

# UC San Diego

## UC San Diego Electronic Theses and Dissertations

### Title

NETWORKS + NEW TOWNS

### Permalink

<https://escholarship.org/uc/item/4td16131>

### Author

Kronick, Samuel

### Publication Date

2013

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA, SAN DIEGO

NETWORKS + NEW TOWNS

A thesis submitted in partial satisfaction of the requirements  
for the degree Master of Fine Arts

in

Visual Arts

by

Samuel Kronick

Committee in charge:

Professor Benjamin Bratton, Chair  
Professor Sheldon Brown  
Professor Teddy Cruz  
Professor Kelly Gates

2013

Copyright

Samuel Kronick, 2013

Licensed under the Creative Commons Attribution-ShareAlike License:  
<http://creativecommons.org/licenses/by-sa/3.0/>

This thesis of Samuel Kronick is approved and it is acceptable in quality and form for publication on microfilm and electronically:

---

---

---

---

Chair

University of California, San Diego

2013

## TABLE OF CONTENTS

Signature Page .....	iii
Table of Contents .....	iv
Abstract .....	v
Earth .....	1
The Experimental City .....	1
Neighborhood .....	4
Data .....	7
Action #1: Transposition (Maps) .....	7
Grace .....	11
Action #2: Line Following / Last Mile .....	13
Access .....	15
Walled Gardens (Part I) .....	15
Action #3: High Place .....	17
Walled Gardens (Part II) .....	19
Network .....	24
Topological Alternatives .....	24
Model Model City .....	29
It's No Longer OK To Not Know How The Net Works .....	31
Notes .....	33

ABSTRACT OF THE THESIS

NETWORKS + NEW TOWNS

by

Samuel Kronick

Master of Fine Arts in Visual Arts

University of California, San Diego, 2013

Professor Benjamin Bratton, Chair

NETWORKS + NEW TOWNS is an extended site study of Jonathan, Minnesota and related areas. The suburban neighborhood of Jonathan was one of the first “totally planned communities” in the Midwest, born during the short-lived “New Town” movement of the late 1960’s. It grew up during an era characterized by great faith in the power of urban planning and the transformative potential of communications technology. This work uses Jonathan as a microcosm to understand the ways that we augment the earth with matter and data in an ongoing pursuit of better living.

# EARTH

## THE EXPERIMENTAL CITY

### *Field Trip Summary*

*Sites #3 & #5 - Aitkin County, Minnesota*

### *Land Character*

*Sites #3 and #5 are located near the headwaters of the Willow River and its branches which are tributaries to the Mississippi River.*

*Throughout both sites the stream courses are well developed, although the flow is of nominal quantity. The stream channels are definite and the influence of surface water is sharply confined to a channel. The scale of subdivision - ridge and valley - is about 2 miles in width; the pattern of subdivision is generally parallel systems from N. W. to S.E. The general elevation range is from 1250 to 1400 feet above sea level. Local high points on adjacent land include 1500 and 1625 feet above sea level.*

*The character of the landscape is completely dominated by the vegetation cover. The percent of cover is nearly 100% and the density is consistently heavy which tends to eliminate long vistas and evidence of topography. Road cuts provide the only panoramic view of the sites and represent linear cross sections through the site.*

*(And then the following, scribbled out on the typewritten draft)*

~~*The control exercised in public land no doubt helps to maintain an image of "virgin North Woods" throughout the area.*~~<sup>[1]</sup>

That last bit— was it too political? Too subjective, not fitting with the matter-of-fact tone in the rest of the report? This field trip to Aitkin county was an endeavor of the Minnesota Experimental City Project (MXC), a product of 1960's optimism that sought to build a new city for 250,000 people where there was none before— in the heart of the northern Minnesota wilderness. The MXC was initiated by a man named Athelstan Spilhaus, a scientist who emerged from the war years into a heroic era for scientific reason and progress.

His relevant publications include:

- Observations of light scattering in seawater (1968)
- Ecolibrium (1972)
- Air condition indicator [US Patent 2,107,017] (1938)
- Waste management and control (1967)
- Control of the world environment (1956)
- Bathythermograph [US Patent 2,297,725] (1942)
- Marine resources (1962)
- Hydrostatic instability in the ocean (1950)
- Resourceful Waste Management (1966)
- Goals in geotechnology (1966)
- The Next Industrial Revolution (1971)
- Note on the Diurnal Changes in the Free Atmosphere Over Pretoria in a Normal Stagnant Winter Condition (1936)
- Technology, living cities, and human environment (1969)
- Why Have Cities? (1969)
- The experimental city (1967)

The MXC would be a clean place, a fresh start in the north woods. It would be isolated by at least an hour's drive from any existing city so as to avoid undesirable social or material contamination. It would be a controlled environment, a totally planned environment. It would be a place to experiment with the latest in technology— the proposed cure for a poisoned world.

*Nature has no pollutions—it has very valuable chemistries that function only under special conditions... Pollution is simply energy—in the form of unfamiliar matter—which the timing of omniregenerative cosmic system cannot immediately use but must use later.*

(Buckminster Fuller, *Critical Path*)<sup>[2]</sup>

Buckminster Fuller, 20th Century futurist *par excellence*, was recruited to sit on the MXC's advisory board. His primary contributions seem to have been his name and his signature structure— the dome. When so much of the MXC's physical design remained



nebulous, that the city should be covered by a large, transparent geodesic dome was almost universally agreed upon. The dome would keep pollutants from factories in the surrounding area segregated from the residential core of the city. As a bonus, the cost of covering the city would, it was argued, pay for itself by virtue of eliminating snow removal expenses for the city's streets.

Here, just one time out of many, technology confronts Earth, an entity that, according to this point of view, does not automatically arrange its material into the optimal configuration for human inhabitation at time scales that satisfy our desire for convenience and efficiency. Fuller, Spilhaus, and their colleagues promoted a fundamentally holistic philosophy that holds that humans, as completely legitimate agents in Universe, fundamentally "natural" beings, have every right and responsibility to intervene in the course of things with force equal to the falling sky. This is the mandate of planning.

## NEIGHBORHOOD

The MXC does not, in fact, exist. To the team's dismay, not a single experimental structure was ever built on the hinterland site in Aitkin County— dome or no dome. The project ran out of political support and thus money before any real urban modeling or control could occur. Their scientific design methodology was halted in the observation phase; the plan remained purely a study.

The surviving remnants of this great exercise in environmental control are the archived papers of the Minnesota Experimental City Project, stored deep within a climate-controlled 600-foot-long artificial cave carved from sandstone beneath the bank of the Mississippi River. I learned of the MXC papers from the collection's archivist at the Northwest Architectural Archives in the University of Minnesota, whom I contacted while looking for information about a building in a neighborhood where I grew up.

For the first 18 years of my life, my sense of regional geography was simple; the space around me was unremarkable. Farms were to the west, the Twin Cities of Minneapolis and Saint Paul to the east, with a band of nondescript suburban sprawl constantly radiating outwards, wedging a gap between city and countryside. I was caught somewhere in the middle, living in a century-old farmhouse, surrounded by a rolling landscape of active dairy farms, but participating in a thoroughly suburban lifestyle where friends, school, and livelihood were all based in the ever-evolving sprawl. Then I went away to college on the east coast, fell into studying architecture, and on my first summer visiting home again, the space around me took on a new character. One area in particular—a neighborhood called “Jonathan”—stood out. Hiding under mature oak trees, the houses in this neighborhood were of a different species altogether than the beige boxes I remembered as defining the monoculture of suburbia. The houses in Jonathan seemed *designed* rather than simply *built* in the image of all their neighbors. Even the signage, with its Helvetica Bold lettering and

abstracted graphics, was a clue that someone, once upon a time, conceived of this place with an attitude foreign to that of today's common sub-developer.

Though I, like most Minnesotans, had never heard of the Minnesota Experimental City Project, its directors had certainly heard of Jonathan. The MXC's papers include correspondence with and information about numerous other projects around the nation that identified with the short-lived "New Town" movement, but by far the largest share of case study documents concern Jonathan, the budding New Town in Minneapolis' backyard. The contents of the archive suggest that the MXC project members might have perused the seasonal newsletters of the Jonathan Association, studied pamphlets hawking houses by homebuilders imported from California, or read the news about the innovative technologies being built into this state-of-the-art suburb.

Jonathan was a 45-minute drive south and west from the MXC's headquarters at the University of Minnesota in Minneapolis. Within the archive, I discover a set of photographs that—judging by the seasonal variation in snow cover—indicate MXC team members made at least two field trips to visit the Jonathan New Town in person.

The MXC had grand ideas, but Jonathan had the cash, the land, and even some residents early on. As I thumb through the photographs of that young neighborhood, I try to understand the photographer's disposition in the way he or she frames the site. There is an element of wistfulness, of admiration, of longing as the photographer captures someone else's city-building in the nascent throes of success. I contemplate Bruno Latour's thoughts on the "reality" of Aramis, the French project to build an innovative rapid transit system from the same era.<sup>[3]</sup> When could such a project be considered "real?" he wonders. Is the design, the plan on a map, real enough? Does the prototype push it over the threshold? Or are such big plans only real when they are solid enough for people to use, old enough that they have been accepted into everyday routines and forgotten about?

I try to enter the mind of that anonymous photographer. A week

earlier, perhaps, the whole MXC team was seated in a north woods county courthouse as the Aitkin County Board voted unanimously to replace their rural farming community with an experimental city, the most futuristic metropolis conceivable.<sup>[4]</sup> How very real it all must have felt to everyone leaving the courthouse that evening as they crossed the sparse landscape on their way home, imagining monorails and hovercraft and computer terminals and a geodesic dome in the sky superimposed over that pristine image of “virgin north woods.” And then, standing on the not-yet paved cul-de-sac in a growing neighborhood, the photographer is confronted with actual earth, flesh, and built form. All the years of hard-won agreements, grant-writing, sketches and plans congeal into the banality of everyday life: Children playing in the streets. Discarded beer cans underneath a crawl space. The parallel lines of mowed lawns littered with bicycles and the occasional front-yard sunbather. Cars, parked.

Like a good student of architecture, the photographer’s eyes search for meaning in the size, shape and quality of things. The camera dwells on details, materials, framing the interface where the buildings hit the ground, fascinated by the way structures mingle with the surrounding earth. And there is an almost fetishistic taste for signage— structures that redundantly underscore the existence of this place, the Borgesian extrusion of the architect’s diagrams to the scale of one-to-one. “This place is here,” say the signs, “and over there, too.” The photographer standing in this sub-developed field sees Jonathan all around. The MXC can be found only on paper.

# DATA

## ACTION #1: TRANSPOSITION (MAPS)

If Jonathan was intended to be, as its marketing literature proudly proclaimed, a “totally planned community,” the settlement born of an antipodal attitude can be found in the desert of Southern California east of the Salton Sea. During World War II, this section of land along a branch of the All-American Canal was chosen as the site for the Marine’s Camp Dunlap. The military gave form to the desert’s amorphous gravelly sand by mixing it in as aggregate for dozens of concrete slab building foundations. After the war was over, the buildings were razed in an attempt to de-program the space, leaving only the rectangular footprints of bare concrete and a grid of dusty roads behind. The only plan was concerted dissolution. But the allure of such free space in the shell of regimented civilization drew a crowd and today Slab City is the informal home for a seasonal population of thousands. The inhabitants of The Slabs arrive with their own portable architecture units in mobile homes and RVs of all sizes. They distribute their shelters and services without regard to any bird’s-eyed planning commission’s directives. Atop the primal infrastructure of transmuted earth, an unintentional community thrives in informality.

In the late 60’s, a visitor to Jonathan could drive out to the future site of the neighborhood and join a guided tour via minibus to learn of the coming attractions. Such a visitor would be confronted with a landscape that might have seemed as raw as the Sonoran Desert, as unlikely of a place to call home as bare concrete slabs, but they would find reassurance of the impending domesticity in a set of colorful graphic signs planted in the fields. These signs, designed by the Jonathan Development Corporation’s staff graphic designer Alvin Collins, set the tone for the neighborhood’s image. Their flat colors and clean geometry were clearly inspired by the Modernists’ International Style— a style that

eschewed local context in favor of the transcendent spectacle of order. But not all critics were convinced:

*Some of the people involved in the planning have been a little too enthusiastic in trying to convey to people that Jonathan is innovative and exciting... there are large posters, and, in some cases, sculptures, all painted in supergraphics (brightly painted letters on brightly painted backgrounds)... They announce such names as “Forever Woods”, “Tree Loft Apartments”, and “Friendship Lane North” (and South). Jonathan would do far better to ride on its own merits.<sup>[5]</sup>*

But what are the merits of a place that does not yet exist, a promise of a place that is merely peddling the generic zeitgeist? The presence of *these* signs on *that* land helped disarm any thoughts in the mind of a visitor that this neighborhood could have been built just anywhere. Style made the place stick.

In Slab City, I observe a method of making and measuring space radically different from Jonathan’s signs in the ground: A modest antenna connected to a centrally located Airstream trailer emits a signal at 96.3 MHz between the hours of 9:00 am and 9:00 pm daily. It energizes the neighboring spaces with sunlight transmuted into low-frequency oscillations via a system of off-the-shelf photovoltaic panels and grey market transistor circuitry. Radio Mike is the human host, but his voice is silent on the air. The broadcast defines a zone with a fuzzy edge: inside, you can hear the music; outside, there is only static; in between, a fading indicator of your proximity to the electromagnetic heart of the community. Cross the space with the appropriate handset, consume this bountiful data-vapor, and you become a user of Slab City Free Radio— you become a user of the Slabs. I bottle the sound with transistors and freeze it into flash memory. I take a bright orange surveyor’s wheel and modify its mechanism for measuring distance to conflate space-time and test the services of the Slabs on other spaces.

I turn on my radio in San Diego after the drive back from the desert and 96.3 is only

dead air, those sounds of the Slabs unreachable without intimacy to the place. The tale of the signs, too, is marked with impermanence. Since they were conceived of as placeholders, they were removed after the actual buildings were built and park areas designated. When I stare at the black-and-white images I found in an old neighborhood newsletter, I try to imagine what power such ephemeral graphics could possibly hold. I shake my head and think, “but they’re just shapes with colors, nothing like the real, lived experience of a generation that has called that place home.” But I doubt myself and remember how many events (and particularly many from that time in history) are memorable for the way they presented themselves in graphical form. What remains of, for example, the 1968 Mexico City Olympics today if not powerful images? The controversial form of bodies and a memorable logotype, Olympic rings that mingle with geometric letter forms, create a more lasting impression than any list of medal counts or individual victories. Sometimes shapes are what it takes to persist.

Signs and sounds are interesting to this story because they begin to carve space out of the Earth by purely *virtual* means. “Virtual” here does not mean anything like “not-real” nor does it suggest anything in terms of media (i.e. “existing on a computer network”), but rather the virtual system is that which functions primarily through the transmission of information in lieu of matter. With enough signs, enough sounds, enough *data*, the physical built form of the town is not needed to convey some fundamental characteristic of the space.

Data holds an implicit promise of transposition. It can be processed by different routines, with different contexts, in different spaces and it still computes. That doesn’t mean such transpositions are necessarily believable; to the contrary, the effect often highlights the absurdity of the assumptions that generated the data in the first place.

I become fascinated by the humble audacity of Alvin Collins, the signs’ designer, and do some searching online for what became of him after his tenure in Jonathan. Maybe taking

his signs to the desert wasn't such a stretch. After Jonathan, he started a for-profit graphic design school in Phoenix, Arizona. The website for Collins College, was, however, a tragic departure from Collins' clean-lined past, a descent into a bro-roke nightmare. Looking deeper, I learn from sites with names like "RipoffReport.com" and "PissedConsumer.com" that the Internet's consensus on Collins' educational legacy is that it is nothing short of a scam. Today (though perhaps not tomorrow), CollinsCollege.com will inform you that it is no longer accepting students.

Transposition has its limits. Data needs a more secure place to live.



## GRACE

In 1967, as Henry McKnight, the state senator who dreamed up Jonathan, was plotting out his New Town in the Midwest, Caltech poet-in-residence Richard Brautigan was up in Berkeley handing out copies of his latest poem. *All Watched Over By Machines of Loving Grace* earnestly describes a dream for “a cybernetic meadow where mammals and computers live together in mutually programming harmony” and “a cybernetic forest filled with pines and electronics where deer stroll peacefully past computers as if they were flowers.”<sup>[6]</sup> McKnight held no business interests in poetry, but his acumen for selling real estate appealed to the same cybernetic exuberance that reached its zenith around that year. Jonathan was to be a completely wired town, incorporating the latest technological developments directly into the fabric of its urban plan. Not only would it be a living laboratory for futuristic communications and transit systems, all the associated wiring for these novel apparatus would be embedded underground. This was apparently a response to the image of so many older neighborhoods where first electrical then telephone wires were strung from pole to house, cluttering the airspace with the tracers of invading technology. To plant the wires underground from the start was to integrate electrons into the domain of landscaping “as if they were flowers.” This design expressed the hope that technology would be accepted as an invisible part of everyday life in Jonathan rather than a reluctant, disharmonious appendage.

*July 31<sup>st</sup>, 2012:*

I stop and watch a construction crew as they upturn the turf and thread a thin strand of glass beneath the ditch along Hundertmark Boulevard. The road’s line provides a frame for this exquisite piece of machine theater. It’s a bright summer’s day and I am steps away from Lake Grace, the jewel of Jonathan where, if the vintage advertisements

are to be believed, children frolic with kites and sailboats cruise across the miniature sea. The reality is that today, this construction crew is the sole highlight of public life in this town; the workers' presence contrasts with the relative vacancy of the meticulously designed promenades and parks. This long-distance burial is a ritualized symbol of the neighborhood's activity patterns; sitting in their homes, folks Skype with distant loved ones, stream cartoons to sedate squirrely children, search for how-to's on the pickling techniques of their pioneer forebearers, and generally transport their selves along this longest-thinnest-truest element that the men and machines deposit into the soil with grace and care.

Coming home later that night, my senses tuned a bit higher to the orange caps and yellow plaques that poke through the earth to mark that glass strand's path, I notice a pair flanking the driveway to the house where I grew up. The headlights illuminate the letters in a way that reminds me of running around as a kid with a flashlight, playing games in the dark, and I think about what those words might have meant to us had we seen them back then— WARNING: FIBER OPTIC CABLE. They punctuate the landscape as a bold counterpoint to the surrounding rolling hills, unmistakable to the point that they almost beg to be ignored. The WARNING is clearly delivered only in the interest of self protection; disturbing a buried fiber optic cable would not cause harm in the same way as hitting an electrical or gas line is likely to. These lines transfer only photons in pulses of light— the closest thing we've got to pure information, communication stripped bare.

One of the night games that we used to play as kids was "ghosts in the graveyard." That name makes me wonder when suburban mythology will embrace the constant but imperceptible chatter that passes underfoot. Once you take note of the ubiquitous warning signs, they suggest an immaterial force as creepy as any headstone's evocation of dead people rising from their graves— other people's bits illuminating the thinnest transit line not quite six but two or three feet under.

It is a fiction that information could really be so phantasmal.

## **ACTION #2: LINE FOLLOWING / LAST MILE**

Daylight now, another season, another visit to the site. The sod along Hundertmark Boulevard has been replaced and is now covered in patches of snow. All those who live here share in a culture which teaches that not only water in the air turns to ice, but the ground freezes, too. The effect of such knowledge is subtle, but it instills a certain lifelong sense of urgency in a person. The earth only lets you in on its own schedule; in predictable cycles, you can no longer dig and plant your crop. Some paths are perennials, some bloom and change fresh with each digging season, but today, these lines are encased in ice, they will not change out from under me, and so their route must be traced.

Fifty years ago, the planning reports for these New Towns gushed endlessly about the potentials of different transit networks—public transit in a multitude of forms, for example, was already perceived as a superior mode to the private car—but there was little nuance in the understanding of communications networks. “Wiring” a place was taken to be a panacea, an undifferentiated process that could bring only a singular positive effect.<sup>[7]</sup>

Today, it’s a truism to say that these places are connected—quite literally they are. The conditions and techniques of their connection are even evident above the surface all along the way. But what are the effects of networking geography according to the particular design that has been planted in the ground over the past century?

The Union Pacific Railroad leaves Yuma and heads west for the California border parallel to US Interstate 8. Shortly thereafter, the tracks diverge from the freeway and travel northwest through the expanses of the Algodones Dunes, nobly trekking with absolute linearity through shapeshifting sand on their way to the Coachella Valley. Evenly spaced along the way are a series of names that float in an otherwise featureless void: Ogilby; Cactus; Clyde; Ruthven; Glamis; Mesquite; Acolita; Amos; Tortuga; Iris; and, not too far off the tracks, Slab City.

This strange desert geometry was revealed to me by a particular version of Google's map labeling algorithm, now lost to an imperceptible cycle of what might be called in software jargon "continuous delivery." By interacting with Google's software as a service, I am at the whim of distant developers as to which version I am allowed to access and my preferred copy may have as well been eradicated. (Fortunately, I have developed a habit of meticulously archiving via screenshots, embalming ephemeral information in robust pixel grids.) The place names are still there when you zoom in—I'm reassured I didn't just dream this up—but whatever parameters once gave them undue prominence have been adjusted to de-value their remoteness and better understand their vacancy. Wikipedia still has an entry for each— stubs automatically generated by a script that transformed the US Geographic Names Information System's Feature Detail Report Database into passable English sentences. The GNIS database itself was generated by another piece of code— directives written in the language of an Executive Order from President Benjamin Harrison in 1890. The federal database is the official arbiter of place names both natural and built and has an extensive categorization system that Google's algorithms have been programmed to trust. Cactus, Clyde, Ruthven, et al are clearly neither airports, arches, bridges, channels, churches, craters, glaciers, lakes, lava, levees, post offices, seas, streams, swamps, wells, or woods, but apparently their intermittent relationship with human activity placed them within the category of "populated places."<sup>[8]</sup>

Yet I will never have a friend to go visit in Tortuga. The most I could hope for is that the unpredictable environment would rupture the fiber line which passes through this otherwise anonymous space and a maintenance crew would be sent to the site with reference to its archaic name. My data might perchance be the first to pass through the repaired cable, illuminating the LED indicator of some test equipment on the other end, confirming for an indifferent sysadmin that a box could be checked off and the issue ticket for the "Tortuga Incident" marked as resolved.

# ACCESS

## WALLED GARDENS (PART I)

The original dream for Jonathan included not only a suburban residential core, but also a significant region zoned for industry in hopes that it would allow residents to work near their homes. The first industrial building was done in the brutalist style, concrete fins accenting its functionalist core. The first tenant was the Computer Timeshare Corporation, a business with a matter-of-fact name that specialized in the dissemination of computation to remote sites over telephone wires. The town's developers chose the location of the industrial zone for its proximity to the railroad, the steel lines of that network facilitating the import of raw materials to the site. But the Computer Timeshare Corporation moved in more likely as a result of a secondary infrastructural development— copper wires of the telephone lines routed along the railroad's right of way. Because of important clients such as this, the telephone companies improved their infrastructural links through the rural fields radiating out from the heart of Minneapolis and St. Paul. In this way, the site's use as an unlikely information hub was programmed in hardware. As copper gave way to glass, various telcos brought enhanced bandwidth through this node. The current tenant of 105 Peavey Road is HyberData, a provider of “modular, scalable colocation facilities.”<sup>[9]</sup> In short, it is a data center for hire.

**Question:** *What makes up an ideal data center?*

**Answer:** *The most crucial ingredients are availability of multiple connections to both the Internet and electricity. A facility must have reliable infrastructure, power and cooling systems with appropriate capacity and redundancy; meaning that no single point of failure will cause the facility to stop functioning.*<sup>[10]</sup>

Choosing the site was a matter of seeking out where the lines of appropriate infrastructure intersected, and Jonathan's history constructed those lines in favor of this sort of industry. From the sky, the maps don't reveal what functions lie within this anonymous-looking industrial building; I discover it by tracing lines, honing in on the increased density and diversity of buried fiber optic cable markers that populate the landscape.

When I send an e-mail introducing myself to John Livingston, CEO of HyberData, my data identity is suspect. I leave a phone number with a 612 area code implying proximity to the Twin Cities, but mention that I'm doing my research from UC San Diego. I reference an affiliation with the Center for Design and Geopolitics at the California Institute for Telecommunications Technology (which in hindsight might sound a bit *too* official) but I'm not listed on their website. When I finally get Livingston on the phone, he immediately mentions these discrepancies with suspicion. I say that I swung by the building the other day and would love to sit down with him for an interview but couldn't tell if he was just setting up or already shutting down since the company's website was offline (a bad omen for a data provider, but I keep that accusation to myself and don't even bother mentioning the diminished credentials that come with his choice of "hyberdata.us" as a domain over the conventional ".com". If our status and addresses are up for consideration, I take note only in the interest of playing fair). In a classic passive-aggressive Minnesota Nice way that takes me a few minutes to fully parse (I'm a bit out of practice), he advises that if I ever lurk around his data center again, he'll have me arrested. I figure we'll never speak again.

### ACTION #3: HIGH PLACE

*Pattern #62: “High Place”*

*The instinct to climb up to some high place, from which you can look down and survey your world, seems to be a fundamental human instinct...*

*Build occasional high places as landmarks throughout the city. They can be a natural part of the topography, or towers, or part of the roofs of the highest local building— but, in any case, they should include a physical climb.*

(Christopher Alexander, *A Pattern Language*)<sup>[11]</sup>

One of the fallacies of networks is that they represent some idealized non-hierarchal space. The straw man sounds something like this: by drawing lines between all points, all points gain the potential to become equals. The rhetoric of ascension that dominates old structures like the Vatican or the corporate ladder would necessarily dissolve in the face of an inevitable networked future. Of course this is illusory once you realize that a hierarchy is composed, like all networks, out of *edges* and *nodes*.

In a hierarchal system, it is the nodes and their functions that exhibit the most diversity and convey the most information about the arrangement of power—the corporate structure has executives, managers, and entry level workers, for example. And in a hierarchal space, the diverse nodes are connected by predictable edges— in the corporate hierarchy, each layer is simply the boss of the one below it. What has changed over the past century is not that hierarchies of communication have dissolved, but that the methods with which we relate and connect to the objects of communication have multiplied. The objects we use to talk to each other are laden with a multitude of ownership models, licensing agreements, subscription plans, intentionally crippled feature sets, encryption schemes, location-sensitive price schedules, and more all bundled into singular, sleek packages designed to hide the complexity of the relationships within. The edges which define who bosses whom, what programs and what is programmed, are obscured or shift nebulously.

In a network, there are of course still points of prominence. There are asymmetries.

There are limitations on coverage and restrictions designed into the patterns of connectivity. There is still a tangible and semiotic order to the way things are positioned and accessed. There are still high places, and they still matter. Tracking the high place to its base can reveal if it bears any resemblance to the community-generating-machine-for-perspective Christopher Alexander proscribes with pattern #62. Often times today, we find something else at ground level.

The official website for Alexander's work, PatternLanguage.com, lists the names of the 253 original patterns for free, but keeps their full text descriptions behind a paywall. Membership to the site costs five dollars per month and requires you to accept a membership agreement that preemptively threatens legal action under the Digital Millennium Copyright Act, Title 17, United States Code, Section 512(c)(2) ("DMCA"). It warns: "Expect Changes. PatternLanguage.com may, at any time, alter any feature of the site and of these terms of use with notice, and you agree to be bound by these changes."<sup>[12]</sup> Disclaimers of instability are not what I would expect from a man who wrote a book with the bombastic title, "The Timeless Way of Building." I opt to purchase the hardcover edition instead.

Design and planning in a broad sense could speak a common language across media, from sidewalks to software. Alexander's *A Pattern Language* might be a candidate for ambassador; today the book holds greater valence in the community of software developers than in its original audience of architects.<sup>[13]</sup> But it is easy to adopt the structures of one domain as metaphors and techniques for another; what is more difficult is to translate the humanism which motivates one practice into tools that can be applied to the same ends in a different space.



## WALLED GARDENS (PART II)

A variety of forces push people to live in the vast region between the edges of the city's core and the sparse density of rural fields. It's a misnomer to refer to all such components of the urban network as simply "suburbs." To the point: Jonathan was never conceived of as a gated community. It was born in an era of egalitarian optimism that championed neighborliness and the intermingling of people from different backgrounds. This was evident at all levels of its design, from the mix of single-family homes, apartments and townhouses; to its backyard walking trails and public, shared playgrounds; to streets with names like "Friendship Lane."

Today, it adopts an ironic legacy as its massive projects in infrastructure bring a second data center to town.

United Health Group's data center on Highway 10 is an impenetrable fortress. It presents a windowless facade along the entirety of its 500 feet of highway frontage. Seventeen floor-to-ceiling exhaust vents are the dominant feature of its public face, easily mistaken for shuttered shades or just abstract lines from a distance, but their thermal profile belies the building's function: 190,000 square feet of servers which turn data into data, motionless but for the heat they expel as waste.<sup>[14]</sup> Few will ever go inside and little matter will ever emerge from its walls; unlike a factory of comparable size, it will only ever employ a dozen or so employees tasked with monitoring systems that process and store information rather than producing anything from the workers' hands. It is more cryptic than even the home of Hyberdata; I cannot lurk and peek for long until a young man emerges from a black SUV at a full sprint, overdressed for the summer heat in a suit and tie as if he worked for the Secret Service, gasping for breath while informing me that I am a security risk on private property and need to leave immediately. For a building defined by its concentration of connectivity and ability to communicate, on a site chosen for its fluid access to the furthest corners of the

world and all points in between, the data center is markedly devoid of conversation with the local, nearly useless to the project of community.

Wedged between UnitedHealth's data center and the original neighborhoods of Jonathan is another subdivision called Clover Ridge. Clover Ridge and the neighborhoods of Clover Field and Traditions at Clover Ridge are something like Jonathan's Bizarro World New Urbanism cousins— while the New Town movement championed a forward-looking, progressive and occasionally downright futuristic approach to city-building, New Urbanism represents a conservative commitment to the past. Born in the 80's, when even the punks rallied around the cry of NO FUTURE, New Urbanism neighborhoods feel as if they were built by set designers tasked with creating environments that most generically embody some imagined "simpler time" à la Reagan or Romney. In Clover Ridge, there are no streets named Friendship, but a lucky few can make their home at the corner of Traditions Trail and Legacy Lane.

Clover Ridge and Jonathan are more than just neighbors. They are both part of the same homeowner association. Homeowner associations (HOAs) were relatively uncommon when the plans for Jonathan were being laid, but it was decided from the start that some kind of legal structure would be needed to enforce a certain amount of unity amongst the parcels of land if Jonathan was to be more than just an arbitrary collection of houses. An HOA has legal authority beyond that of the state, county, or city and can impose restrictions that dictate the appearance of its members' homes and surrounding property. Yet an HOA is not a government body; it is a corporation. It does not own the land or homes where its members reside, but the homeowners consent to its authority when they purchase the property because membership is required as part of deed restrictions that are said to "run with the land."<sup>[15]</sup>

Forgetting that history for a moment, instead beginning with the restrictive covenants we are more familiar with today, an HOA is then a strange hybrid of different

kinds of software licenses and hastily accepted terms of service such as those one might click through without reading on their way to signing up for the latest web app or while activating a newly purchased hardware gadget. Such licenses and agreements are not generic disclaimers of liability. They actively carve paths within the murky territories of freedom, rights, and responsibilities, often using restrictions or affixing themselves to pieces of code with the same virality as allegiance to an HOA bonds to a plot of land. Licenses, covenants, and terms of service alike are not only statements of law, but arguments of philosophy, promises of a particular flavor of liberty.

From the GNU General Public License, Version 2, June 1991:

#### **PREAMBLE**

*The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software—to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. You can apply it to your programs, too.*

*When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.*

*To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.* <sup>[16]</sup>

There is a man named Jason Holt who lives in Clover Ridge and wants to secede from the Jonathan Association, to stop paying his annual \$236 in dues, and regain his freedom, citing a Randian self-interest and the bylaws and state statues pertaining to neighborhood

parliamentary procedure. He has led two lawsuits against the association and attends neighborhood meetings regularly in pursuit of his goal. <sup>[17]</sup>

**Chaska Herald (@chaskaheald)**

*No big surprises at Jonathan Association Annual Meeting. No challengers against three incumbent directors, so no 2013 board election.*

**Reply from KiMiKi (@kdcajt)**

*@chaskaheald parliamentarian would not let that man speak (likely anti Jonathan) w/o a motion but let that woman gush at the about...*

**Reply from KiMiKi (@kdcajt)**

*@chaskaheald wanting to be a Jonathan kid... gush gush gush pro Jonathan so no motion needed. I am 15 yrs in Jonathan and not an agitator btw*

**Reply from KiMiKi (@kdcajt)**

*@chaskaheald jonathan has a loooong history of small & big rule bending for various cronies (passed to me like oral history over the years)*

**Reply from Jason Holt (@jaysenrh)**

*@kdcajt @chaskaheald you are correct. Parliamentarian wouldn't allow me to speak without a motion but let some woman gush about JA. #joke*

**Reply from Jason Holt (@jaysenrh)**

*@kdcajt @chaskaheald apparently open forum doesn't allow residents to speak, unless you're pro-Jonathan. <sup>[18]</sup>*

Exclusive, high-security data centers and right-wing secessionists: these are the headlines from what was once one of the most reasonably progressive developments in the country. How does a place drift so far from its original program of openness towards an environment of walled gardens and gated communities? In recent years have we begun to identify our technology-enabled communications networks with the word “social.” But in fact what is networked and what is social have been intimately intertwined from the start and they reconstruct each other at every step of the way. Jonathan is more than a piece of land marked by carefully planned walking paths, playgrounds, and homes— these gestures have been mediated by the architecture of experimental information systems. The designs

of these systems—and they are as designed as any street pattern or floor plan—have had effects which are inseparable from the history of the town as a whole.

# NETWORK

## TOPOLOGICAL ALTERNATIVES

In the late 60's, most of the nation's hopes for the next generation of high-tech correspondence looked towards coaxial cable as the transmission medium of choice.<sup>[19]</sup> What we now call cable TV was once more widely known as Community Antenna TV. The physical properties of the materials involved dictated a unique network topology— a single, towering receiving antenna could pull in transmissions from distant broadcasters and push them down the line to all homes physically connected on the community-wide cable network. Coaxial cable wasn't good at sending information over massive distances, so it necessarily grouped homes in more local regions. A side effect of moving transmissions from the air into the ground was that *local* television became not only a technical possibility, but a government mandate; in exchange for the opportunity to run cable along public rights-of-way, commercial cable providers had to allow individual community members access to the mechanisms of cablecasting.<sup>[20]</sup>

A group of General Electric engineers moved to Jonathan and formed a company called Community Information Systems, Inc. which launched a pilot study of the feasibility of pushing this democratizing trend even further, allowing community members to talk back not only from the public-access TV studio but from within each and every home. Their plans for *two-way* cable television projected that the home of the future would not simply receive broadcasts, but be able to request specific programs and information, read and write messages to a community bulletin board, engage in individualized learning programs, play networked games, provide feedback to the local government through voting and public opinion polls, and make realtime video calls to their neighbors with the same

ease as picking up the telephone. In the end, the efforts to make the system commercially viable and of general interest favored the lowest common denominators of programming and interaction; the results of Community Information Systems' extensive demographic studies, interviews, questionnaires, and accounting estimates showed that what the people really wanted and would be willing to pay for were special entertainment programs, movies, and sports.<sup>[21]</sup> Today, we are familiar with this revolutionary concept in the form of pay-per-view TV, a mode of "talking back" to the cable companies that lets them know when we want more pro wrestling or porn.

It might be tempting to call any electronic system that allows more than two people to transmit data a precursor to the Internet. Yet enabling more than one set of voices to speak is only a small part of the equation. Just as important are the abstracted shapes of things, the routes one can or must traverse to get between nodes in the system, the degree of hierarchy and distribution of control. These are questions of *topology*. The Internet is named such because it is a collection of many smaller networks, each with their own topologies (classified with names like bus, star, ring, tree, and mesh) linked through standard protocols. Jonathan's local cable system would have been a composition with a rather centralized star-shaped plan, moving all traffic through one master node. But without similar systems with which the local net could speak, Community Information Systems' network would have been a corporate-controlled private island.

In the early 2000's, the city of Chaska, which long ago annexed the New Town of Jonathan, installed one of the nation's first city-wide WIFI networks. Using industrial strength antennae attached to the city's lamp posts, the entire region is blanketed in 2.4 GHz of radiated Internet. The network is not free and open, but unlike most internet service providers, Chaska.net (as the WIFI network is called) is maintained and sold by the municipality as a public utility like water or sewage.<sup>[22]</sup>

The distinct equipment suspended up high marks a departure from Jonathan's commitment to buried utilities; infrastructure has climbed the totem pole by a combination of physical necessity and the creeping influence of modern life. Whether desired or not, these antennae and what they represent have become a highly visible component of the image of this city.

When we get comfortable enough with a system, the nuances of topology fade away. Our words begin to mirror our internal mapping of concepts, apparent when we use a word like WIFI as a metonym for the Internet in whole. But WIFI only takes us to another local node, not to our data spread around the world. Before our bits hit the wild Internet, they must pass through a router, or as this type of computer was originally called, a *gateway*. While we don't often consider the different types of physical gates or doors we use every day, we at least understand there is a radical difference between the experience of a border crossing and a shower curtain. Computer networks are no less diverse.

Because we have harnessed matter and wired the earth to the point that it feels easier to connect to the entire planet than remain offline, we have internalized a binary logic that says either you're connected—completely, globally, publicly—or you're not. Any nuanced middle ground of intentionally constrained access is read as an anomaly. "Slow Internet" sounds like a complaint, a bug rather than a feature, while we have turned "slow food" into a lifestyle, a business model, a fashion statement, a political stance on the relationship to one's local space.

The first place I felt comfortable stopping at in Slab City was the Slab City Internet Cafe; like eating at a McDonald's in a foreign country, I knew I would be welcome there, and I knew more or less what would be on the menu. And there was, as advertised, Internet access, but also conversation that illustrated what William Gibson might have meant when he wrote, "the street finds its own uses for things." The cafe's regulars told me about Radio Mike and the pirate FM radio broadcast, CB Linda who reads community messages over



the air every weeknight on the long-haul trucker's network of choice, and a permanent drifter who claimed to have the location of every Walmart in the country programmed into his cell phone (because that's where the best panhandling was to be had).

I began to think of how incongruous the Internet seemed in a place like The Slabs, even if it were useful. For a group of people who intentionally left the built up centers of communication and exchange, connecting electronically to the entire world at once seemed inappropriate as the only option for trading data. I decided to offer an alternative built on a network model that mirrored the philosophy of its surrounding space— autonomous, deliberately isolated, connected to the outside world only by that which people bring with them and leave behind. A couple of miles southeast from The Slabs' central grid, there is a small structure atop a concrete pad that provides shelter and power from the sun. The properly equipped visitor will notice an open WIFI network which, upon connecting, will lead them to a single page that lists the contents of a locally embedded USB drive. The listed files have been contributed by other visitors who have brought something with them to share. The system is indeed a WIFI network, generated by a small Linux-based computer, but it is disconnected from the Internet or any other machines.<sup>[23]</sup> It is an isolate, an intentionally designed new space with an unconventional topology.

I leave no instructions except for a variation of the internationally recognized WIFI symbol painted on the roof. I can't claim ongoing ownership or control of this utility, so I can only hope it becomes a sort of oracle in the void where deliberative public debate occurs one ASCII .txt file at a time, where local knowledge can be furtively transferred sans encryption, where families might sequester their heirloom jpegs.

I set it up, I test its functions, and I leave. Upon arriving home, I learn a new feeling when I find a web site listing files left open in a browser tab, only to realize all of its links are now broken because I am no longer in the same place as when I opened it. It's similar to the feeling of hearing the radio static coming through on a channel that was tuned to

another place. Perhaps these are the diversified feelings we should cultivate rather than just retreating to the safety of asking the universal question, “what’s the WIFI password here?” How about: What files are on tap tonight? Is this routing protocol local? Who grew your subnet?

How could we ever claim to separate our personal politics, the politics of how we relate to the people and spaces around us, from the politics of how we relate to our data?

Or maybe it’s as simple as the proprietor of Slab City’s Internet Cafe put it: “I love the WWW but I don’t care much for the ISPs.”

## MODEL MODEL CITY

How do you design a city? One approach is to draw a picture. Make up shapes for things, label them on a map, be a form-giver and build to spec. Or you can see planning as a game of setting rules, a process of writing code; acknowledge that the outcomes are always more open-ended than a master planner might hope and that is a good thing. Modify parameters and different configurations result. Decide not what the image of the city will be directly, but choose instead the topology of the walls and pathways— what is connected to what (and how)? What is enclosed, what is open, where are the access-controlled gates? How does the data flow? How does the matter move? Draw with *infrastructure*.

Grand plans for the future have a tendency not to fail, but rather their code transforms space into unexpected, mutated forms. It is difficult to predict what a certain rule system, a certain program, a certain connection pattern or topology will generate. From this point of view, history is just a particularly good simulation. Places like Jonathan and the Minnesota Experimental City Project had aspirations to be simulations of this sort, ones built at full scale and out of real earth. They desired to become examples for future city-builders, to become models of themselves. Unfortunately simulations like this only run in realtime and in one direction. So when we get impatient or nostalgic, we turn to building models at different scales. It's a popular hobby to do this with railroads. Though model railroads are not active simulations in a scientific sense, looking for what might be next to come, they do play fantastic tricks with the compression of space and time. Distant geographical features might be relocated to fit on a single sheet of four-by-eight plywood, preserving local scale while squishing the regional picture. Similarly, 19<sup>th</sup> century steam engines and modern high speed electric rolling stock can coexist on the same rails without offense.

Taking such liberties of spatiotemporal compression is antithetical to the architect's modeling tradition, but it reminds us that designed spaces are sites open to continuous

redefinition, redesign and reinterpretation. Railroad model-builders *play* with their creations, running simulated traffic schedules moving simulated goods. They learn some about what works and what doesn't work as expected on these networks. The only problem is, railroads are rather removed from our everyday American experience of networks. What if we turned to model something much more in the present? With the same seriousness and joy, we could be building models of the communications systems we might otherwise take for granted. We could imagine our selves as sysadmins and network architects rather than tycoons or train conductors, reading the existing landscape of communications infrastructure and inventing our own hardware and software stacks to move fictional information streams. We could be "playing network" with the bits and pieces that move our selves through space and time every day.

## IT'S NO LONGER OK TO NOT KNOW HOW THE 'NET WORKS

This has been a story mostly about objects, about places, about information. But as Galloway and Thacker remind us “what is at stake in any discussion of the political dimensions of networks is, at bottom, the experience of living within networks.”<sup>[24]</sup> Networks are material, they are spatialized, they are “real life,” they are designed, they both constrain and enable human interaction, and human action both constrains and enables their development throughout different parts of the earth.

In discussing these different places and systems where communication happens, I have largely ignored *what is communicated*, keeping with the spirit endemic to information theory and its descendents which treat data as a content-agnostic universal substance.<sup>[25]</sup> For better and for worse, this legacy is inherited in the design of most message-passing technological spaces. Data centers like Hyberdata are sites of commingling bits— a given server is indifferent to both meaning and format of the information present. Jonathan’s two-way cable experiment was an attempt to turn the domestic television into a multifunctional information center, evolving beyond its limited role as news and entertainment provider. But undifferentiated information transfer is something like the *tabula rasa* of the un-surveyed desert— in order to make sense of it all, we draw arbitrary lines through different zones of activity, reify things with names, and invent rules that seek to bring order to systems where the parameters of governance have been altered beyond recognition. The productive outcomes of these tendencies are apparent when we can readily connect to what look like coherent, functioning networks, but that doesn’t mean we’ve moved beyond the problem of agreeing on *what it is we’re even talking about*. BitTorrent, the Pirate Party, SOPA/PIPA/ACTA, DMCA, Kim Dotcom, Kindle silent recalls, app store rejects, crippled devices and jailbreak rebels, Aaron Swartz, Bradley Manning, Tor, Silk Road, Wikileaks, Cypherpunks, BitCoins, illiterate masses under the control of the vectoralist class— a cliché like “freedom

of the press” seems anachronistic not only in its material implications but also for the fact that the topology of our systems has shifted to prioritize the network over the broadcast, distributed forms (perhaps under centralized control) rather than total centralization. The varieties of egalitarianisms codified over the last century of urban planning—New Towns and New Urbanism, communes and unintentional communities, experimental cities of all kinds—are problematic along many dimensions, but their conflicts highlight the uneasy prominence of the network . Their incompleteness suggests that any liberating potential of the city must be matched by a redesign of our networks to give us the freedom to communicate.

The Minnesota Experimental City, alive on paper; Jonathan, embedded in the cold ground; Slab City, grown from unplanned desert alchemy; Clover Ridge, trapped in conflicting contracts of freedom. Each of these programs can be read as a microcosm to gain understanding of—and perhaps relieve some anxiety about—the networks we move through today. They are first lines of a diagram, then lines in the dirt, lines in the sand, lines to agree to and sign on. They are spaces to travel to and through, spaces as literature which can be read, and spaces which, perhaps, can be re-written.

# NOTES

1. “Field Trip Summary,” author and date unknown, Minnesota Experimental City papers (N 71), Box 6, Northwest Architectural Archives, University of Minnesota Libraries, Minneapolis.
2. R. Buckminster Fuller, *Critical Path* (New York: St. Martin’s Press, 1981), 277.
3. Bruno Latour, *Aramis or the Love of Technology* (Cambridge, MA: Harvard University Press, 1996).
4. “*The Aitkin County Board voted 5-0 in favor of MXC. They felt it would be good for the county, as the city would create jobs for the young people and help keep them in the are. The mood was mixed in the Swatara-Hill City area. Many people were for the city, at least at first. There were a few against the concept, and they kept up their efforts and got more support as time went on. They simply could not see how a city of 250,000 people could be built without destroying the current environment.*” From Leo Trunt, *Beyond The Circle*, as re-printed on <<http://www.lakesnwoods.com/SwataraHistory.htm>>, accessed 25 March 2013 .
5. Jennifer Kerr, “Living Room: New dimensions in city and country housing”, Minnesota Technolog, February 1972, 21.
6. Richard Brautigan, *All Watched Over By Machines of Loving Grace* (San Francisco: The Communication Company, 1967), re-printed at <[www.brautigan.net/machines.html](http://www.brautigan.net/machines.html)>, accessed 25 March 2013.
7. See “Chapter III - Technology and City-Building”, *The Minnesota Experimental City Progress Report*, University of Minnesota / Experimental City Project, May 1969, 3rd edition, Minnesota Experimental City papers (N 71), Box 17, Northwest Architectural Archives, University of Minnesota Libraries, Minneapolis.
8. “Feature Detail Report for: Tortuga”, ID 252997, *USGS Geographic Names Information System*, <[http://geonames.usgs.gov/pls/gnispublic/f?p=gnispq:3:494631160245852::NO::P3\\_FID:252997](http://geonames.usgs.gov/pls/gnispublic/f?p=gnispq:3:494631160245852::NO::P3_FID:252997)>, accessed 2 January 2013.
9. *HyberData, LLC*, <<http://hyberdata.us>>, accessed 5 August 2012.
10. Tom Gump, “The ideal climate: data center development in Minnesota”, *Minnesota Real Estate Journal*, Volume 28 Number 1, January 2012. (Also available online at <[http://hyberdata.us/userfiles/mrej\\_HyberData\\_reprint\\_jan12.pdf](http://hyberdata.us/userfiles/mrej_HyberData_reprint_jan12.pdf)>)
11. Christopher Alexander, Sara Ishikawa and Murray Silverstein, *A Pattern Language*,

(New York: Oxford University Press, 1977), 316.

12. "SEQUENCE AGREEMENT", *Patternlanguage.com*, <<https://www.patternlanguage.com/clickagreement/clickagreementmember.htm>>, accessed 1 March 2013.
  13. See, for example, Erich Gamma, Richard Helm, Ralph Johnson and John Vissides, *Design Patterns: Elements of Reusable Object-Oriented Software* (Addison-Wesley Professional, 1994).
  14. Sam Black, "UnitedHealth plans 2nd Twin Cities data center", *Minneapolis St. Paul Business Journal*, 21 March 2010, <<http://www.bizjournals.com/twincities/stories/2010/03/22/story1.html?page=all>>.
  15. For more on the history of homeowner associations, see Evan McKenzie, *Privatopia: Homeowner Associations and the Rise of Residential Private Government* (New Haven: Yale University Press, 1996).
  16. "GNU General Public License v2.0", Free Software Foundation, Inc., June 1991, <<http://www.gnu.org/licenses/old-licenses/gpl-2.0.html>>.
  17. A summary of the lawsuits and the ultimate ruling in favor of the Jonathan Association can be found on the association's webpage, "Lawsuits Against Jonathan Concluded" <<http://www.jonathaninchaska.com/index.cfm/newsmediapress/lawsuits-against-jonathan-concluded/>>, accessed 15 March 2013. A full video recording of an association meeting in which Holt attempt to get elected to the board with the intent of dissolving the association is available from Chaska Community Television on Vimeo, "Jonathan Association Annual Meeting 02-21-12", <<http://vimeo.com/37224531>>.
  18. Chaska Herald, (@chaskaheald), 19 Feb 2013, 5:25 PM, Twitter, <<https://twitter.com/chaskaheald/status/304039008751718400>>.
  19. "Jonathan developers plan to cause the installation of a coaxial communications system which would be available as a utility at all sites. Stations would include a time-sharing computer, a learning center library and audio-visual center, local CATV, and a local television station. Jonathan has applied to the telephone utility for installation of coaxial cable in Village One and is working through Jonathan Housing Corporation and Stanford Research Institute on home communications terminals which would be leased to individual households. Jonathan developrs predict the system will have a major role in the life style of future Jonathan residents."
- "Jonathan New Town Study", April 1972, Minnesota Experimental City papers (N 71), Box 8, Northwest Architectural Archives, University of Minnesota Libraries, Minneapolis.



20. “Effective on and after January 1, 1971, no CATV system having 3,500 or more subscribers shall carry the signal of any television broadcast station unless the system also operates to a significant extent as a local outlet by cablecasting and has available facilities for local production and presentation of programs other than automated services.”

*The Code of Federal Regulations of the United States of America*, Title 47, Chapter 1, § 74.1111 (1970).

21. Community Information Systems, Inc., *The Jonathan/Chaska Community Information System Experiments*, (National Technical Information Service, PB-224 145), June 1973.
22. Tropos Networks, “Chaska.net and Tropos Unwire Chaska, Minnesota”, January 2007, <[http://www.tropos.com/pdf/case\\_studies/tropos\\_casestudy\\_chaska.pdf](http://www.tropos.com/pdf/case_studies/tropos_casestudy_chaska.pdf)>.
23. This project was inspired by Aram Bartholl’s “Dead Drops” (2010) <<http://deaddrops.com/>> and David Darts’ “PirateBox” (2012) <<http://daviddarts.com/piratebox/>>.
24. Alexander R. Galloway and Eugene Thacker, *The Explot: A Theory of Networks* (Minneapolis: University of Minnesota Press, 2007), 70.
25. “In this secret paper, almost in passing, [Claude] Shannon used a phrase he had never used before: “Information Theory.” First Shannon had to eradicate “meaning.” The germicidal quotation marks were his. “The ‘meaning’ of a message is generally irrelevant,” he proposed cheerfully.”
- James Gleick, *The Information: A History, A Theory, A Flood* (Vintage, 2012), 219.