

Digital Media and the Built Environment

The suspected impact of digital devices on public space



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Table of Contents

Introduction.....3

Background.....22

Characteristics of Public Space.....22

Successful Modern Public Spaces.....32

Pervasive Computers and Digital Technology....37

Current Applications of Digital Media in Cities....43

Projected Implications.....51

Digitized Utopia.....53

Disorganized Chaos.....57

Sustainable Mix.....60

Recommendations.....64

Conclusions.....69

Resources.....75

Great public spaces are those places where celebrations are held, social and economic changes occur, friends run into each other, and cultures mix. They are the 'front porches' of our public institutions- libraries, field houses, schools- where we interact with each other and government. When these spaces work well, they serve as the stage for our public lives. ("PPS,")

Introduction

After brisk five-minute walk down the sidewalk and a quick detour into the neighborhood deli, and you've arrived with lunch in hand to your favorite spot, an open-air plaza with the sound of a gurgling water feature in the background. You quickly scope out the seating options. This spring afternoon renders café tables hard to come by, but alas, there are few sunny spaces at the edge of the fountain basin. The sunlight makes the spaces warm and inviting, a needed refresher after the morning rush. The rest of the scene boasts a diversity of activity. Nearby, a few children stare mischievously at the waters edges, while their mothers talk candidly over cups of coffee. College students and young professionals work intently on their laptops, soaking up the Wi-Fi and the sun. At the plazas edge, an elderly couple sits eyeing the scene, subtly performing the necessary watchdog activities that are inherent to successful public spaces.

The above scene describes a public space serving as a haven for activity, a critical function to the well-being of the individuals engaged in the space and the amenity itself. Imagine however, a similar scene but one inundated with technology. Screens running perpetual advertisements line the flanking buildings ran; sensors in the sidewalks count every step moderating capacity for public spaces, meanwhile layers of hidden sensors absorb data to calculate responses. An environment that exists to collect data, calculate responses, and infiltrate the public with constant messages seems more like the function of a mobile phone rather than a public space. If the feeling and quality of the space is so significant to the quality of human life, community,

culture, and cities in general, why are we so apt to transform our spaces into places that resemble hand held devices rather than actual places?

The public realm is arguably one of the most critical components to successful cities. It encompasses some of the most beloved places and fosters experiences that are remembered for a lifetime. The public realm recognizes the social ability of cities, with parks being some of the earliest forms of open space purchased by the city and transformed into a civic space or network of spaces (Banerjee, 2001). To one level, public parks inspired the “republican virtue” of civic pride, social connections and interactions among diverse groups of people, as well as quality aesthetics that represented these ideals (Banerjee, 2001). In the early 20th century, open space transformed into a valuable platform to protect or ensure human health and hygiene. The value of public space and open space was viewed as a significant to the overall quality of life and population health and adopted as a standard for neighborhood planning (Banerjee, 2001). Still largely seen as a public good, parks and public spaces found their root and early significance as reflections of civic, social, and physical health of the community.

Technology is also a critical component to life in the twenty-first century. It manifests in nearly every facet of ones day, from large-scale transportation networks and movement of people to the smallest detail of a coffee pot. With new innovations appearing on the market almost daily, the rhythms and patterns of daily life are quickly changing in an effort to keep with the influx of new devices. But what exactly is the relationship between public space and technology? The physical environment grounds our daily operations, providing meaning and purpose to every decision and destination.

As technological innovations progress, their presence in the built environment becomes even more dominant, transforming not only the individual's life but also the space in which they operate. Numerous scenarios emerge for the future of public space, the impacts technology and digital devices will create, and the overall purpose and experience these spaces will provide, some present cases of extreme fear and uncertainty while others bring hope of increased access and equality.

The Case for Public Space

Public spaces showcase the vibrancy of the city, as places for community gathering, political demonstrations, or places of individual leisure or group recreation. They embrace the cultural and community element of cities embracing public art exhibits or cultural festivals and markets. Thriving public realms are those characterized by great social diversity and low levels of acquaintanceship, which means an individual stands a greater chance interacting with a stranger rather than bumping into a friend (Hampton, Livio, and Sessions Goulet (2010)). In addition to hosting a number of activities and experiences, public spaces take a variety of shapes and forms, from expansive plazas to pockets of green space. They line the edges of districts or emerge as opportunities of rest in the midst of a busy block. From centuries old plazas surrounded by architectural



Figure 1: Personal Sketch of a Public Plaza

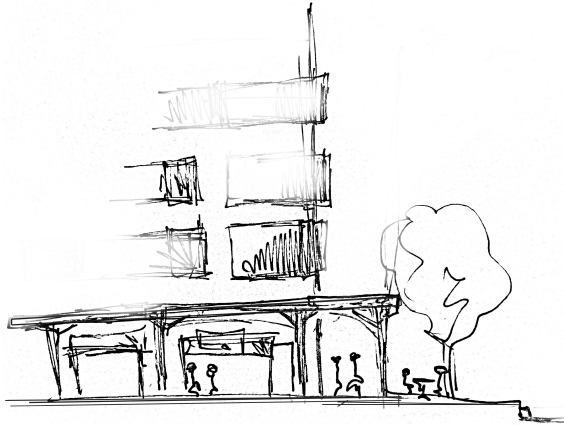


Figure 2: Personal Sketch of an Arcade and Sidewalk

of an arcade, plaza, or outdoor seating area. Regardless of shape and size, public spaces capture the uniqueness of place and culture. They boast the opportunity to define and display the values of each culture through both physical design and social function.



Figure 3: Privately Owned Public Space in New York City

Included within the discussion of public space, its overall significance to the urban environment and the looming impact of certain technologies is the notion of

quasi-public space. Quasi-public space is privately owned space that has the appearance of public space. From the public's point of view it generally looks no different. It allows space for congregation and interaction and embraces similar aesthetic elements like landscaping, varieties of paving, and options for seating. In most cases, quasi-public space is a welcomed amenity to the city and one often stipulated by local zoning code. Cities like San Francisco take additional steps to bolster their role in the communities and ensure their accessibility and visibility to the public, and even go as far to require public access to bathrooms (*Planning Code*, 2011). Proper signage is required to inform of operating hours and ownership (*Planning Code*, 2011). However, the main caveat is that though open and inviting, the open space does not allow the full level of accessibility or interaction that true public space supports. Instead, public entities dictate "operating hours" which might be in reason, but are not true characteristics of public space. Additionally, ownership possesses the right to remove individuals causing a "nuisance or disruption." While certain political freedoms are limited in privately owned public space, they do enhance the overall urban aesthetic through providing additional space for the more amiable interactions while also contributing to the overall aesthetic of the city through architectural elements, landscaping, or water features.

It is clear that public space and even quasi-public space enhances daily activities and creates vibrant city life. Thus, the case for preserving and even incorporating more public spaces in cities is equally strong. Most recognizable is their overall contribution to the aesthetics of the city. Public spaces are generally well landscaped with sufficient shade trees, plant species, or public art. Subsequently they boast a strong positive

connection to the health and psychological wellbeing of local residents as well especially when they take the form of parks, greenspace, or linear paths or trails. Public spaces also possess the intrinsic opportunity for the formation of deeper communal meanings and connections. In a sense, they are the physical glue that holds communities together providing opportunities for exchanging ideas and information.

Introduction of The Technological Threat

“Spaces are perceived and experienced, and as they acquire meaning they are produced in particular ways,” remarks Kelley in his article “The semantic production of space: pervasive computing and the urban landscape (p.838).” However, with each new technological innovation an increase in reliance on technology for the supply of a greater number of services is also seen. For example, the progression of mobile phone and Internet usage has created a culture that is driven by immediacy and reliance on instant access to information. What impact will technological innovations continue to have on public space? The potential to severely impact or even disrupt life is apparent, and here lies a great concern or even fear as to the future of public space. Though assumptions and predictions can be made for the types and forms of new innovative technology, not all forms can be predicted nor can the degree of application, making it difficult to determine the degree of disruption, or even for how long. Though, just like the automobile dramatically changed transportation and the street network, how will public space and the built environment change as a result of new pervasive technologies? And how do we determine and prepare for the best possible outcome?

Presently, public space is already in a state of flux, as new approaches to planning and urban design in the last century alone dictated the appropriateness and effectiveness of new design and programming methods. The Internet and associated devices, boasting rapid speed and generating an overabundance of information are already believed to have shaped public space or at least give rise to question whether this truly is a good thing. Is connecting to someone on the opposite side of the world necessary and supremely beneficial? Sheller and Urry would argue that wireless communication offers instantaneous communication but with a premium. The premium is one that is responsible for "...dismantling of the ideals and infrastructure of universal access that once underpinned the public utilities and the social inclusion of the entire 'public' in urban public space (Sheller & Urry, 2006)." It introduces a mechanism for greater discrepancies between wealth and social classes, which in many ways creates a larger divide and greater opportunities for social injustice. In a similar vein, Tridib Banerjee pinpoints three factors, which pose the greatest threat to society, include our withering public spaces, local conflict, and the rapid pace of information and communication technology.

For the past few decades, the public realm has been steadily shrinking due to exacerbated worldwide campaign for market liberalism and downsizing governments (Banerjee, 2001). Public funds are simply not directed to the creation of great public spaces like they once were, leaving the development of meaningful "public" space in the hands of the developer. Spaces that once stood for civic life and represented notions of inclusion and diversity are now largely spaces of exclusion. Privatization enables exclusion in exchange for aesthetically pleasing spaces or services that are only

affordable to a few. Privatization also renders an unequal spread of quality public space throughout the city. More affluent neighborhoods thus have greater privilege and access to public space while lower income neighborhoods have fewer quality spaces.

In addition, local tension in response to the larger restructuring of the global economy also diminished the prominence and importance of public space putting minimal effort into design and even less into acquisition (Banerjee, 2001). Creating vibrant areas for communal gathering or leisure simply ranks lower on the political radar of elected officials and community activists than it has in the past. Even in the case of quasi-public space this can be seen, as local governments are less strict about the amount of open space required in conjunction with a new development. Lastly, the rapid development of new technologies and modes for information sharing will continue to dramatically shape interactions (Banerjee, 2001). Technology, historically, has led to a number of disruptive technologies, and the likelihood that this will continue is nonetheless inevitable.

The third factor presented by Banerjee informs much of this paper. Technological innovations, particularly those pertaining to pervasive computing, digital media and devices, shape interactions between not only individuals but also the places they populate. Other likely technologies that are currently being developed include the autonomous vehicle. The autonomous vehicle, though not a component of public space, will likely alter street life, development trends, and parking structures as well as requirements. Each of these elements does impact public and quasi-public space, thus including the driverless car in the discussion will prove beneficial and shape the discussion further.

Digital technology poses an additional threat in that it is a highly privatized industry and will likely continue as such. The power resides among a few large corporations creating a potential imbalance and opportunity for disruption. Is it truly in the public's best interest that the development and control of digital devices be managed by a few? The few corporations essentially possess control over marketing platform and provide the media and advertising industry more opportunities to inundate the environment with their messages.



Figure 4: Outdoor Advertising, a message that can't be turned off

Advertising has always been a component to the urban landscape. Even the earliest of cities were filled with painted signs carrying relevant information or advertisements for specific industries. This remains true of modern cities and cities across the world, rich and poor. In the last century, outdoor advertising has shifted from static forms like store signs, billboards, or posters to more dynamic forms like digital facades or revolving screens (Iveson, 2011). Iveson remarks that the prevalence of outdoor advertising, despite the advertising capabilities of digital hand held devices, can

largely be attributed to the significance of public space. Meaning that, because public space holds intrinsic value within our cultures, outdoor advertising remains a viable and affective mechanism for broadcasting to a larger public (Iveson, 2011). Within the scope of digital devices, it becomes a message that can't be turned off or changed, and because of this, is highly desirable to corporations vying for their product or service to be bought or consumed. Additionally, outdoor advertising generally has a large captive audience and a diverse audience at that. The emerging issue is, however, the monopolization of outdoor advertising. It is increasingly becoming viable for only those willing and able to pay the price, limiting smaller corporations or cheaper forms of advertising from having an impact on the market (Iveson, 2011). An inherent element of digital devices is of course the expense. While mobile devices are significantly more affordable, the newest technology is frequently only available to those who possess the means to buy in. Giving rise to yet another concern, the growing wealth gap and division of social classes. Mobile and digital technologies will likely escalate the problem, creating a further monopoly on advertising through pricing out the lower tier thus playing a significant role in shaping public space. Media messages conveyed in the public realm will be highly controlled by those able to pay, thus giving these few organizations greater control over the form and content of media pushed to the greater public.

Recent technology related innovations have incurred a number of results, some mildly make known their presence while others have been quite disruptive and produced massive changes to everyday life. As a relatively new innovation, digital devices and pervasive computing pose a threat to public spaces in that they are in a constant state of flux and supported by infrastructure that enables rapid connectivity. Sharing ideas is no longer bound to the physical face-to-face interaction or handwritten communication, but rather exchanged via the Internet's vast network and availability of a Wi-Fi connection. Wi-Fi connections have pushed the capability of the Internet to another degree, enabling users to be logged on at all times, sharing thoughts, images, or movies at the blink of an eye. It generates an ever-widening network and expedites the presence of even more types of devices. Tangible digital devices shape users interaction within public space as well, through both the information they receive and the physical manifestation of that information. It's easy to recognize the first of these, mobile technologies, due to the intrinsic nature of the device to monopolize the individuals attention, distracting them from their perceived surroundings. They pose an incredible power to not only facilitate communication but also push

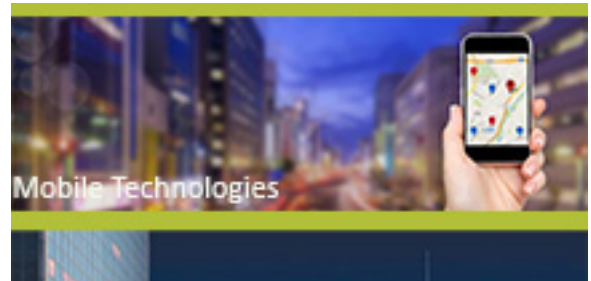


Figure 5: Forms of Digital Media



advertising and marketing schemes of larger corporations. How frequently people slow their pace while walking and operating a smart phone or even act out of character when driving due to information they are receiving via their device. Other forms of media encompassed in the discussion, include digital screens and computers that distribute collected information at will. The messages take the form of news highlights, advertisements, or other context relevant information. Though largely seen as an advertising mechanism, digital screens are becoming more prevalent as an interactive interface that assembles information and facilitates engagement. Sensors and pervasive computing devices and applications operate as information gatherers, archiving pertinent details and perceptions, only to later share the data with a specific audience or entity. Digital glasses, like Google Glass, add another layer of to existing spaces, augmenting reality and altering the physical experience. Though not widely used, devices that augment reality are certainly relevant to this discussion. As each of these devices and others are implemented in public and quasi-public space, the meaning of sense of place is called into question.

Historically, certain interactions and activities only took place in public space, for example the exchange of goods or communicating with community members; however, the evolution of technology and digital devices has enabled these activities and others to occur in isolation or the private realm. In sum, a key concern is the threat of sense of place. Will place take on another meaning, one that is not based on the physical world but rooted in an augmented reality?

Lastly, though the future of the autonomous vehicle is not known, the rapid pace at which prototypes are being tested and the potential impact of the innovation will like

incur dramatic changes to the built environment. Chicago School of Urban Theorists described mobility as the best index of the metabolism of the city (Sheller & Urry, 2006). The advent of automotous vehicles will essentially provide another layer of mobility and potentially enhance mobility services provided. However, among the caveats to the driverless car is their potential to dramatically impact public space through altercations in street life. Swift, on-demand vehicles will replace short trips, those characteristically performed on foot, creating a serious threat to street life and public space at large. Street life and active sidewalks are often crucial to the success of public spaces because they are the means of connection. Sidewalks that are heavily traversed enable busy plazas and active green space, whereas dead sidewalks often are reflective of equally dead adjacent public space. As the function of streets change due to type of transportation technology, public spaces level of effectiveness is certainly valid. Though the hype and fears associated with Segway didn't play out, other forms of technology threatening last miles connection are certainly not ruled out. The opportunity exists then for the primary function, purpose, and even shape of the built environment to change significantly in response to the dramatic change in transportation services. Influencing not only the services provided at the ground floor but parking and density as well, which in turn influences the number of people occupying a space and their motivation to visit a certain place. Though not prevalent in our current daily, deep consideration of added driverless car technology is essential when understanding and planning for the future of public space and its impact on the quality of life for the individual.

Additional threats and fears associated with increased technology and digital devices include those of surveillance and security. In the early days of the Internet,

many feared that the accessibility to vast amounts information would cause greater evil than good. Visions of dramatically different public spaces buzzing with robots, wires, and a bleak grey cloud of industry perpetuated conversation. Other popularly held beliefs were those reminiscent of George Orwell's "Big Brother" scenario. Surveillance mechanisms infiltrate even the smallest of devices manifest in a number of forms all in an effort to keep careful watch individual's daily activities. Everyday life is inevitably dictated by fear of the repercussions of acting outside of the proscribed behavior. Environments shaped in this manner would be less than life giving while also placing too much control and even access to information in the hands of the government.

Cyber security is certainly an issue at hand. With the advent of the Internet, common fears included ideas of "cyberspace" and "techno-futures," where flying cars and augmented reality dominated the landscape. And rightly so, while numerous advancements have been achieved, countless innovations have also spurred great conflict, terror, or detrimental breaches in security. Recent accounts of pacemakers being hijacked or the slight glitches due to software updates, presents a number of questions as to where and how a highly digitized public space would be affected by similar glitches (Taylor, 2016). Cyber security is an even bigger issue when dealing with the public



Figure 6: How visible will surveillance mechanisms be?

realm as it likely affects larger quantities of people and has the potential to severely disrupt everyday life. Imagine if hackers were able to reroute buses or a fleet of driverless cars, or turn smart buildings into death traps. Cyber security also encompasses individuals right to privacy and ability to withhold personal information from the government. With so many devices gathering data and analyzing interactions, many are worried that this will give the government or any entity for that matter, too much knowledge about the public. This leads to questions as to whether greater technological advances will enable opportunities for hacking or will system virus and hacking be prevented once and for all? With confidential information floating through the invisible wires of the Internet, it seems all too easy for hackers to intercept very important data, and of course this has already proven of concern. The issue of increased security breaches due to hackers vying to disrupt are certainly a viable concern. It gives sufficient reason to determine the appropriate level and degree of information that should be collected and further investigated for optimum security. Though the initial fears of heavy surveillance have not panned out verbatim (or at least not in the United States), surveillance issues and certainly cyber security remain relevant to the discussion.

In contrast, technology has also been the barer of great advancements and overall improvement of the quality of life. Ever expanding networks and faster connection speeds have greatly enhanced mobility options and services like automated and sensing traffic lights, programmable streetlights, and interactive wayfinding. The global economy has certainly benefited from the greater opportunities to conduct business and interact with

difficult to reach clients. In the same manner, handheld devices have proved beneficial in developing worlds through programs like Map Kibera which engages community members to participate in



Figure 7: Brooklyn Digital Real-Time Bus Portal

mapping particular needs, services, or issues within the given slum ("Map Kibera,"). Digital technology, particularly smartphones, has saved countless lives due to their prominence in society (large proportion of individuals have access to a phone) and the rapid communication services they provide. With many cities instituting "Amber Alerts," the greater public can be included in search operations. Smartphones have long served as convenient platforms to relay important weather warning information or transmit safety alerts. In disaster-laden areas of the world, they have enabled search and rescue teams to not only find survivors but also communicate to rescue teams when additional support was needed. Smart technology has also induced better

building practices as well as a broader implementation of green technologies, which improve the inefficiency of building operations. As the field of urban informatics continues to grow the opportunities to incorporate the benefits of digital media and devices into the environment expands as well. Collected data can be used to inform building practices, site selection, contamination, and issues of injustice. Hope exists that citizen collected data will be presented in an interactive format, be it touch screens or another device, which can be used to garner citizen engagement and inform community members (Valkanova, Jorda, & Moere, 2015).

In addition to a vast array of social benefits, the Internet and digital devices have provided a number of beneficial consumer related goods. From delivering goods and services to your doorstep to enabling navigation of new cities less daunting, the Internet has enabled numerous on-demand services just in the past decade alone. With the sheer number of services and types of services dramatically changing new opportunities arise for digitized maps and real time wayfinding apps to market themselves as the simplest way to achieve the most efficient route to the intended destination. The workplace has evolved as the sheer amount of space needed is being reconsidered on a daily basis, large file or storage rooms can be consolidated and shared and the physical workspace has also considerably shrunk. The reliability and connectivity provided the Internet enables more employees to work remotely or institute flexible work hours. The Internet has also made large amount of data and Information more readily accessible. In the right hands, large amounts of data or “Big Data” can provide robust answers to seemingly complicated problems. Despite the gloom and doom presented earlier, innovative technology, particularly those associated with digital devices can

provide a number of services and conveniences that enhance daily life. Throughout the remainder of this paper, further consideration will be given to how these different applications can be incorporated seamlessly into the built environment thereby enhancing the experience within public space rather than morphing it into a chaotic mess of digital screens and devices. The purpose of this paper is to explore digital media in its various forms, how it has evolved and historically shaped public space as well as speculate possible futures.

With various viewpoints presented, it is evident that technology has inundated our environments, weaving a network of connections, that welcomed or not, provides and collects various amounts of data. Computers and the Internet have been facilitators of this process providing greater access to information and quicker exchanges of information connecting individuals from opposite ends of the world or the opposite side of the room. With even more data being collected and processed, the expectation is that technologies will increasingly impact daily life through both services and the physical design and function of space. A few questions remain including how significant will change be? Will it benefit society as a whole or those with the means and access to digital devices? Will a world so entrenched with digital media, computers, and sensors look and feel different, creating new experiences and redefining previous ones? There are countless unknowns yet these likely futures might be closer than many think and thus deserves a closer look.

A number of factors, some speculative and some matter of fact, inform our interpretation of the future public space. Digital technology is ever present in our environment and only gaining ground, and because of that fact the perception of place

is shifting. Activities that once required a physical platform or represented the civic pride, no longer necessitate physical space. Likewise, digital devices and augmented reality present new methods of engaging with space that are questionable and also raise concern as to whether they are suitable methods for experiencing a pleasurable sense of place. Public space is shifting and in many cases shrinking due to lack of attention and in many cases funding. Security issues and surveillance are primary threats and instigate legitimate fears for the very near future. Understanding the future of public space and in particular how digital media and technology impacts space is important to preparing for the best likely future.

In order to fully address this issue and provide reasonable speculation, this paper will look briefly at what constitutes successful public space. Identifying the consistent themes or attributes that define thriving spaces and present examples of modern public spaces in an effort to inform how can they best be preserved in a digitized future. An examination of the evolution of the Internet and digital media will likely show the rapidity and potential pitfalls of the technology as well as inform projections for likely futures. Looking back at the past will provide a basis for how things have changed and helped to predict how they will continue to change. What is our intended trajectory? And is it a viable and beneficial course?

Background

Characteristics of Successful Public Space



Figure 8: Active Public Space, Millennium Park, Chicago, Illinois

Public space has been a dominant element of cities since the beginning of time. In the earliest cities, town centers and plazas provided the opportunity for trade, information exchange, socializing, and political action. As society has evolved, public spaces still capture these original activities but have also grown to include a variety of other activities. Many would argue that the health and vitality of the city is, in part, dependent on the vitality of its public spaces. But what exactly defines a vibrant public space? Jane Jacobs would argue that vibrant public spaces are ones that are designed for people and a diverse group of people at that. Fred Kent of Project for Public Spaces

also harps on the community component of successful public spaces. His main point being that successful places are those embraced by local communities. They resemble the community's needs and thus are "owned" to some degree by that community (Michaels, 2011).

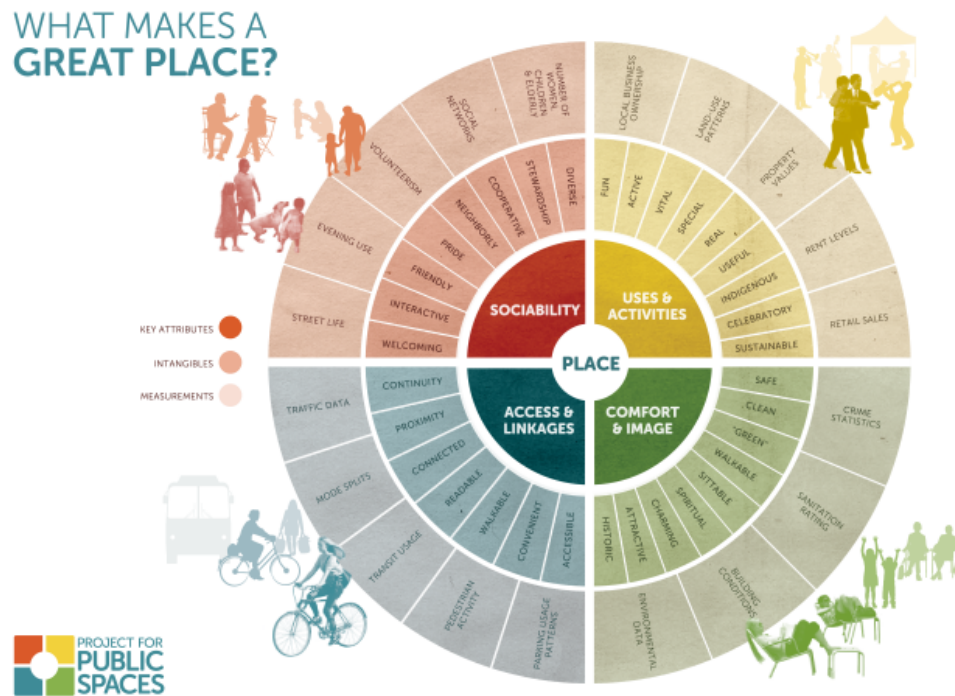


Figure 9: Place Diagram; Project for Public Spaces

William H. Whyte closely documented public space, analyzing activities and interactions within space in an effort to identify and characterizes successful public spaces. His evidenced based observations revealed that while design is important, people ultimately attract more people (Whyte, 1980). Project for Public Spaces, the brainchild of William H. Whyte, summarized a public spaces success based on four qualities: sociability, use and activity, access and linkages, and comfort and image illustrated in Figure 9 ("Project for Public Spaces," 2016b). The sociability of a space reiterates Jane Jacobs point, that spaces should be designed for people and where

strangers feel comfortable interacting. Use and activity encompasses having a range of activities and attractions, which draw various users at different times of the day, week, or year. The concept of access and linkages refers to the notion that the space is both easy to access via various modes of transportation and also distinct from the surrounding edges. And lastly, comfort and image refer to the overall aesthetic. Does the place feel inviting and reflect a general feeling of safety and cleanliness? Though this list is certainly not complete, it provides one valid framework for investigating public space or creating new spaces and may prove to be a valid framework for judging the appropriateness of digital media within the built environment.

Another framework for analyzing urban space was developed by urban planner and environmentalist, Kevin Lynch. His research on public space emphasized the connection between the built form and the environment. He concluded that there were five key elements, which shaped individuals perception of the city: paths, edges, districts, nodes and landmarks (Tonnelat, 2010)



Figure 10: The Elements of Kevin Lynch

Paths represent the spaces for circulation and movement typically realized through streets, sidewalks, and other forms of connection. His study proved that street life dramatically shaped individuals perception of the city as a whole (Tonnelat, 2010). Street life also bares an intrinsic sociability that should be preserved and strived for. Edges form the boundaries or breaks in continuous scenes of the city. Edges may be

blurred and less noticeable or the hard edge of a fence or gate. To some degree, most public spaces are shaped by edges. The landscaped edge of a park or distinct paving of a central plaza solidify a boundary that is either welcoming or a barrier. Districts are classified as areas resembling a similar character or attribute. In the case of public space, a district may encompass several public spaces all of which boast similar landscaping, attractions, shapes, or purposes. The district may be unified under one architectural or cultural characteristic that distinguishes it from other areas. Nodes embody the focal points of the landscape, like a square or intersection. They are essential to the way finding component and orientation of a city. Lastly, landmarks are the icon points of orientation, which are easily recognizable and often celebrated. Architecturally significant buildings, icon statues, or public art are common examples of landmarks. Each element presented by Kevin Lynch is essential to orienting an individual informing a mental map as one navigates a city. They encompass public and quasi-public space in their various forms and thus prove beneficial in the analysis of public space and its projected future.

In order to create a successful place, a space must be both comfortable and attractive to the intended user. Comfort and image can manifest in a number of ways as public spaces are quite diverse, and should remain so. Their primary function could include serving as one of the few opportunities for green space and recreational use within a city or as the primary gathering place for a community. Regardless of the purpose of the space, physical characteristics do inform the overall perception of space, for example, one's sense of safety within a public space is largely due to the physical nature of the space. Is it well lit? Are large obstacles or strange building formations

creating dark nooks and crevices where danger might loom? Is the space well kept and free of trash? While the physical nature of a space may not directly render a space safe or unsafe, it can attract or detract individuals from experiencing a space. Physical comfort, thus, can be achieved in a number of ways

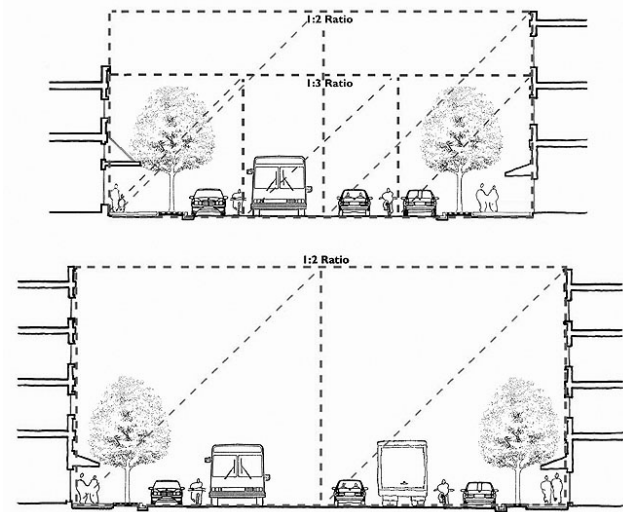


Figure 11: Rule of Thumb Building to Street Ratio Also Speaks to Sense of Enclosure

including location and proximity to nearby uses, attractiveness of the surrounding architecture, landscaping and shade, as well as seating options. Visually, public space once again creates a perception of rest through visual breaks in a sea of buildings. Giving the eye somewhere else to look or providing a scenic vista or iconic element, adds interest and garners attraction. Small pocket parks or plazas scattered every few blocks help to break up longer walking trips and create visual interest. Often,



Figure 12: Piazza Novona provides a rich backdrop for lively interactions

successful public spaces have a strong feeling of enclosure created through strong architectural features framing the open space. Building height is a key indicator of comfort for example tall buildings



Figure 13: Campo de Fiori alive with its daily food market

paired with a small amount of open space create spaces that feel constrained and perhaps rushed, while building heights that relate one to one or even two to one with open space feel more comfortable and conducive to lingering. For example,

Italian cities are often recognized for their expansive plazas and bustling piazzas. Two such plazas with very different experiences include Campo di Fiori and Piazza Novona. Four to six story buildings and humble architecture characterize campo Di Fiori while Piazza Novona boasts a larger footprint. Buildings in Piazza Novona range from four to five stories and are decorated with grand architectural details. Despite their physical differences, both of these spaces are active with a variety of users from locals grabbing cappuccino or selling merchandise, to tourists soaking in the richness of Italian architecture. They are active throughout the day due to the number of attractions and activities taking place within the plazas and on the immediate edges. Components of successful plazas and piazzas included well-articulated edges and enclosure.

William H. Whyte also noted that the most successful places provided a variety of seating opportunities as well as seating types. Diverse seating options enable groups of varying sizes and dynamics to occupy the space while promoting social interaction and flexibility (Whyte, 1980). Though the majority of individuals that utilize a public space venture on their own, seating arrangements should not deter larger groups. Adaptable and moveable furniture is most desirable as it accommodates growing and

shrinking group sizes, and enables flexibility. At the end of the day, in order to attract people there must be places to sit (Whyte, 1980). Jane Jacobs adds public space must contain a centering



Figure 14: A variety of seating options in Paley Park, New York City

element such as a major crossroad or pausing point as well as good access to sunlight (Jacobs, 1961). William H. Whyte also noted the importance of adequate sunlight in his observations of individuals in public plazas. His observations concluded that even on the hottest days of the year, people migrated to the sunny portions of space (Whyte, 1980). Of course shade is also necessary, but sunlight appeared to be more so. Lighting, seating arrangements, enclosure, and physical aesthetics all contribute to the comfort and overall image of the space.

Public spaces enhance everyday life and overall wellbeing by providing an outlet for recreation, social activity, or contemplation. In other words, they promote a number of uses and a range of activities. Cities as a whole must first have a variety of public spaces including green space for recreational and environmental purposes, open plazas for markets and community gatherings, small squares for more intimate meetings, sidewalks and periphery spaces that provide suitable places for people watching and contemplation. Public green space takes the form of pocket parks, expansive parks, or linear trails and parks all of which provide the urban dweller with a safe place to walk the dog, throw a Frisbee, or enjoy the outdoors on a sunny, spring afternoon. While

planned green space and linear trails support physical activity inherently, many cities and municipalities incorporate fixed exercise equipment to further encourage physical

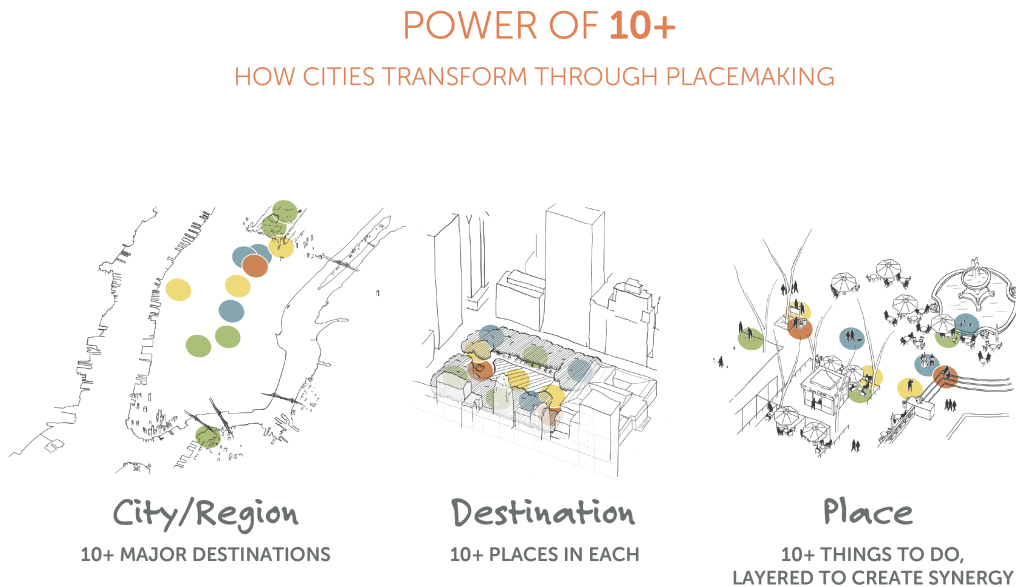


Figure 15: The Power of 10+; Project for Public Spaces

activity. Plazas are generally paved areas at the base of an office tower or corner of a prominent intersection. They generally supply some sort of shading, water feature, and seating arrangement. Smaller quasi-public spaces like pocket parks, stairs, and sidewalks offer a range of activities generally supported by the retail and commercial uses flanking each of their spaces.

In order to function as a successful space the area must develop a level of intricacy that stimulates a number of users, Project for Public Spaces refers to this notion as the Power of 10+ ("Project for Public Spaces," 2016a). The Power of 10+ is a tool utilized by Project for Public Spaces (PPS) to frame placemaking approaches and tactics. It holds the belief that places that thrive boasts at least ten different reasons for people to be there ("Project for Public Spaces," 2016a). These might manifest in a variety of seating options, landscapes, playgrounds to enjoy, or art to touch ("Project for Public

Spaces," 2016a). Maintaining a diverse number of activities populates the place throughout various times of the day as well as supports a diverse group of users. It reiterates the notion that public space is intended for the human and provides an opportunity for individual communities to dictate their desired needs.

Successful public space is both visually accessible and physically easy to get to. It may be located on a transit line or adjacent to a bike lane or simply along a heavily utilized sidewalk. When considering new public spaces, it is important to plan for various modes of arrival and make accommodations that will encourage public transit or alternatives. Also, it is important to consider adjacent uses and nearby attractions. Buildings that line the edges of the space can serve as attractors to the space if their first floors are filled with active uses such as retail or restaurants open throughout the day ("Project for Public Spaces," 2016b). Determining a mix of uses active at various times of day helps to ensure that there is a successful turnover of people and the space remains equally safe and enjoyable.

Lastly, public space is essential to the overall function of the city because it provides necessary gathering spaces that are essential to civic life. The sociability of public space is a difficult element to master, as interaction cannot be forced, but several tactics can be incorporated to support interaction and community engagement. In order to aptly provide for this component, public space must be flexible and able to accommodate seasonal programming or group gatherings. With appropriate programming, successful public spaces can undergo a transformation from active public plaza to a rally site or community market. In a similar sense, public space should reflect the context of the surrounding community or be flexible enough to transform as the

surrounding neighborhood grows and transforms. This means welcoming a range of individuals of varying economic backgrounds and well as age and ethnicity. They become intergenerational places populated by different groups simultaneously or at different times.

Urban social activity manifests in a number of forms from play to gathering or leisure spots. Play is an interesting function of public space because it addresses both children and adults.



Figure 16: Montreal Emit Light and Musical Harmonies

While formal playgrounds are certainly an attraction for children, well-designed steps, plazas, and even streets create opportunities for incidental play. Adults are excluded from this notion of play rather through placemaking and tactical urbanism techniques, street furniture or public art can engage a number of individuals in playful activities. For example, bus stops with musical swings or a giant chess games in public plazas have been frequently utilized by cities and organizations. Regardless of the size or shape, successful public space enables gathering and exchanging of ideas. They enhance the businessperson's commute and provide an enjoyable lunch spot outside the confines of the office. Street vendors also support a variety of activity and attract additional patrons, adding another layer and attraction to the public space (Whyte, 1980). In short, public spaces support

daily activities and social interactions that are crucial to galvanizing community and creating strong senses of place.

Successful public spaces are those that are characterized by comfortable surroundings; provide a range of activities; are accessible; and promote sociability. They are ones that boast a strong civic image and welcoming environment, but still possess unique characteristics of the community itself. In addition to activities, they support a number of uses and thrive off of the neighboring businesses or attractions. They are flexible to accommodate social gatherings of all sizes or community-centered events, and they even go as far as encourage interaction with strangers. Lastly, they reflect the diversity of the community by become places that are suitable for multiple generations, ethnicities, and socioeconomic statuses.

Successful Modern Public Spaces

Successful public spaces are plentiful. Many of the more recognizable ones are centuries old places that have stood the test of time and remain popular places. The breadth and variety across the United States alone illustrates that there is no cookie cutter format for creating successful places. Adhering to the principles set forth in subsequent sections, more recent public spaces of note include the High Line in New York City and Klyde Warren Park in Dallas, Texas with local examples of the Atlanta Beltline and Broad Street.



Figure 17: Aerial of the High Line; courtesy of Friends of the High Line

The High Line in New York City proved that a once abandoned rail line could be successfully transformed into a thriving public amenity. After numerous plans proposed to tear down the unused CSX rail line that spanned a mile of the Hudson River, neighbors and activist formed a group to save the structure, which served as a catalyst to its current purpose which is a 1.45 mile linear park along the Hudson River ("About the High Line," 2016). The design features contemporary landscaping serving to soften the otherwise harsh, industrial landscape while a variety of unique seating options promote the comfort and overall image of the place. As the trail weaves between buildings and spans busy intersections, glass windows with stadium seating provide an opportune spot to watch the hustle of New York City life. Other portions of the Highline include pockets of green space and rotating public art installations indicative of the surrounding communities. Painted building facades bring blank walls to life and provide unique backdrops for the tourist's photo opportunity. Since the first phase was completed in 2009, the High Line remains a beloved spot by both residents and tourists

and provides a noteworthy example of a well designed adaptive re-use project that quite literally breathed life into old infrastructure.

Klyde Warren Park in Dallas, Texas is a 5.2-acre deck park built over the Woodall Rodgers Freeway represents the success of a massive public-private partnership undertaking. Completed in 2012, the park is centered



Figure 18: Klyde Warren Park; via Reconnect Austin

on a grand pedestrian promenade with a range of activities programmed around (Krueger, 2014). The park was designed to conjure the sense of discovery as one moved through the various “rooms” located within the site ("Our Story," 2015). Components of the park included a child’s park, reading room, great lawn, restaurant, pavilion, fountain plaza, game area, dog park, and botanical garden exemplifying PPS’s Power of 10+ theory. The park functions as more than an active green space, but serves as a connection between Dallas’s downtown cultural district and the diverse neighborhoods to the north (Krueger, 2014). It’s prime location adjacent to the M-Line has actually increased trolley ridership by 60% and spurred the development of three additional trolley stops along the park edges (*Landscape Performance Series*, 2013). It has been recognized as a vital economic development piece that actively reshaped

Downtown Dallas and the surrounding neighborhoods and is projected to generate \$312.7 million in economic development by 2017 (*Landscape Performance Series*, 2013). In addition, the thoughtful programming and layering of activities and attractions provide places for diverse groups of people and at various times throughout the day.

Similarly, Atlanta boasts several successful public spaces both within its downtown and in the various neighborhoods located inside the city limits. The Atlanta BeltLine, is one example of public space using the layering of activities technique described in Project for Public Spaces,

“Power of 10.” The planned trail system not only serves as a linkage between neighborhoods and a means for recreation, but also highlights local artists and organizations through art installations and yearly-programmed activities. Various portions of the trail feature different public amenities and access points to large green space, collectively forming a successful network of greenspace around the city.

In addition to the range of activities and



Figure 19: The Atlanta BeltLine; Eastern Trail

its accessibility, the BeltLine has spurred nearly \$1 billion of private development along the trail and led to the improvement of several local parks and neighborhoods ("Atlanta BeltLine," 2016). As the trail progresses in the development promises, it is expected to

generate even greater for returns for the city creating thousands of jobs and generating millions of dollars in economic development while providing a substantial amenity to Atlanta residents ("Atlanta BeltLine," 2016).

The sidewalk according to many urbanists is one of the most important public spaces. Jane Jacob's, *the Death and Life of Great American Cities*, focuses considerable attention on the

significance of active sidewalks that support a range of activities throughout the day. Among some of Atlanta's more active streets, is Broad Street located in the downtown neighborhood of Fairlie-Poplar. A quaint street, lined with local eateries and sandwich shops, café tables, and manicured tree beds. Broad Street captivates the lunchtime crowd, catering to the mix of Georgia State students and businesspeople.

With a modest number of residents

nearby, it becomes a quaint neighborhood street in the off hours, while programmed activities provide annual activation of the street, transforming a road that was once for cars into a dining space for people. What makes Broad Street successful is its ability to support a diverse mix of people. It proves that great public spaces truly are accessible and beneficial to people of all socio-economic status and backgrounds.



Figure 20: Broad Street on a Friday Afternoon

Pervasive Computers and Digital Technology

Now with a solid framework and definition of successful place, these concepts and ideas can be applied to digital devices and their suspected impact on space. But before jumping immediately into the impacts on space, we need to also lay the framework for the devices being considered and their capabilities.

Thoroughly embedded in the environment, pervasive computing monitors, senses, and connects information to the user. The term pervasive computing in and of itself may conjure up ideas of “cyberspace” or some “techno future” that consists of flying cars and an augmented virtual reality, however this is not a complete picture of pervasive computing implementation in cities. Pervasive computing, as defined by the National Institute for Standards and Technology, is “numerous, casually accessible, often invisible computing devices, frequently mobile or embedded in the environment, connected to an increasingly ubiquitous network structure (McCullough, 2004).” It implies that digital information services are accessible anywhere and at anytime (Kelley, 2013). Within this sphere, mobile devices seem to be king, as they enable connectivity and facilitate the flow of information through various locative apps like Foursquare, Yelp, Around Me, and countless others. However, as the definition suggests, pervasive computing manifests itself in the environment, primarily through architecture and transportation creating a form of “technoscape” in which people, places, and now devices continually script one another (Sheller & Urry, 2006). In simpler terminology, technoscapes refers to the contemporary landscape driven by imbedded technologies that shape interactions and connectivity. It encompasses a range of computer devices

and equipment including visible screens and tangible devices and unrecognizable sensors (Sheller & Urry, 2006).

Pervasive computing relies heavily on the continued communication between user and interface. Information is shared through both user provided information through apps and information gathering devices in the form of sensors. Both provide valuable information that holds potential to shape the urban context. In his article, *The semantic production of space: pervasive computing and the urban landscape*, Matthew Kelley captured this idea, "For, inasmuch as individual technologies might aim to benignly motivate and democratize digital participation, user-generated information has great potential to reproduce or reinforce existing social, cultural, and/ or economic biases." Further, pervasive computing enables individual biases to be collected and archived to push information to other users either immediately or reserve for future marketing schemes. Information shared at any given time on any given day, can later be retrieved to inform individuals who share similar interests. This ability to communicate based on perceived preferences is an area of pervasive computing that is still being explored and is not far off what presently exists in the virtual world. Essentially, pervasive computing would enable the physical realm to respond much like the side bar of websites, which populate themselves with advertisements based on previous search history.

Greater sophistication with this technology presents many concerns in personal privacy and monitoring, and will be addressed in subsequent sections, but at this point it is important to understand the significance and broad issues at play as trajectory of technological development continues. People and places continually script one another

and will continue to do so creating a platform for pervasive computing and other innovations to speak to this interaction. Pervasive computing enables constant information sharing, which translates to implicit shaping of interactions and modification of reactions based on responses. Pervasive computing's influence in the shape and function of cities is increasing due to its abilities to redirect users based on preferences. Additionally, it serves as a viable platform for advertising and potentially renders more power to large corporations already in control of the mass media market.

Past examples of innovative technology and its initial impact on public space enlightens the perspective moving forward. For example, the telephone, a now substantial and often necessary component to everyday life, was not always such. Though invented in the late 1800's, the first public telephone was installed in 1905. A shift from performance design to experience in the 1990's created another milestone for the telephone. Software and media companies shifted the interface of human-computer interaction to focus less on the services provided by the computer's performance and more on the overall experience created by the devices (Teli, Bordin, Mene'ndez Blanco, Orabona, & De Angeli, 2015). The shift from operating primarily to enhance the pattern of workflow to one that addressed more personal contexts, essentially made technologies relevant for everyone. Creating an "experience" became the goal rather than a simple means to enable communication. This can be seen through the progression of the pager to mobile phone and then again to the smart phone. The shift also fed into an economy based on immediacy and instant gratification, which precipitated the future of communicative technology. Cell phones entering the market significantly impacted the future of business interactions. The ability to conduct

business or connect with individuals sans the cumbersome cord of a landline bolstered mobility and the desirability of the device. Mobility and soon affordability spurred its relevance and eventually the prevalence of the technology. Now in the age of the smart phone, even greater mobility and connectivity is possible. Access to information is no longer bound to an encyclopedia or desktop computer, but can be accessed anywhere and at anytime, so long as there is an Internet connection. In many places, free Wi-Fi or Internet connections enable even those with limited economic means, access to the same information. While communicative technology is not affordable or readily accessible to everyone at all times, it is becoming increasingly so.

The Internet enables a superabundance of information to be produced and collected each day. One study conducted in 2003 reported that in 2003 alone an equivalent of forty-seven times the contents of the Library of Congress worth of information was produced through the Internet and Big Data collection (McCullough, 2013). Big data is a term heavily associated with digital media and pervasive computing. It is collected through sensors, cell phones, tablets, GPS devices, retail rewards cards, email, credit cards, texting, public transit card, shopping online, and Social Media and now watches and wearable devices. Its presence in a multitude of devices enables it to capture real time data and perform almost instantaneous analysis. As more data is compiled, it attempts to synthesize large, complex problems (Hammon, 2015).

As a society, we are producing and capturing more data than ever before: 2.5 billion gigabytes a day in 2012, according to IBM (Hammon, 2015). In examining pervasive computing within the urban context, it is difficult to separate the wealth of

information produced from its potential affects on the physical environment. For one, the overabundance of information can serve as a mediocre alternative for truly understanding or interacting with the environment. It clouds the principles of knowledge and understanding and transforms them into principles driven by simulations, networks, and augmented reality (McCullough, 2013).

Another component of digital networks and devices is that of cybernetics, which proves to be relevant to public space through the theoretical and applied framework of feedback control which essentially links humans and technology via sensors, computers, and decision making algorithms (Erlandson & Psenka, 2014). Cybernetics enables architecture to become an interface that creates dialogue between environment



Figure 21: People engaging with the facade of Crown Fountain Millennium Park, Chicago

and inhabitants. It essentially provides the framework for interactive digital media walls and building skins. Sensors and computer technology create the feedback loop which take in individuals needs and wishes and transfer them to the display system or utilize them to inform the

environment (Erlandson & Psenka, 2014). Gordon Pask, an interaction designer, recognized the relevance of cybernetics to architecture, which we have seen realized through digital screens and interactive building facades (Erlandson & Psenka, 2014). A bit before his time, his theories entrusted the occupant with more control over their

environment rather than the planner, builder, or owner. Essentially, Pask contributed to this notion of a bottom up approach to designing. A process which enables people to construct their own distinct environments catered to their specific needs and desires (Erlandson & Psenka, 2014). It recognizes that while professionals may understand technicalities and theories, community members understand needs and problems to a different degree. Their input significantly shapes the success of a place and usually creates places that garner community. Placing more control in the hands of the community enables social barriers to be broken and promotes equity. Pask's approach gives promise that cybernetics and digital screens can be integrated into the built environment in a manner that fosters human interaction and equity while not imposing on the form and function of the city.

Understanding the history as well as the networks and platforms behind various digital devices informs our understanding of the potential these devices have to shape not only our environment but also the interactions within the environment. The Information Age and digital culture show little signs of slowing down. New inventions and product proposals only suggest a rapid pace for new digital interventions and disruptive technologies that will likely continue to produce copious amounts of new information and interface types. The following sections will address various forms of digital media already at play within the environment, and their potential impact to positively or negatively affect sense of place.

Current Applications of Digital Media in Cities

Digital media encompasses a range of devices many of which have been discussed in a previous section in relation to pervasive computing. If pervasive computing is the blood that flows through the veins of digital networks, devices such as digital facades, interactive touch screen displays, and mobile devices are the skin and limbs that create the visual manifestation of the assembled information.



Figure 22: Assemblage of LightSwarm; Future Cities Lab

Since the invention of the Internet, digital media devices have been incorporated into the environment at varying levels of success, some faring better than others. Digital media walls represent one application that has

been tested in a number of forms and configurations. From digital facades that operate as art installations to large television screens that showcase advertisements or news clips, to interactive touch screens, digital media walls fight for visibility. Some forms aim to positively influence the overall experience of the space while others seek to gain new patrons and push advertisements.

Future Cities Lab out of San Francisco is a multidisciplinary group, which hopes to understand architecture's role in expressing data flows. Is it possible for building data to be captured and manifested in a way that benefits our daily lives? Among one of

their more recent studies is the interactive light installation called *Light Swarm*. Thousands of glass tiles with individual sensors attached receive real time data and proceed to move according to a predetermined algorithm ("Future Cities Lab,"). The movements and infusion of different colors of light transform a once simple glass façade into one that the artists describe as “urban sensors-instruments to sense the city, visualize its auditory pulse, and amplify its latent energies into cascades of light ("Future Cities Lab,")” The result of data manifested in glass tiles is a smart surface that can sense, compute, respond and interact with its surroundings. It is activated on both the inside and outside of the building, creating truly unique experiences for both patrons of the building and passersby. In a slightly different vein, *CityWall* Helsinki tested the effectiveness and usability of large media touchscreens. Adhered to a building façade in a pedestrian friendly area, at first glance the large screen almost resembled a darkened store window. Upon getting closer, the pedestrian realizes that the dark wall is not a darkened restaurant window but actually an interactive device. The device enables multiple users to simultaneously access pertinent information about the city



Figure 23: Users engaging with the CityWall, Helsinki digital wall

while also engaging with others (Peltonen et al.). The study revealed that most individuals engaging the wall were part of a larger group but many were also complete strangers. Regardless of the group size

or demographic, CityWall provided an outlet for social interaction, playfulness, and problem solving (Peltonen et al.). It fostered interaction that the street lacked, creating a new and exciting platform to not only learn new information but also potentially interact with new individuals.

Figure 24: Times Square an iconic representation of digital media



In addition to digital skins and interactive touch screens, televisions and tickers are more readily seen in the urban context. This is a purely information sharing or media driven approach seen in Times Square in New York City. This iconic representation of massive digital screens running ever-changing advertisements and stock market numbers is a noticeable icon. At one end of the spectrum, the larger-than-life screens create a unique atmosphere and district for tourists and locals. It certainly is a portion of New York City that is alive with activity at all hours of the day and year. As new technology is adopted, the increased application of digital building skins and media displays only becomes more likely.

Comparing these devices and the interactions they inspire to the characteristics of a great place presented earlier, digital media walls and screens clearly impact the

comfort and image of a place. Interactive skins and screens satisfy the sociability and use or activity categories. Both devices attract crowds and spark conversation with strangers and generally leave individuals mesmerized by their experience. Thus, it is not outside the realm of possibility that digital media walls and facades could be incorporated into public space in a manner that would enhance the overall sense of place. Additionally, drawing on Kevin Lynch's elements of cities, digital media walls and screens serve in many cases as defining characteristics of edges or districts. Take for example Times Square, the allure and attraction of the square is in and of itself the larger-than-life screens and displays. Confined to one area of the city, this "media" district helps to safeguard other areas from an overabundance of similar types of media and display technology. The digital screens also form an edge in that when the screens stop, it is clear that one is exiting the district, in this manner, digital media and screens are helpful with wayfinding and creating the mental map of the city. They serve as suitable backdrops to engagement and memory making and are not discriminatory or alienating to any class of people.

Mobile technologies are the most recognizable form of digital media within the city. The number of individuals with smart phones has dramatically increased in the past few years with over 64% of American adults now owning a smartphone (Smith, 2015). Of those that own a smartphone roughly 10% are highly dependent on the devices for Internet connection, meaning that Internet connection is not available at their permanent residence (Smith, 2015). Based on the sheer number of individuals already owning and using smart devices, the smartphone is a relatively inexpensive platform that developers and designers can utilize in programming public space.

In regards to the built environment, mobile devices have dramatically changed how individuals communicate and carry themselves within public space. For example, instead of seeing a young professional sitting on the edge of the plaza reading the newspaper, we see a young professional with eyes glued to the screen of his mobile device. From his or her interaction with the device, he or she could be participating in any number of activities, be it actually reading the newspaper, caring on a dialogue with a friend or colleague, or scrolling through social media. Within the slender black box of the handheld device is a realm of possibilities and activities that create both deeper levels of connection and distraction. In one sense, “activities associated with wireless Internet use reduce the ability of urban public space to afford exposure to social diversity for Internet users, because they are simply less attentive to their surroundings (Hampton et al., 2010).” Yet another view poses that the mobile device provides a greater level of connectivity and opportunity to engage with a broader network. Networks themselves are changing as individuals have the ability to schedule and reschedule and explicitly pick which networks to interact with (Sheller & Urry, 2006). This ability creates a significant threat to public space allowing for the depth or diversity of the individual’s network to take priority over physical interactions. Interactions become more scripted diminishing the importance of physical space and physical interaction.

Mobile devices also speak to other sensors and computers within the built environment and inform the user with pertinent information and way-finding. Digital media, primarily in the form of maps and navigation systems, has largely affected transportation. Tourism, equally, has been a significant component to many urban cities

economies and historically one of the earliest providers of digital media within the city, the map or travel guide. Travel guides initially served to navigate a visitor from one location to the next, connecting them through planned scenic routes to different points of interest (Sheller & Urry, 2006). These guides have certainly evolved from weighty manuals to condensed apps that can be stored on a mobile device. Open city data at the disposal of tourist and local alike facilitate the urban experience through customized mapping information and personalized way finding. Customized in the sense that mobile apps ranging from quickest route selectors like Wayz, public art finders like ArtAround, and not to mention apps like Yelp or UrbanSpoon which help locate the nearest restaurant within a given budget or criteria. To quote Apple, in terms of navigating a city or improving the urban experience, “there’s an app for that.”

Digital handheld devices don’t fare as well in their contribution to public space. Though theoretically contributors to extensive social networks and quicker communication, they create fewer social opportunities within physical space itself. Occasionally, mutual device users will engage in conversation relative to the connection capabilities or network, but in general they are seen as less approachable. One study that engaged wireless Internet users in Bryant Park reported that only 28% of the wireless Internet users reported meeting someone new in a public space while using the Internet (Hampton et al., 2010). Wireless users typically congregate based on the spaces role of reputation, free Wi-Fi, pre-existing population density, urban design, surveillance or harassment, and local culture, but does little to enhance the sociability among users.

Mobile devices and applications arguably could contribute to Lynch's path, creating access and linkages as one moves from place to place. Mobile apps enable efficient and easy transportation through apps, which plan the quickest route or notify of nearby transit options.

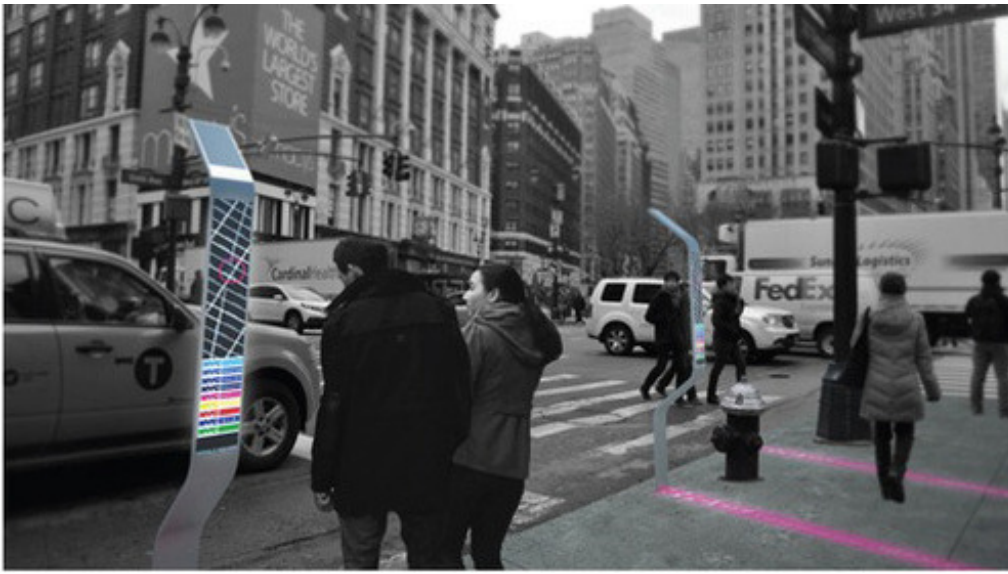


Figure 25: Smart Sidewalks Information Hub and Charging Station; via bbc.com

They can be of particular use as an informational system that delivers way-finding information or points of interest to tourists and the everyday citizen. Here, the mobile device can be better argued as a contributor to a great public space. It enables a large number of people to navigate to the intended spot, find the quickest or most accessible route, and locate other points of interest along the way. It can encourage multi-modal transportation or rideshare and also encourage walkability. In sum, the greatest contribution mobile devices have to public space is that they can get you there. However, the discontent with the mobile device is that its contribution is less visible due to the realm of possibilities contained discreetly in the mobile device. And while it provides excellent and efficient means of direction, it also distracts. Distractions

can be as minor as obliviousness to great architecture or event or significant incurring vehicular crashes. In essences, its hard to determine the positive benefit of mobile devices contribution to sense of place, but in most cases, its safe to assume that the mobile phone serves more as a distraction and method of isolation rather than one that garners community and engages on in place.

There are a number of hypotheses regarding the future of public space in relation to the driverless car. One belief suggests that public spaces will likely be even more important and necessary to attract individuals from the confines of their vehicle to outdoor environment. The combination of ease in an on-demand car service and an intuitive fleet may present little reason to use active modes of transportation even for short trips. This would result in a greater reluctance to leave the confines of the car and therefore less likelihood to engage in the physical environment. Dead sidewalks and empty parks would result effectively eliminating the sociability of public space. Removing the people from the streets and public spaces would also detract from the overall feelings of safety and comfort that good, well-designed spaces exude. It is also speculated that the driverless car scenario would render outdoor advertisement a relic, transferring the real advertising power to the interior of the vehicle and the individuals smart phones or mobile devices. This major shift in advertisement could play an influential role in digital facades, media screens, and displays in the public realm (Tumlin, 2016). On the other end of the spectrum, public spaces will likely increase due to increased availability of land once held captive to parking lots or decks. Of course much can be speculated here, but it is worth considering and seeking to understand in order to better gauge the physical state of public spaces.

Digital media and devices are already inundating our environment. Some have contributed positively to the sense of the place creating environments that are safe and engaging, while other applications have not. However, the sheer fact that a number of applications have successfully created positive interactions and experiences gives hope that future forms of digital media can also incorporate these tactics and further the tangible benefits that these platforms created. It may also provide insight into methods for integrating less desirable platforms more seamlessly into the urban context in manners that will bolster physical engagement and social interaction.

Projected Implications

With every new innovation or technology, there is generally some level of fear or uncertainty related, and for good reason. Disruptive technologies are hard to predict and plan for and likely have varying degrees of impact. To what degree does digital media deserve our concern and attention as we prepare for future cities. Will digital media become a disruptive technology that creates chaos rather than order? Or will technology create an urban landscape that is more fully enjoyed and accessible to all individuals? “Fortunately, so far in the history of computing, the law of unintended consequences has tended more toward chaos, creativity, and occasional delight, and less toward the sorts of command-and-control anticipated in the industrial era (McCullough, 2004).” There are certainly opportunities for a number of scenarios, but what exactly do these worlds look like? Will the physical environment be deeply affected and hardly recognizable by today’s standards? Will new technologies impact building methods and design approaches enabling new building forms infused with responsive technology? Or would the virtual world dominate the physical landscape to such a degree that augmented reality is the only known reality? Will society itself experience vast changes as social interactions and community transform with the new advancements in communication devices? Will the political climate dramatically change rendering too much or too little control to the government or large corporations? These questions beg the answer as to whether there is in fact a successful balance between the two, where technology and digital media can be integrated into the urban landscape while preserving place thus enhancing the users experience. In this next section, three possible future scenarios will be explored: a digitized utopia, a disorganized chaos, and

a sustainable blend. Dissecting the possible futures, the physical landscape alterations as well as social and political element will help to inform the discussion on the future of public space, what it should be, what it should not be, and how to achieve the most desirable future.

Digitized Utopia



Figure 26: A Digitized Utopia, reminiscent of the 1960's TV Show the Jetsons

The mission of this future is speed as a mechanism to enhance the overall quality of life, under which “promises gleaming efficiency, citizen-centered services on demand (Hill, 2015).” The city in a sense is a hefty algorithm, chronically calculating and iterating the best possible scenario. The *Internet of Things* enables smart and intuitive technology to integrate every object. Inanimate objects respond intuitively, even going as far as predicting what good or service the user might need next. Waiting is practically eliminated or dramatically shrunk.

As for the physical landscape, architectural detail will take on a completely new dimension. Today, architecture is comprised of a series of intricate details, but with the power of ubiquitous computing and in this digitized utopian future, it holds the potential to communicate the most meaningful, “invisible detail” (Ratti & Claudel, 2014).

Technology integrated within the built environment would transform the lifeless bricks and concrete blocks into a series of living “bits and bricks” that respond to users- absorbing information and data and reacting accordingly. Calculating outdoor temperature and humidity to inform the indoor environment. In addition, the sensing technologies would affectively gauge the wear and tear of a structure. Buildings and infrastructure would become keenly aware of degradation and overall lifespan. Bridges and tunnels also have personas of their own becoming “anxious hypochondriacs” due to their ability to self-monitor and predict repair (Hill, 2015). Bearing the capabilities to remedy the issues without human involvement. In the digitized utopia this sort of technology and information gathering would render building methods that are more permanent rather than quick solutions to a growing demand. With flying cars being the preferred or elite mode of transportation, what little infrastructure that actually remains is overgrown with flora or redeveloped to provide housing or office space for the growing number of urban dwellers. New infrastructure senses and shares information regarding travel patterns, working to also predict future movement patterns and market needs. Retail centered streets count every footstep to predict commercial activity for the day, week, or season enabling land values to change at a similar pace.

Likewise, public space would be characterized by a constant state of flux. New technologies and responsive infrastructure would enable rapidly changing pedestrian

experiences unique to each individual. Sidewalks and way-finding devices would augment themselves to appeal to a certain market, directing advertising or media messages in accordance. Media messages would be largely tailored to the individual but not encumbering the environment with a mess of digital messages and sounds. The pervasive quality of the devices may enable public spaces to better be designed and augmented to appeal to a greater public, crossing socioeconomic lines. Where streets once stood, a dominating feature of the urban landscape, now they lie covered with vegetation as flying cars take the air. The streets are left as places that are now truly



Figure 27: Future of Paris, designed by Vincent Callebaut Architectures

for people and as a result, a large contribution to public space in the digitized utopia. An overall increase in urban dwellers demands a number efficient transportation options, including driverless car and bus, flying car, and bicycle.

Traveling and experiencing public space will be a commoditized venture, where the latest, greatest, and trendiest stores and restaurants push notifications with deals and tips for a more “local” experience (Kelley, 2013). In one sense traveling to new places becomes easier. Less planning and careful research is necessary, as pervasive computing has done the work to garner personal information and preferences that will inform the experiences you will most enjoy in another city. In another sense, this future

could also be dubbed the “consumption future,” making it significantly easier to consume and dispose of products and services.

The Digitized Utopia is a world entrenched with pervasive technology, responsive and adaptive to growing needs. Despite the invasive nature of the devices, the overall quality of life for urban dwellers is improved rather than diminished. Though public space becomes induced with devices, technology actually works to enable individuals to take back the streets and thoroughly enjoy public space. The greatest concern in this scenario is actually social equity and the growing disparity between rich and poor, and the likelihood that it could become increasingly so. Despite the technologies best efforts to adapt and respond to all individuals needs, it proves more beneficial to the wealthy, creating a further divide.

Disorganized Chaos



Figure 28: A scene from *Minority Report* sets the vision for a future of disruption and chaos

Another alternative emerges, that of a highly digitized world marked by chaos, security breaches, distrust, and lower quality of life, essentially a world where digital media reduces the quality of life. Will future cities be inundated with digital signs and techno-facades, overpowering our environments creating an abundance of visual clutter? Will there be a heightened threat to safety, both personal and at a national level? Will it create a larger gap between rich and poor and make it increasingly more difficult for immigrants to assimilate into new cultures? Or will society simply suffer from always being “connected”? Creating poor community and cultural connections and apathetic generations that care less about the physical environment and more about the experience of virtual reality. A disorganized, chaotic future is certainly feared, but what exactly does it entail?

Among the negative impacts of an increasingly digitized city, is the disruption of architecture and sense of place. Architecture has long been a grounding element. Malcolm McCullough makes the case for the necessity for context within a city, in his book *Digital Ground*. He explores the physical and social elements that defining architecture contributes to a city. Historically, the built environment provided more than just a space for our daily activities. It shapes intents and provides context (McCullough, 2004). Grand, richly ornamented buildings denote power and civic pride, while the tall steeple or spire suggests worship. Ordered columns or ornate tracery might suggest Italian culture while crenellated arches and vibrant tiles give reference to Moorish influence. Contextually, architecture creates a sense of place, it reflects culture, and evokes feeling, in a sense it provides “ground” (McCullough, 2004). But in a digitized dystopia, architecture and sense of place are valued to a lesser degree. Little weight is given to architectural details, rather buildings become isolated boxes for activities and less of a stimulation for creativity, contemplation, or awe. In accordance, building ornamentation is also bland. Masked with screens or digitized facades, buildings become loud annoyances that hurry pedestrians along, ushering them quickly off the streets and into the quiet solitude of the buildings. Where as context used to inform individuals on location, navigation, or even accepted interaction, a digitized, chaotic future leaves little room for context.

The space between the buildings also undergoes a bleak transformation, no longer an important function of the environment but rather one that is rarely considered. This draws a stark contrast to Jane Jacobs’ advocacy for the significance of the street level experience as one that emanates from its surroundings. She defines suitable

sidewalk character as being well lit, active, accessible, a place that is inviting to people. According to Jacobs, prevalence of people directly relates to safety, community, and context (Jacobs, 1961). Busy vibrant streets service a multitude of interactions, therefore being essential to this notion of grounding and a vital concern when exploring the way pervasive computing will penetrate urban environments. In a world where digital devices render physical chaos rather than order, a virtual world would be the only viable source of interaction creating a sort of “hyperlink between personal experience and, well, everything (Ratti & Claudel, 2014).” Likewise, pervasive computing would have profound impacts on the way individuals experience a city.

In the worst-case scenario, pervasive computing becomes an invasive technology, which interprets individual’s personal preferences and alters their movements based on such. While this might not seem entirely disadvantageous, advertising and political agendas would heavily inform decision-making signaling alternative routes regardless of preference. Similar to the popup ads on websites today, prior decisions or interests will inform which marketing messages an individual sees. However, at the end of the day, entities with the greatest capital and control of the market will boast the privilege of pushing their messages through regardless of the users preferences or tendencies. Commercial and public entities willingly pay for increased foot traffic to their brick and mortar store, so information is pushed through your mobile device informing you of local attractions, restaurant deals, or events to attend. The onslaught of information is perpetual and never ending. Those that have the most capital and sway inform decisions or work with other entities to attract your business. A future controlled by a few corporations will thus provide these corporations

with even greater over the built environment and the messages conveyed therein. Pervasive computing works less off of personal preferences and more on the private and public sectors advertising schemes, taking advertising to an entirely different level. Should the driverless car be a likely future, digital advertising will make its way off of the sidewalks and into the confines of the vehicle. No longer will the casual trip be restful or an opportune spot for a quick catnap, but rather it is like a bad infomercial with a constant barrage of advertisements. The noise will be incessant, loud, and not necessarily tailored to your interests. Public entities will also possess the power to manipulate course of movement based on vested interests in certain programming or uses. This of course gives rise to an overarching fear that lingers over society like a dark cloud. Under this scenario, the Big Brother concept is a reality. The government knows a too much about you and is liberal with inflicting punishment for even the slightest misstep. Public space becomes less of a place to gather and rest, less of a place for activity or socializing, and now a holding place for outdated vehicles, furniture, or devices. Clouded by the ding of disinvestment, digital media and pervasive technology successfully removes the human component of public space.

Sustainable Mix

How can digital media enhance the quality of life? What would a well-balanced urban space look like and how will individuals interact within it? How can technology be used to increase access and equity? What steps need to be made in order to address this scenario and ensure the best possible outcome?

Ubiquitous computing integrated to a degree where computers and hardware fade into the background will likely form the framework for the sustainable mix scenario. It incorporates highly intuitive technology in a manner that enables people to actively engage their environment while not detracting from the physical landscape (Erlandson & Psenka, 2014). Ambient intelligence utilize sensors, microprocessors, and technologies that communicate with people and entities lending to a “vision of a future in which environments support the people inhabiting them (Erlandson & Psenka, 2014).” The resulting city would be that of a sensate city, one that successfully integrates ambient intelligence, cybernetics, and ubiquitous computing without compromising the quality of life for the individual or the quality of place. Varying levels of converging networks and computing would allow for greater integration in the transportation field in particular. Driverless cars outfitted with a multitude of sensors and computers would adapt and respond to the urban landscape and impeding situations enabling more efficient movement of people and goods. As a result, streets would be less congested and crashes would be minimized as well as severity dramatically reduced. Public transportation services would remain affordable and desirable, not limited to a certain class or restricted based on route. Streets and sidewalks would be, in and of themselves, intuitive. Responsive lighting and wayfinding would reflect the movement of pedestrians and cyclist creating safer and more energy efficient sidewalks. Lighting and building facades would also serve to engage the individual, illuminating their path while conscious not to inundate their experience with endless amounts of advertisements or visual clutter. The on-demand street lighting would enable safe routes to and from attractions while also minimizing adverse environmental side affects

such as light pollution. The overall pedestrian and cyclist experience would be one that is safe and enjoyable rather than noisy and full of bombarding images. Street character and sidewalk intelligence would span the breadth of the city, creating a sustainable network of paths that connect all neighborhoods. This would in many ways mobilize individuals in impoverished neighborhoods by creating the perception of safer streets and better-maintained public realm. The sustainable mix is a future that represents incremental growth so as not to further alienate the marginalized.

Intelligent infrastructure, or smart buildings, would enable responsive environments that shift to fulfill a range of human needs and lifestyles. The systems would accommodate those with physical disabilities or illnesses or even adapt to accommodate individuals who might be otherwise healthy but at the moment less capable. This might look resemble doors or windows opening on demand to accommodate egress or ventilation and overall ease the flow of individuals in and out of the building. Systems would easily identify native and foreigners not for discriminatory purposes but rather to ensure proper communication methods tailored to the individual's particular need (Erlandson & Psenka, 2014). "Combining ambient intelligence and ubiquitous computing with the goals of universal design can lend to more equitable, secure, and sustainable urban space (Erlandson & Psenka, 2014)." Essentially, integrated technology has a powerful potential to create urban environments that are engaging and responsive to a multitude of users.

In a world where safety is a growing concern, smart infrastructure would provide the necessary security and services to move individuals to safety during times of crisis. Imagine a world where interactive way-finding systems or screens on the side of bus

shelter transformed from media display to alert system, notifying individuals of a crisis (natural disaster or even terrorist activity) and guiding them to a place of safety. The network would serve as beacons, illuminating a safe route and thus saving countless lives. It would also serve the purpose of crime prevention through environmental design enhanced by digital means. It targets the notion that urban security can be enforced through better design whether it is through simply putting more eyes on the street or providing adequate layers of light.

Buildings would utilize the wealth of data collected to enhance metering and energy usage and even harvest energy become truly sustainable pieces of infrastructures. Sensors attached to bridges and other infrastructure would notify maintenance crews when repair is needed, thus directing capital at the appropriate and most needed projects. Invisible networks demanding new scanning systems and devices would monopolize the landscape, but their discrete design would not detract from the aesthetics of the physical surroundings. As pseudo-urban places become increasingly urban and developable land is less, development will largely be retrofits and upgrades rather than new construction (Hill, 2015).

Digital media supported by wireless connectivity would enhance democratic and social engagement, contributing to broader public participation due to connected devices. Accessible technology would break down socioeconomic barriers, improving the quality of life for not only the wealthy but also the marginalized. Their voices will all carry equal weight in the social engagement process, ensuring that as technology advances; they are still care and provided for.

The Sustainable Mix scenario presents a future that is highly digitized yet honors the human component and community element. It recognizes urban space as a landscape that is constantly in flux and architecture as a continuously adapted piece of art. Yet, the primary concern is whether the space is good for people. Does it create a comfortable and safe environment with ample activities and sociable elements? Is it easy to access via various modes and do these modes create valuable linkages to other destinations? It is less about the actual urban infrastructure and more about the spaces that support interaction and culture. They are not devoid of meaning, but rather foster community engagement and inform identity. To one degree, it seems almost unattainable, however it is certainly something to strive for as urban and non-urban places become increasingly inundated with technology.

Recommendations

Information scientist Herb Simon stated:

In an information-rich world, the wealth of information means a dearth of something else; a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it (McCullough, 2013).

Simon's comment frames the discussion well. The greatest problem that the built environment faces is not the type of technology but rather the devices ability to divert

attention from the physical environment to a different reality. This is not a problem that can necessarily be solved by better designed or programmed spaces nor one completely moderated by zoning, but rather it will require a mix of disciplines advocating for a similar purpose.

Planners play a vital role in shaping the future of cities and public space, and thus hold powerful sway in determining the level of digital media within the environment. First, planners must continue to advocate public parks and open space. In a world where immediacy and experience are in high demand, public space must keep up with this “experience economy,” after all it is the definition of experience in the oldest sense of the word (Banerjee, 2001). Private entities have since seemed to take on the role of providing great open space within cities, and while this is certainly necessary and needs to be encouraged, collaboration between public, private, and nonprofit sections should be enhanced and encouraged in order to create cohesion and better defined public and private spaces (Banerjee, 2001). Privatization of public spaces creates confusion regarding public rights and demonstrations that are otherwise allowed in truly public spaces. Jane Jacobs advocates a similar notion in that clear distinction between places that are purely public and those that are purely private should be preserved. This dictates interactions and specifies appropriate activities, as well as establishes the truly civic places that serve as community icons. Additionally, public space should be designed with the individual at the forefront. Designing spaces that enhance public life rather than simply creating a beautiful place is important (Banerjee, 2001). This can be accomplished through careful programming and community engagement activities that take into consideration the communities needs as far as public space is concerned. It

creates a social bond that iterates the importance and relevance of space to that particular community, ensuring the livelihood of the public space. This directly relates to the reinvestment of underutilized parcels or disinvested public spaces (Banerjee, 2001). Recognizing opportunities for expanding on what currently exists or has worked in the past and engage local businesses, particularly those that perform the function of “third place” (Banerjee, 2001). Regardless of whether the future holds driverless cars or not, attention to the street and particularly the sidewalk should be enhanced, reinforcing the purpose of designing for human beings rather than a particular mode of transportation (Banerjee, 2001). Active, vibrant sidewalks engage individuals and essentially serve as a safe corridor to move from place to place. They recognize that active ground floors, a mixture of use, and transparency produces “autonomous and creative intercourse among persons, and the intercourse of persons with their environment” (Banerjee, 2001). Preserving these interactions through zoning or design standards will distinguish areas that are suitable to digital screens and technology from those that aren’t. Much like the New Urbanist Transect determines the size and shape of buildings, similar code development can be applied to levels of technology and types of application. Lastly, places and communities are constantly in flux. Immigrants, demographic shifts, and other outside factors result in changing neighborhoods and thus changing needs. Bearing this in mind, the planner must constantly attend to the varying demands and increasing diversity of urban populations and reflect this in public space design (Banerjee, 2001). Public space, after all is largely a result of sociocultural influences, so adaptability is of utmost importance. Universal design techniques and versatile design

create lasting places that appeal to a number of individuals represented from varying income streams, backgrounds, or age cohorts.

How do we get there? Deciphering big data seems like one of the most natural ways to get from where we are today to any one of the proposed futures, and it will more than likely play a significant role. With much of the infrastructure already in place and over 2.5 billion gigabytes of data produced everyday, there is likely no turning back (Hammon, 2015). Big data has the potential to provide a number of benefits to the city as a whole, particularly in understanding individual's movements and operations within the context of space. On-demand capabilities can be honed and integrated seamlessly into the currently infrastructure enabling a more efficient delivery of services. Other vital data relating to market demand, security, and even extreme weather will be influential in shaping policy and enacting decisions in critical situations. However, the antithesis of benefits of big data proves just as vast. Despite the breadth of data collected and the years of study invested in deciphering the data streams, there is still a level of fallacy associated with big data due to the difficulty interpreting the overabundance of information which in turn inhibits the development of meaningful solutions (Hammon, 2015). Not all data is good data, and not all data provides great insight (Hammon, 2015). As more data is collected, and better systems developed for interpreting the data, the information gleaned will likely provide great insight. In the interim and also in the future, its important to recognize the significance the physical observations and common sense can provide. Data collected by sensors and computers can certainly enhance certain experiences, but nothing is quite as telling as an individuals physical observations and experience within a space (Hammon, 2015).

Context will likely continue to play an important role. “Because contexts are learned through actions and events, much of this understanding is based on memories of interactions: objects permanence, landmarks, proportional configurations, spatial categories, procedural contexts, swapped frames of references, geometric measures, building elements, generative typologies, systemic behaviors, formal elegance, regional characteristics, ecological sustainability (McCullough, 2004).”

It is commonly understood that urban public space should be accessible and usable for all, regardless of social or physical condition. Universal design and accessible design are important factors to consider as technology continues to inundate the urban landscape. Universal design embodies a commitment to building urban environments that can be used effectively by all people without the need for adaptations or specialized design whereas accessible design focuses on eliminating barriers to public facilities and services for people with disabilities (Erlandson & Psenka, 2014). Are these devices creating equitable environments that support a range of activities and users? Incorporating knowledge into the physical environment has the potential to create an environment that supports a diverse population thus contributing to a more universally accessible public space.

Conclusion

Regardless of whether our environment is monopolized by screens or buildings, it is important to emphasize that the design should first and foremost be for all. Scale, uses, and function should all support the needs of humans. They should enhance the vibrancy of the sidewalk and encourage individuals and a mixture of activities. Jane Jacobs referred to this as a fanciful art that cannot be choreographed but rather reinforced through design and programming. Digital placemaking can certainly have a positive effect on an environment, creating temporary interactive displays that engage individuals and spark conversation. In fact, Project for Public Spaces and Dream Hamar have both utilized digital devices and communication methods to garner civic support of city projects. Mobile technology and open source platforms were used by Project for Public Spaces to identify the missing links between bottom-up and top-down approaches to bringing change to communities (Latore, 2011). PPS uses the influence of technology to facilitate conversations and reinforce community input. Using digital media to enable dialogue has proved successful in a number of applications from the creation of an open-space plan for downtown Baltimore to the Ushahidi project (Latore, 2011). Dream Hamar utilized a similar

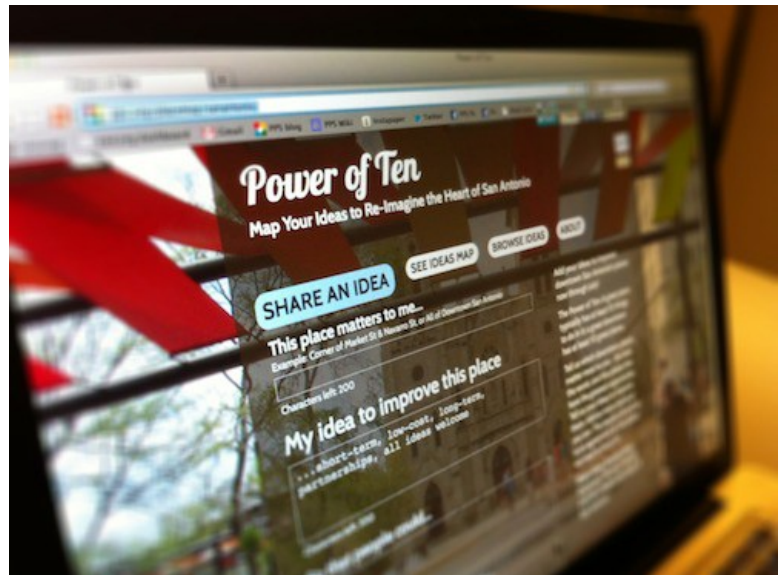


Figure 29: Project for Public Spaces, Power of Ten in Digital Form

approach, digital apps as a means to garner information and feedback during the creation of a prime public space. Through online workshops and portals, program organizers gathered public input on various components and community visions for public space ("Dream Hamar,"). Among the topics discussed was the use of technology in public space and how it might best be incorporated to benefit the communities needs ("Dream Hamar,"). Because of the success of these projects and others, I would argue that screens and digital media could be incorporated into the built environment affectively as permanent applications such as interactive building facades or communicative screens. Of course, context and balance will be key to avoid digital clutter and ensure that the place remains comfortable and inviting. Screens and interactive facades should be regulated and designed with the user as its intended audience. Retaining this goal enables them to more aptly enhance the function of place and fulfill the sociability component of a "great place." Because the great allure of cities is often the variety of streets, users, and building types, integrating digital technology is simply another means

to accomplish this.

Jane Jacobs herself remarked, "the ballet of a good city sidewalk never repeats itself from place to place, and in any one place is always replete with

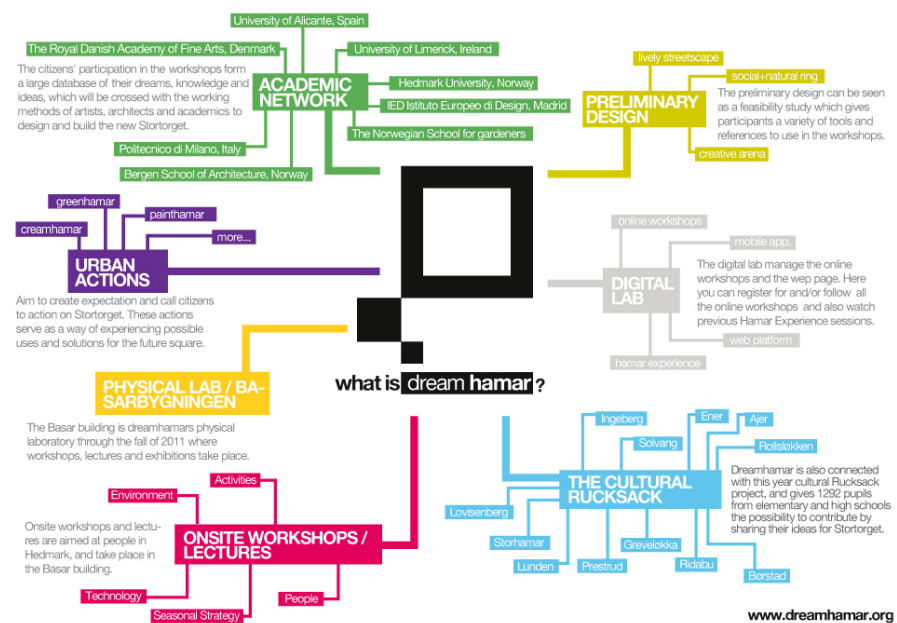


Figure 30: Dream Hamar framework for civic engagement and public space planning

new improvisations,” so why couldn’t city streets of the future incorporate digital media effectively (Jacobs, 1961)? Likewise, digital media and technology can be used to realize Kevin Lynch’s five elements of the city. Digital media displays confined to certain areas of the city enable successful districts and support the concept of edges while mobile devices and interactive way-finding support maneuverable paths leading to various landmarks or districts within the city. The digital devices themselves can serve as landmarks or icons of the new, smart city.

“Appropriateness surpasses performance as the key to technological success. Appropriateness is almost always a matter of context (McCullough, 2004).” The design and functionality of public space in the future will have to consider appropriateness, in other words qualitative methods of study will need to have greater precedents over quantitative analysis. While certain innovations and technology devices render beneficial services, this can’t be assumed across the board. Context must continue to be valued above all else. Considering key questions like: how has this space functioned in the past? What is the defining architectural character of the space? And what sort of social interactions do we want to facilitate? Regardless of the technology incorporated within the built environment, a true and honest consideration for the surrounding context and intended users must be the first step in programing a space. Defining the context and framework then allows for the appropriate technologies to be incorporated. It enables highly digitized environments like Times Square in New York City or Shinjuku in Japan to be maintained and celebrated, but also preserves quiet streets and parks from being inundated with screens. Zoning or design guides may become increasingly necessary to regulate where certain types of invasive media and

appropriate placement. This is not a new concept, but rather a practice many cities currently incorporate in zoning regulations to moderate digital billboard placement or signs. Future cities however, may need to look further at the contextual surroundings and deem the appropriate levels for media, determining through qualitative measure the appropriateness and level of impact on the overall human welfare. Incorporate universal design elements to ensure that spaces are continuously designed for a diverse number of users regardless of the level of integrated technology. Universal design is rooted in developing design standards that enhance the experience for the greatest number of individuals and should be strongly considered when integrating technology and digital media into an urban environment. And with regard to the actual buildings and media types, we must recognize architecture for what it is and honor the elements of design through attending to the details. As Ratti aptly phrased it, “And that, precisely, is the power of the architectural detail in the digital era; to refocus the minimum meaningful unit of significance onto human interaction (Ratti & Claudel, 2014).”

In conclusion, not all hope is lost in the digitized future. Though mobile technologies may prove to be a discouraging factor and distraction from the beauty and experience of the built environment, there are a range of other technologies that enhance interaction. Interaction design closely studies these relationships, creating new technologies that further address the individual and the space they occupy. As time progresses, it will become even more important for multidisciplinary work between interaction designers, planners, architects, and community members in order to design the most worthwhile public spaces.

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