading to a false understanding of the whole.*<sup>15</sup>

Like many writers, Lerup’s point of view has emerged from the inadequacy of approaching some of the defining characteristics of the late 20<sup>th</sup> century city – sprawl, the strip, post-industrial wastelands – with traditional ideas and attitudes regarding form and space.<sup>16</sup> Spaces such as these, which may be seen simultaneously as the detritus and heart of the late 20<sup>th</sup> century city, are not easily explained through traditional urban design. These spaces fall outside traditional expectations of beauty, form and, more often than not, function. It is in part cause and symptom of the perceived decline of the city that these spaces exist at all; the modern city is described by Wamble as “the significant disintegration of physical space relationships, a city that is no longer driven by modern industry and the resultant centripetal distribution of capital.” It is a city decimated by information technologies and the global movement of labor, capital, and currencies.<sup>17</sup>

Theorists such as Lerup argue that it is precisely because the traditional city has been ravaged by our contemporary, globalized society, that a reconceptualization of the city is necessary. “The metropolis has replaced the city,” writes Lerup, “and as a consequence architecture as a static enterprise has been displaced by architecture as a form of software (a suggestion posited at the outset as a mild provocation).”<sup>18</sup> In this, he argues, the historic built structure which constituted the collective values of the city has been replaced by transience, mobility, void, and flows of capital, information, and people.<sup>19</sup> This is the first component of postmodern urban theory: the city, it is argued, is a network of flows; it has become a *process*.<sup>20</sup> Corner suggests that the larger processes at work in the city – flows of money and capital, globalization, and environmental education – “are much more significant for the shaping of urban relationships than are spatial forms *per se*.”<sup>21</sup> Indeed, he argues that modernism failed in part because it attempted to arrest or restrain these processes.<sup>22</sup>

The concept of city-as-process has accompanied the comprehension that the forces which shape cities are not always physically or spatially identifiable. Not coincidentally, this conceptualization of the city has paralleled the rise of globalization and information technology. Buck-Morss argues that urban reform movements in the 1970s failed because power had been shifting from the streets to the despatialized networks of cyberspace. In terms of power, she states that “the connecting grid of urban space is being made obsolete by the ‘information highways’ of electronic communication.”<sup>23</sup> In fact, Verwijnen argues that the “movement of information is... a substitute for the movement of people.”<sup>24</sup> But this is not the only way urban space has been reconceptualized in this manner. Social networks, for instance, frequently transcend the local spaces in which individuals are located.<sup>1</sup> Granted, this is not a new idea; Jacobs devotes several pages of *The Death and Life of Great American Cities* to the idea of “hop-skip” connections and their importance to the

proper functioning and well-being of neighborhoods.<sup>25</sup> What has changed, according to the Ghent Urban Studies Team [GUST], is that traditional social structures such as churches, neighborhood organizations and political parties no longer are the focal point for urban socializing. Instead, individuals socialize via interest-based and subcultural organizations which may bear little correspondence to any spatial form; this, GUST argues, is a direct result of the increased mobilization of society.<sup>26</sup>

This is not to say that space and form are entirely obsolete in the contemporary city. Despite the rhetoric surrounding cyberspace and deterritorialized networks, GUST reminds us that “the city obviously stays a material given, to which even the virtual world... is forced to adapt.”<sup>27</sup> They also note that the telecommunications and information industries (amongst others) depend on face-to-face contact between their employees for innovation and the development of new technologies.<sup>28</sup> Other nominally non-physical entities such as currency networks and global finance must also both emanate and reveal themselves in discrete locations. Müller and Dröge assert that even as the city becomes a global entity, it continues to retain local qualities both spatial and non-spatial. This is in large part because of the “cultural sedimentation” of built form in the city: entrenched spatial forms and cultural patterns which change only gradually.<sup>29</sup> The global space of flows, they argue, can only operate in the city if it is concretized in the fabric of the city.<sup>30</sup> This is because, as Hillier maintains, the transmission of culture is largely based on the relations between form and space in the city – and the persistence of those forms and spatial configurations through time.<sup>31</sup> Global networks and cultures require localized expression just as localized cultures do, albeit in different forms and at different scales.

The means by which designers concretize cultural forms in the city, however, is a difficult task indeed. Even a team of hundreds of landscape architects and architects, planners, and engineers could not hope to direct the formal development of even a tenth of the city; urban growth will occur with or without creative design intervention. Even where such intervention does occur, it tends to be piecemeal and, according to Betsky, often detrimental to the city as a whole. This is because while the growth of the city is dictated in part by non-spatial networks both local and global, designers have tended to think solely in spatial terms when developing spaces in the city. Lerup’s arguments are based in large part on the acceptance of this fact, and that designers must learn to accommodate (if not embrace) the new “field conditions” of the contemporary city.

Thus Betsky contends that “one must discover the inherent relational networks and coherent markers or vectors within the sprawl and go, so to speak, with the flow.”<sup>32</sup> One of the most familiar of these networks – the spatial configuration of the city and its corollary, human movement – has been the focus of research in the field of space syntax. Space syntax expresses these relational networks in such a way as to link these basic spatial vectors to the multivariate attributes of the contemporary city.<sup>33</sup> Based on research in this field, Hillier argues that cities are shaped primarily by “socio-economic forces... [acting] though the relations between movement and the structure of the urban grid.”<sup>34</sup> These reciprocal effects, he says, engender a whole range of other urban structures and characteristics from building density and land use to crime rates and shopping districts – and these structures have very little to do with aesthetic or symbolic intentions.<sup>35</sup> Movement is so important to this process, Hillier says, “that we should forthwith cease to see cities as being made up of fixed elements and movement elements and instead see the physical and spatial structure as being bound up to create what we have called the ‘movement economy’, in which the usefulness of the by-product of movement is everywhere maximised by

\* Hillier asserts that “all the evidence [from anthropological studies and so forth] is that human societies were always – at their appropriate scale of course – global as well as local entities, and virtual as well as spatial entities in some ‘face to face’ sense.” Thus the notion that interpersonal networks have only recently begun to transcend their immediate locality is a myth. (Hillier, *Society Seen Through the Prism of Space: sketch for a theory of society and space*, p.4)

integration in order to maximise the multiplier effects which are the root source of the life of cities.”<sup>36</sup> Because the spatial network of the city is relational – meaning that all spaces of the city are impacted by all other spaces in the city – inherent inequalities exist at all levels of the spatial network. These inequalities are expressed in space syntax theory and analysis as *integration*.<sup>2</sup> In the movement economy, Hillier postulates that the city-as-process maximizes integration so that the main by-products of movement – co-presence, interaction and exchange – are also maximized.

A quintessential attribute of the contemporary city in which we see the movement economy at work is *the strip*. The strip has developed with the rise of the automobile as a primary vernacular expression of North American culture. It had its first defenders in the architectural realm with Venturi and Scott-Brown’s seminal book, *Learning from Las Vegas*. It is characteristic of what Corner describes as a “systematic and infrastructural landscape,” the result of a pragmatism which “may be brutal, and sometimes ugly in scenic terms, but so beautifully enabling of certain social possibilities and relationships... [it] is more *operative* than representational, more about the logistics of use and program than appearance... more *field-like* than scenic.” [emphasis Corner]<sup>37</sup> But it is J.B. Jackson who best captures the social and economic *process* of the strip of the American West: “I know of no more vital area in the town; and a well-equipped, well-planned, versatile strip is what these new towns depend on to attract outsiders and to maintain contact with the rural economy.”<sup>38</sup> The strip, he writes, is where information is exchanged, meetings are held, where teenagers conduct their social lives. This is a quality echoes by Lerup; he remarks on the ability of the strip to capture and hold, however briefly, the *stim* of a row of parked cars in a lot, radios blaring hiphop/mariachi/country/hard rock while their owners confer beneath the hoods.<sup>39</sup>

The activity of the strip, however, rarely persists through an entire 24-hour day. In cities where the original sprawl has been left to decay, the forgotten space between urban revitalization and post-urban development, there may not be any activity whatsoever on the strip. In either case, the strip becomes *void*; or, as Lerup describes it, a “gap in the holey plane.” The concept of the void has become a centerpiece of the writings many postmodern urban theorists. The void may reveal itself as a parking lot, an abandoned strip mall, a brownfield – a space programmatically vacant, an afterthought. These are often perceived as ugly spaces by the public, ignored or neglected in traditional urban design. But while these spaces are often decried, writers such as Lerup argue that these spaces have an inherent potential – *stimdross* – which is infinitely valuable for the metropolis. They are valuable for their potential alone, even if that potential goes unrecognized.<sup>40</sup>

In his essay *The “Void” as a Productive Concept for Urban Public Space*, Borret distills from the idea of void two different conceptual approaches. One is the strategy employed by Geuze/West 8, Koolhaas/OMA, and the Field Operations team of Corner and Allen. Theirs tends toward a positive view of empty space; the void is simply potential to be used and adapted by urban dwellers. This is as true for designed spaces such as Schouwburgplein or Downsview Park as it is for postindustrial derelicts and parking lots.<sup>41,42</sup> To a certain degree this represents a reworking of the old idea of the city as event space: Walter Benjamin’s *flâneur*, Jane Jacob’s “ballet of Hudson Street”<sup>43</sup>, and Lawrence Halprin’s practice of “scoring” spaces for events all come to mind. But whereas Geuze/West8 (hearkening back to the *flâneur*) and Koolhaas/OMA aim their spaces toward the individual<sup>44</sup>, the absence of the individual is conspicuous in Corner’s writings. Instead, he marks the potential and openness of void space in terms of “shifting populations, demographics, and interest groups.”<sup>45</sup> In his design for Governors Island in New York, he describes how the “formal void- a cleared field of emptiness, manipulated only in various edge conditions- becomes filled over and through the activities and patterns

\* The concept of integration is discussed in detail below.

of occupation that the project instigates and sustains through time.”<sup>46</sup> It is a method of design of which the purpose “would be not to celebrate differentiation and pluralism in a representational way, but rather to construct enabling relationships between the freedoms of life (in terms of unpredictability, contingency, and change) and the presence of formal coherency and structural/material precision.”<sup>47</sup> And yet the next sentence shows that there is very little separating Corner and Koolhaas’ perceptions of the void; here Corner writes that his method of design is similar in many ways to Koolhaas’ design for Parc de la Villette.<sup>48</sup> But perhaps the uncertainty is in the nature of the void and depends, as postmodern theory tells us, on the perception of the viewer.

This raises a point closely linked to ideas of “staging” or “scoring”: the importance of time and event in urban life. Borden et al. assert that time in the city is not only expressed in the cultural sedimentation of the urban fabric, the architecture both grandiose and banal. “It is also the everyday architecture of the city – that which is embedded in all the routines, activities, patterns, and emotions of quotidian life; that which ranges, spatially, from the body to the globe and, temporally, from the ephemeral and the briefest moment to the longer time of the generation, cycles of life and death, and beyond.”<sup>49</sup> These patterns, in constant dialogue with the vernacular architecture of the city, appear in dense urban neighborhoods just as they do in the form (or formlessness) of the strip. As stated before, these patterns or networks are not confined only to the space in which they operate. Let us return again to J.B. Jackson, who writes so succinctly: “What brings us together with people is not that we live near each other, but that we share the same timetable... That is why we are more and more aware of time, and of the rhythm of the community. It is our sense of time, our sense of ritual, which in the long run creates our sense of place, and of community.”<sup>50</sup> Following this thread, Corner writes: “If it is true that today’s public sphere is structured more through the time of collective events... than through the fixity of urban place, then the provision of seemingly ‘blank’ space is perhaps all that is needed for a seasonal choreography of events to occur and assume their own provisional geometries.”<sup>51</sup> Thus, given the proper *fieldwork* (à la Corner), the void has the capacity to engender any number of patterns, any kind of event, any system of interactions.

This is only one concept of the void, however; the outlook of the second is less positive. Borret cites the work of Stefano Boeri as an example of this approach, which is centered around the idea of the metropolis as a diffuse, fragmented entity. In such a metropolis, voids appear at many different scales and in many different situations: abandoned industrial-era buildings; the scattershot development of the second half of the 20<sup>th</sup> century; spaces in which there is no clear structure – physical, political, social or otherwise. While some of these spaces are appropriated by the urban dweller – as was the case at the decaying steel mill which was subsequently redesigned by Latz to become Landschaftspark Duisburg Nord – many are not desirable even in the most fervent postmodern sense. These are voids which are so removed from the fabric of the city and, to an extent, even from the larger system of networks which overlays the city, that no one can truly lay claim to them. These are spaces which tend to be sporadically inhabited by individuals such as transients, juvenile delinquents, and drug dealers, all of whom operate, to a certain degree, beyond the confines of society.<sup>52</sup> Hillier defines voids of this nature as “disurban spaces;” these spaces are a result of “the breaking of the relation between buildings and public space; the breaking of the relation between scales of movement; and the breaking of the interface between inhabitant and stranger.”<sup>53</sup> In disurban spaces, local space is so poorly configured that the ‘movement economy’ no longer operates. Poor integration means that there is very little movement through the space; without movement through a space, there can be no co-presence, no passive surveillance as described by Jacobs.<sup>54</sup> In these spaces the *flâneur* is mugged; the driver locks his/her doors and tries to find an exit, the guarded silence is broken by the suggestion of event. Some of these spaces play a vital role in the city and should be left to sustain life at the margins. Others, such as public space in poorly designed public housing complexes, can and should be reconfigured so that

they are not as dangerous for the local residents. In the case of the latter, these are voids that have been created through the neglect of design, spaces which were intended to be an asset for the residents surrounding that space. In cases such as these it is not a matter of creating defensible or sanitized space; instead, it is a matter of correcting poorly executed design intent, achieved by reopening or reconnecting these spaces to the full range of functions and possibilities of the city.

Borret makes the point that Boeri's classification of urban voids (as well as, to a lesser extent, West 8 and OMA) exhibits "a characteristically postmodern insistence that personal identity is not stable and singular, and it possesses – along the same lines – a liberating potential, a possibility of moving beyond established social values."<sup>55</sup> As Hillier demonstrates, however, to operate outside societal norms is not necessarily a desirable thing. In their focus on the contented, liberated, middle-class urban individual, Borret, Geuze, Koolhaas and others betray their own social and cultural prejudices. While earlier theorists such as Simmel and Benjamin acknowledged a darkness associated with the isolated and alienated urban dweller, the concept of aloofness as a virtue is distinctly postmodern. That this liberated, atomized individual is directly linked to an increasingly formless metropolis is a point raised by many theorists. Geuze describes "the contemporary city dweller [as] self-assured and intelligent," an individual who actively seeks the abrupt and changeable in the urban landscape, an individual who will not seek out a city which forces an identity on him/her.<sup>56</sup> Geuze's city dweller is an unabashed driver, a condition which is reflected in the structure of the city;<sup>57</sup> it is a city of places which are only accessible by automobile. Interpreting de Certeau and Lefebvre in terms of the individual rather than society, Lerup asserts that the freeway drivers are, in fact, creating *place* through their transversal of the *space* of Houston.<sup>58</sup> Even if this evaluation is correct, it is a double-edged sword; Betsky calls attention to the speed from which the individual experiences the Los Angeles strip, the "spectacle" of the lights and signs, and the inevitable social fragmentation that follows.<sup>59</sup>

Thus the city becomes ever more fragmented, both physically and socially. Within these conditions, however, new (or newly defined) spatial typologies begin to make themselves clear. Borret offers as example a number of typologies – "linear attractors," "repetitions," and so forth – defined by Boeri in his study of Italy.<sup>60</sup> On an even larger scale, Lerup suggests looking at the metropolis in terms of *megashapes* as opposed to more familiar, smaller-scale spatial forms; thus sprawl itself takes on new meaning, as does the *zoohectic canopy* – the vast metropolitan tree canopy.<sup>61</sup> And despite the demographic and social changes which have rendered many cartographic techniques obsolete, GUST notes that the purportedly autonomous urban dweller "corresponds [to] a fracturing of urban space into sometimes highly homogenous neighborhoods, [which] leads to a remarkable paradox: whereas posturban space appears to resist all attempts at mapping (in cartographical and functional terms), it goes hand in hand with a social polarization that is at times all too easily mapped (in residential terms)."<sup>62</sup> Accompanying these social developments, the form and space of each separate piece of the metropolis become concretized, further exacerbating the overall fractional character of the city. These newly identifiable pockets of social and spatial homogeneity can then be mapped and remapped, reinforcing the separation between one another. This creates (and sustains) a situation, McCreery argues (after Lefebvre), in which "bored individuals are rendered incapable of creatively imagining any kind of alternative life. As life is objectified, so individuals are subjected to it."<sup>63</sup>

Thus we find ourselves in a situation where the social and physical structure of the postmodern metropolis simultaneously allows for incredible individual freedom and well as the establishment of rigid social, economic and physical boundaries. It is highly unlikely, however, that any contemporary city lives up to the glowing reinterpretations offered by many postmodern critics. According to Buck-Morss, there was a pragmatic idealism inherent in postmodern architecture at an early stage, an idealism still evident only in Corner's writings. That pragmatic idealism was stripped away, however, by an economic and political system unwilling to allow

## The Generic City

urban reforms to take place, leaving us with the amoral pragmatism of theorists such as Koolhaas and Lerup. Thus, Buck-Morss says, “a postmodern virtue was made of the accidental way that cities evolve, justifying the lack of any urban policy whatsoever. Style has become eclectic, a *mélange* of neo-, post-, and retroforms that deny responsibility for present history. They reproduce the dream-image, but reject the dream.”<sup>64</sup> Such a standpoint is clear in Lerup’s discussion of the Museum District in Houston: “the lack of zoning, the resulting absence of hierarchy, and the ‘accidental’ juxtaposition of many uses add more openness, since you may stumble on a museum while on another errand.”<sup>65</sup> Given his attention throughout much of the book to the metropolis *after the city* – the *megashapes* of tract housing, the *stimdross* of the freeway and parking lot – it is curious that he returns to an area which is unique within Houston and unquestionably urban (and indeed, arguing *for* boulevards, plazas, and the pedestrian<sup>66</sup>), rather than choosing an area which is more characteristic of the *holey plane* of Houston. Like Koolhaas, Lerup is admitting with this example that a return to the traditional city may be necessary.<sup>67</sup> In this admission, Lerup reveals another characteristic common to postmodern urban theory: it is much easier to *talk* about the conditions of the contemporary metropolis than it is to *design* for it. However the city might be described in theory, architecture is still revealed in concrete forms of the real world – and the vastness and uncertainty of the metropolis posed by Lerup would engulf even the largest and most grandiose design project, rendering the architect virtually obsolete.

The ultimate postmodern city is exemplified in Koolhaas’ “Generic City.” The Generic City is a city without identity; Koolhaas asserts that it is in this “blankness” that the greatest degree of freedom and flexibility can be found. Identity is imprisonment; *tabula rasa* is infinitely preferable.<sup>68</sup> “It is the city without history,” he writes. “It is big enough for everybody. It is easy. It does not need maintenance. If it gets too small it just expands. If it gets old it just self-destructs and renews.”<sup>69</sup> Lerup’s Houston has many qualities of the Generic City, as does Koolhaas’ Atlanta. But whereas in the final pages of *After the City* Lerup acknowledges the problems faced by the suburban metropolis and calls for “a new alliance” in which designers learn from suburbia and vice-versa,<sup>70</sup> Koolhaas seems to shrug, decreeing the end of the city by “assimilating and defending the developer’s logic (à la Portman).”<sup>71</sup> Whereas Lerup retreats from the uncertainty of the Generic City, Koolhaas proclaims it as a strength: economies of gigantic scale allied with designs of gigantic scale.

In any case, Koolhaas makes it clear that the historical city – that is, the city as *cultural sedimentation* – is dead. The contemporary metropolis, he notes, “is a plane inhabited in the most efficient way by people and processes, and in most cases, the presence of history only drags down its performance.”<sup>72</sup> If we understand history as Koolhaas does, as an aesthetic and formal determinism forced upon contemporary architecture by traditional architecture, then we find at first glance that Hillier might agree with this statement. “Space in the city is *about* movement,” he writes. “It does not seek to express the relations of major buildings, even the largest and most public, on the pattern of movement on which the life of the city as a centre of business always crucially depended.”<sup>73</sup> As has been stated, however, movement depends on the configuration of space in the city, and by extension, the relations of built form to those spaces. To a large extent, the *cultural sedimentation* of the city does not drag down its performance – it *drives* it. In fact, Peponis et al. argue that the structural relationship between urban space and human movement persists even in contemporary urban development exemplified by Portman’s Peachtree Center in Atlanta and in Buckhead, a suburb of Atlanta identified by Garreau as an “edge city.”<sup>74</sup> They write: “Commentators have perhaps been too quick to suggest that Atlanta exemplifies a dissolution of traditional structures and a rather chaotic pattern of growth. Our analysis suggests that the underlying spatial principles are still felt. ... The effects of integration are present both in the old city center and in new centers, such as Buckhead, that have arisen at a distance [from the core city].”<sup>75</sup>

Koolhaas maintains that only extreme scale – “Bigness” – can sustain the complexity necessary for architecture to act unimpeded. He boldly states that Bigness “is the one architecture that engineers the unpredictable.”<sup>76</sup> Consider Koolhaas’ infamous statement from *S, M, L, XL*: “Together, all these breaks- with scale, with architectural composition, with tradition, with transparency, with ethics- imply the final, most radical break: Bigness is no longer part of any urban tissue. It exists; at most, It coexists. Its subtext is *fuck* context.”<sup>77</sup> The concept of Bigness is inextricably linked with the Generic City – and is exemplified in projects such as Koolhaas’ EuroLille in which the city is substituted for by “urban megastructures.”<sup>78</sup>

While the attribute of Bigness refers primarily to building mass – and skyscrapers in particular – the concept of scale cannot be confined solely to the skyscraper. Nor can it be confined to the metropolis. Regardless of whether Koolhaas’ judgement of the city is simply a study in irony or is “the right way to go, a new paradigm,”<sup>79</sup> to confine the concept of size to the metropolis or even to megaprojects such as EuroLille is a major shortcoming. This is true not only for Koolhaas but for much of the work of contemporary urban theorists: the relationship between the city and all its supporting landscapes (local and global), if mentioned at all, is generally phrased in terms of trade, the exchange of goods and services, and not of the very real physical scale which these systems operate. Despatialized networks shape the supporting landscapes of the city just as they shape the metropolis. What is often overlooked is that large-scale operations within the metropolis require large-scale operations outside the metropolis. Stores such as Wal-Mart and Home Depot are able to maintain their low prices in part through sheer volume and in part through agreements with distributors who, like the businesses they supply, rely on volume to keep their overall costs down. This same pattern continues down the line to the agribusinesses and forestry companies who produce and harvest the raw materials. Like all the organizations and businesses they supply, volume is the critical factor in maintaining their profits. It is a matter of scale, not only for the city but for the countryside.

Operations at these scales necessarily have political ramifications in addition to economic and physical effects. Berry argues that “as a social or economic goal, bigness is totalitarian; it establishes an inevitable tendency toward the *one* that will be the biggest of all. ... The aim of bigness implies not one aim that is not socially or culturally destructive.”<sup>80</sup> He continues, writing: “The size of land holdings is likewise a *political* fact. In any given region there is a farm size that is democratic, and a farm size that is plutocratic or totalitarian. A great danger to democracy now in the United States is the steep decline in the number of people who own farmland – or landed property of any kind.” [emphasis Berry]<sup>81</sup> This is a strong charge (even despite Berry’s clear Jeffersonian inclinations) against the supposed freedoms supported by Bigness, given the operational scale which the metropolis demands of its supporting landscapes *and* the global reach exercised by contemporary cities. But perhaps the regimes of Bigness *have* entirely surpassed smaller-scale political, social, and economic systems, and Koolhaas *is* merely being pragmatic. As Wamble writes: “The civil doctrines of Thomas Jefferson and Adam Smith, once the defining factors of a new national ethic, are laughable in the context of global market strategies.”<sup>82</sup> Even if this is the case, political and economic systems are inextricably intertwined, and the concept of democracy (if not the practice) remains a mainstay of Western societies. Yet still the issue of politics is studiously avoided by Koolhaas.<sup>83</sup> Indeed, Koolhaas yields only three sentences to the subject of politics in his Generic City essay; three sentences are enough for him to grant that the Generic City tends toward authoritarian regimes, but that this does not diminish the *freedom* he claims for these cities.<sup>84</sup> As to whether or not these freedoms extend to the surrounding landscapes, Koolhaas remains silent; the relative freedom of the countryside is irrelevant so long as the metropolis has its liberties.

Bigness also effects the land immediately surrounding the city. The sprawl enveloping Koolhaas’ Generic City might be tract housing, shantytowns, or miles of industrial derelicts. Koolhaas responds to this with his usual sardonic prose: “It is strange that those

with the least money inhabit the most expensive commodity – earth; those who pay, what is free – air.”<sup>85</sup> While this may be no more than a sarcastic (if not cynical) joke, it reveals much in Koolhaas’ point of view: land may be valuable, but it is not worth thinking about – particularly in terms of the architecture he champions.

Lerup, on the other hand, believes that there is value in the sprawl of the metropolis. But, like Koolhaas, he is unable to envision anything beyond the last suburban development. Throughout the book Lerup admonishes us to expand our view beyond the city to the metropolis, to the *megashapes* which become apparent only once one apprehends the city at the scale of the metropolis. Thus sprawl, with its miles of tract housing and “power centers” of big-box stores and malls, is a megashape which impacts all the space of the city. The unbroken carpet of trees he describes from the point of view of his apartment tower – the zoohemic canopy – is another. Lerup argues that the combination of sprawl, redolent with open space (“nature”), and the zoohemic canopy provide the ecological foil within the metropolis.<sup>86</sup> This standpoint, however, entirely disregards the effect that the metropolis has not only on the surrounding territory but on all territories which feed the desires and needs of the city. The ecology of the metropolis is no more confined to the limits of the metropolis as are the flows of capital, people, goods, or services (to say nothing about the highly questionable concept of sprawl-and-canopy as ecology).<sup>3</sup>

But perhaps it is not necessary for theorists to acknowledge the countryside; GUST notes that “according to the French critic Sébastien Marot, the very dichotomy between city and countryside has even lost its validity altogether. As causes he cites the monoculturalization of agriculture, the appropriation of supposedly rural or picturesque sites by tourism, and the encroachment upon rural space by sprawling cities.”<sup>87</sup> Müller and Dröge argue that, even while the modern metropolis cannot be understood without its surrounding countryside, the characteristics of the supporting countryside have changed dramatically. “Local surroundings in this case does not mean, as it did for industrial cities in the past, the supply belt consisting of arable and livestock farming. In the age of globalised air travel, ‘surroundings’ extend to the heart of Africa and to Tierra del Fuego, but have virtually disappeared from the immediate urban locality. Local surroundings comprise a belt of small and medium-sized industry, made up of utility companies, suppliers, consumption-oriented services, back-offices of financial institutions...”<sup>88</sup>

## ***The Specific City***

As noted before, while Portland is unique in many ways, it remains a North American city. Like all North American cities, it has its share of big-box stores, strip malls, strips, expressways, office parks, and tract housing. It is also fully integrated into the global systems of trade, finance, information, capital, and so forth. In short, it exhibits dynamized spatial characteristics of the global economy in which aspects of global culture are concretized in local space.<sup>89</sup> And yet it is very different than Houston, Atlanta, or Los Angeles. The metropolitan area remains centralized with downtown Portland as the hub; key metropolitan services are almost all in Portland proper. Abbott notes that “specialists on the multinodal city can identify only one ‘edge city’ (Joel Garreau’s term, applied to Beaverton-Tigard-Tualatin triangle) or ‘suburban activity center’ (Robert Cervero’s term, applied to the I-5 corridor from Tigard to Wilsonville). Even these are incomplete examples at best.”<sup>90</sup> Furthermore, the metropolitan area does not exhibit the *holey plane* qualities described by Lerup: “Outside the employment core, Portland lacks the ‘dead zone’ of derelict industrial districts and abandoned neighborhoods that surrounds the high-rise core of many cities. ... [Portland] has seen essentially no abandonment and,

<sup>3</sup> Lippard argues that “undifferentiated” sprawl has been generated as settlement patterns, histories, and other cultural systems have been lost. Sprawl, along with the disorder (which is to say, the lack of *any* order), has become “an environmental hazard as great as the pollution and decay of the inner city.” (Lippard, 223.)

now, accelerating investment in light industrial and warehousing districts. Portland now treats the downtown core and surrounding frame as a single high density 'central city.'"<sup>91</sup>

The process through which Portland became the city it is today was set in motion in the late 1960s. At that time both Portland and the State of Oregon began to develop a framework for planning unique in North America. The key element of this framework – state mandated land use planning and review – was legislated in 1973. Senate Bill 100, as it is commonly referred to, "requires every Oregon city and county to prepare a comprehensive plan that responds to a set of statewide goals. The plans provide the legal support for zoning and other specific regulations, and the Land Conservation and Development Commission (LCDC) can require local governments to revise plans that do not conform to the state goals."<sup>92</sup> One of the most important parts of this legislation is the requirement of all municipalities of a given population to establish an urban growth boundary, or UGB. This is a critical (and often overlooked) aspect of the UGB: it is not a mandate established by the City of Portland, or by Metro, the regional government of the Portland metropolitan area. It is a state mandate.

When regional planning was legislated it was not enacted as simply a measure to limit sprawl and unrestrained development. Abbott writes that "The movement for state mandated planning originated in efforts by Willamette Valley farmers to protect their livelihoods and communities from urban engulfment and scattershot subdivisions, with their disruptive effects on agricultural practices."<sup>93</sup> According to Kunstler, "The whole package was sold to the public as a measure aimed at protecting Oregon's valuable farmlands... The UGB was [and still is] as much antisprawl as profarm."<sup>94</sup> The persistent strength of the UGB system, and of the state-mandated land use planning process as a whole, has come to depend on a coalition of urban and rural constituencies. Indeed, the cooperation between city and countryside has enabled the UGB to withstand five attempts to repeal the measure under Oregon's public referendum process.

Abbott suggests that the successes of the planning process in the City of Portland are due in part to the existence of similar coalitions of interest groups and voters operating at two different scales: that of the city and that of the region.<sup>95</sup> To a certain extent, planning efforts at both scales would not be nearly as successful as they have been without these alliances. Portland cannot exist as it is without collaboration with the surrounding farm and forest communities. Summarizing Lewis Mumford, Heinz Paetzold writes that "the city should be in a cultural, political, and economic balance with the surrounding countryside, in terms of exchange, rather than of exploitation"<sup>96</sup> Paetzold cautions, however:

*Although I share many of Mumford's convictions – the stress on a concrete urban community, the stress on democratic principles, the stress on the relevance of the symbolic-aesthetic dimension of our environment, the stress on an interrelationship between cultural determined regions as an alternative to national and international acts of unification from above – I find his approach in the end too idealistic. It should be clear, of course, that any definition of urban culture has a normative basis.<sup>97</sup>*

It appears that Portland and the State of Oregon have established a broader political, cultural, and social system which continues to foster not only a relatively progressive, responsible urban community in Portland itself but in the broader regional community as well. Abbott notes that "Portland ranks high in comparison with other cities in the average level of citizen involvement, particularly in 'strong participation' activities such as service on committees or direct contact with local government."<sup>98</sup> He also writes that the income disparity between urban and suburban households is lower than in other cities of comparable size and that there is a

fine-grained mix of economic classes throughout the city. Portland also ranks far below the national average in terms of both child poverty levels and the proportion of those children who lived in economically depressed neighborhoods.<sup>99</sup> This is a far cry from Lerup's assessment of the contemporary metropolis: "The deep-seated denial of the larger consequences of all accumulated actions has produced a holey plane with too many voids of social and economic depression, serious environmental problems, and often banal and overly striated spatial stereotypes."<sup>100</sup> Indeed, Portland has been able to "build new and more diverse coalitions, and to construct richer and more complex environmental conditions"<sup>101</sup> that have been missed by most other contemporary metropolises.

In defining the salient attributes of *fieldwork*, Corner refers to the technique of working a surface – as in Koolhaas' concept of *staging* for Parc de la Villette – such that it is continuous and yet differentiated. "This is linked to his argument that urbanism differs from architecture in that rather than consuming the potential of a given site through building, urbanism irrigates or conditions a site potential."<sup>102</sup> We might understand the planning process in Portland in this way: rather than permitting the flows of the global economy to flood the city, the planning process in Portland (and Oregon) has diverted portions of these flows such that they *irrigate* the metropolitan area. It is a tenuous arrangement; proponents of unrestrained free-market growth have tested the limits of the system both from within and without. Time and time again, however, residents of Portland and Oregon have rejected efforts to repeal planning legislation. As Borret describes it, "The unity and significance of society are forever precarious, and public space is the site where they are constantly being negotiated. A radically democratic public space thus lives off conflict and can never be a harmonious haven of consensus. ... The unknowability of society and the instability of public space are to Deutsche no reason for political despair, but the starting points for a contemporary democratic politics."<sup>103</sup> These characteristics are displayed nowhere more clearly than in the neighborhoods and farmlands of the Willamette Valley. Thus we see that, as Bacon maintained, it is possible for human will to be exercised upon a city, even as the city participates fully in the globalized networks which flow through it. Portland may be thought of, therefore, as hybrid city; neither metropolis nor city bounded by its own identity.

## Agri[culture]

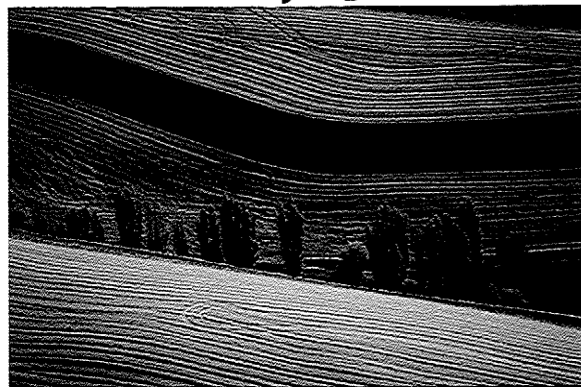


Figure 4. Alex MacLean, from *Taking Measures Across the American Landscape*, with James Corner

The benefits of Portland planning and the UGB have not been restricted to the urbanized metropolitan area. In an era when farmers at the edges of most other North American cities find it cheaper and easier to sell their land to developers than to continue farming, farmers beyond the borders of the Urban Growth Boundary are investing in their land and operations. This has allowed agriculture to continue, if not flourish, at the doorstep of the Portland metro area. Of all Oregon counties, two metropolitan counties – Clackamas and Washington – rank third and sixth, respectively, in the value of the agricultural products they produce.<sup>104</sup> These statistics are meant to underscore the fact that in Portland, as is the case in many North American cities (and Midwestern cities in particular), is surrounded with still-fertile and valuable farmland. The value in this farmland, however, is too often seen in terms of real estate value, and not productive value. "Yet amazingly, according to the American Farmland Trust's 1993 'Farming on the Edge' survey, 56 percent of all U.S. agricultural products and 86 percent of its fruits, nuts, and vegetables are still produced in areas ringing the nation's cities, even as they fall daily to the creeping blob."<sup>105</sup>

Despite all the good that has come out of 30 years of regional planning in Portland, it is only a first step. Berry, in an essay entitled *Out of Your Car, Off Your Horse: Twenty-Seven Propositions About Global Thinking and the Sustainability of Cities*, argues that "The only sustainable city – and this, to me, is the indispensable ideal and goal – is a city in balance with its countryside: a city, that is, that would live off the *net* ecological income of its supporting region, paying as it goes all its ecological and human debts."<sup>106</sup> Portland is nowhere close to Berry's ideal. It is, after all, still a North American city; it demands of its countryside a similar scale and level of

production as any other Western city. It has the same strip malls and fast food restaurants and big-box stores found in Boston, Houston, or Los Angeles. To a certain extent the existence and location of these businesses depend on whether or not zoning guidelines are in place and enforced. This is an issue which is much larger than planning, however: it is cultural. There are whole populations who have come of age in this cultural milieu, expecting to find everywhere easy automobile access to their desired destinations and packaged meals in convenient, ready-to-serve portions. But these are not behaviors and practices confined to the suburbs, for urban children grow up with many of the same expectations as well. The issue before us is the changing of culture itself – a far more difficult and slow-moving task than the changing of laws and regulations. And yet, as Wendell Berry argues, culture is the key to the long-term health of land and city alike.

Agriculture is the foundation upon which urban civilizations have been built since the beginning of recorded history. Agriculture has always been based on the seasonal planting of a small number of annual grass species: wheat, corn, rice, sorghum, barley, and oats. Add to this list a single legume – soybeans – and the list of basic crops which has sustained humanity for 7000 years is basically complete. The methods for planting and harvesting these crops have changed little over seven millennia: the ground is cleared, disturbed, and planted with a single species, other species are suppressed during the growing season, and the crop is harvested once the seeds are ripe. Sometimes the ground is replanted with a forage crop such as alfalfa or timothy following the harvest; sometimes the ground is left fallow until the next spring. In all cases, the land must in a state of near-constant disturbance to provide the seeds on which we depend.

The first major change to agricultural technology was the introduction of the moldboard plow by the Romans. The moldboard plow permitted farmers to create deeper furrows and to turn over soil as opposed to pushing it aside. It also allowed the cultivation of wetter, heavier soils. As with any new technology, however, came costs. More animals were required to pull a moldboard plow than the lighter, simpler ard (a simpler plow). More animals needed more food and care, and were therefore unavailable to the majority of farmers. As a result, societies in Europe changed to accommodate the new technology, becoming more centralized, more organized, and less geared toward local subsistence farming.<sup>107</sup>

While the development of the moldboard plow proved to be a major change in agriculture and society, it pales in comparison to the revolutionary changes to agriculture wrought by petrochemicals. The use of hydrocarbons encouraged an incredible increase in the scale at which agriculture is practiced; like the increase in animal power required by the adoption of the moldboard plow, the stored chemical energy in oil allowed farmers to plow much deeper, faster, and farther than before. Exponential changes in energy use translated into exponential changes in the acreage held by individual farmers. But the relationship between agriculture and hydrocarbons is not confined to the gasoline used to power combines, tractor trailers and freight trains. Virtually all the anhydrous ammonia - used as fertilizer in most large-scale farming operations - is derived from natural gas. The “green revolution in farming”, which doubled or tripled the yields of many crops beginning in the 1970s, is entirely dependent on oil.<sup>108</sup>

The changes in agriculture in the last hundred years have dramatically changed societies around the world, western societies in particular. The moldboard plow enabled a relatively small proportion of the population to benefit from the surpluses generated by more efficient farming practices; the surpluses generated by the application of hydrocarbons to agriculture is able, in theory, to provide for the entire population of the world, at least for as long as oil reserves hold out. The fact that most of us in the west do not have to concern ourselves directly with providing our own food has facilitated the rapid development of countless new technologies,

cultural expressions, and scientific discoveries. To put it simplistically, the vast increase in food production has been accompanied by a concomitant increase in cultural production.

But it is not as simple as that. For at the base of these changes lies the inescapable reality that modern agriculture - and hence culture itself - is reliant on two limited resources. Oil is the first. The second is far more important, and much easier to take for granted: soil. Agricultural researcher and critic Wes Jackson, founder of the Land Institute, writes that "the erosion loss of soil carbon and other soil nutrients to our offshore deltas and other places inaccessible to agriculture is more serious than the exhaustion of metals and fossil minerals of our globe. ... Soil loss lies at the core of the problem of agriculture."<sup>109</sup> This has been true from the beginning; one has only to look to the depleted soils in parts of the Mediterranean and Middle East to see the long-term negative impact that farming has had over the centuries. Of course, there are many other places - in China and other parts of Europe, for example - where agriculture has been practiced for just as long with little degradation of the soil. Part of the difference lies in climate and the original characteristics of the soil. To a great extent, however, the health of the land is tied to the knowledge and skill of those farming: the knowledge of how to control erosion and how to maintain the fertility of the soil. The use of hydrocarbons in agriculture has made it possible to artificially maintain that fertility by compensating for the extraction of naturally occurring carbon with the substitution of fossil carbon. Thus erosion now occurs at two levels: the age-old problem of wind and water erosion and the newer problem of chemical erosion. And these are further complicated when we take into account the uncertainties associated with global climate change.

The great danger in the chemical erosion of the soil is that once lost, the chemical makeup of the soil cannot be replaced except through the processes which created it in the first place. Fertile soils have developed over eons through the relationship between soil ecosystems and the parent mineral soils, in which the plant and animal life in the soil help to conserve and create mineral content. The relationship between life and the soil extends beyond the chemical to the conservation of organic matter and water as well. Wendell Berry notes that "we know that we cannot have a healthy agriculture apart from the teeming wilderness in the topsoil, in which worms, bacteria, and other wild creatures are carrying on the fundamental work of decomposition, humus making, water storage, and drainage."<sup>110</sup> The loss of this inherent complexity cannot be substituted for - or approximated by - the application of a technological solution.

One approach to this problem is to rework agriculture itself. This is the goal of Wes Jackson and the Land Institute: the creation of an agriculture modeled on a prairie ecosystem: a perennial, polycultural agriculture which would require little or no cultivation and little or no chemical inputs. In a native prairie, all the various species (warm and cool season grasses, legumes, members of the sunflower family, and other herbs and forbs) each contribute different enzymes and chemicals to the environment. Taken as a whole, these chemicals and enzymes operate as a broad set of naturally occurring pesticides, fungicides and herbicides, thus endowing the entire ecosystem with a nearly total protection against most damaging intrusions. An agriculture based on the prairie ecosystem would operate in much the same way, controlling pests and fostering its own fertility through the interrelationships of the plants in the system.

The goals of the Land Institute are admirable. Should they accomplish their objective of creating an agricultural system based on grassland ecology, it will be a greater revolution in agriculture than anything which has preceded it. But it will take much more than test plots and careful plant breeding for this new system to work. As Berry reminds us, agriculture and culture are inseparable from one another; in this regard a new agricultural system will be no different than the old. Jackson estimates that it will take at least one

generation for the Land Institute to be able to create a the first working polycultural perennial farm.<sup>111</sup> The larger and more daunting questions are: how many generations will it take for *all* farmers to adopt the new system? And given the incredible economic and political power yielded by agribusinesses such as Monsanto and Cargill (who would stand to lose billions if farmers *did* switch), how can such a system be promoted in the first place?

These are cultural questions which must be addressed not only to those who produce the food, but to those who consume it. Berry notes that agriculture, like any technology, is a cultural and social artifact. Agriculture is not agribusiness; it cannot be winnowed down to a series of financial and chemical inputs and outputs. He finds no great accomplishment in the incredible quantities of food that the modern farm can produce, or in the technologies which claim to make the modern farm more productive and more exact than ever before.<sup>112</sup> Most of the recent advancements in agriculture, he argues, have been detrimental to both natural and human communities because they have been carried out without regard to the cultural and ecological complexities in which agriculture is imbedded. He writes:

*We now have more people using the land (that is, living from it) and fewer thinking about it than ever before. We are eating thoughtlessly, as no other entire society has been able to do. We are eating – drawing out lives out of the land – thoughtlessly. If we study carefully the implications of that, we will see that the agricultural crisis is not merely a matter of supply and demand to be remedied by some change of government policy or some technological ‘breakthrough.’ It is a crisis of culture.*<sup>113</sup>

And he continues:

*A culture is not a collection of relics or ornaments, but a practical necessity, and its corruption invokes calamity. A healthy culture is a communal order or memory, insight, value, work, conviviality, reverence, aspiration. It reveals the human necessities and the human limits. It clarifies our inescapable bonds to the earth and to each other. It assures that the necessary restraints are observed, that the necessary work is done, and that is to done well. A healthy farm culture can be based only upon familiarity and can grow only among a people soundly established upon the land; it nourishes and safeguards a human intelligence of the earth that no amount of technology can satisfactorily replace.*<sup>114</sup>

The interrelationships between humanity, culture, and the land are critical not just to the health of the land but to ourselves and our society. He asserts that to maintain the vitality of the land, the people who are working the land must possess the knowledge – and the means – to care for it properly. The knowledge for the proper care of the land can only be passed on through the rites of culture; specifically, a culture *at home* in its particular place. J.B. Jackson writes that “If we hunt, if we farm, even if we botanize, we are benefiting from and sharing in the accumulated experience of others, so this other identity of ours also its social implications. It implies that we recognize other people as inhabitants of the earth as well as members of a social order.”<sup>115</sup> These cultures and accumulated knowledge arise from the relationships between individuals and the land. The sum total of this defines a community which includes not only humans but all other non-human life and the land itself.<sup>116</sup>

Berry’s utopian vision of knowledgeable, compassionate, and free human communities living and working on the land is rarely realized. Inhabitation carries with it cultural patterns which reveal themselves in practice, both positive and negative. Citing her

own experience and observations, Lucy Lippard writes: "People can love their land and still be lethally short-sighted about its use. ...Disrespect is not incompatible with familiarity. In fact, like domestic violence, it can be spawned by long familiarity and a sense of ownership."<sup>117</sup> Despite the shortcomings of Berry's worldview, Lippard agrees that the long-term health of the land will depend on the evolution of conservative and restorative cultural practices in rural communities. In fact, this evolution must take place in the metropolis as well as the countryside, for it is the city which demands the most from the farmlands and forests beyond its borders.

## ***Spatial practice***

But how can this cultural evolution take place?

According to the Borden et al., Lefebvre identifies three kinds of space: spatial practice, representations of space, and spaces of representation. Each of these kinds of space affects and is affected by social practices and culture in different ways: *spatial practice* "concerns the production and reproduction of material life;" *representations of space* encompass spaces comprehended through abstract knowledge, codes, and signs; and *spaces of representation* exist through the interaction between imagination and lived experience, as images and non-verbal symbols.<sup>118</sup> To a certain extent, every real, physical space incorporates aspects of each of these kinds of space; in fact, Borden et al. argue that *spatial practice* cannot operate without both *representations of space* and *spaces of representation*.<sup>119</sup> In terms of rural space or landscape, the *representations of space* have been documented by Denis Cosgrove, James Corner, J. B. Jackson, Frederick Jackson Turner and Henry Nash Smith, amongst others. Different *spaces of representation* are identified by Lucy Lippard in *The Lure of the Local* and by Lars Lerup in *After the City*; authors such as Leslie Marmon Silko, Linda Hasselstrom, Kathleen Norris, Edward Abbey, Louise Erdrich, Gary Snyder, and Wendell Berry also describe these spaces in their books and essays. In terms of *spatial practice*, however, the association between urban and rural spaces has been largely overlooked – and this is precisely the area which requires the most attention.

Spatial practice requires knowledge, pattern, culture. It requires, as Corner suggests, the *cultivation* of an urban culture which will take responsibility for the health of the rural landscape. A cultural evolution of this sort will depend on a strategic application and exchange of words, symbols, and images. For it to succeed and to endure, however, it will require intervention in the physical space of the city, in the places where the spatial practices involving commodity, exchange, and use dictate the effects on the distant countryside (although, to be sure, this is true of every space in the city to a certain extent). This means not only that spatial practices will have to be changed to encourage a more sustainable use of physical resources, but that these practices must also be symbolic in and of themselves, enshrined in culture through lived, daily experience.

The question becomes, then, can the design of space – or the tactical reworking of specific spaces – have any real effect on culture or society? Lerup hints at the potential of architecture to impact culture through means other than that of words and symbols - indeed, he says that architecture needs to conceive of itself in terms other than signs and symbols – but he does not offer any strong strategies on how to approach this project.<sup>120</sup> Lawrence Halprin used the concept of *scoring* to design spaces in the 1960s and 70s, with varying success; the concept has been reworked and updated by Koolhaas, Tschumi and others through the 1980s and 90s. Corner is more explicit in his attempt to understand and design spatial vectors for social, political, and ecological processes. He writes that "field operations point to certain instrumental techniques and agencies which aim to both subvert and engage dominant interests; they enable alternative ideas and effects to be played out through conventional filters."<sup>121</sup> While this is an interesting approach for the design of space, it simply sets the stage for change that may or may not occur, and does not provide us with a mechanism for cultural change.

First and foremost, we must understand that cultures and societies are not static. Corner defines culture as “a dynamic entity constructed from the vocabularies, attitudes, customs, beliefs, social forms, and material characteristics of a particular society. Culture is a thick and active archaeology, akin to a deep field that is capable of further moral, intellectual, and social cultivation.”<sup>122</sup> All cultures evolve over time, short-term and long-term, from pressures both internal and external. A culture is the amalgamation of all the actions, practices and responses of each individual within a given society, and is therefore in a constant state of flux.\* Just as the combined actions of uncounted individuals develop and sustain culture, so culture impacts and structures a given spectrum of responses and actions for those individuals. We begin learning these structures at birth; culture is the grammar which establishes the ground rules for our daily practices. Every situation we come into, every person we interact with, every place we enter, every word and sign affects our particular individualized understanding of our culture.

While the mechanisms which mediate between culture and the individual are manifold, involving every conceivable method of communication and exchange, *space* is the primary means through which societies and cultures express and structure themselves. “Space,” writes Betsky, “is no more than a socially determined form of measurement that, like time, allows us to locate ourselves in the world according to commonly recognized criteria. It is, in other words, an artificial interpretation of a particular relationship our body has to the physical world we experience as other. This interpretation is conditioned by social relations and, in turn, determines those relations.”<sup>123</sup> Borden et al, take this concept a step farther: “Space, Lefebvre postulates, is a historical production, at once the medium and outcome of social being. It is not a theater or setting but a social production, a concrete abstraction... such that *social relations have no real existence except in and through space*. This relationship between the social and the spatial – in Edward Soja’s term, the ‘socio-spatial dialectic’ – is an interactive one, in which people make places and places make people.” [emphasis mine]<sup>124</sup> Finally, Hillier writes:

*“Culturally and socially, space is never simply the inert background of our material existence. It is a key aspect of how societies and cultures are constituted in the real world, and, through this constitution, structured for us as ‘objective’ realities. Space is more than a neutral framework for social and cultural forms. It is built into those very forms. Human behavior does not simply happen in space. It has its own spatial forms. Encountering, congregating, avoiding, interacting, dwelling, teaching, eating, conferring are not just activities that happen in space. In themselves they constitute spatial patterns.”*

Hillier goes on to argue that these patterns are established not by individuals but by the relationships – or configurations – between many individuals. Space works in much the same way: a particular space does not exist apart from all other spaces, but in relationship to all other spaces. No space, no building is truly autonomous. The relationship between society and space does not exist between individual people and specific spaces but through “configurations of people and configurations of space.”<sup>125</sup> In other words, this is not a matter of the relationship between one thing and another thing, but of the relationship between one set of relations and another set of relations.

\* In this sense, one’s culture cannot be assumed or discarded like a piece of clothing. It is not an “industry”: cultural industries, in the sense of art, music, or other aspects of the “creative cities” described by Verwijnen, are only a handful of many forms of cultural production. They cannot, therefore, define an entire culture.

The reason to conceive of the spatialization of society and culture is simple: interactions between people, while always necessary, are ephemeral. Hillier likens these interactions to “blips on a computer screen flashing on and off, and leaving no trace in space.”<sup>126</sup> Lerup provides us with a more poetic vision: “Pools of cooled air dot the plane, much like oases in deserts. Precariously pinned in place by machines and human events, these pools become points of stimulation – *stims* – on this otherwise rough but uninflected hide, populated only by the *dross* – the ignored, undervalued, unfortunate economic residues of the metropolitan machine. Space as value, as locus of events, as *genius loci*, is then reduced to interior space, a return to the cave.”<sup>127</sup> He goes on to describe a *stim*, an art opening, writing: “after all, this fragment of Siena is held in place not by a city, by streets, piazzas, walls, or a city-state and its culture.”<sup>128</sup> While it may be true that *stims* are not held in place by their city, in Lerup’s Houston, as in all cities, the potential for spaces to become the location for these interactions and events *is* determined by the configuration of space in the city. It is a *potential*, not a given, just as interactions in the Piazza del Campo in Siena are, at their core, only potentials inherent in the spatial configuration of the city – potentials which have been magnificently put to use.

A *stim* does not and cannot constitute society. Nor can a brief interaction encompass an entire culture. The effects of one art opening extend beyond the well-lit, guarded interior space of a gallery. Those who supply the materials to the artist are involved, as are the caterers, the food wholesalers and distributors, and ultimately, the farmer. The fleeting interactions of one evening cannot bear the wealth of social and cultural information required for either the production or reproduction of social patterns.<sup>129</sup> Indeed, these social and cultural patterns – situated spatial practices – are rooted in the spatial configuration of the city itself, in the different potentialities for interaction and connection (both *stim* and *dross*). Thus cities develop, not around buildings, but around space; or, more specifically, the spatial practices which arise from and are supported by unique configurations of space.

Social space, Hillier argues, is governed by a set of autonomous spatial laws which individuals and societies then use to generate their own social and cultural norms. Just as with our cultural norms or the grammar of our first language, we understand and use these spatial laws intuitively from an early age. Hillier refers to this as *non-discursive* knowledge, for we learn and use this knowledge without being conscious of it.<sup>130</sup> For instance, at its most basic level we use this non-discursive knowledge when we position ourselves in respect to others in a room or around a table. In positioning ourselves we make use of inequalities inherent in space: favorable lines of sight, ease of access to other parts of the room or building, physical access to other people or other things. There is no question that we make use of these spatial laws on a daily basis, usually without being conscious of it. *How* we use these laws is directed by our cultural and social norms. This is a critical distinction: spatial laws are inherent in the ways that we, as real, embodied, physical creatures, inhabit space. We cannot set or change spatial laws. Cultural and social norms – which change over time, and which vary from culture to culture – set the guidelines for the use of these spatial laws.<sup>131</sup> These guidelines are set in large part through the configuration of space. Müller and Dröge’s term, “cultural sedimentation,” acknowledges this spatial and cultural dialectic; these spatial forms, however, are not in and of themselves the mechanism through which culture is transmitted. Far more important are the spatial configurations which establish the framework for *spatial practices* to occur; it is through these spatial practices that societies and cultures reproduce themselves through time.

Spatial configuration is not deterministic in the sense that it does not mandate that interaction between people must occur. Nor does it determine the exact forms that situated spatial practices will take. Spatial configuration is probabilistic: it only determines where interactions and spatial practices *might* happen. The basis for this potential exists in a side-effect of movement, the precursor

to interaction: *co-presence*. Co-presence is defined simply as any situation where there are two or more people in a space, regardless of whether or not they know or even acknowledge one another. Co-presence, according to Hillier, is the basis for community, for it is the most basic form of awareness of others. It is not community of itself, but a social resource to be drawn upon if necessary. This characteristic of co-presence is also identified by Lippard, who writes: "A peopled place is not always a community, but regardless of the bonds formed with it, or not, a common history is being lived out."<sup>132</sup> There is, however, more than just potential in co-presence. Read, citing Boden and Molotch, writes that co-presence also carries with it cultural and social information which, when structured appropriately, is "'thick' with meaningful and orienting detail."<sup>133</sup> Well-configured space, he argues, is likewise replete with information.

Given that the conditions for co-presence are established by spatial configuration, we begin to see that space can be configured to predispose spaces for, or maintain the conditions for, specific kinds of spatial practice.<sup>134</sup> For instance, Hillier suggests that a residential spatial morphology will tend to "restrain and structure co-presence," while the spatial morphology of a traditional urban core tends to maximize co-presence for the benefit of micro-economic activity and increased interaction. Thus we can define two "modes" for space: one which conserves or reproduces established social patterns, and one which generates or produces new social patterns through increased interaction and co-presence.<sup>135</sup> These modes of space therefore relate to two strains of spatial practice: those which maintain social and cultural norms, and those which hybridize and change those cultural norms.

Like Lefebvre, Hillier argues that these spatial practices are fundamental to society itself and, in fact, a society cannot exist without spatial practices.<sup>136</sup> Indeed, societies depend not on spatial practices in general but on both generative and conservative forms of spatial practice, carried out by individuals and groups of individuals acting within the scope of their own cultural framework. Hillier writes: "Each individual is therefore a link between a particular set of – for the most part recursive – situated practices, and all situated practices connect to each other through these changing memberships. Through the interconnection of situated practices, then, the individuals who take part in them construct a large graph of interaction, in which most individuals are remote from most others, but nevertheless have a finite depth from all others in the graph."<sup>137</sup> Each place, each situated practice is therefore "an existing hybridity, which is really what all 'local places' consist of. By entering that hybrid, we change it, and in each situation we may play a different role."<sup>138</sup>

Berry asks the question: "How do we begin to remake, or to make, a local culture that will preserve our part of the world while we use it? We are talking here not about just a kind of knowledge that *involves* affection but also a kind of knowledge that comes from or with affection – knowledge that is unavailable to anyone in the form of 'information.'<sup>139</sup> This is knowledge learned through practice, through use. It is knowledge learned and internalized through situated spatial practices. Hillier reminds us that this kind of knowledge – social knowledge – cannot be learned in universities. Instead, it is learned through the very process of living, through the complexities of interaction in space and time. Hillier suggests that "social knowledge works precisely because the abstract principles through which spatio-temporal phenomena are brought together into meaningful patterns are buried beneath habits of doing."<sup>140</sup> He goes on to caution that social knowledge (and, likewise, cultural knowledge), must be distinguished from "analytic" knowledge such as the kind we learn in schools and universities. The key difference, he notes, is that while the purpose of analytic knowledge is to understand the world, social knowledge informs us on how to *act* in the world.

The difference between discursive knowledge and analytic knowledge is one of Wendell Berry and Wes Jackson's major points of criticism. Jackson states: "The culture believes that we are in the midst of an information *explosion* because of the status granted the

knowledge accumulated through formal scientific methods. In contrast, knowledge accumulated through tradition, daily experience, and stories, mostly in an informal setting, has little status. We have taken this 'folk knowledge' for granted, I suspect, for however *complex* it might be, it was not all that *complicated* to internalize."<sup>141</sup> In speaking of cultural information, Jackson is speaking primarily about the knowledge needed to farm carefully and successfully, knowledge which has evolved over generations – knowledge which derives from situated spatial practices. The danger is that, as rural areas have been depopulated, much of this knowledge has been lost. Jackson likens it to the loss of genetic information through extinction and the genetic narrowing of major crops; he writes: "This cultural information, which was hard won through sweat, tears, injuries, and death, will have to be won back in the same manner, and not just for the land, but for the urban culture too. Though cultural information can evolve faster than biological information, once lost it will be difficult to regain."<sup>142</sup>

In order to support the retention and evolution of land-based cultural knowledge in rural areas – and the spatial practices which support that knowledge – we must build spatial practices into cities which correspond directly to their rural counterparts. It is all the more important to do so if the city has become, as Paetzold charges, "a zone of signs and media that could be defined as a sophisticated but banal total environment, destroying the symbolic forms of cultural and political relations, concealing and cosmeticising the precarious social and natural situation worldwide."<sup>143</sup> The strength of the discursive knowledge carried through spatial practice is that it precedes knowledge passed through words, signs, and symbols; it is, therefore, potentially much more resistant to the totalizing effects of the metropolis and its global networks. This is only true, however, as long as the proper spatial configuration exists to sustain these spatial practices in the first place. As Lefebvre says, "It is not a question of *localizing* in pre-existing space a need or function, but on the contrary, of *spatializing* a social activity, linked to the whole by *producing* an appropriate space." [emphasis Borden et al.]<sup>144</sup>

Thus we come to the goal of this project: the identification of spaces in the city with the most potential for a specific spatial practice: the farmer's market. The farmer's market is supported by small-scale, local producers – the very farmers lionized by Berry, and the people who at present probably retain the most cultural information about how to farm appropriately within their given region. The ultimate goal, of course, would be to identify an entire network of locations for farmer's markets throughout the metropolitan area, not only in the core of the city but along the strip, in parking lots, and at city parks, thus seeding these spatial practices through urban as well as suburban cultures. In the creation of these spaces we forge a direct link between the spatial practices of the city and those of the country, and in so doing we link the cultural information systems which have been sundered for so long. It is a first step, a slow cultural change, but a necessary first step.

## Process: space syntax

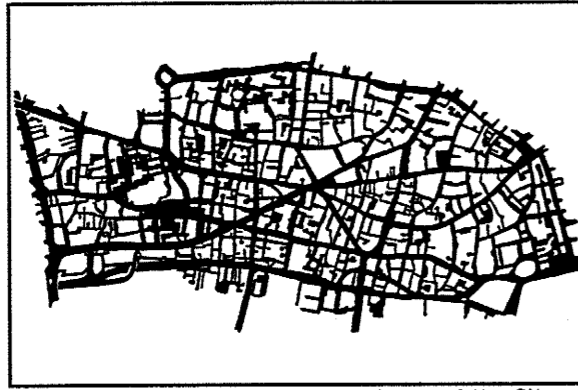


Figure 5. Inverse figure-ground map of the City of London showing spatial configuration. Hillier, *Space is the Machine*, 157.

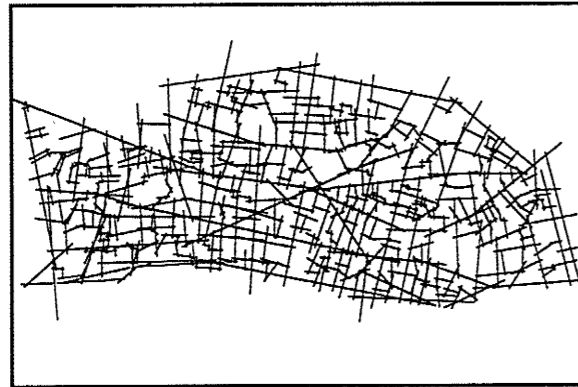


Figure 6. Axial map of the City of London, derived from the space map shown above. Hillier, *Space is the Machine*, 157.

Because this project depends upon the identification of places which are formed through the configuration of space in the city, we must understand the origins of space syntax and how it is used as an analytical tool. And specifically, how I have used it in this project.

Space syntax began to be developed at Cambridge during the 1960s as a way to understand how human societies gave themselves spatial form, and has since developed into three related strands of research: first, to investigate space as an independent variable in society; second, to understand what common effects spatial configuration has on human behavior, and in particular movement; and third, to understand how different societies use autonomous spatial laws (as identified in the first two strands of research) to construct themselves in space-time.<sup>145</sup> Research in the field has sought to link syntactic analysis, which is based on mathematical graph theory, with a wide range of other fields ranging from anthropology and sociology to human cognitive studies and urban studies.

At the heart of space syntax theory are relatively simple and elegant mathematical models of cities and buildings – graphs, composed of nothing but lines – called *axial maps*. Axial maps were conceived as a means to model how humans orient themselves and move through space. As research has repeatedly shown, human movement – pedestrian movement in particular – can be predicted to a large extent simply through the analysis of an axial map.<sup>146</sup> This despite the fact that axial maps do not take into account the physical distance between points, topography, or “attractors” such as shopping centers, museums, or landmarks. This is not to say that these do not matter; for instance, the presence of attractors or areas of higher building density will increase the number of people moving through a space. But as the analysis of syntactic models versus empirical data shows, it is the configuration of space in the city that makes the difference.

In an axial map, the space of the city is abstracted as a network of lines. These lines are laid out in such a way that they pass through all the spaces in the city, using the fewest number of lines and the longest lines possible (Figures 5 and 6). These lines are understood as potential lines of movement; literally “desire lines” in some cases. In arranging them using the fewest number and the longest lines possible, the simplest and most direct routes through a space are represented. This quality – finding the most direct routes through space – thus internalizes, to a certain extent, both metric distance and direction.<sup>147</sup> But we must also note that axial lines do not represent movement from one location to another location. Instead, they represent movement from *all* locations to *all other* locations – any place can be an origin of travel, any place can be a destination. The basic spatial grid (in this sense, grid does not necessarily mean an orthogonal grid) of the city makes no differentiation to where people start and finish their journeys.<sup>148</sup> It is exactly this quality of *not* privileging one space over another, in looking at space from a purely *relational* point of view, that permits the axial map to express both local and global spatial characteristics.<sup>149</sup>

This does not mean, however, that the axial map is constant. Each line in the map has a unique relationship to every other line in the system. If we count the number of steps it takes to get from one line to every other line in the system, we quickly find that each line has a unique value, or *depth* in the system. If a line is said to be “shallow”, it means that, relative to all other lines in the city, it takes fewer steps to reach any other line in the city. A “deep” line is just the opposite. If we look at the city as a whole, it is fairly obvious that the shallowest lines will tend to be near the core of the city while the deepest lines will be close to the periphery. These different depth values create enormous inequalities throughout the grid; “it is these differences”, writes Hillier, “that govern the influence of the grid on movement in the system: roughly, the less depth to all other lines, the more movement; the more depth the less.”<sup>150</sup>

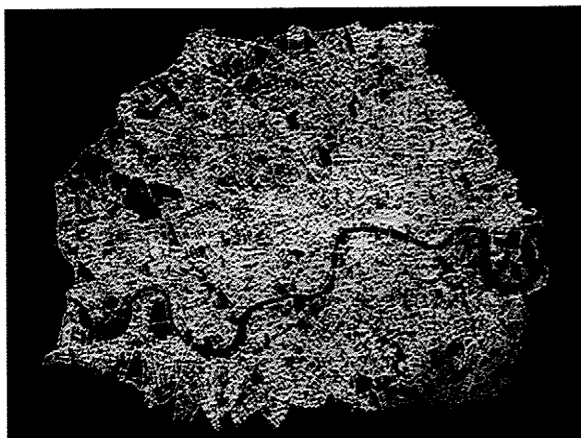


Figure 7. Integration map of London at radius-N, or global integration. Hillier, *Space is the Machine*, plate 2.

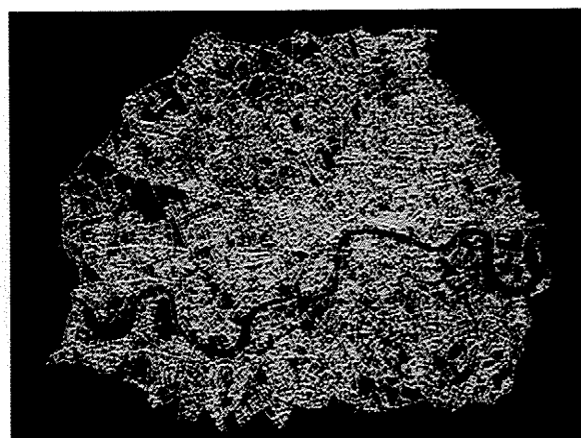


Figure 8. Integration map of London at radius-3, or local integration. Hillier, *Space is the Machine*, plate 2.

A second measurement which is closely related to depth is *integration*. Integration is the primary measurement in axial analysis. Whereas depth measures the mean topological distance from one line to all other lines in the system (a measurement that can be done without knowing the depths of any other lines in the system), integration is a relational measurement: the integration value of one line depends on the integration values of all other lines in the system. Integration can thus be used as a powerful analytical tool when investigating complex relational entities such as cities. "Integration values in line maps are of great importance in understanding how urban systems function," Hillier writes, "because the amount of movement associated with each line "is very strongly influenced by its 'integration value' calculated...by how the line is positioned with respect to the system as a whole."<sup>151</sup> It seems paradoxical that a single line with no attributes of distance could accurately reflect the amount of pedestrian movement present in that space. Penn makes it clear, however, that a single axial line should not be understood as a single line on a single route, but as a line which is potentially part of any and all routes in the system.<sup>152</sup> Once again, it is a relational measurement, not a direct measurement.

Axial analysis is typically done in terms of different *radii*. This means that for a given study area the integration value is calculated for all lines within a specified number of steps: from one (radius-1, which is also known as *connectivity*) to three (radius-3, or local integration) to infinity (radius-n, or global integration).<sup>153</sup> These different expressions of integration are crucial because when they are analyzed against one another they begin to exhibit the characteristics of activity and use we associate with urban space. There are, for instance, two primary measurements based on different integration values. The first is intelligibility, which is a function of connectivity (radius-1) measured against global integration (radius-n). This is essentially an expression of how many spaces are connected to a given space. Hillier defines "an intelligible system [as] one in which well-connected spaces also tend to be well-integrated spaces."<sup>154</sup> While pedestrians need intelligible spaces to understand how to move through their immediate surroundings, it is also important for axial analysis. As Penn notes, "as areas become less intelligible, they also appear to lose the relationship between spatial integration and movement."<sup>155</sup>

The second measurement shows how well urban sub-areas are situated within the system as a whole. This is a function of local integration (radius-3) against global integration (radius-n). Because local integration provides a good indication of local movement and short trips, and global integration is a good model for longer trips and movement across a large area, this measurement can offer insight into how spaces might be used and occupied. Furthermore, a well-developed city will produce strong and productive relationships between local and global scales, both in terms of movement and form. According to Penn, this relationship also will determine to what level locals and non-locals will interact: "If cities act as mechanisms for generating contact between locals and those from elsewhere (as the needs for transaction and communication would dictate), then a spatial mechanism at the basis of this would be likely to include correlations between local and global movement structures."<sup>156</sup> An analysis of the radius-3 and radius-n relationship of one area of the city can, in relation to the rest of the city, show how well these relationships are working.<sup>157</sup> According to Penn, this same analysis not only can identify neighborhoods, but can show where neighborhoods are particularly spatially well-established: in these neighborhoods "there is a strong and substantially steeper correlation between local and global measures for the neighborhood as compared to the city as a whole."<sup>158</sup>

The major function of axial analysis, however, is the prediction of pedestrian movement. Let us be clear about one thing at the outset: axial analysis does not predict actual pedestrian *counts* or *numbers*. Axial analysis only shows the movement *potential* on a given line. The correlation between the values of an axial map and real-world values, however, is very high: in general, axial

analysis can account for 75% of all movement through space.<sup>159</sup> The remainder can be traced to functions of building density, land use, attractors, and other effects which increase or decrease the rates of movement through space.

Hillier asserts that it is this relationship between space and movement that drives the evolution of cities – from Atlanta to London to Beijing. “The urban grid evolves and creates a pattern of movement potentials, and, to some degree, movement. Land uses which are movement dependent, such as retail, then select locations with high-movement potential, and others, such as residence, select locations with lower movement potential.”<sup>160</sup> Commercial areas attract more movement, which attracts more retail; these developments lead to higher building densities and even higher rates of movement. And because different societies have different expectations of how much movement or interaction should occur at varying scales and locations in the city, the spatial form of the city will be expressed differently depending on culture.<sup>161</sup> This is an *emergent* quality of city evolution: small changes affecting changes at larger levels. This conceptual thread – that there is an inherent logic to space, even if there is not an observable order – runs through Hillier’s arguments. So while cities may evolve unconsciously, it is highly unlikely they develop accidentally or chaotically.

Different *kinds* of movement also follow these patterns of attractional inequalities in space. Some trips are made with the intent to traverse distance; movement of this variety requires relatively direct and unimpeded travel and tends to suggest the idea of a specific origin and destination. For instance, we might think of major highways; these roadways have almost always been based on older highways, arterial roads, back to old trading routes. The same purpose for travel on these roads has always been a part of human civilizations: to move people and goods over long distances. On the other hand, spaces which are geared to move people as quickly and efficiently as possible is detrimental to interaction and commerce. Spaces of interaction require slower, more interrupted movement – and movement from potentially any point in the city.<sup>162</sup> While these two kinds of spaces or movements can and do coexist, it is rarely an easy coexistence. In this sense, the city is not, as Koolhaas says, “a plane inhabited in the most efficient way by people and processes.”<sup>163</sup> Given the many varieties and purposes for human movement and the scales between and through which these kinds of movement pass, it is rare that we might find instances in real space in which true efficiency occurs. What axial analysis can show, based on the relationship between radius-n and radius-3 integration values, is how these different kinds of movement relate.

## **Case study: Atlanta**

As previously mentioned, Peponis et al. conducted a study of space syntax in Atlanta, Koolhaas’ example of the metropolis *par excellence*. This study is particularly important for my own work given that this is the first major test for space syntax that I know of in a North American city. They focused on two areas of Atlanta in particular: downtown Atlanta, including Portman’s Peachtree Center, and Buckhead, a suburb identified by Garreau as an “edge city.” A comparison of the integration patterns of the two areas – a relatively dense, urban core development with its requisite voids and parking lots, versus a suburban development with segregated land uses and strip development – shows how different spatial typologies give rise to different patterns of movement. Peponis et al. also compared these areas of Atlanta to Greek towns which exhibit similar spatial patterns and thus, it was thought, similar movement patterns. Their findings for downtown Atlanta were much as they expected. The *integration core* – the areas where integration values were highest – was found at the center of the city, and was reasonably well-connected to surrounding areas. An area with a spatial typology similar to the strip (such as that in Mytilini, Greece) will have a strong central “spine” as its integration core, and will tend not to be as well connected with its surroundings.<sup>164</sup> But Buckhead, they found, was still different, owing perhaps to its genesis as an edge city. In Buckhead, they write, “There is an evident distinction between the large secluded areas in the periphery and the integrated hub in the middle. It is more striking, however, that the integration core should fail to extend significantly in any

direction... Not only are we not encouraged to traverse the neighborhoods, but we also cannot develop a clear sense of the larger scale of urban organization.”<sup>165</sup>

Despite the significant configurational difference between space in Buckhead and more traditional urban space, Peponis et al. found that there was still very good correlation between integration values and observed pedestrian movement. The same was true for downtown Atlanta, including the area around Peachtree Center. All in all, the correlation between pedestrian movement and integration is similar to that observed in Europe, even if the observed pedestrian counts are lower.<sup>166</sup> Peponis et al. do make a significant observation, however, regarding the correlation between observed pedestrian movement and integration: in Buckhead – and, to a lesser extent, downtown Atlanta – higher integration does not translate directly to a higher density of pedestrian traffic, but a greater *range of densities* of pedestrian traffic.<sup>167</sup> The reason for this, they speculate, is that because there are more people on the streets downtown than in Buckhead (1 per minute in Buckhead versus 13.6 per minute downtown). Thus “as the overall number of people on the street increases... the streets become used proportionally to their integration.”<sup>168</sup>

With this study we find that the patterns predicted by space syntax work in American cities, even in the largest and most sprawling. Perhaps Lerup understands this intuitively when he writes: “It may seem ironic, in light of the optimism that pervades this book in relation to radical mobility, fluidity, change, even placelessness, and instant communication, that in the end the most direct solution to museum isolation [in Houston] is the call for a measure of pedestrian space best performed by traditional plazas and boulevards.” He goes on to caution that all the space in the city cannot be seen as public; “Public space,” he says, “happens wherever it can land. ... [It] is not the plaza of the city, but a particular blend of soft and hardware, more vapor than pavement, more dynamic than stable, because it is bound to events rather than manifested by places.”<sup>169</sup> The lesson of space syntax, however, is that while public space may indeed occur “wherever it can land,” the potential for any space in the city to be a well-used public space is largely determined by the configuration of space in the city. The location of public space is not accidental, whether it be in Portland or Atlanta. If we understand space in the city with respect to configuration, then, we can cultivate those spaces with the amenities and qualities which give rise to truly successful public spaces. If we construct these spaces in conjunction with civic programs which support small-scale, local, and environmentally friendly agricultural practices, we can begin to engender the broader social and cultural practices which must form the foundation of the sustainable city. Ultimately, then, the construction of the sustainable city must occur at every scale: from the individual to the metropolis, from the kitchen to the countryside, and from the practices of one person to the cultural practices of an entire society. And this all must eventually be revealed in *space*.

## Site Analysis

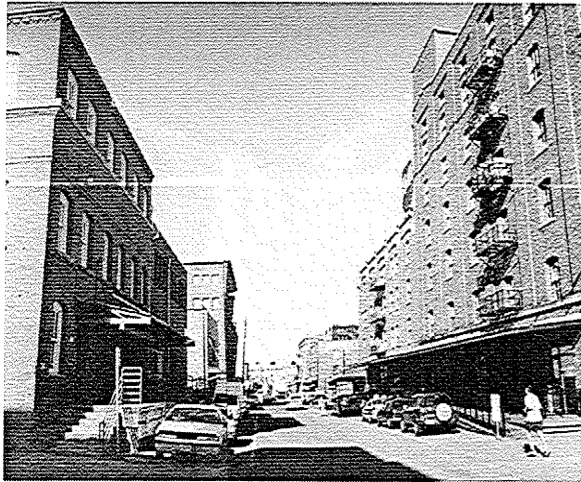


Figure 9. The Pearl District. Flanders at 13th.



Figure 10. The Pearl District. Everett at 15th.



Figure 11. Northwest Portland. Everett at 18th.

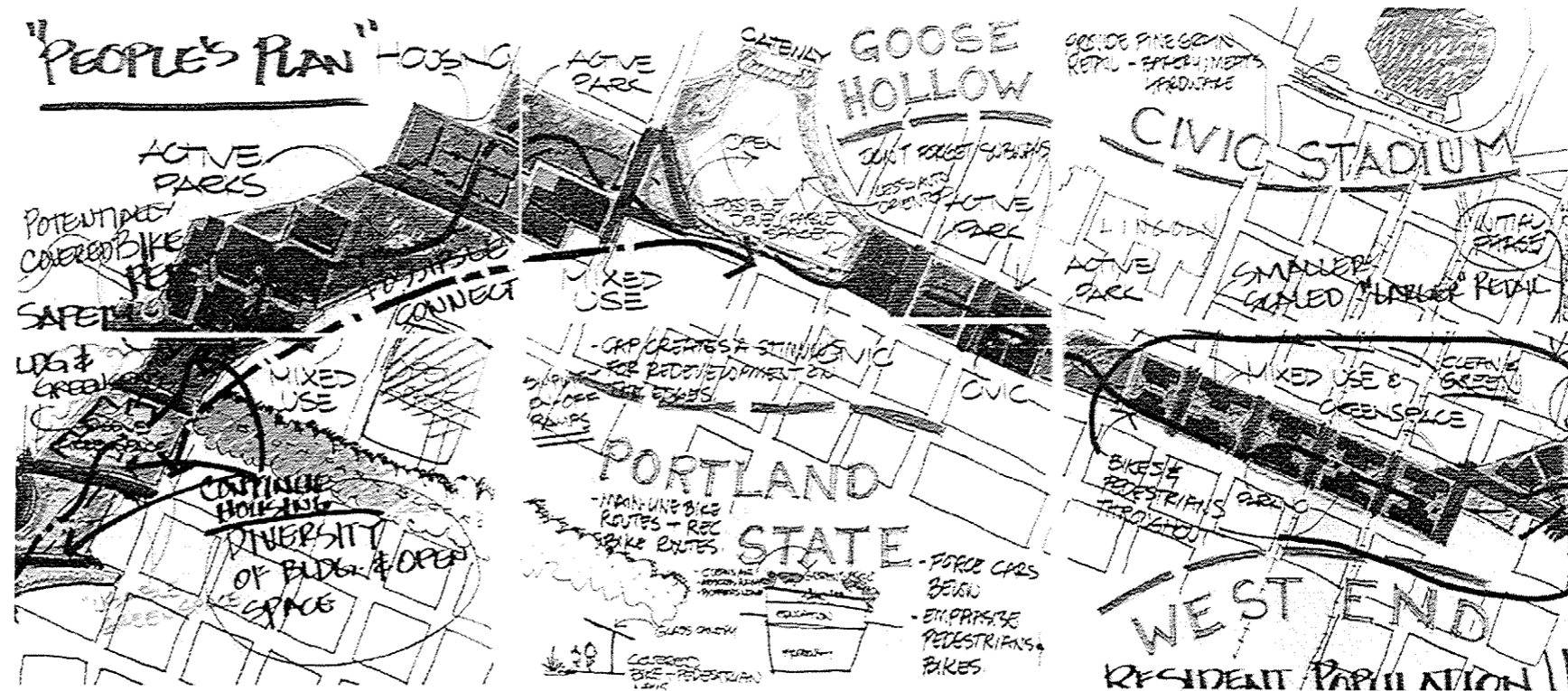


Figure 12. "The People's Plan:" a map assembled from public design charrettes. ASLA. *Bridge the Divide and Cap I-405: Vision Study*, 19.

I first encountered the concept for building a cap over I-405 when I was living in Portland in 1998. It was during this time that the city of Portland and the American Society of Landscape Architects (ASLA) were conducting public design charrettes; articles and commentary on the project appeared regularly in *the Oregonian* newspaper. At the time, the project held a particular interest for me as I was living a block away from the highway. I left Portland that fall, and my interest in the project went dormant, only to reawaken when I began to consider possibilities for practicum projects. It seemed a good base for a project: it was a site I knew fairly well, I was aware that some work had been done on the project, and I had connections in Portland from which to begin my investigation.

My first step was to track down information on the project. Using some basic internet searches, I found a few names and email addresses of people who had worked on the project. I contacted the City of Portland as well as the landscape architecture division of Parsons-Brinkerhoff in Portland, who had acted as the primary consultants on the project. I learned that the Vision Study team had investigated the potential for capping the entire length of I-405, from the Glisan Street bridge on the north side to 4th Street on the southeast side. This investigation included research on precedents (from Freeway Park in Seattle and Ronda De Dalt in Barcelona to "The Big Dig" in Boston) and three-phase public input process.<sup>170</sup> From the public input and through their own design process they determined that it was feasible to cap 26 of the original 38 blocks above the interstate.<sup>171</sup> As mentioned at the outset, they focused on two areas in particular: the MAX blocks adjacent to the MAX light rail lines, and the so-called "Bright Lights District" at Burnside Street.

Using the Vision Study and the subsequent I-405 Strategy Team Final Report as a benchmark, I began my own analysis with several trips to Portland in 2000 and 2001. It quickly became clear to me that it was well beyond my reach to take on the entire capping project. It seemed prudent to focus my efforts on the same area as had been identified in the Vision Study – the MAX blocks

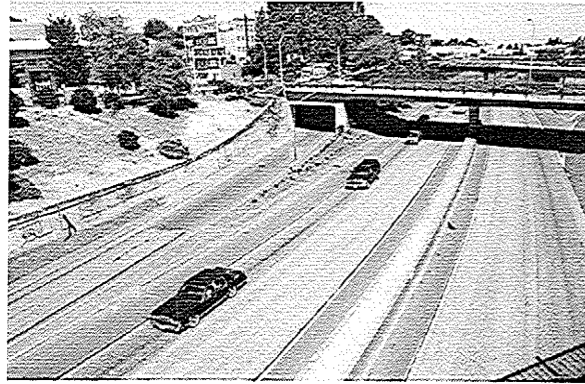


Figure 13. Site photo of I-405, from 14th Street.



Figure 14. Looking south along I-405 toward downtown Portland, taken from 16th and Everett.



Figure 15. Goose Hollow/Stadium District, Morrison and 17th.



Figure 16. Goose Hollow/Stadium District: MAX blocks, Yamhill and 13th.



Figure 17. Site photo, Burnside and Alder bridges over I-405, taken from the Couch Street bridge.

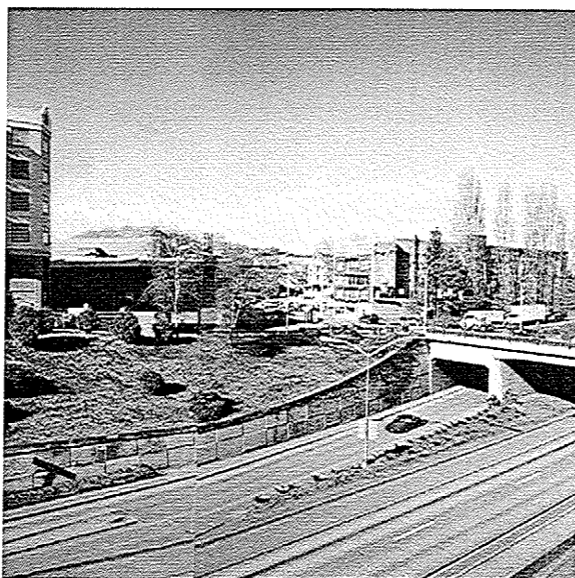


Figure 18. Site photo, looking northwest from Washington and 14th Streets.

and Burnside – not only because of their reasoning but because I knew that area quite well from when I had previously lived in Portland.

I began basic site analysis - sketches, diagrams, photographs, and notes - in February of 2000. I recognized intuitively that there was a potential to the site that surpassed the programs suggested by the Vision Study and Strategy Team Final Report, a potential which it seemed would be supported analytically through space syntax theory and axial analysis. I expanded my site analysis in July and August of 2000 and began to consider different approaches I could take with the application of axial analysis to the site. I had hoped to compare syntactic modeling with pedestrian counts, but I had neither the time nor the ability to do all the counts that would have been necessary. Nor did I have the statistical knowledge necessary to interpret my data. I was aware, however, of the general flow of people and vehicles across the bridges over the freeway, both through observation and the experience of living in the near vicinity for nine months.

The fact that I had a feel for the area helped to narrow down the site even more. I knew from experience that many more people- both pedestrians and vehicles - used the Burnside bridge over the freeway than neighboring bridges. I knew how people moved through and used the area, both day and night. I was familiar with the character of the four neighborhoods surrounding the site and how they had changed in the two years since I had left – the Pearl District in particular. The conclusion I arrived at – similar to the one reached by the Vision Study Team – was that while the MAX blocks were important, the block between Burnside and Alder was far more important. The Burnside block was the crux of the four neighborhoods.

More significant than the geographical location of the site, however, was the syntactic potential of the space. At present, Washington Street comes to an abrupt



Figure 19. Site photo, Couch and 16th, looking southeast towards Burnside.

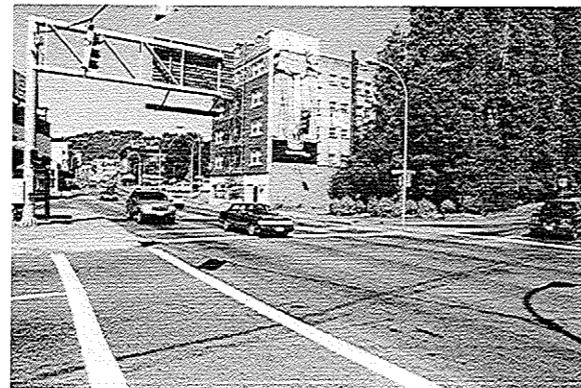


Figure 20. Site photo, Burnside and 15th, looking west.

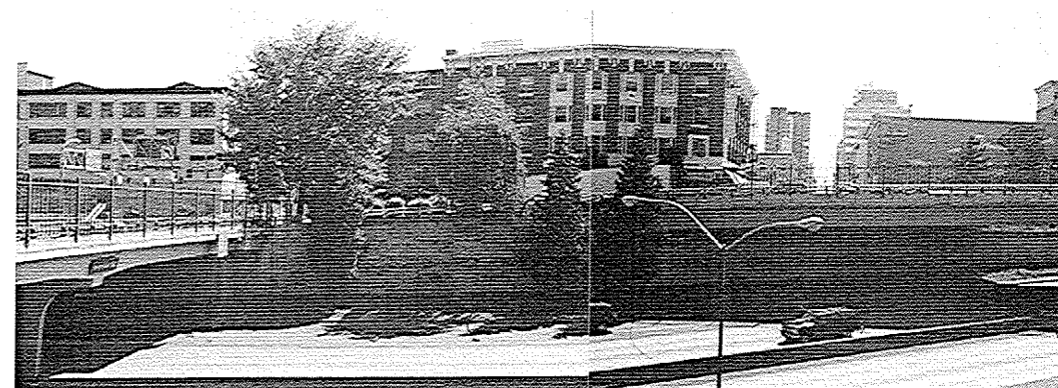


Figure 21. Site photo, on the Washington Street axis at 15th, looking east down Washington.

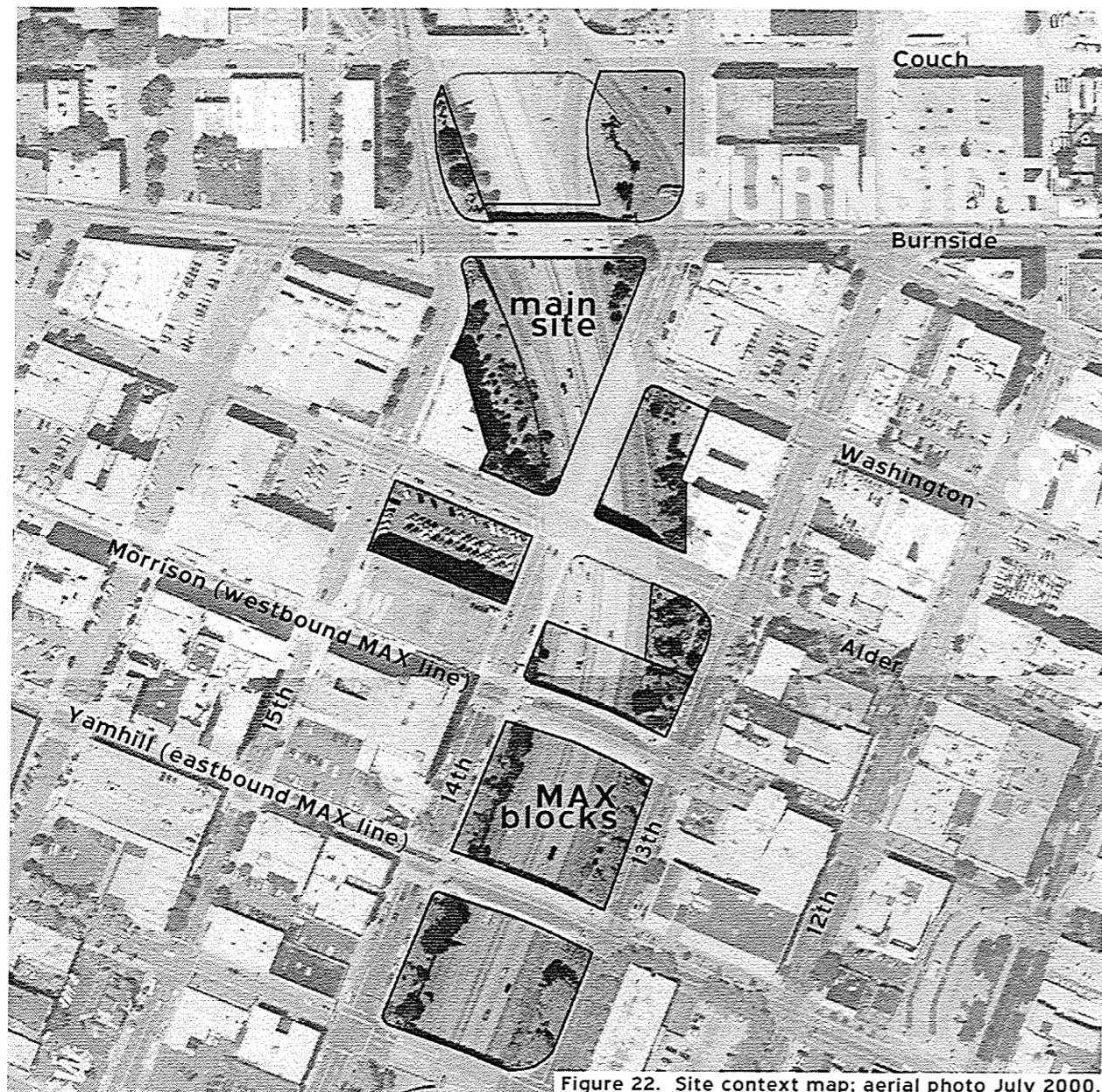


Figure 22. Site context map: aerial photo July 2000.

end on the east side of the freeway, between Burnside and Alder. Washington is one of the few streets in downtown Portland which has a direct connection to a bridge crossing the Willamette River. Alder is its twin: the Morrison bridge splits into the two streets when it reaches downtown. Burnside also spans the Willamette. If the interstate were to be capped such that Washington could meet Burnside, it would connect two very well integrated lines of movement in one space. I resolved, therefore, to focus on the block between Burnside and Alder, with some additional attention paid to the blocks between Burnside and Couch and the MAX blocks. In general I accepted the recommendations of the I-405 Strategy Team for the MAX blocks: mixed use housing, commercial on the ground level, and some parking. This approach would extend the character of the surrounding urban fabric across the freeway, as a link between the neighborhoods.<sup>172</sup>

The key, however, was to conduct an axial analysis of the site. I conducted this process in tandem with the design process, constructing axial maps and experimenting with the axial analysis software while generating design solutions for the cap at Burnside. For the most part, however, the construction and analysis of the axial maps did not depend very much on the site design. Indeed, the evolution of the site design depended in large part on space syntax theory. My early sketches for the site plan were based largely around pedestrian flows through and around the site, and site form evolved from these. I knew that because the site lies near the intersection of two major streets, it was quite clear that the site configuration would have to maintain those basic axial relationships if the potential of the site was to be realized. By the time I was ready to undertake the actual analysis, then, much of the basic site structure had already been set.

There are a number of different ways to construct axial maps, the most basic of which is to use the principle of abstracting the space of the city

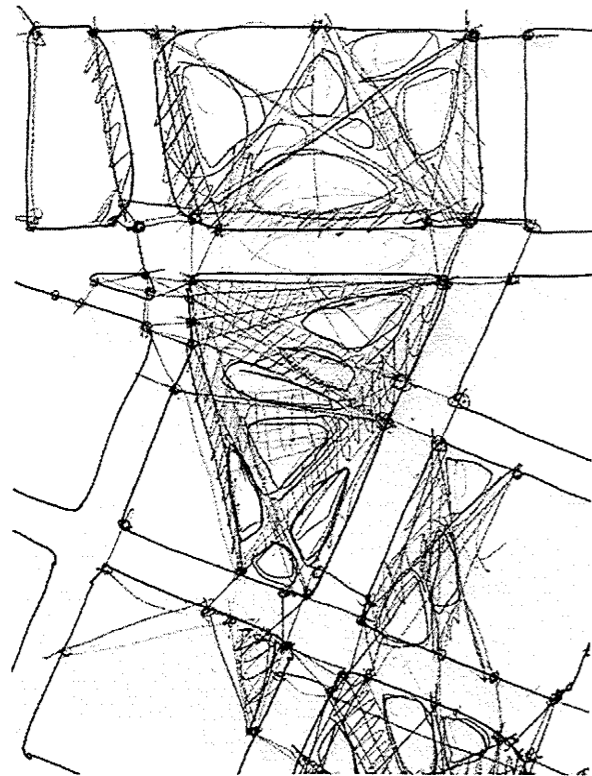


Figure 23. Early schematic sketch showing potential lines of movement and lacunas

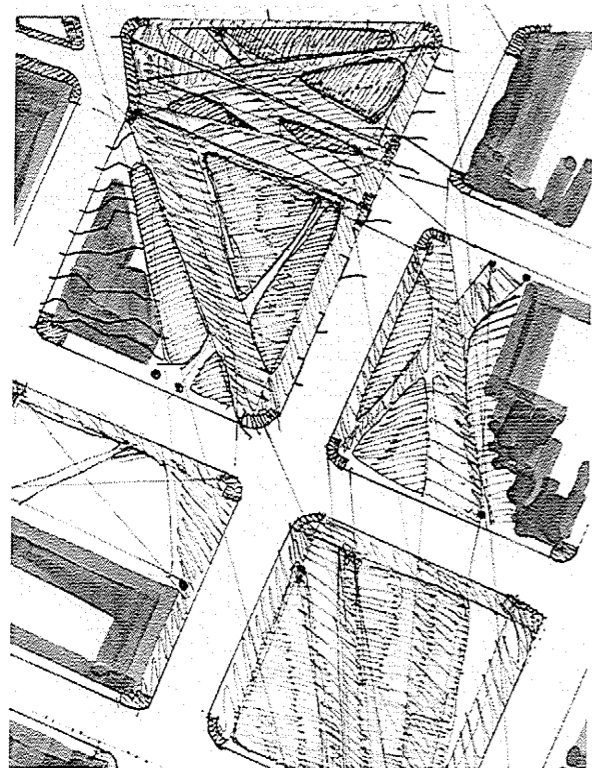


Figure 25. Early schematic sketch showing a more refined concept of lines of movement and lacunas

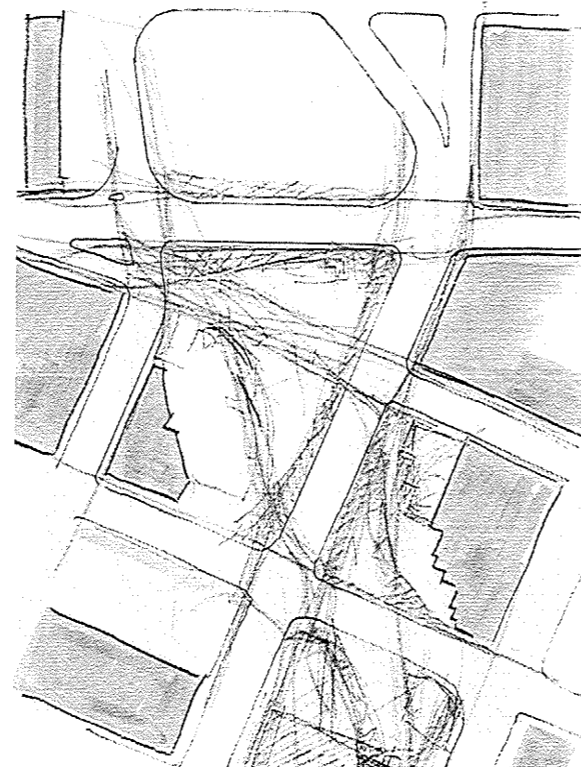


Figure 24. Early schematic sketch showing main flows between Burnside and the light rail stops at Morrison/Yamhill and 13th

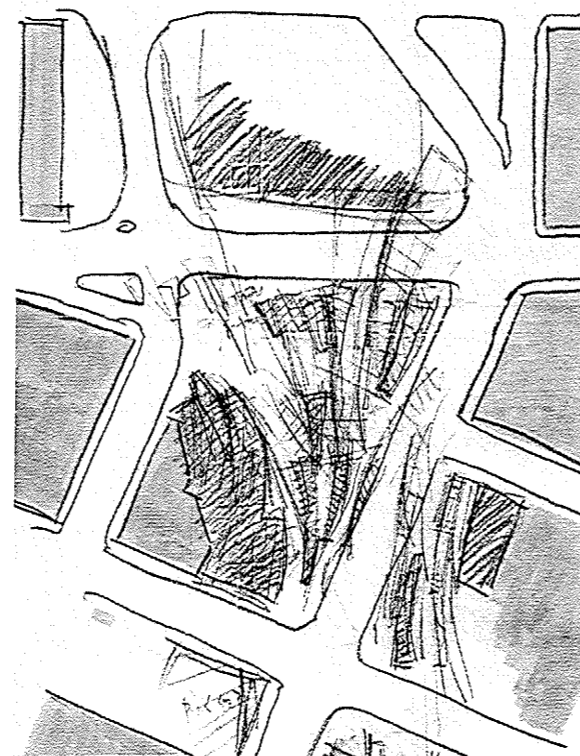


Figure 26. Early schematic sketch showing the influence of pedestrian movement on potential form



Figure 27. Major lines of movement.

using the fewest and longest lines, ignoring the differentiation between pedestrian and vehicular zones of movement. There are variations within this theme, however; of particular interest to me was the syntactic analysis commissioned by Sir Norman Foster for the redesign of Trafalgar Square.<sup>173</sup> Given that one of the primary goals of the redesign was to make Trafalgar Square more pedestrian friendly, the axial map was constructed to only include spaces which were pedestrian oriented: sidewalks, plazas, and specific crossing points (both formal and informal). The subsequent analysis found that the axial model, like other axial models in other situations, accounted for 75 percent of the pedestrian movement in and around Trafalgar Square.<sup>174</sup> Based on these findings, I used this method to construct an axial map for Portland.

The second key point in the construction of axial maps is determining the extents of the map. Theoretically, one could construct an axial map not just of one city but an entire state or country. In the instruction manual for the syntactic analysis computer program 'Axman,' Tim Stonor and Nick Dalton recommend limiting the axial map to areas accessible within 30 minutes from the site of interest – for pedestrians, this is about a two-mile radius. It is not a hard and fast rule, however: if there are natural barriers – rivers, impassible hills, highways with few crossing points – these can be used as a boundary to the map.<sup>175</sup> Although downtown Portland is constrained by two such barriers – the Willamette River to the east and the West Hills to the west, both are easily within a half-an-hour walk from 14<sup>th</sup> and Burnside. In addition, the bridges across the Willamette are the only connections between downtown Portland and the East Side; as such, all the bridges and the areas of the city on the near east side needed to be incorporated into the axial map to provide a realistic model of movement across those bridges.

The base axial map I constructed for this project, therefore, incorporated an area of Portland roughly within a 2.5 mile radius of the site. The East Side is more heavily represented than the West Hills, in part because I wanted to ensure that the movement rates on the bridges were properly represented. It is also because there simply are not as many roads or neighborhoods in the steep terrain of the West Hills, and, in fact, part of the study area – Forest Park – lies outside the Urban Growth Boundary. I set the southern limit to include the Ross Island Bridge; the northern and eastern limits were generally set by the radius of the map. The map

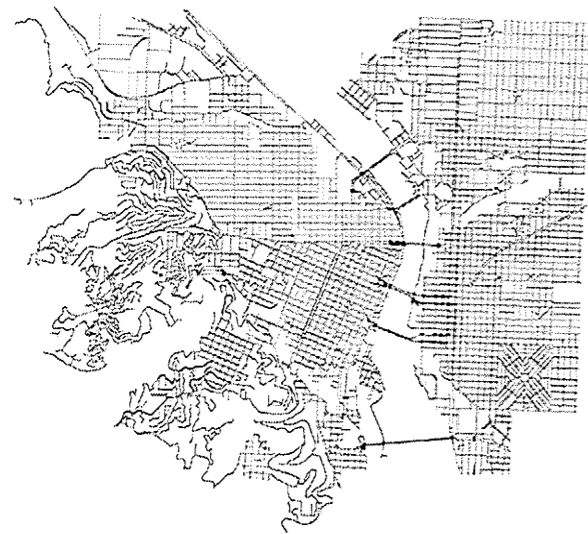


Figure 28. Existing conditions axial map.  
radius-3 integration

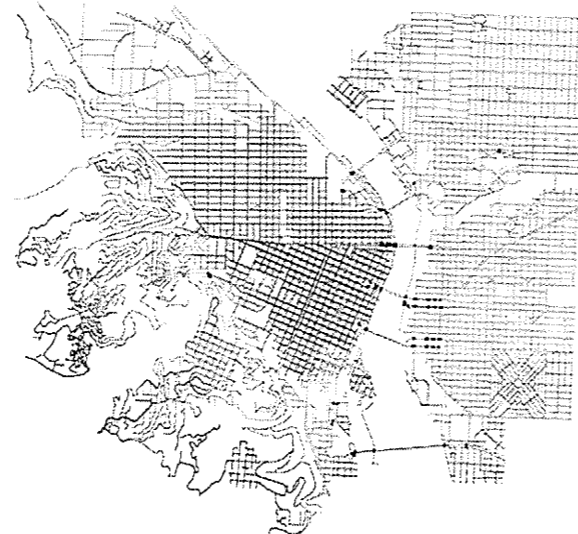


Figure 29. Existing conditions axial map.  
radius-n integration

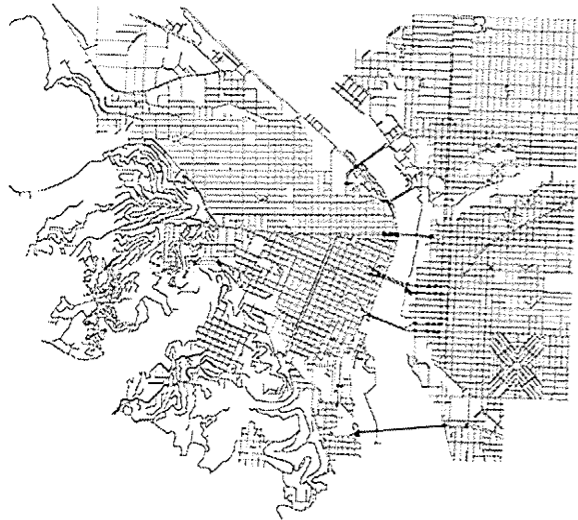


Figure 30. Proposed design axial map.  
radius-3 integration

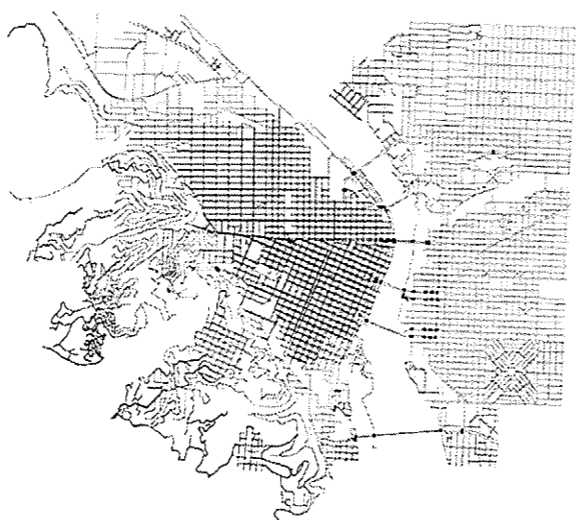


Figure 31. Proposed design axial map.  
radius-n integration

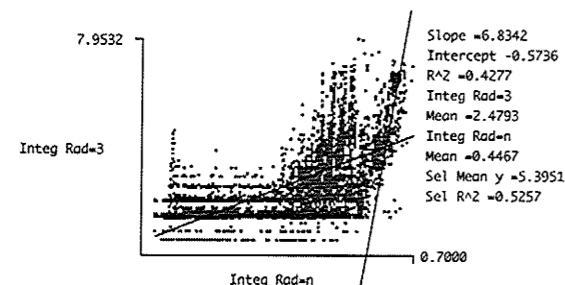


Figure 32. Scattergram showing Pioneer Courthouse Square in relation to the study area.

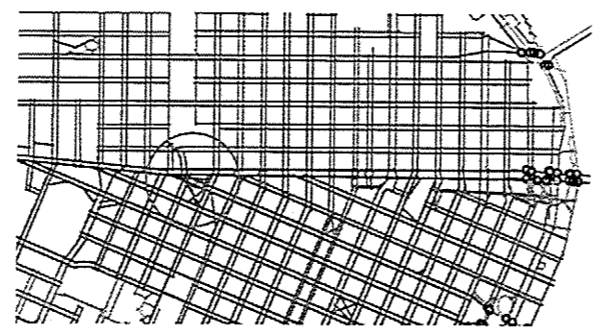


Figure 33. Enlargement of proposed design axial map.  
radius-n integration

was primarily based upon city of Portland CAD drawings and supplemented with aerial photographs from the city of Portland, GIS files from Metro, and my own personal experience. The latter proved to be helpful, for there are areas which are accessible to pedestrians which do not appear on maps or aerial photos; likewise, there are places which pedestrians cannot cross and streets which are virtually impossible for a pedestrian to cross. These characteristics needed to be taken into account for the analysis to function well.

Once the base map has been created, any number of changes or additions can be made and analyzed. I therefore created many different axial maps, each slightly different: one based on my own design for the I-405 cap; one based on the schematic design shown in the Vision Study document; and one based on a simple cap on I-405, without plaza or market. I also constructed and analyzed axial maps for the following: seven variations on my design; Saturday Market (an open-air market, under the west side of the Burnside Bridge); Pioneer Courthouse Square; O'Bryant Square; Ira's Fountain and Lawrence Halprin's pedestrian network (including Pettygrove Park and Lovejoy Fountain); and 35 other potential sites for a farmer's market, located in existing open spaces and parking lots in downtown Portland and the near East Side.

Given that the design of a market/plaza space is the primary purpose of this project, the comparison between global systems of movement (radius-n) and local systems of movement (radius-3) is the appropriate syntactic method of analysis. Sites with the most potential for the development of a market/plaza space will most likely be those which are highly integrated both globally and locally, meaning that there will be both local and non-local people passing through the space. Read proposes that areas with these attributes – spaces situated on a highly integrated radius-n, or *supergrid*, line, which are also highly integrated at the local level – tend to serve not only “the population of the adjacent local area but also people from further away who access it via the supergrid.”<sup>176</sup> What is more, Read says, is that because of the relationship to the supergrid line, these spaces become more important for adjacent local areas than highly integrated spaces within each area.

In the axial analysis of the existing conditions, the sidewalk on the south side of Burnside is the most highly integrated line in global terms, and is among the most highly integrated lines in local terms. This is simply because Burnside not only spans the Willamette but also is one of the few direct routes over the West Hills. The north sidewalk is not so highly integrated, in large part because there

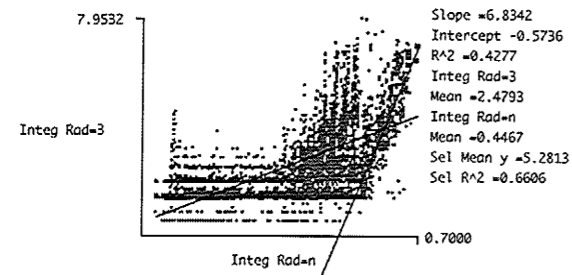


Figure 34. Site scattergram, existing conditions

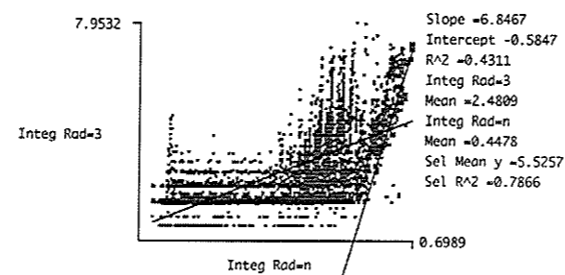


Figure 35. Site scattergram, proposed design

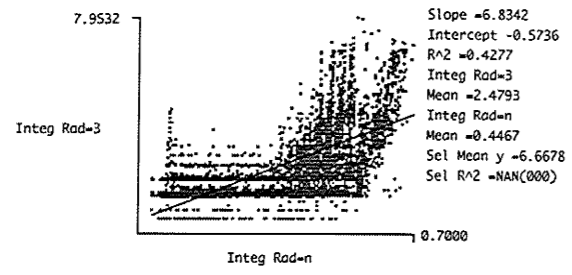


Figure 36. Scattergram, Burnside North existing

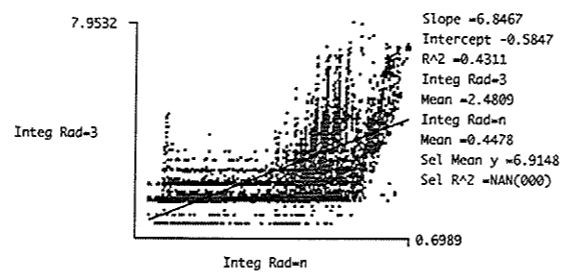


Figure 37. Scattergram, Burnside North proposed

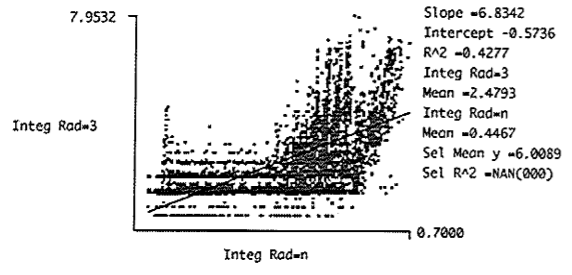


Figure 38. Scattergram, Washington North existing

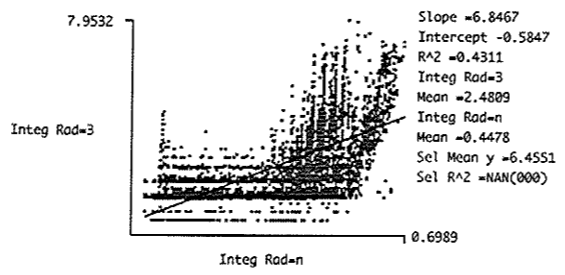


Figure 39. Scattergram, Washington North proposed

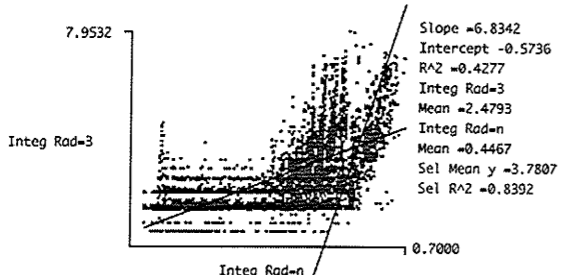


Figure 40. Scattergram, Lovejoy Fountain

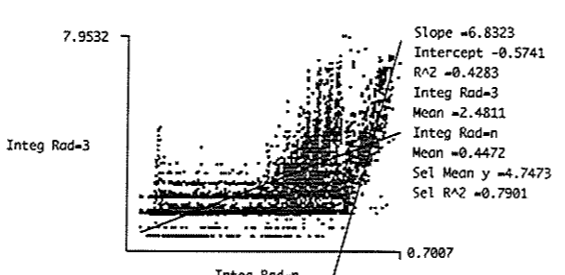


Figure 41. Scattergram, alternate site 7, MAX blocks

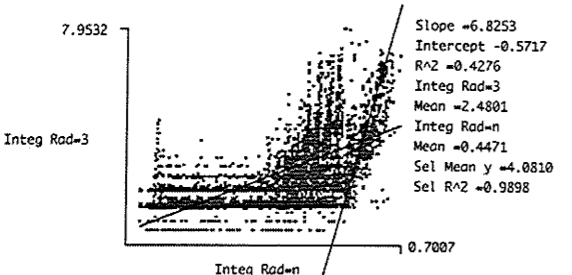


Figure 42. Scattergram, alternate site 19

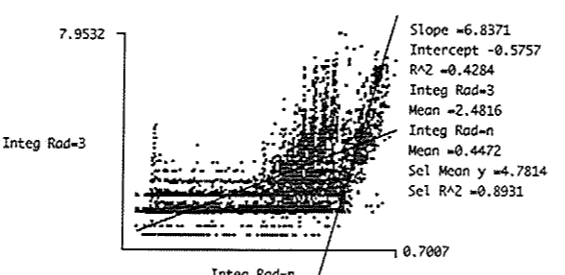


Figure 43. Scattergram, alternate site 28

is no sidewalk on the bridge over I-405. Both the north and south sidewalks on Washington are well above the mean values for both local and global integration.

When we analyze the map with the project design in place, however, we find some marked changes. With a new sidewalk across I-405 on the north side of Burnside, the northern sidewalk becomes, in global terms, the most highly integrated line in the map, with the southern sidewalk a close second. Both sidewalks are still very highly integrated locally. In addition, the sidewalks on Washington now are the fourth and fifth most highly integrated lines in the map in global terms, and still very highly integrated locally.

To the left are a series of scattergrams showing both existing and proposed conditions for the Burnside site; specific scattergrams which show how the existing and proposed conditions affect the sidewalks on the north side of Burnside and the north side of Washington; and scattergrams for three of the thirty-five alternative sites in addition to the scattergram for Halprin's Lovejoy Fountain. In each case I have included the streets and spaces immediately adjacent to the sites. Figure 34 is a scattergram which plots the radius-3 values against the radius-n values for each line in the axial map. When we pick out the lines which pass through the project site, we find that they form a tight scatter around a regression line which is much steeper than that of the rest of the study area. The tight scatter around the regression line means that there is a good correlation between local and global integration in the site; the steep regression line shows that the local integration for the picked lines is enhanced by its global integration.<sup>177</sup> Figure 35 shows the scattergram which includes the project design. While the overall change is subtle, it is significant. Even when we compare it to similar scatters such as that for the alternate site 7 (one of the MAX blocks slated to be capped), it is apparent that the density and tightness of the scatter for the proposed design is superior to alternatives. While the majority of the alternative sites are highly globally integrated, in some cases their local integration falls below the regression line for the study area, meaning that that particular space will have less movement in general than adjacent areas. The most important difference between the alternative sites and the proposed site, however, is that in almost every case the most highly integrated lines (globally and locally) for the alternative sites do not pass through the heart of the space. Market stalls at the Burnside site, on the other hand, take advantage of the Washington axial lines: they straddle major pedestrian routes while not interfering with or obstructing them.

site design



Figure 44. Site context.

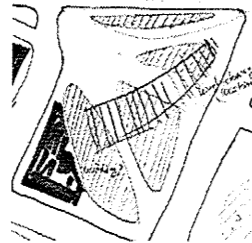


Figure 45. Sketch of site zones and level changes.

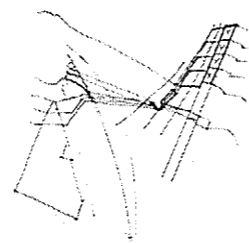


Figure 46. Grading study.

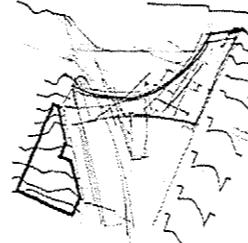


Figure 47. Grading study.

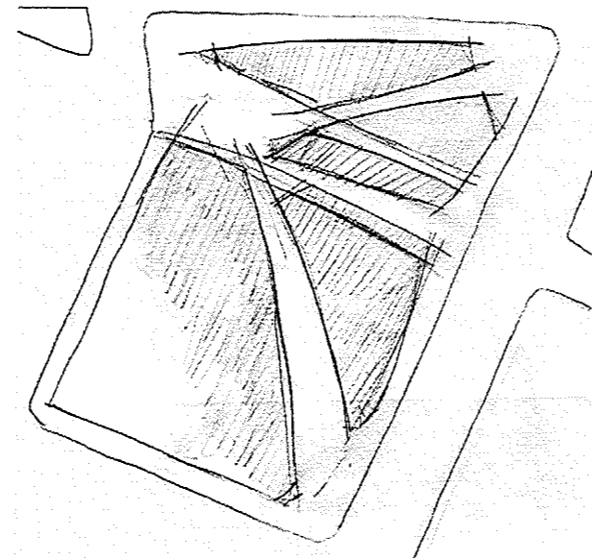


Figure 48. Site zones.

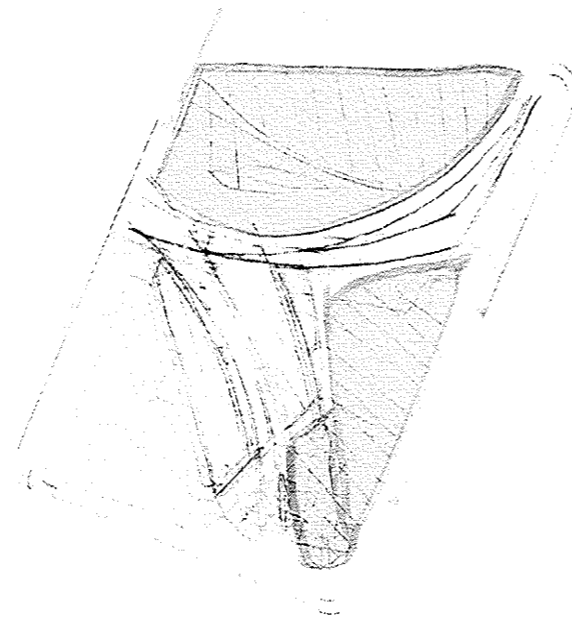


Figure 49. Sketch plan showing upper and lower plazas and building location.

In configuring the space of the Burnside block in this manner, I have attempted not only to take advantage of the syntactic properties of the site for use *and* exchange but also to seed the site in such a way that it can be well-used when the farmer's market is not in session. Speaking in much the same vein as William Whyte, Hillier notes: "The primary activity of those who stop to sit in urban spaces seems to be to watch others pass by. For this, strategic spaces with *areas close to, but not actually lying on*, the main lines of movement are optimal. The main fault in most of the modern open spaces we have observed ... is that the designers have given too much attention to local enclosure of the space, and too little to strategic visual fields- yet another instance of an overly localised view of space. The general rule seems to be that a space must not be too enclosed for its size."<sup>178</sup> [emphasis mine.] Most important, however, is the relationship between the syntactic potential of the site and the spatial practice of a farmer's market. In creating a farmer's market at a site which has so much potential for movement, use, and exchange, we can then begin to construct and transmit the cultural values and practices in the city which will support related practices in the countryside. While one site may not make a dramatic difference in the metropolis as a whole, as a demonstration site and as a major node in a wider network of farmer's markets in the city it could begin to make a significant difference in the way Portlanders relate to their surroundings.

Before the site could be configured in this matter, however, I needed to ensure that people would be able to cross the site in the first place. It is not a flat site; from the corner of Alder and 14th to the corner of Burnside and 14th there is about 20 feet of vertical change, the majority of which lies just south of the Washington Street axial lines. I quickly surmised that I would need to create two plazas: the lower plaza, adjacent to Burnside and straddling the Washington Street axis, would be the main market space. The upper plaza, at the southeastern corner of the site adjacent to Alder and 14th, would be the secondary plaza and market. Connecting these areas - or at the very least keeping intact the potential main lines of movement across the site - was the major challenge (Figure 48). This was also a matter of creating a system of connections which would be fully accessible: ramps at no more than 1:12, preferably at 1:20. I also wanted to maximize the area for the lower plaza to provide as much space as possible for the farmer's market (Figure 49).

There were a number of additional issues which affected the grading. The first was the inclusion of new building - an "urban conservatory," a site amenity

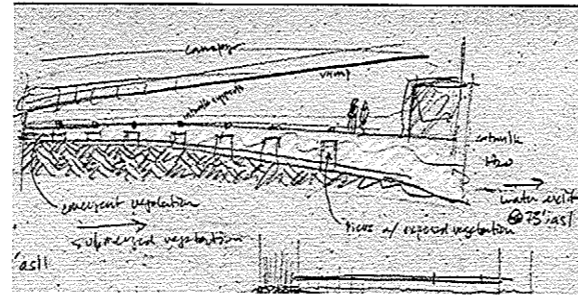


Figure 50. Sketch for the conservatory rainwater detention pond/wetland

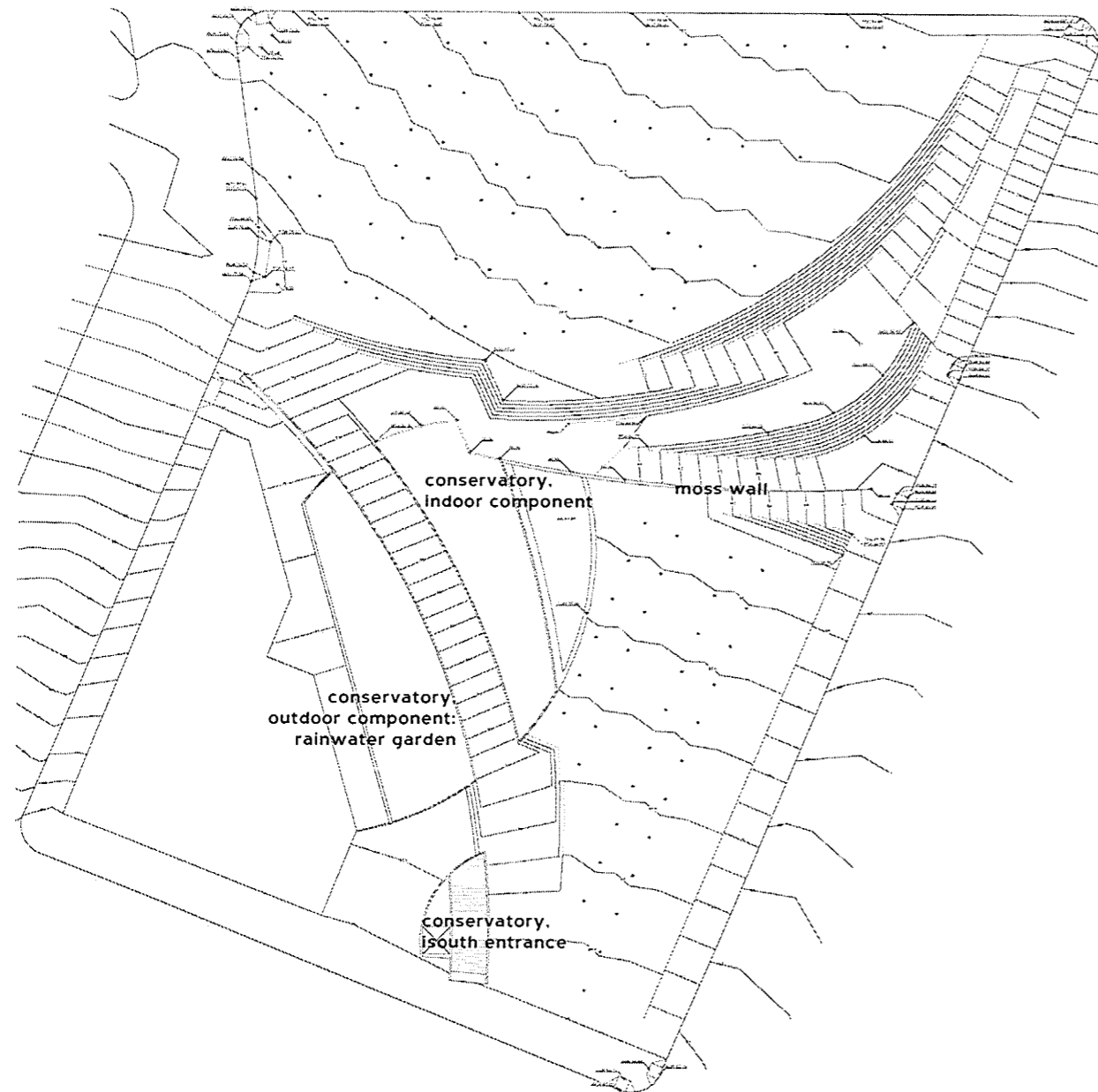


Figure 51. Site grading plan.

suggested in the Vision Study document - just to the west of the middle of the site. The form of this structure was strongly influenced by the location of the highway below: because of the limits of the spaces which could be feasibly capped to support building mass, this building needed to be sited where a highly engineered cap would not be necessary. Thus the building sits just to the west of the existing retaining wall on the western side of the highway. This location, however, compromises the line of movement from the northwest to the southeast corner of the site - an axial line which connects the neighborhoods of Northwest Portland with the West End of downtown. I found, however, that I could place some of the building functions beneath the surface of the upper plaza and to build a long, curving ramp into the center of the building mass to connect one end of the plaza with the other. This also served the purpose of dividing the conservatory into two sections: an indoor component on the east side of the ramp, and an outdoor component which I saw as a possible rainwater garden or demonstration wetland (Figure 50). At the northern edge of the building this ramp joins a second ramp which descends from Washington Street; these ramps, together with ramps linking the northeastern corner, the southern limits of the lower plaza, and the upper plaza, make it possible to reach all parts of the site without using stairs.

Stairs are the medium through which the ramps are integrated into the overall site design. This is a technique borrowed from Pioneer Courthouse Square, where the stairs encircling the edges of the site have become popular places for people to sit. I found, however, that there were a number of situations where stairs could not be used to mediate between changes of level. The first was a narrow band between 14th and the ramp above the lower plaza. I decided the best design solution was the construction of a series of low, stepped retaining walls and planters which would provide more informal seating. Combined with tree planting, it would establish a much needed shady counterpoint for an otherwise open plaza.

The second situation which required a wall was the break between the lower and upper plaza. I attempted to find a solution which would allow at series of stairs at the very least; to install stairs in this location, however, would drastically reduce the area of the upper plaza. I elected instead to build a long, curving wall with a slight vertical angle. Initially I envisioned this wall to be a major water feature, but given the complexities of designing a water wall at this scale I abandoned the idea. Given Portland's generally damp climate and the northfacing orientation of the wall, however, I realized this was an ideal location for a *moss*

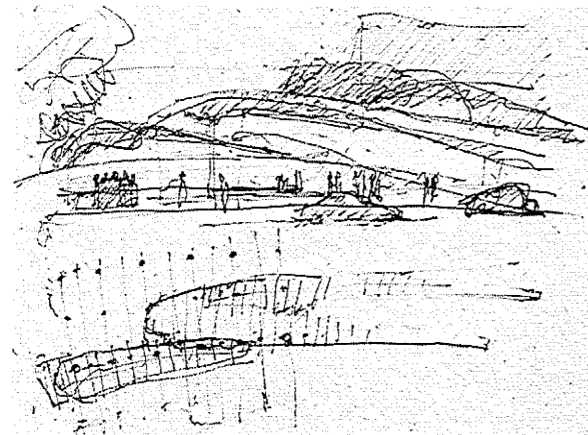


Figure 52. Early canopy sketches.

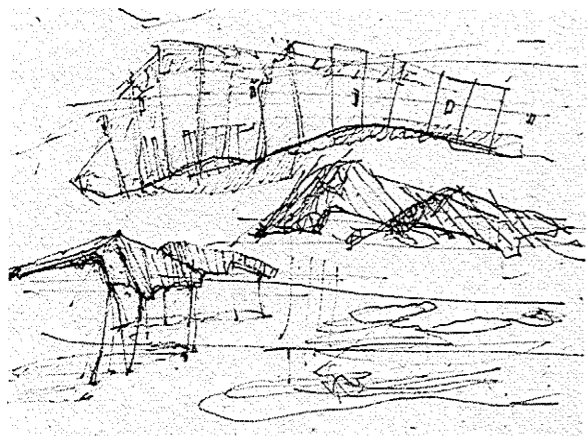


Figure 54. Early canopy sketches.

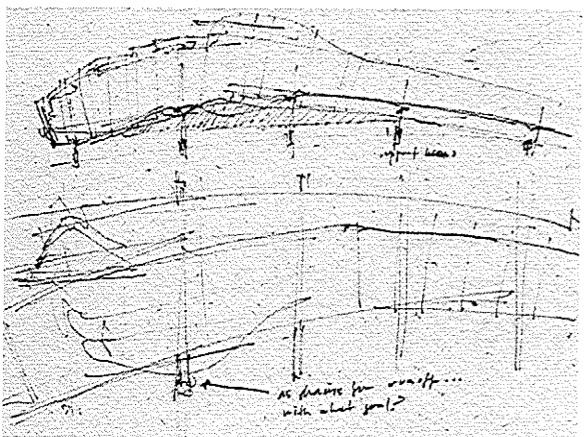


Figure 56. Canopy development sketches.

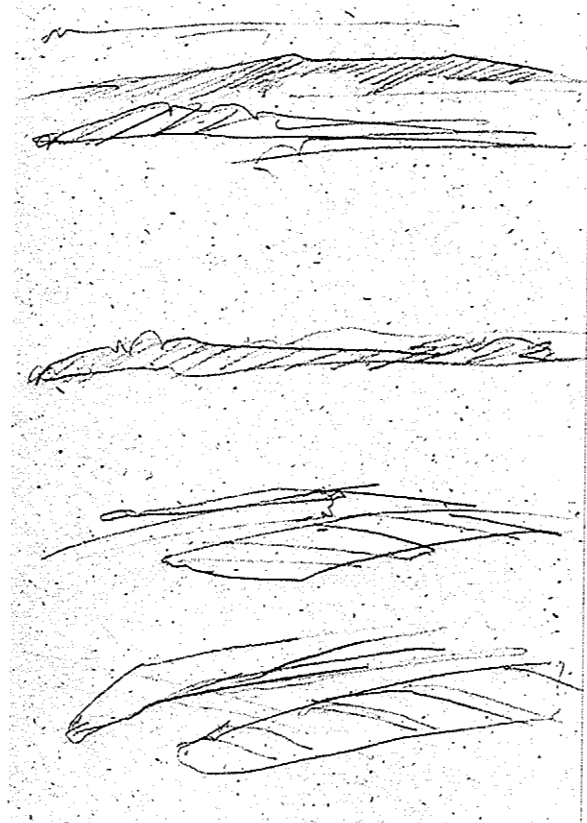


Figure 53. Conceptual canopy sketches.

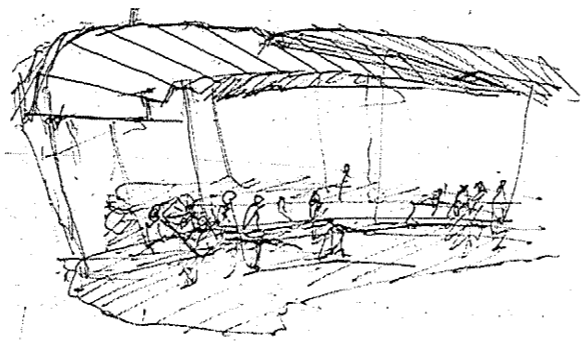


Figure 55. Early canopy sketch.

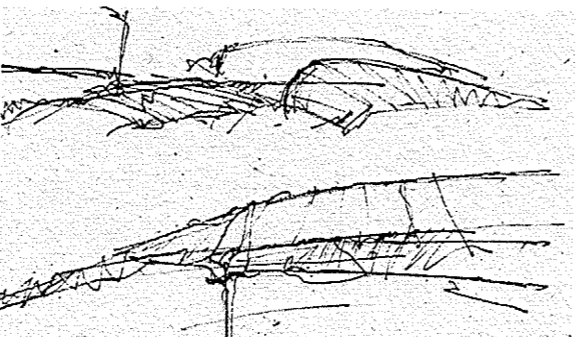


Figure 57. Canopy development sketches.

wall, complete with different textures and colors of moss. The wall would require irrigation during the summer dry season, but during the majority of the year it would require little upkeep. The green of the moss would be set off against a warm-colored basalt such as Montana ledgestone, which varies between tans, reds, and dark grey tones.

Portland has a rainy season and a dry season. Or, to be more precise, Portland has three seasons: July through September days are generally clear and warm; February through June and October and November are cloudy, cool, and showery; and the big rainstorms come off the Pacific from the end of November to the middle of February. For an all-season outdoor farmer's market to be successful there must therefore be a good system of canopies. This became one of the defining characteristic of the project. I investigated a number of strategies for designing canopy structures, from the tensile structures of Frei Otto to the plaza canopies of Enric Miralles. The Vision Study projected using a series of "tensile umbrella structures,"<sup>179</sup> similar to those employed by Otto, to cover the site. I felt that a more subtle scheme would be more appropriate for the site, however: if one stands at a vista in the West Hills on some winter days, one can see three or four distinct layers of clouds stacked up against and overarching the peaks of the Cascade Mountains to the east. I realized this formal language of layering and transparency could be used to great effect for the canopy system of the site, as evidenced in figure 53.

There were three problems I needed to solve in order to make this system work. The first was deciding on the materiality of the canopy structures: glass and steel, tensioned mylar on a frame, or a combination of the two. Because of the difficulties with maintaining tension of mylar, I elected to focus on glass and steel construction. The second problem was the functional design of the canopies. While it would be relatively simple to construct canopies which would shield the plaza from the rain, it is necessary to devise a system to catch the rainwater before it drips on those below. In addition, there must be adequate ventilation beneath the canopies, which means that they cannot be closed at the top. The third problem was the issue of layering the canopies. This required finding a way to support or suspend the canopies such that the entire canopy system was not overburdened with extraneous structure. In other words, I wanted to find a way to make it visually as lightweight as possible.

All these problems were interrelated, of course. An elegant design solution would be able to address not only the problems of the supporting structure, but

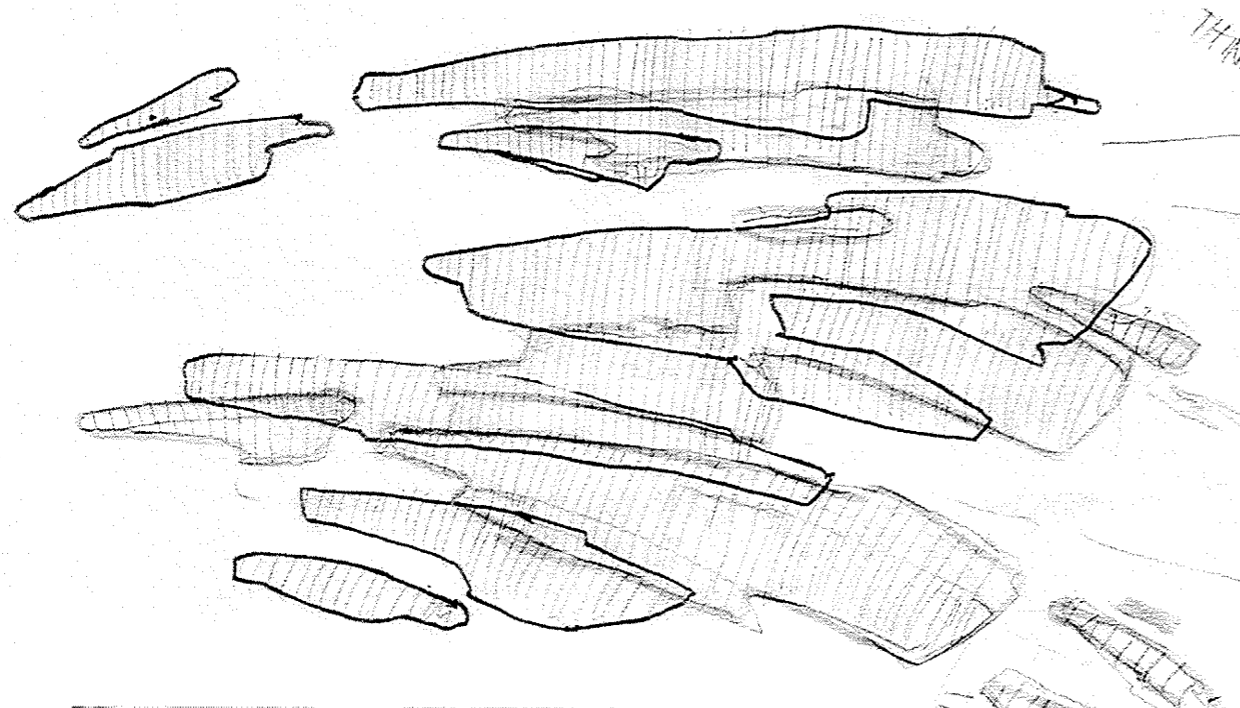


Figure 58. Canopy plan sketch.

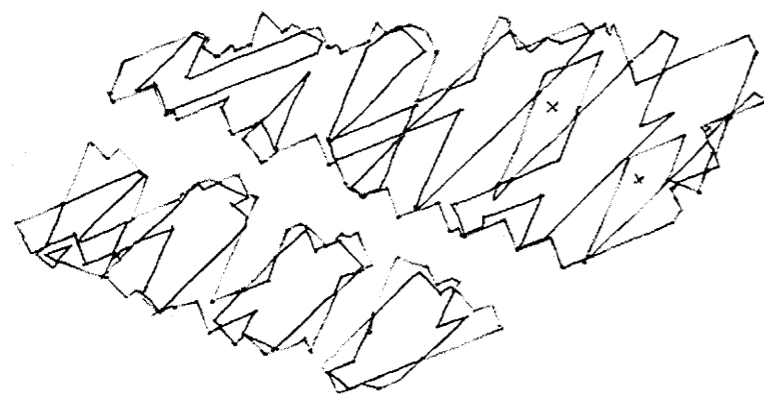


Figure 59. Market stall overlay diagram.

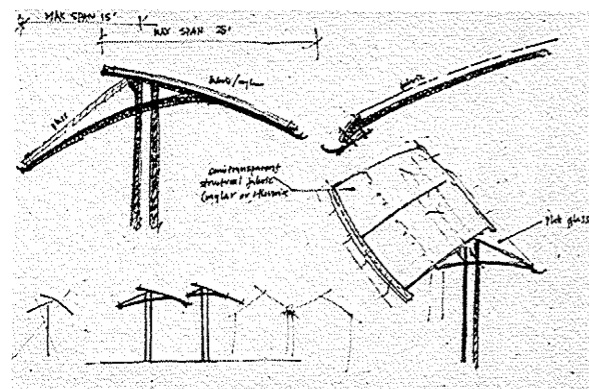


Figure 60. Canopy structural development.

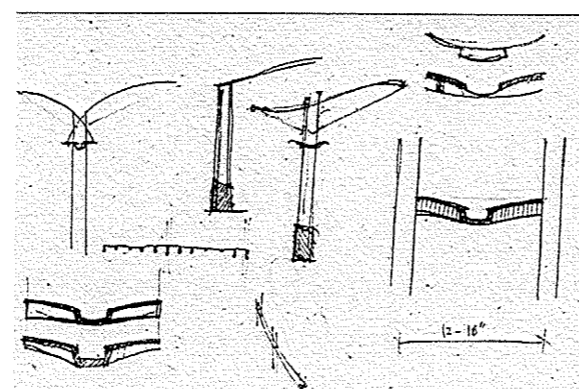


Figure 61. Canopy structural development.

would incorporate water collection systems and the subtle layering I sought to achieve. The figures to the left illustrate the design process I went through to find a suitable form for the canopies in addition to a means of supporting them. Figure 52 was one of my earliest sketches: in that scenario, the system of eaves has not been worked out and the glass panels are directly supported by a steel frame and posts. Figures 54 through 57 still rely on a fairly heavy internal steel frame, supported in the first case by posts and then by a series of post-and-beams, stretched across the site in accordance with site geometries. While these sketches make clear the formal language I was attempting to relay, they have not solved the essential problems facing this kind of canopy system of the site.

At the same time I was attempting to solve the combined problems of form and structure I was working on concepts for how to cover the space of the lower plaza. I was not interested in covering every square foot of the plaza; it was not necessary, in any case, because the whole space could not be used as market space. In conjunction with the work to configure the space to be integratively effective as possible I had come up with a number of layout schemes for farmer's market stalls, a system which would eventually inform much of the geometry on the site. At the time I was not sure which scheme I would use; however, by overlaying the schemes and identifying which areas would be *most* likely to be used (Figure 59), I had a good idea of which areas of the plaza the canopy would have to cover. Figure 58 shows a sketch plan of the canopy system derived from the configuration of the farmer's market below.

From this canopy plan I began to develop more detailed plans and sketches. I also carved a scale model of the canopies, intending to make a translucent plastic cast for a full site model. Once the cast had been made, I intended to slice the wood model into sections which could then be scanned and traced in a CAD program, from which a digital model could be constructed. After developing the site geometry further, however, and fixing the locations of the farmer's market stalls, I found that the broad, cloudlike sweep of canopies I had designed no longer referred to the geometry of the site in any way. I scrapped the plans, then, and drew up a new set of sketches for the canopies which were better integrated into the site geometries.

By the time I had worked through these aspects of the canopy system, I had made progress on the formal and structural elements of the design. As figure 60 shows, I was still working from the assumption that the structure would be some sort of internal structure supported by columns. The planes of the canopies would

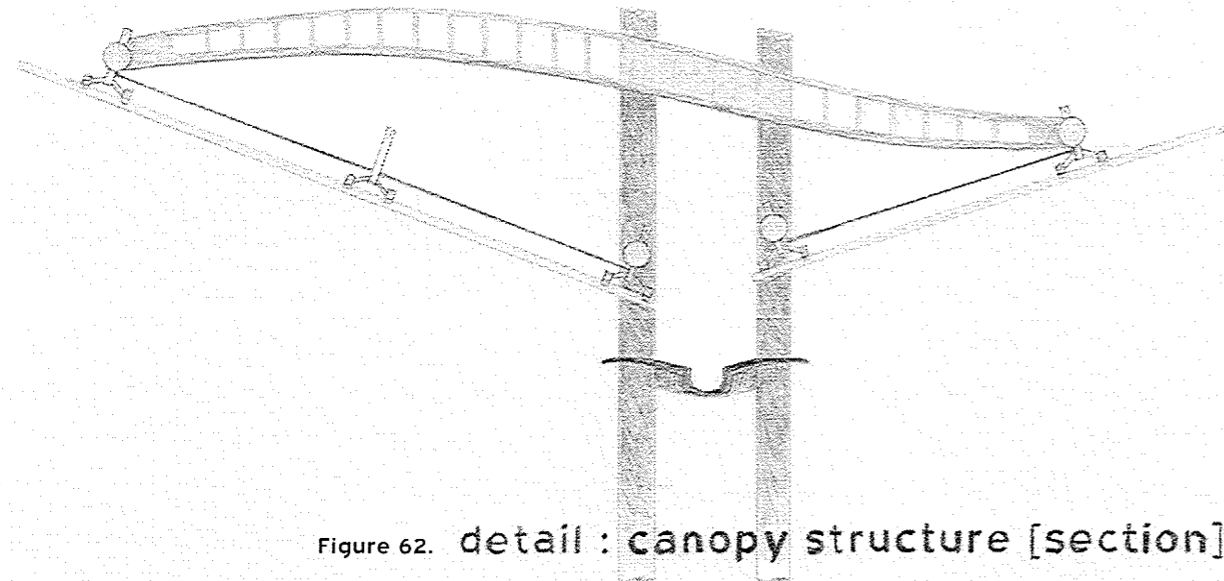


Figure 62. detail : canopy structure [section]

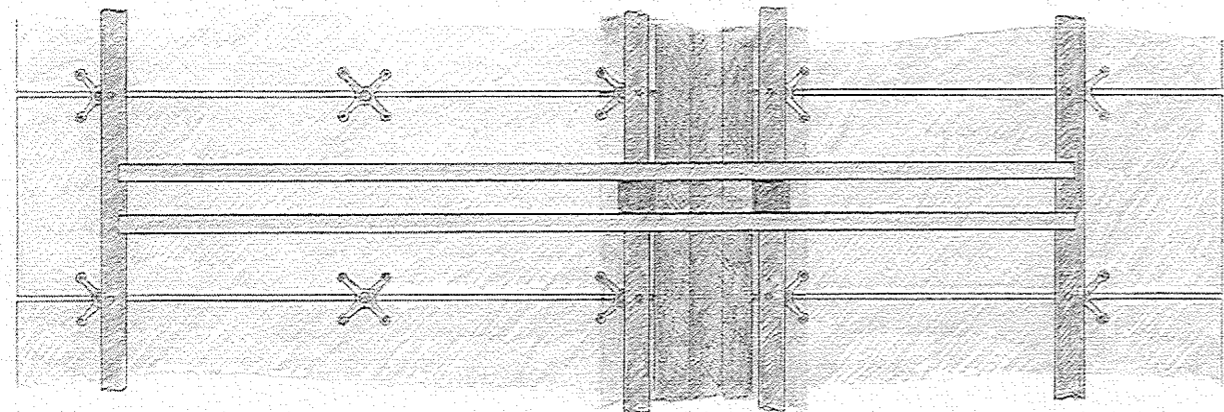
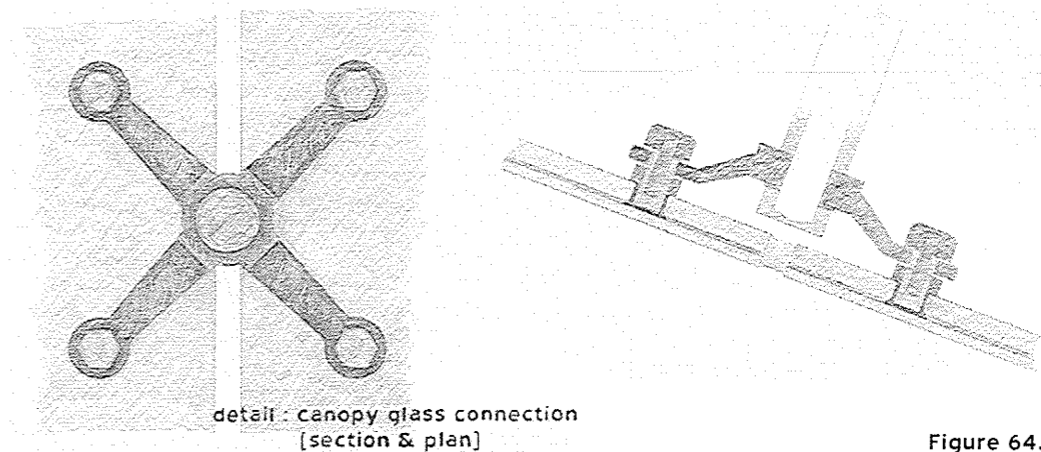


Figure 63. detail : canopy structure [plan]

overlap at the top with a space between; eavestroughs would collect water at each end. I was not satisfied with this design, however: the eavestroughs were poorly integrated with the rest of the canopy, and the structure still seemed too heavy. About this time I discovered a glass support system devised by Pilkington in which individual panes of glass are supported by stainless steel fittings which are connected to the support structure. According to Pilkington's literature, it is a highly stable and flexible system, tested to withstand seismic, snow, and wind loading.<sup>180</sup> Given that snow and ice storms hit Portland once or twice a winter, and that the West Hills fault line lies close to the site, such a system would be ideal. Figure 61 shows the revisions I began to make to the canopy design. In this case the glass panels have been suspended from steel members using Pilkington (or similar) fittings; the steel members are supported by a column and cantilevered beam system, which is fixed to the foundation structure of the plaza. In addition, the canopies now overlap at the outside edges, draining to a common eavestrough at the center of the structure; this eavestrough is also supported by the column system (Figure 62). These eavestroughs drain into the stormwater system of the site, which would then be piped via gravity feed to a stormwater retention pond located off site. As a whole, this design solution allows for less structural mass while providing as much strength as is necessary, and still permits the overlapping planes I originally envisioned.

The final aspect of the canopy design I needed to address was the interface between the structural columns and the plaza surface. I did not think it would be appropriate for the columns to meet the plaza surface without mediating between



detail : canopy glass connection [section & plan]

Figure 64.

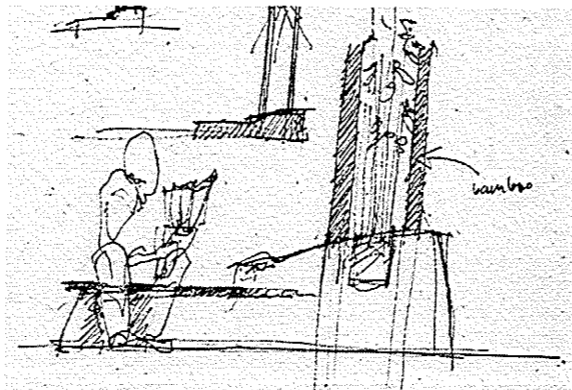


Figure 65. Conceptual sketch for canopy base/seating element.

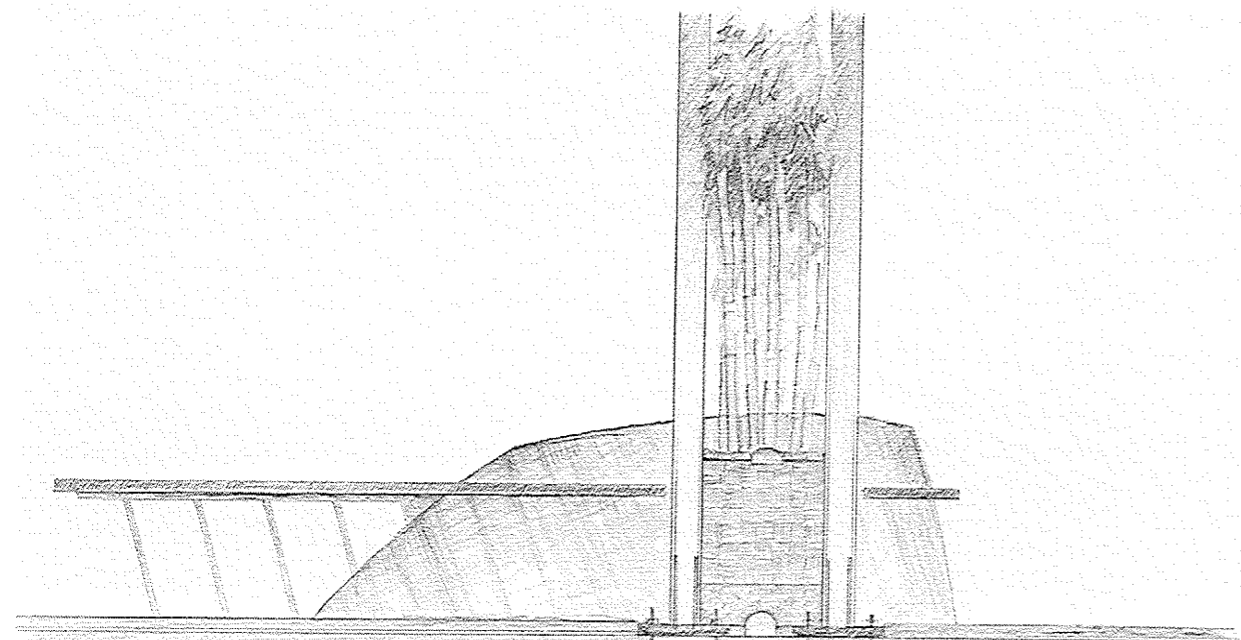


Figure 66. detail : canopy base/seating [section]

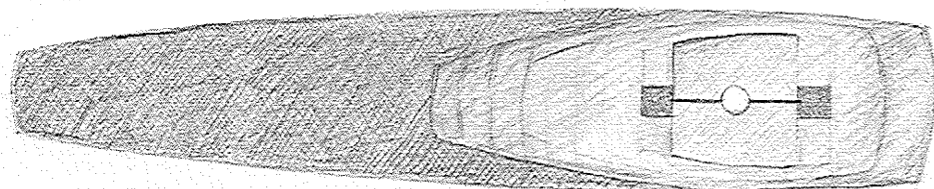


Figure 67. detail : canopy base/seating [plan]

them in some way; a perpendicular connection between the two would be too abrupt. At first I considered simply cladding the base of the columns with stone to set them off against the plaza paving, but this solution, too, was not substantive enough to bear the visual weight of the canopies.

There was, however, another important consideration I needed to address at this time. I had not established the locations for seating elements in either the lower plaza or the upper plaza aside from the very informal seating offered by stairs, but seating of that nature would certainly not be sufficient for a plaza and market. This was an opportune occasion to solve two problems at once. I expanded the idea of cladding the base of the columns to a wider, oblong form. The form encasing the column bases was hollowed out to create a planter, which would then be planted with a small, relatively hearty variety of bamboo to accent the verticality of the columns while simultaneously acting as a living, leafy foil to the steel structure (Figure 66). The bamboo would then be underlit with lights located in the center of the planter. The remainder of the form - which I generally oriented to the southwest, toward the sun - was flattened to create a bench. The edges of the bench curved around and merged into the rounded form. Like the moss wall, these seating elements would be clad in Montana ledgestone, with the surface of the bench constructed of a dark red-grey slate.

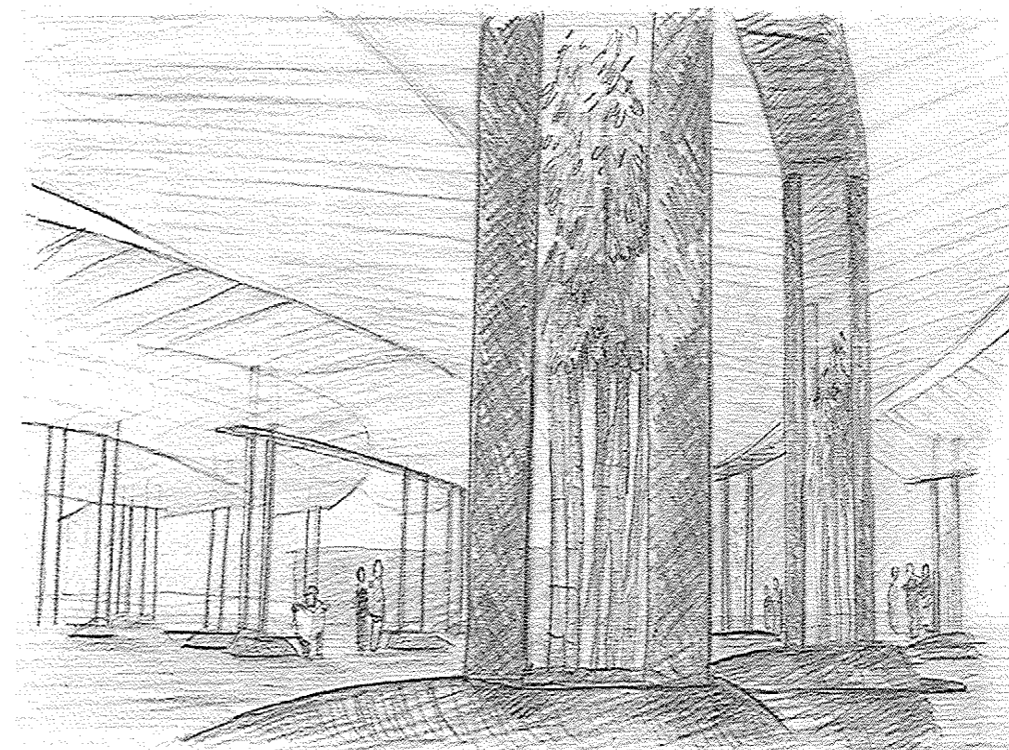
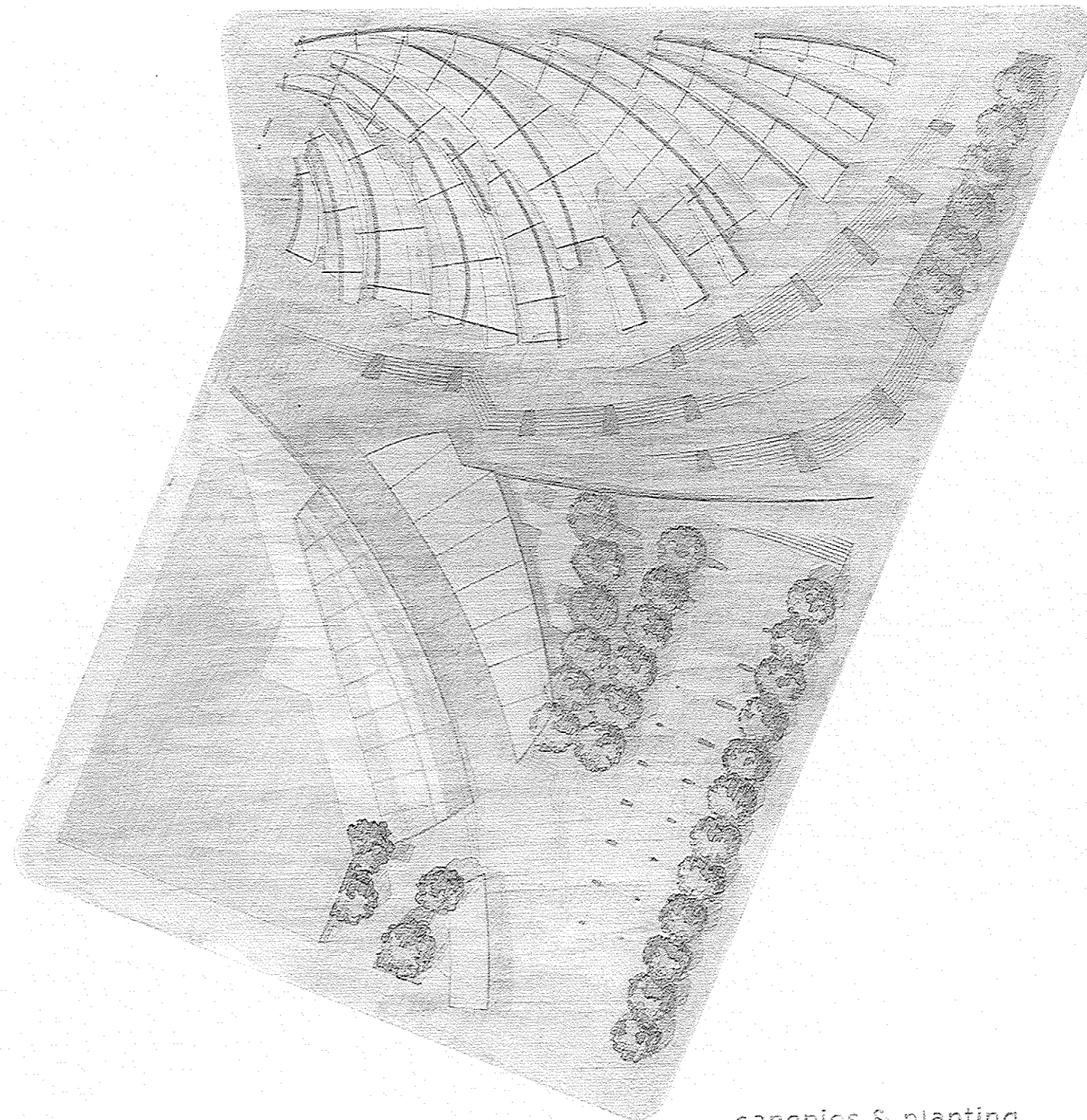
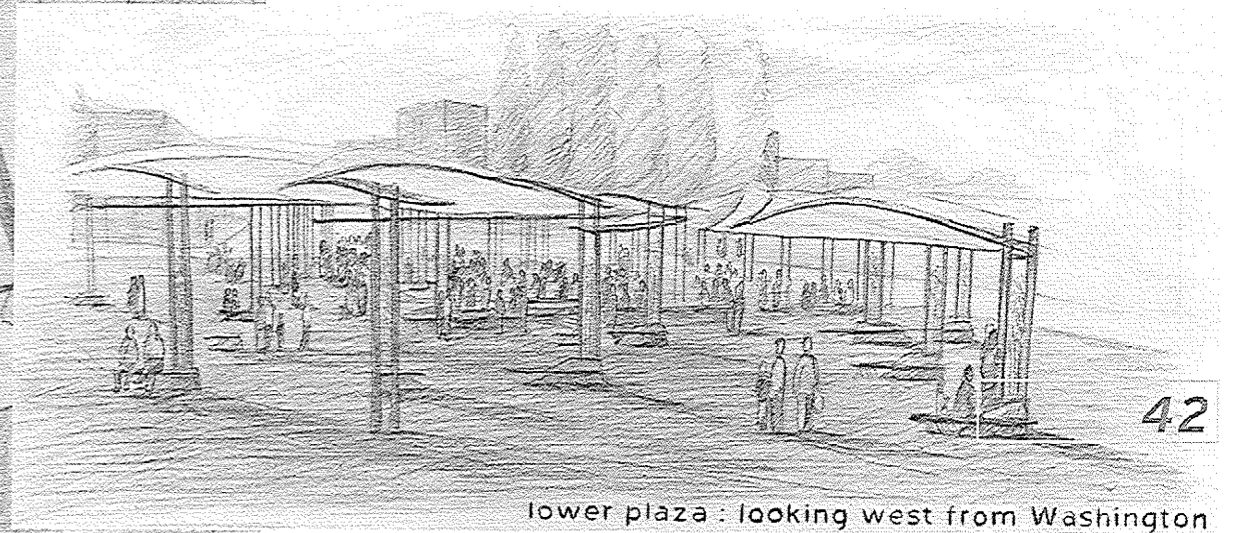
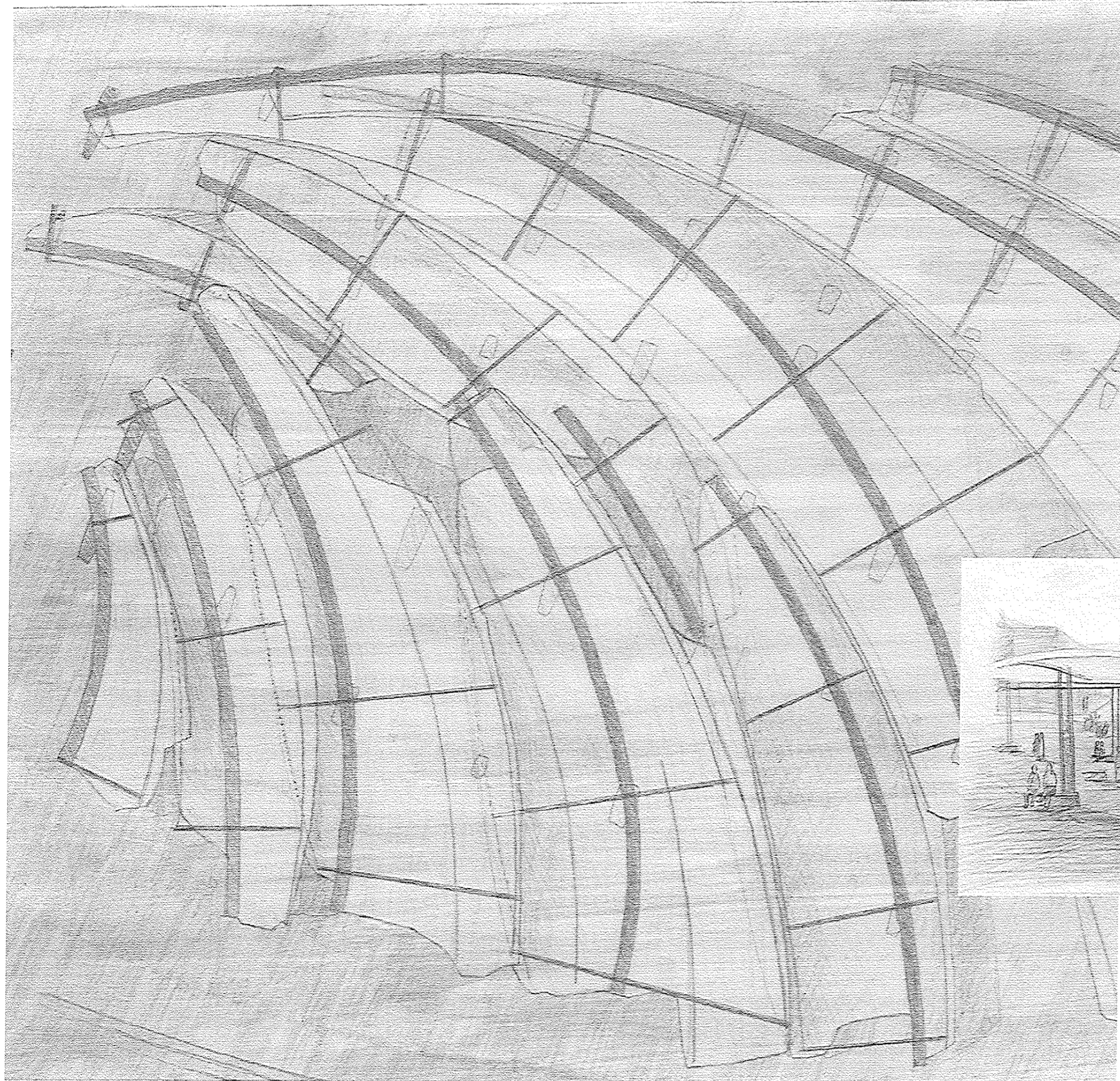


Figure 68. Perspective sketch showing the area below the canopies and the seating elements.



canopies & planting  
**washington street market**

Figure 69. Final canopy and planting plan.



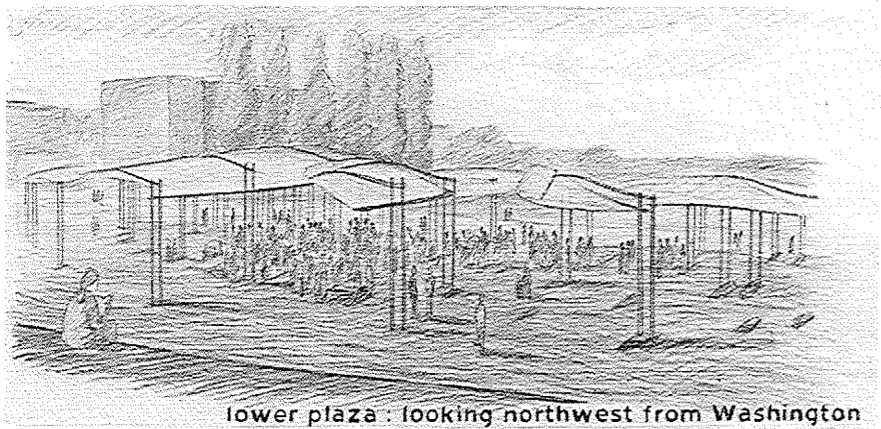
lower plaza : looking west from Washington  
Figure 70. Perspective sketch of lower plaza.

Figure 71. Enlargement of the final canopy and planting plan showing canopies, center eavestroughs, and lateral supporting members.



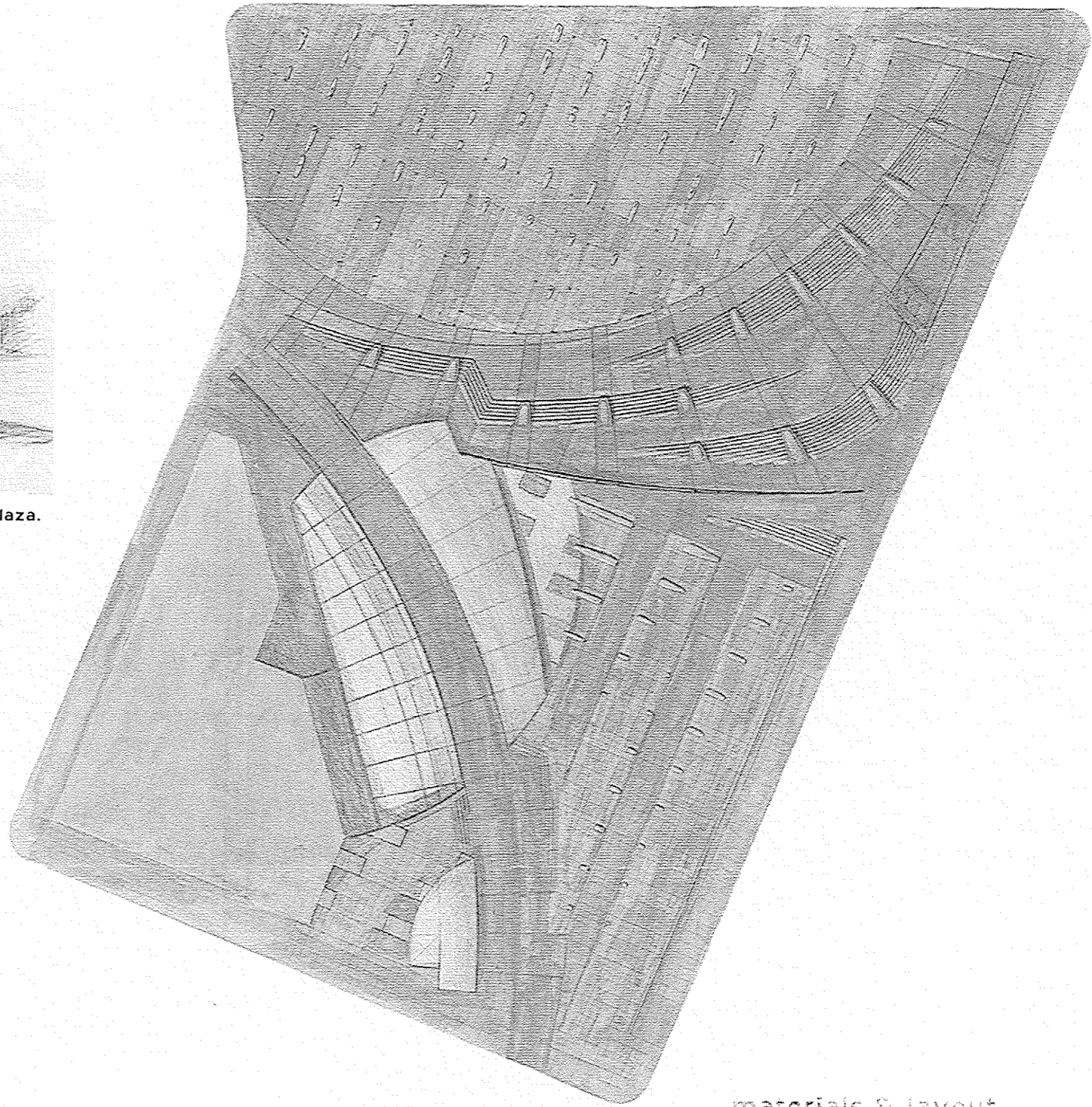
lower plaza : looking southeast  
from Burnside

Figure 72. Perspective sketch of lower plaza.



lower plaza : looking northwest from Washington

Figure 73. Perspective sketch of lower plaza.



materials & layout  
washington street market

Figure 74.

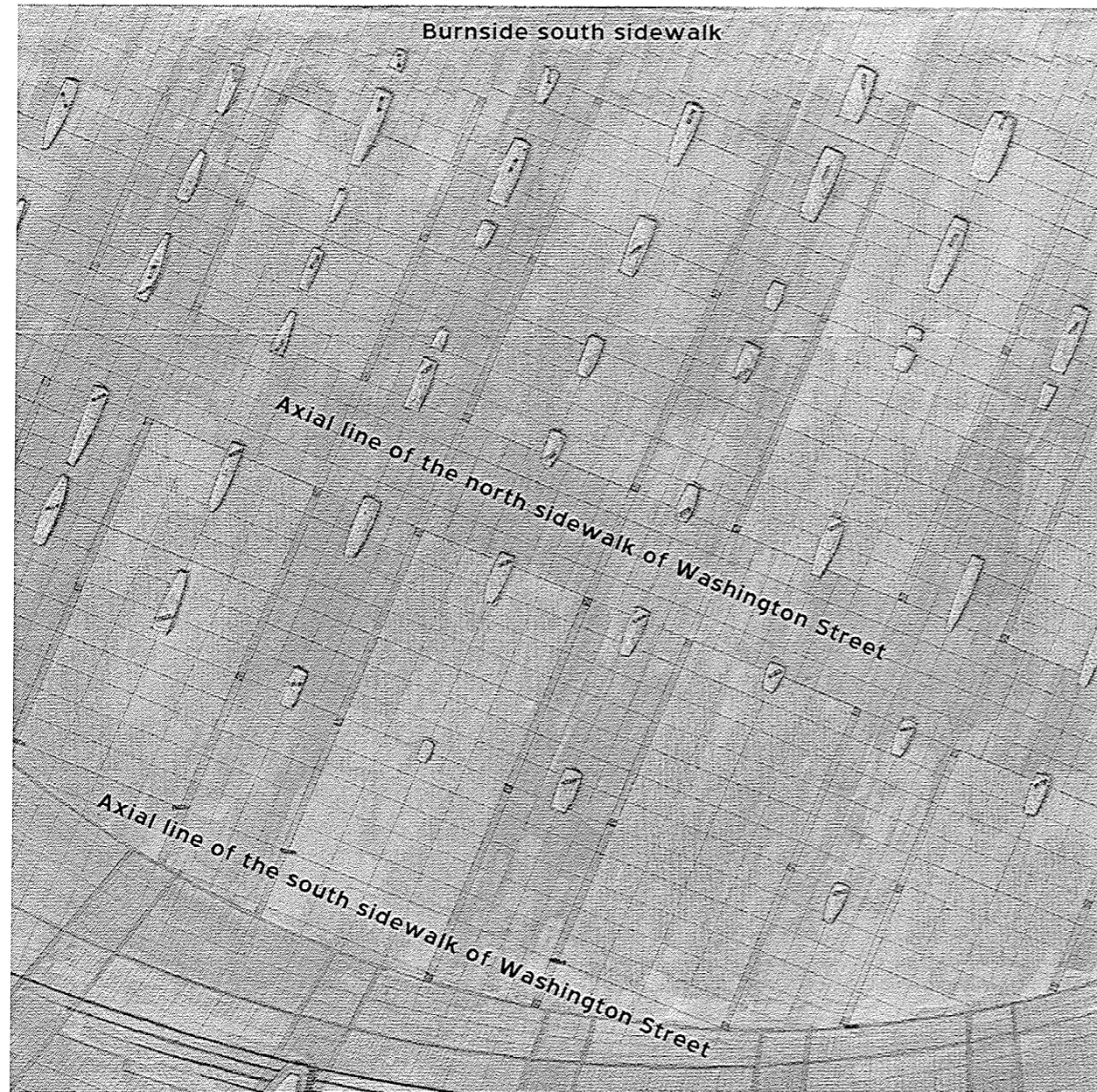


Figure 75. Materials/layout plan enlargement showing market stalls and paving of lower plaza.

As the design for the canopies took shape I continued to refine the overall site geometry. I based the orientation of the farmer's market stalls on the skewed grid of downtown Portland; this meant that the stalls were perpendicular to the Washington Street axial lines. Each stall is twelve feet wide and nine feet deep; aisles are twelve feet wide. There is a subtle nine inch wide gutter on both sides of the aisle; the lower plaza drains from the ridgelines between the stalls and at the centerline of the aisles to the gutters. All these characteristics are expressed in the paving pattern as seen in figure 75. The paving of the plaza consists of two blue-grey shades of slate, split to provide a relatively rough surface for traction.

The geometry of the system of stairs and ramps determines the main geometry of the eastern and middle part of the site, with a counterpoint provided in the level areas by the grid of the market stalls. These geometries are woven into one other where the ends of the sweeping arc of stairs and ramps meet the sidewalks adjacent to the streets. A dark red-grey slate - the same used for the surfaces of the benches - is used to accent the ramps and the arc at the edge of the lower plaza.



Figure 76. Materials/layout plan enlargement showing paving patterns on ramps and stairs.

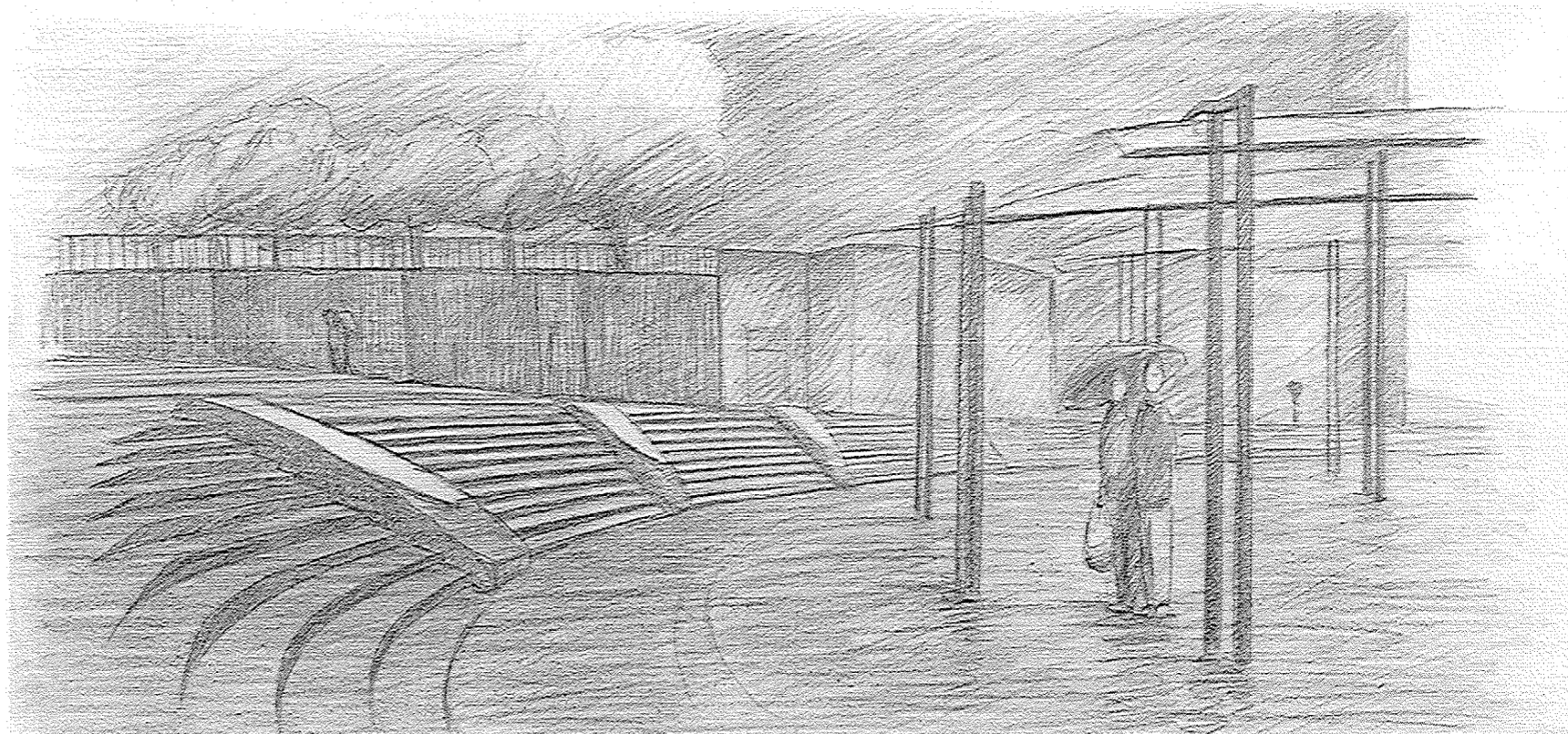


Figure 77. lower plaza : looking south, near Burnside

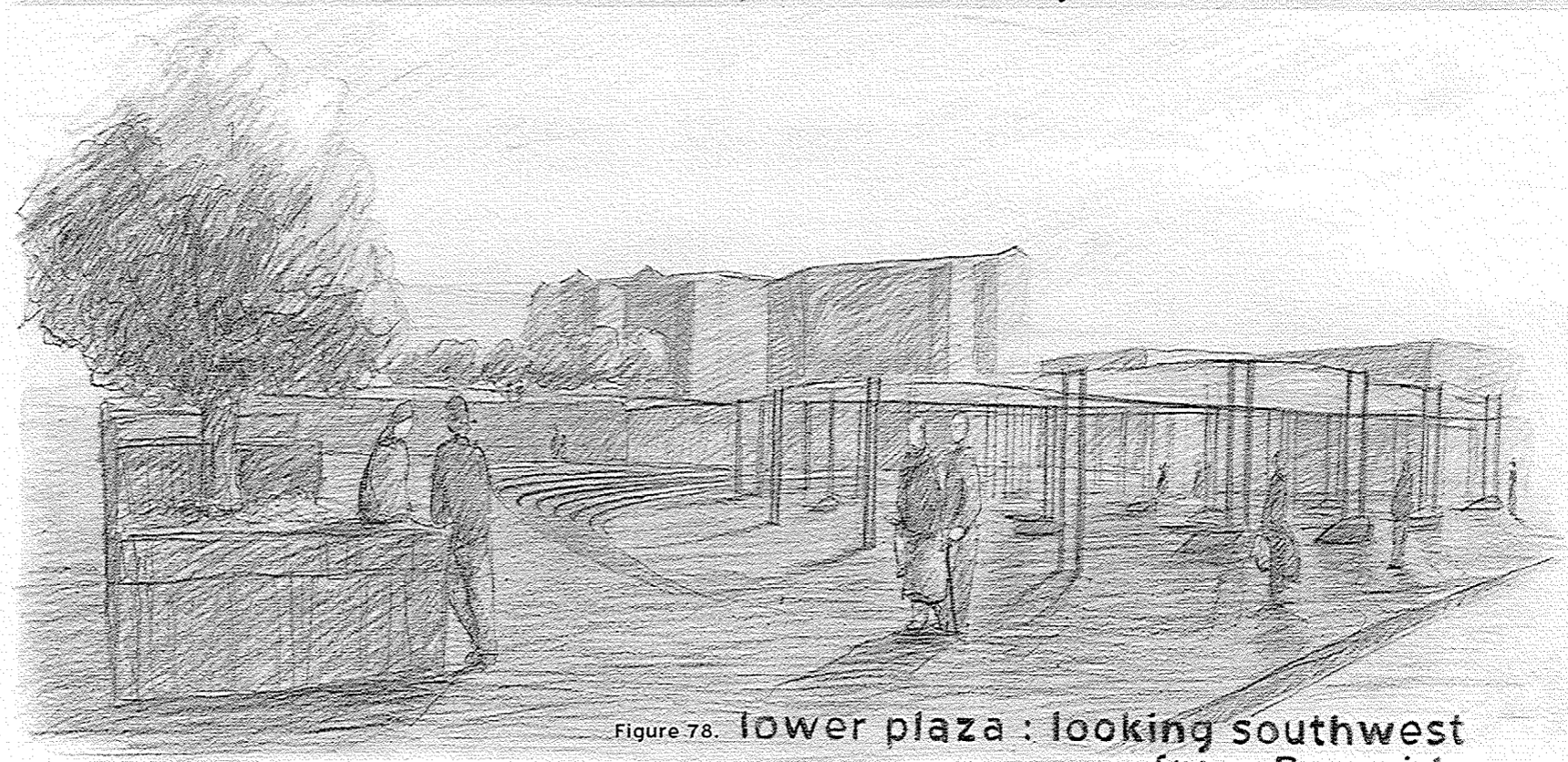


Figure 78. lower plaza : looking southwest  
from Burnside



Figure 79. Materials/layout plan enlargement showing the upper plaza and seating elements.

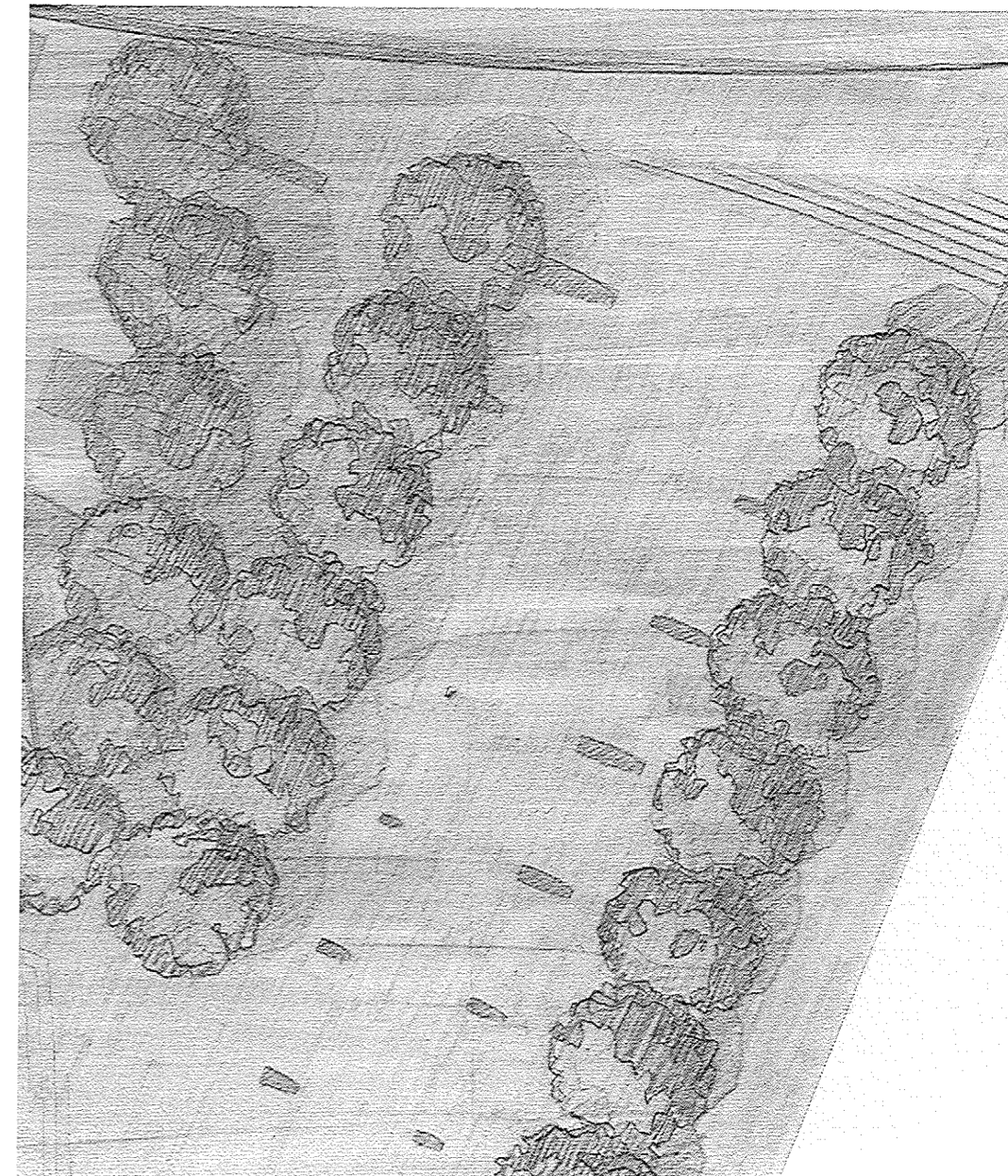


Figure 80. Canopy/planting plan enlargement showing upper plaza.

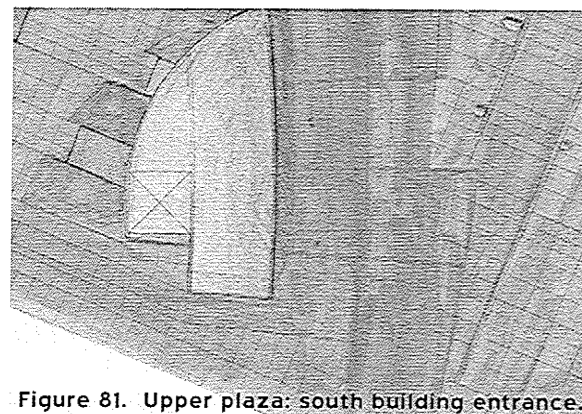


Figure 81. Upper plaza: south building entrance.

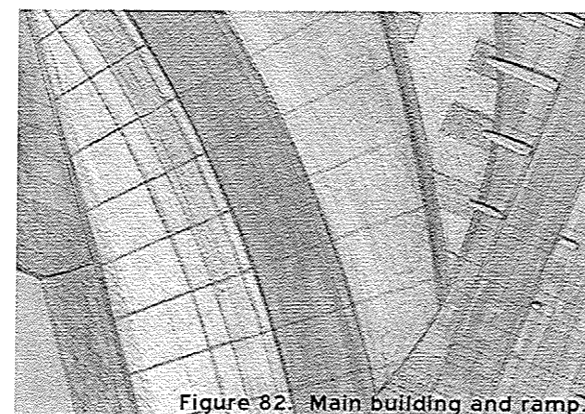


Figure 82. Main building and ramp.

The upper plaza is based on the same geometry as the lower, but the lateral geometry is based not on market stalls but on the grid of trees running down 14th street. Like the lower plaza, the upper plaza has shallow gutters and drain tiles on either side of the aisle. And like the stairs and ramps, the blue-grey slate is complimented by the red slate. The arc which defines the outer edge of the pool at the northwest edge of the upper plaza is a continuation of the same arc which defines the exposed portions of the urban conservatory.



Figure 83. upper plaza : looking northeast from Alder



Figure 84. (winter) upper plaza : looking north from Alder

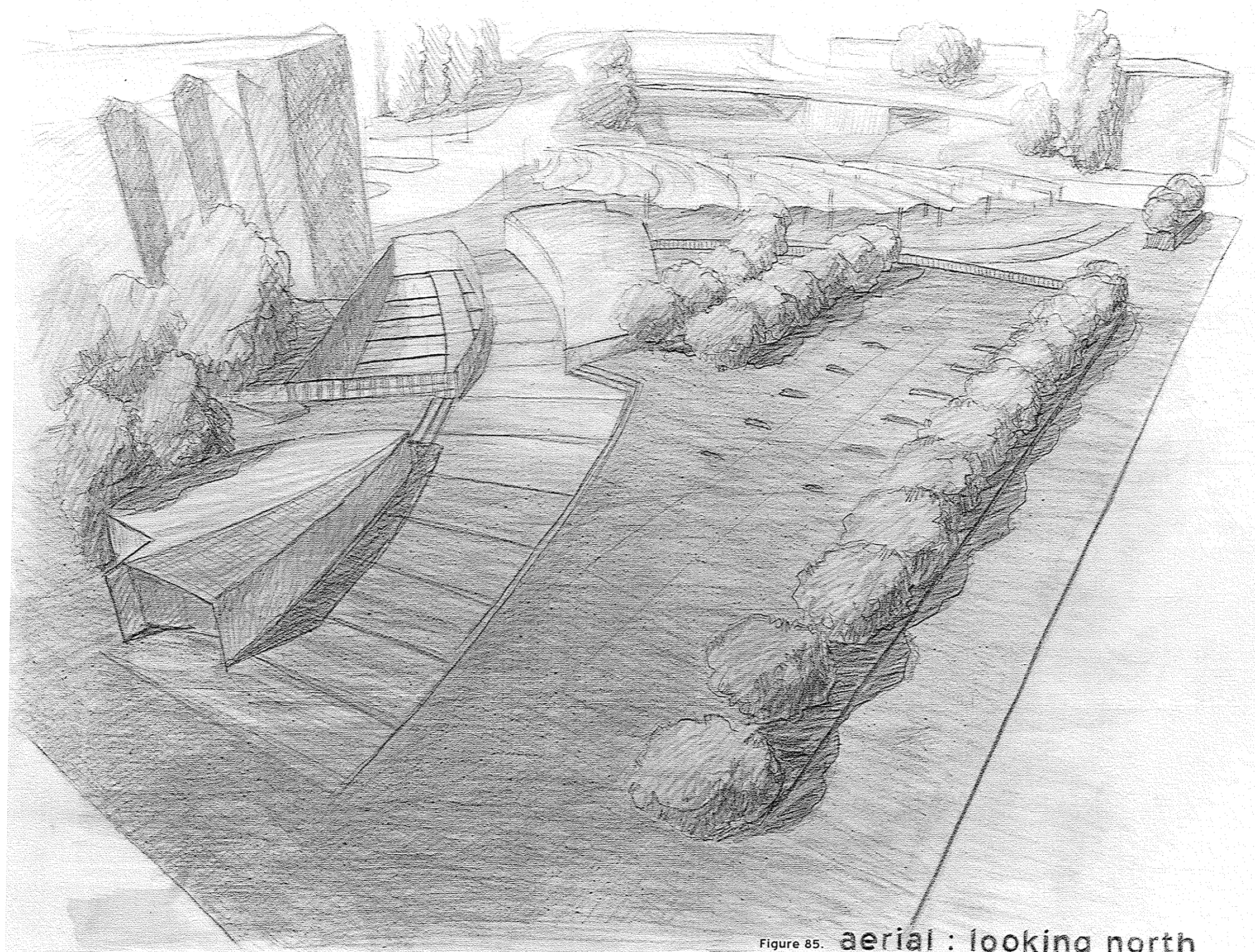


Figure 85. aerial : looking north

## Endnotes

- <sup>1</sup> Wendell Berry. *Sex, Economy, Freedom and Community*, 25-26.
- <sup>2</sup> Iain Borden, et al. "Things, Flows, Filters, Tactics." in *The Unknown City*, Iain Borden et al., eds., 16.
- <sup>3</sup> Iain Borden, et al. "Things, Flows, Filters, Tactics," 6.
- <sup>4</sup> *Bridge the Divide and Cap I-405 Vision Study*, 2.
- <sup>5</sup> *Bridge the Divide and Cap I-405 Vision Study*, 3.
- <sup>6</sup> *I-405 Strategy Team Final Report*, 1.
- <sup>7</sup> *Bridge the Divide and Cap I-405 Vision Study*, 5.
- <sup>8</sup> "About Town." *OregonLive/The Oregonian*, October 15<sup>th</sup>, 2001. [newspaper online.] (Portland: Oregon Live, 2001; available at [http://www.oregonlive.com/printer/printer.ssf?/xml/story.ssf/html\\_standard.xml?/base/portland\\_news/](http://www.oregonlive.com/printer/printer.ssf?/xml/story.ssf/html_standard.xml?/base/portland_news/)).
- <sup>9</sup> James Corner. *Dispositions*. (lecture given at the Faculty of Architecture, University of Manitoba, 30 October 1998. Transcription from videotape by Andrew Sheie.)
- <sup>10</sup> Vera Katz, Mayor. *Bridge the Divide and Cap I-405 Vision Study*, introduction.
- <sup>11</sup> Bill Hillier. *Space is the Machine*, 151.
- <sup>12</sup> Edmund Bacon. *Design of Cities*, 13.
- <sup>13</sup> Borden et al. *The Unknown City*, 4.
- <sup>14</sup> Lars Lerup. *After the City*, 22.
- <sup>15</sup> Lerup, 180. (Endnote 7 to a passage on page 26).
- <sup>16</sup> Ghent Urban Studies Team, *The Urban Condition: Space, Community, and Self in the Contemporary Metropolis*, 47.
- <sup>17</sup> Wamble, "Knee Play," in *Slow Space*, Michael Bell and Sze Tsung Leong, eds., 221.
- <sup>18</sup> Lerup, 22-23.
- <sup>19</sup> James Corner. "Recovering Landscape as a Critical Cultural Practice." in *Recovering Landscape*, 15.
- <sup>20</sup> Jan Verwijnen. "The Creative City's New Field Condition: Can urban innovation and creativity overcome bureaucracy and technocracy?" in *Creative Cities: Cultural Industries, Urban Development and the Information Society*, 25.
- <sup>21</sup> Corner. *Dispositions*.
- <sup>22</sup> Corner. *Dispositions*.
- <sup>23</sup> Susan Buck-Morss, "The City as Dreamworld and Catastrophe." in *The Unknown City*, Iain Borden et al., eds., 113.
- <sup>24</sup> Verwijnen, "The Creative City's New Field Condition," 17.
- <sup>25</sup> Jane Jacobs, *The Death and Life of Great American Cities*, 173-81.
- <sup>26</sup> GUST, 58.
- <sup>27</sup> GUST, 54.
- <sup>28</sup> GUST, 52.
- <sup>29</sup> Michael Müller and Franz Dröge. "Museumification and Mediation: Two strategies for urban aestheticisation." in *City Life: Essays on urban culture*, Heinz Paetzold, ed., 152.
- <sup>30</sup> Müller and Dröge, 161.
- <sup>31</sup> Hillier, *Space is the Machine*, 43; also 92-93.
- <sup>32</sup> Betsky, "Nothing but Flowers: Against Public Space." in *Slow Space*, Michael Bell and Sze Tsung Leong, eds., 465.

- <sup>33</sup> Hillier, *Space is the Machine*, 136; also 152.
- <sup>34</sup> *ibid.* 152-153.
- <sup>35</sup> *ibid.*
- <sup>36</sup> *ibid.* 170.
- <sup>37</sup> Corner. *Dispositions*.
- <sup>38</sup> J.B. Jackson. *Discovering the Vernacular Landscape*, 79-80.
- <sup>39</sup> Lerup. 61-62.
- <sup>40</sup> *ibid.*
- <sup>41</sup> Borret. "The 'Void' as a Productive Concept for Urban Public Space." in *The Urban Condition*, Ghent Urban Studies Team, eds., 241-248.
- <sup>42</sup> Corner. *Dispositions*.
- <sup>43</sup> Jacobs. 199.
- <sup>44</sup> Borret. 245; Rem Koolhaas/Bruce Mau/OMA, *S, M, L, XL*, 511-512.
- <sup>45</sup> Corner. *Dispositions*.
- <sup>46</sup> *ibid.*
- <sup>47</sup> Corner. "Ecology and Landscape as Agents of Creativity." in *Ecological Design and Planning*, Frederick Steiner and George Thompson, eds., 102.
- <sup>48</sup> *ibid.*
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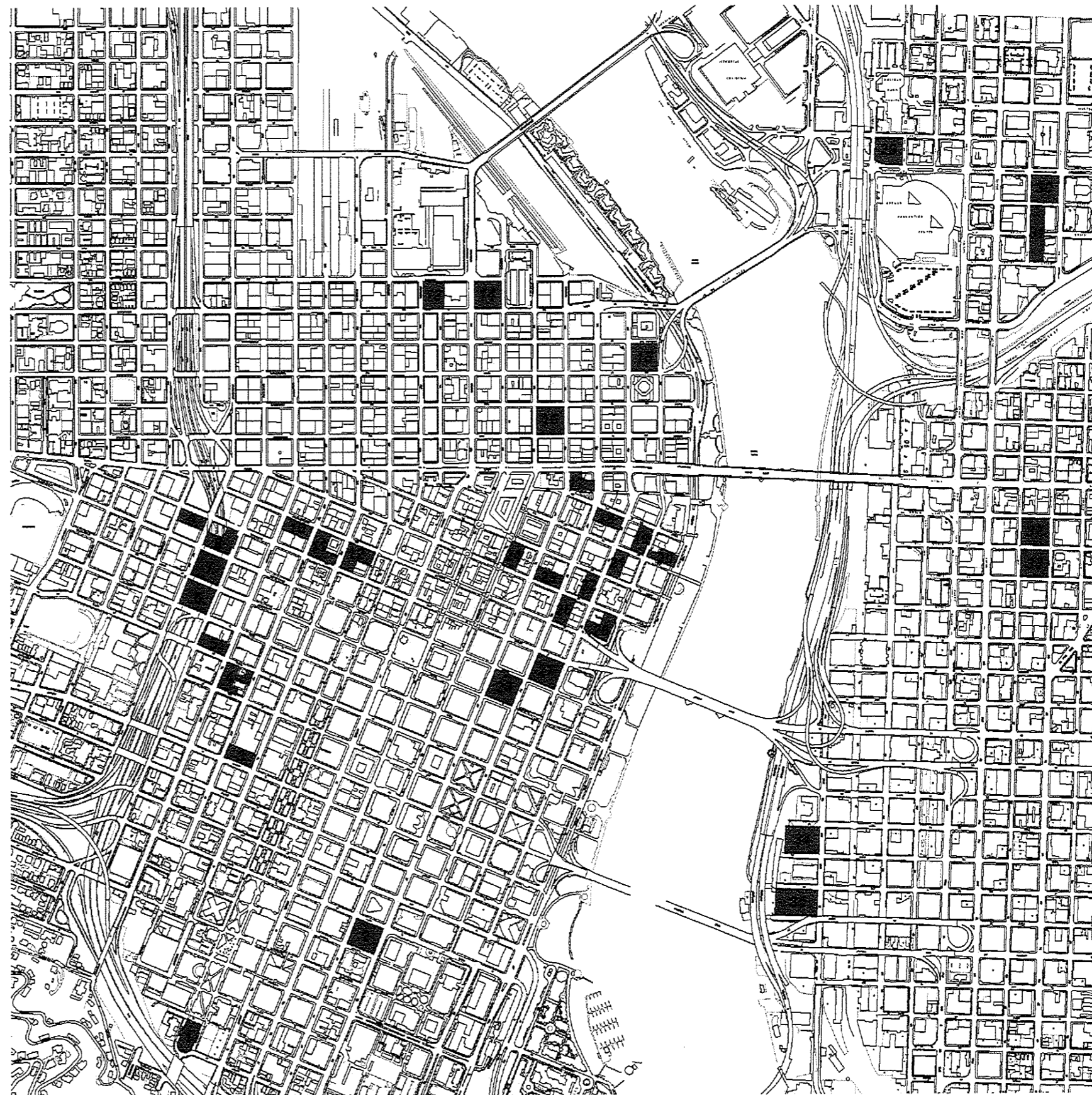
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**Appendix A:**  
map of alternative market sites



**Appendix B:**  
*comparison of the radius-3 values  
 for existing and proposed conditions,  
 alternative market sites,  
 and specific axial lines.*

<i>Study area</i>	<i>r-3 value</i>	<i>Specific axial line</i>	<i>r-3 value</i>
site design proposed	5.45	Burnside east (s) proposed	7.07
main site scatter existing	5.44	Burnside east (n) proposed	6.91
site broken 4	4.61	Burnside east (s) existing	6.89
whole site vision study	4.53	Burnside east (n) vision study	6.69
cross-site design proposed	4.52	Burnside east (s) vision study	6.65
cross-site vision study	4.45	Burnside west (s) proposed	6.56
site broken 1	4.41	Washington (s) broken 4	6.56
site broken 3	4.35	Washington (n) proposed	6.45
site broken 2	4.34	Washington (s) proposed	6.41
market option 3	4.34	Washington (n) broken 1	6.38
O'Bryant Square	4.33	Burnside west (s) vision study	6.34
Pioneer Courthouse Square	4.28	Burnside west (s) existing	6.33
possibility 28	4.18	Washington (s) broken 1	6.31
market option 2	4.16	Washington (s) broken 2	6.31
possibility 32	4.11	Burnside west (n) proposed	6.29
Saturday Market	4.07	Washington east (n) vision study	6.28
possibility 17	3.97	Washington (n) broken 3	6.28
possibility 2	3.96	Alder (n) proposed	6.27
possibility 33	3.96	Alder (n) vision study	6.24
market option 1	3.95	Washington (n) broken 4	6.24
possibility 7	3.91	Washington east (s) vision study	6.22
possibility 27	3.91	Alder (n) existing	6.15
possibility 1	3.85	14th (w) proposed	6.02
possibility 24	3.84	Washington (n) broken 2	6.01
possibility 6	3.75	Washington east (n) existing	6.00
possibility 23	3.75	Washington (s) broken 3	5.89
possibility 25	3.75	Washington east (s) existing	5.80
possibility 4	3.69	Burnside east (n) existing	5.64
possibility 8	3.65	14th (w) existing	5.64
possibility 9	3.65	14th (w) vision study	5.62
possibility 21	3.65	Washington west (s) existing	4.40
possibility 26	3.65	Burnside west (n) vision study	4.29
possibility 3	3.63	Burnside west (n) existing	4.17
possibility 14	3.58	Vision study skywalk	3.76
Ira's Fountain	3.56		
possibility 35	3.55	mean radius-3 integration for the study area:	2.47
possibility 15	3.53		
possibility 11	3.52		
possibility 12	3.52		
possibility 22	3.45		
possibility 16	3.44		
possibility 20	3.42		
possibility 31	3.41		
possibility 13	3.39		
Lovejoy Fountain	3.34		
possibility 10	3.33		
possibility 34	3.33		
possibility 30	3.31		
possibility 18	3.24		
possibility 29	3.18		
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possibility 19	3.02		
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