COUNTER-MAPPING THE NEIGHBORHOOD:

A SOCIAL DESIGN EXPERIMENT FOR SPATIAL JUSTICE

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To my son, Frank Matheson Taylor,

for providing me with motivation, perspective and joy throughout this process

and

To my best friend, partner in life, and husband, Robert Taylor,

for giving me infinite support, kindness, love, and wisdom

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PROLOGUE

> Counter-mapping…is not only an effective method for reclaiming material resources for those who have been dispossessed but it works to counter particular forms of economic subjectivity and space; it inserts a non-capitalist presence into locations where only a capitalist potential had been identified via scientific and institutionalized mappings of nature and resources.
>
> --Kevin St. Martin (2009, p. 493)

The two scenes that follow are examples of people *counter-mapping* their neighborhoods – when "locals" make claims to resources for the future by leveraging representations and tools of powerful, outside entities (Peluso, 1995). The first example occurred during a participatory planning process facilitated by urban planners and attended by residents of a racially segregated, economically marginalized area of the city I am calling "Woodbridge." Rogers Hall and I attended this meeting as participant observers, filming the talk and interaction that took place around a table covered with a large map of Woodbridge.

September 2010: *During a "Community Plan Update" process with an urban planner and local stakeholders, "Ms. Sanders," a resident of the community under discussion — "Woodbridge" — gave her recommendation for the location of a new grocery store. A food activist, a grocery store developer, an urban planner, and two other residents were positioned around the table, with Ms. Sanders standing. As she talked, Ms. Sanders leaned into and peered at a giant map that covered the tabletop. Divided into yellow, green, and beige pastels, the map showed permissible development scenarios for land parcels. Ms. Sanders ignored the colors, however, and immediately oriented to an unmapped attribute — Charlotte Avenue, a major road*

that creates the southern border of Woodbridge.

Ms. Sanders: Well, I'll ask my usual question…Some of the concerns that we've heard from, uh, large-scale developers like Hill, and that kind of thing, that locating a grocery store ((reaches to the map)) in here, both rooftops and as well as being able to sustain itself as a full-service grocery store ((slides finger along the map twice)), putting it along this corridor, this neighborhood could access it, ((points to a location on the map)) TSU could access it –

The others seated around the table responded positively, adding information and/or desires they had regarding grocery stores coming to the neighborhood. Then Ms. Sanders continued:

Ms. Sanders: So, it's like I'm sorta wondering, it's like what-has anyone said they would be willing to ((taps map with index finger)) to put a grocery story, like Key-like ((points)) right here, where ((slides finger along map)) we could GET to it?

As she asked this question, Ms. Sanders looked up, away from the map, and at the urban planner, "Stephanie." However, she kept her index finger anchored to the map and re-inscribed a possible route by which neighborhood residents could access a grocery store if there were one located on the corridor of Charlotte Avenue.

More than a year after video recording Ms. Sanders at the Community Plan Update process, I began research in an afterschool bicycle workshop located in Woodbridge with six youth and several adult mechanics. The bicycle workshop was located on Charlotte Avenue, the very same "corridor" to which Ms. Sanders was referring. At the Workshop, youth built and rode bicycles around their neighborhood, and made observations about the built environment in relation to their newfound form of mobility — riding a bike.

June 2011: *A teenage resident of Woodbridge, Carissa, gave her recommendation for the locations of bicycle lanes. After having lived in this community for several years, having*

attended school there, and having recently built her own bicycle to ride around, Carissa mapped and described potential bicycle lanes for her neighborhood. She shared these recommendations with planners, cartographers, and neighborhood stakeholders. In our university computer lab for an audience consisting of the director of a bicycle workshop, adult researchers, and her peers, she pointed to new map layers she had created in Google Maps™. She used a yardstick in her right hand to highlight the additions she made to the map as she talked:

> *Carissa: And then, I had another one [bike lane], oh, on Jo Johnston, right here, going from DB Todd down to this interstate right here ((uses yardstick to trace from home neighborhood to edge of interstate)). Sixty-five, I think.*

The adult research facilitating the conversation asked Carissa why the bicycle lane needed to go all the way to the interstate. Carissa responded:

> *Carissa: Um, because you can't really drive on the interstate. So like this, like, a lot of people, there's a lot of things right here, that people go to, ((traces south of proposed bike lane)) like the places, the park, and the community garden, here. But then not everybody over here has cars, so I want there to be bike lanes so they can get from here to there, ((traces from home neighborhood to edge of the interstate)) and not have to walk.*

From here, Carissa continued pointing to and describing her additions to the map that included an "under 18" mall and a water park.

CHAPTER I

INTRODUCTION

This dissertation is a grounded theoretical analysis of counter-mapping, a concept that emerged across three distinct but connected phases of research – participant observation of professional practice, an experimental teaching case with youth, and a designed context for youth community engagement. Counter-mapping emerged as a sociotechnical *performance genre* (Stevens & Hall, 1998) involving "locals" or residents making claims to resources for the future by leveraging the representations and tools of the state or other powerful entities (Peluso, 1995; St. Martin, 2009; Wood 2010). By describing it as a sociotechnical performance genre, I mean that counter-mapping involves "a set of specific forms of embodied action" (Stevens & Hall, p. 108) in relation to maps and to an audience of powerful outsiders and other local stakeholders.

For this work, the concept of counter-mapping developed over three phases of research, each phase informing the next. First, counter-mapping was an emerging object of study from ethnographic observations of a participatory planning process with adults (Phase I). Second, counter-mapping was a cumulative learning objective for designing an experimental teaching case study with youth participating in an after school bicycle workshop (Phase II). Third, counter-mapping was a vehicle for (the same) youth to realize spatial justice for their communities in conversations with urban planners and local stakeholders (Phase III). I call this study a *social design experiment for spatial justice* — a historically situated and collaborative design (Gutierrez & Vossoughi, 2010) of activities that engaged youth in re-imagining the infrastructure of their community to be a more equitable place. The two opening examples illustrate counter-mapping as it occurred in the first two phases of research — Ms. Sanders was participating in the Community Plan Update (CPU) of Woodbridge as facilitated by urban planners and Carissa was a youth study participant in the bicycle workshop located in Woodbridge. These two examples will help us explore the following questions in this introductory section: What is "counter" about counter-mapping? How is counter-mapping different from mapping? What does one need to

know to counter-map? And why is counter-mapping so important?

Counter-mapping as Thirdspace Practice

From my position as someone who is neither a "local" of Woodbridge nor a powerful entity, but also from several years of participant observation and study, I have come to think of counter-mapping as a thirdspace practice. By thirdspace, I mean a kind of interface "produced by processes that exceed the forms of knowledge that divide the world into binary oppositions" (Routledge, 2009; p. 753). Thirdspace is where unofficial meets official, informal meets formal, represented meets lived, and concrete meets abstract to create and/or imagine something emergent and new (Lefebvre, 1991; Soja, 1996). I want to propose three specific ways in which counter-mapping is a thirdspace practice. These distinct qualities of counter-mapping relate to how people understand, make, and take place. By understanding place, I mean to describe how people know what they know about a particular geography. By making place, I mean to describe how people talk about and imbue geography with personally relevant meaning. And by taking place, I mean to talk about how people exert ownership of and agency within a geography of which others may have designs.

The following analytic categories of counter-mapping emerged from watching adult residents participate in a participatory planning process with urban planners (Phase I) and became important for developing research questions and designing activities for youth in an experimental teaching case (Phase II). I then looked for these categories in how youth were talking about and representing their neighborhoods throughout the designed activities (Phase II) and in interaction with urban planners and local stakeholders (Phase III) to determine if the design met its over-arching objective – to teach and engage youth in counter-mapping. These categories then became more refined during retrospective analyses, looking back across all three phases. The three analytic categories of counter-mapping that this dissertation describes and examines across the three phases of research are as follows:

- Counter-mapping creates opportunity for residents' "on the move" epistemology based on mobility (Cresswell, 2006) to meet a "grid epistemology" (Dixon & Jones, 1998); locals (*informally*) know places by moving through them rather than from (*formally*) seeing an area

from above (e.g., de Certeau, 1984; Creswell, 2006; Jacobs, 1961).

- Counter-mapping creates opportunity for story-telling from sensuous, historical, and lived experience to simultaneously understand and disrupt a disembodied, abstract narrative represented by a map (Eckstein, 2003); locals bring *concrete* experiences in place to *abstract* conceptions of space to build "sense-scapes" (Grasseni, 2009) or lived experience and desire.
- Counter-mapping creates opportunity for demonstrating spatial literacies; residents leverage "official" tools (i.e., geospatial information and technologies) and discursive practices (e.g., understanding urban phenomena through spatial concepts like scale, distribution, accessibility) to tell and re-represent personally relevant arrangements for the future (Fox, 1998; Peluso, 1995).

People may be inclined to take-up counter-mapping as a sociotechnical performance genre because of spatial inequities that they experience on the ground, in their daily lives (e.g., living in a food desert, no bicycle lanes), in an effort to *take place* in the ongoing "official" discursive processes of their ever-evolving communities. These three analytic categories of counter-mapping may not exhaustively describe this performance genre. However, these categories describe how counter-mapping is a thirdspace practice where informal and formal ways of understanding, making, and taking place come together and inform the other. These categories were the most visible and reoccurring in my analysis of interactions during Phase I of the study. These categories were also the most helpful in making conjectures about designing activities for youth counter-mapping in Phase II and Phase III, and then making sense of what occurred. These analytic categories are fluid, in interaction, and inform the other, but for clarity of design, analysis, and writing, I will attempt to separate them in the sections and chapters that follow.

Characteristics of Counter-mapping Unpacked

The three analytic categories demonstrate how counter-mapping is a thirdspace practice where informal and formal ways of knowing, making, and taking space come together and inform

the other. While these three characteristics of counter-mapping will be described in greater depth below, each quality will also serve as a central organizing concept for the three Findings Chapters (chapters 4-6). The mobile epistemology of residents will lead and frame chapter four. Constructing sense-scapes will organize chapter five. Leveraging official tools and discursive practices will conceptually frame the sixth and final Findings chapter. The following discussion of each characteristic will be extensive, but in each of the Findings chapters, there will be much more empirical material from each phase of the study and room for exploration and analysis.

Spatial Epistemology

How do you know a place? How did you come to know what you know about that place? What mediated the ways in which you came to know about a place?

Counter-mapping creates space for residents' "on the move" spatial epistemology to contact a grid epistemology on which maps are based. Because counter-mapping is a claim to resources authored by insiders — or people dwelling within the space that has been abstracted by authoritative/ "non-proximate forces" (Graham, 2009; p. 423) — the spatial epistemology that is operating is one based on movement or physical mobility. Residents know places from on-the-ground, mundane activity that occur in locations and along pathways. The knowledge demonstrated in counter-mapping is not merely from a situated perspective, but from a fluid perspective, as well.

This epistemological orientation of locals is contrasted to a "scientific" epistemology of maps that are built from remote sensing data in a Geographic Information System (GIS). Remote sensing data is based on observations from above, either through aerial photography, infrared scans, or radar, and often used in conjunction with the representational conventions of GIS (i.e., points, lines, polygons, rasters). In this version of mapping, the specificity of location on a Cartesian grid is of the utmost importance (e.g., Ingold, 2007; Roth, 2009). As Harley (1989) stated, "The object of mapping is to produce a correct relational model of the terrain. Its assumptions are that the objects in the world to be mapped are real and objective, and that they enjoy an existence independent of the cartographer…"(p. 4). The below image highlights the

perspectival position of cartographers as being above or apart from the space to be mapped, rather than *of* or *in* a place.

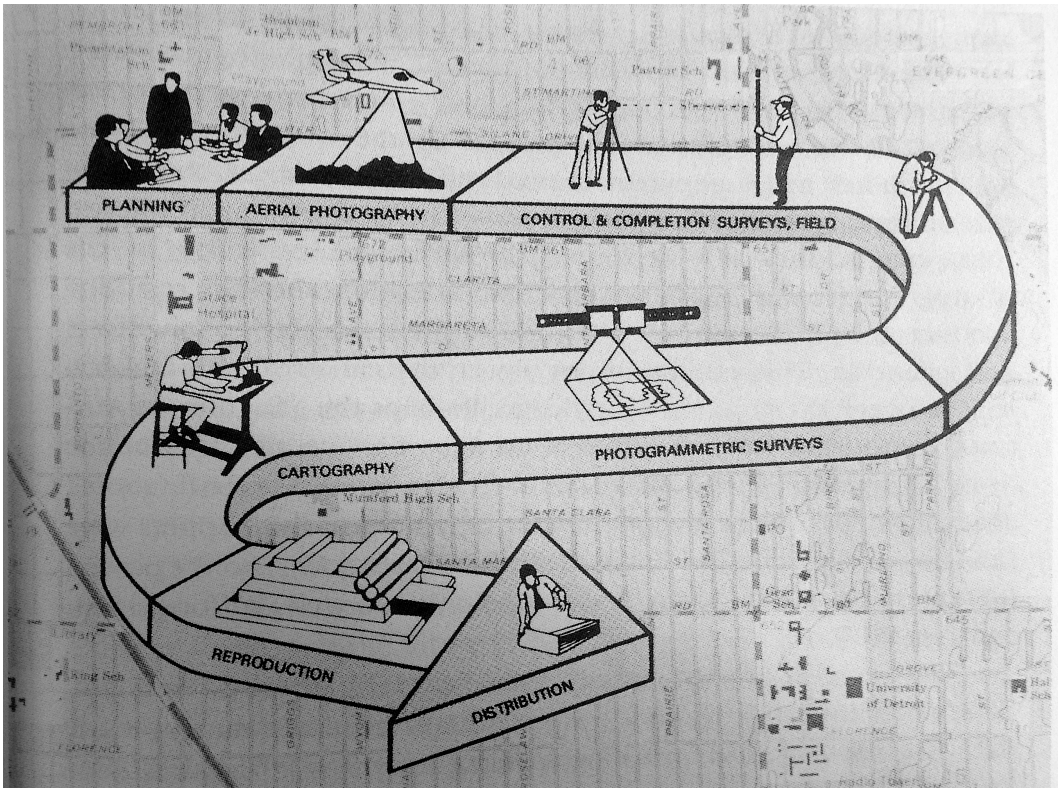

Figure 1-1. A typical map-making process. From Thompson (1981, p. 24).

Obviously this perspectival difference between mapping from within and from above has been problematized by researchers and activists since the advent of satellite photography. An extensive critical examination of GIS, remote sensing data, maps, and cartography exists, and my purpose for this project is not to review it. However, for this dissertation research, it is important to assert that maps are treated as abstractions of place, *conceived* by (Lefebvre, 1991) powerful outsiders, be they entities of the state/government (e.g., an urban planning department) or of corporations (e.g., Google). Such entities rely partly on remote sensing data — observations and imagery from thousands of feet above — to create maps of places where people actually live. This contrast – between personal and professional ways of knowing space – relates to scale (e.g., the scale of the body, the scale of the map), and the scaling and rescaling of knowledge as socially and politically laden (e.g., Brenner, 2000; Lefebvre, 1991).

This is not to say that urban planners and Google do not consider an insider's perspective, or the scale of geographic experience from moving through places. We know that both of these entities devote a considerable amount of resources to "crowd-sourcing" data for and "ground-truthing" their maps. However, often these processes are exercises in professionals (rather than insiders) filling already existing classifications and/or categories of displaying spatial data in a GIS, such as with points, lines, polygons (vector data), and raster data. What would happen if residents/locals/insiders of the geography controlled this process?

As Graham (2009) states, "Advances in information and communication technologies (ICTs) and transportation technologies have intensified the ability of non-proximate forces to have a bearing on the here and now of any given space/time moment" (p. 423). These maps are increasingly ubiquitous, be they in the news, in our cars, on our computer screens, and in other arenas of our daily lives. More importantly, many of these maps have the potential of shaping the ways in which we see our lived spaces and how they will transform. But like no other time have mapping tools, like GIS and GPS (Global Positioning Systems) technologies, been so accessible to the "insider." Therefore, being able to talk back to and change the map with mapping tools has never been more important, or more possible.

Residents or locals operate from a different spatial epistemology when they counter-map. They *make sense* of places by moving through them rather than from seeing them from above (Jacobs, 1961; deCerteau, 1984; Roth, 2009). (Think about how strange and disorienting it is to see your home or neighborhood from the window of a plane.) People who dwell within and move throughout the geography have perceived and experienced the space in ways that are fundamentally different than those looking at a satellite photo of the area from fifteen thousand feet above. In terms of map views, the local sees the world in profile, where the outsider sees it in plan view.

From the perspective of urban planners, locals are essential to establishing the *ground truth* of maps — residents can use their on-the-ground experiences to either complement or negate the accuracy of maps built from remote sensing and survey data. But in the act of ground-truthing, a lot more of the affective, embodied experience of place comes forward that is

difficult to capture and represent as vector or raster data (Eckstein, 2003). For the resident that is a pedestrian, a particular intersection *feels* unsafe because of the absence of a crosswalk. One city block is noisy and smells funny because of the endless construction project happening on several lots. A stretch of road is a poor candidate for a bicycle lane because of the steep grade that causes shortness of breath for pedestrians (all of these are real observations mentioned in the CPU or the design experiment with youth).

As my dissertation data show, residents (young and old) are concerned with movement – with pathways — as those are the on-the-ground resources that facilitate physical mobility to important places. As Ms. Sanders and Carissa remind us, pathways facilitate people getting to and from grocery stores, work, gardens, etc. Ms. Sanders disrupts the Cartesian representation of her community as she continues to push her finger across rigid boundaries on the map, even extending her desired pathway outside the "study area" (a planner term) since her mobility obviously does not stop just because the map does. Carissa, too, "knows" the neighborhood based on moving through it as she highlights assets on the map as if she were riding her bike by them. Both women speak on behalf of getting the community "on the move" — Ms. Sanders wants to get people to healthy food at a grocery store; Carissa wants to move them to neighborhood resources in ways other than just walking.

Constructing sense-scapes

How do you describe a place that you know intimately? What are the salient experiences you have in that place? How do you show that you know a lot about a place?

Residents treat the map as an invitation for story-telling when they are counter-mapping. The typical way of *proving* to others that you know a place well is to impart the rich history of many lived experiences you have had there. These stories serve to disrupt the disembodied, abstracted narrative represented on the map to create a *sense-scape* of lived experience and desire. I use Grasseni's (2009) term sense-scape to

> …play on the double meaning of 'sense' (evoking the senses but also a 'sense' of place) to stress that sense of place is not just a phenomenological experience, but is also imbued with symbolic meaning, through memory and through the actual practices of

locality that allow us to share a space socially, as a *place* (98).

Adding to Grasseni's term, I use a *triple* meaning of "sense" in sense-scape, to talk about the ways locals use stories to *make sense* of the mapped/abstracted landscape. Sense-scapes often bring the sensuous experiences of the body forward, but also layer abstracted space with *common* narratives of nostalgia, desire, fear, and morality that give the map meaning.

Constructing sense-scapes occurs through talk, gesture, and interaction with each other and the map and spans past, present, and future time. In this way, counter-mapping is not the artifact produced, but the performance genre (Stevens & Hall, 1998) in interaction with the map and an audience. Like most activities involving stories, counter-mapping targets a *particular* audience. In this case, the audience is perceived as more powerful than the counter-mapper(s) and more interested in advancing capitalistic developments rather than promoting change for the commons (St. Martin, 2009).

The way I use counter-mapping – as a performance genre in interaction with artifacts employed – is an important distinction between my work and that of critical geography and anthropology research. This literature espouses counter-mapping as the material product created by locals (e.g., Fox, 1998; Hodgson & Schroeder, 2002; Peluso, 1995; Roth, 2009), and they may argue that the artifact is more sustainable and effective than what I describe here. In many geography and anthropology studies, the power and agency eventually resides in the document made by locals who have been trained and taught the tools of GIS (by a social scientist or geographic researcher), but not necessarily in the residents themselves.

In this study, I argue that the power of counter-mapping occurs in interaction, *in situ*, when residents are persuasively and persistently constructing sense-scapes of spatially-indexed (to the map) sensuous and emotional feeling with and for a powerful audience. Sense-scapes become more significant and more sustainable the more they are repeated, the greater the duration, and the more closely aligned they are to the geographic scale of the map (Eckstein, 2003). I use "sustainable" here to describe how some sense-scapes have the capacity to endure through time, but also to recursively reference a sense-scape in professional planning that values urban development while preserving the environment for future generations. Ms. Sanders and

Carissa provide examples of how particular sense-scapes – living in a food desert, the intrusion of interstates on the fabric of the neighborhood, the lack of bicycle lanes – became sustainable over the course of this social design experiment.

Ms. Sanders began her contribution by framing it as her "usual question," looking at the map and launching into an account of grocery stores and food deserts. Over time, Ms. Sanders had become the face of what it felt like to live in a food desert, and her recommendations during the CPU typically addressed building a grocery store in Woodbridge. The planner and food activist at the table already knew her and were familiar with her concerns. While she often repeated this desire to have a grocery store in the area at every meeting she attended, Ms. Sanders also took significant interactional time constructing this sense-scape. The duration of her contribution was long (much longer than the opening excerpt) and extended across what she had heard from grocery store developers, the feasibility of locating a store along a busy corridor, and a kind of plea for action. Ms. Sanders was also deliberate about keeping her sense-scape at a comparable scale to that of the map. Almost all of her thoughts were grounded to the map as she extensively pointed to attributes both shown and not shown.

Carissa's counter-mapping performance provides another example. Not surprisingly, as a participant in a bicycle workshop, Carissa repeated a sense-scape that was dominant throughout the study; she talked about the need for more bicycle lanes, especially because many residents in her neighborhood did not have cars. (How it felt to be carless in a city built for vehicular traffic was a sense-scape constructed by several youth study participants other than Carissa.) While doing so, she also reminded us how dominant the presence of the interstate was in her neighborhood – another frequently repeated story told by residents young and old. While Carissa's talk was imbued with a familiarity and strong sense of place, her sense-scape covered the same geographic scale as the Google Map that she was annotating with desires for the future. Because she repeated dominant spatially-indexed themes of Woodbridge and matched the scale of the mapped landscape, Carissa's sense-scape was more sustainable than other desires for a teen-only Chuckee Cheese or for a water park. Constructing sense-scapes was not a trivial activity but required extended and frequent interaction with maps and technologies. Being

able to construct sense-scapes was an emergent and learned aspect of participating in this study.

Leveraging the map and tools

What is the most powerful way to show what you know about a place? What do you need to know to effectively take place in (and from) official processes of urban change?

Lastly, counter-mapping creates opportunity for demonstrating how some persistent residents and youth study participants learned spatial literacies through prolonged participation in design charettes (in the CPU) and designed activities (in the experimental teaching case). Broadly defined, "spatial literacy is the ability to use the properties of space to communicate, reason, and solve problems" (apps.carleton.edu/collab/spatialanalysis). Spatial properties or concepts include scale, distribution, density, situation (the location of a place relative to other places), and accessibility. Like mathematical literacy or scientific literacy, spatial literacy is being able to see and understand the surrounding world through a conceptual framework organized around these properties — scale, density, situation, and so on (NRC, 2006). Therefore, in order to effectively counter-map, residents must undergo a process of conceptual change whereupon they restructure their understanding of sensuous, everyday experiences of place as *spatial phenomena*. Everyday experiences in place are perceived and organized around concepts central to the domain of spatial thinking.

For counter-mapping, spatial literacy is essential because of the ubiquitous use of GIS in building maps, and the increasing availability of geospatial technologies. Counter-mapping involves first understanding and sometimes using geospatial information and technologies to support a claim to resources for the future (e.g., Fox, 1998; Peluso, 1995). Counter-mappers must understand geospatial information because it is through this mode of communication that their communities are represented by powerful outsiders.

Because we do not have "an equality of documentation" (Rundstrom, 1998), where a story is as powerful as a GIS data layer, countering, or talking back to the representation, necessitates a basic understanding of the map, and sometimes, how it was produced. As Jeff Fox stated in *The Common Property Resource Digest* (1998), "maps are the most effective,

legitimate, and convincing means available to insiders for demonstrating to outsiders" that they know and take ownership of their neighborhood resources, "and hence for proving claims to their customary" geography (p. 2). Counter-mapping in coordination with the technology with which maps are created, is another way of tempering the "power asymmetries" between map-makers and counter-mappers; leveraging the tools of the powerful to oppose their maps is an effective strategy for being recognized as having "legitimate" claims (Harris & Hazen, 2006).

In the two opening examples above, Ms. Sanders and Carissa are both demonstrably comfortable with their endemic knowledge in relation to the map — the first, a map from the planning department, the second, a Google Traffic map — so much so that they both inscribe new "desire layers" on top of it. Ms. Sanders uses her finger to trace important pathways (as lines) and highlight food deserts (as polygons), neither of which is shown by the planning map. Carissa actually builds bright green pathways and polygons (to show the community garden) using the very technology with which the map was created. In this way, Carissa went a step further than Ms. Sanders; she made her desire layers by appropriating mapping tools and technology. Carissa's changes to the map now live on through the seemingly immortal portal of the internet. However, there is also evidence provided later in this study that Carissa's *performance* had lasting consequences, even if her online map is never again accessed.

A Social Design Experiment for Spatial Justice:

Learning to Design Activities to Support Youth Counter-mapping

Describing this study as a design "experiment" invites the expectation of a clear beginning and end to the study. But my understanding of and relations to adults and youth living in Woodbridge started years before the designed activities analyzed in this dissertation, and my efforts in Woodbridge and "Metro" (the entire city) have continued into the present. In what follows, I describe this history, as it has a bearing on the design of the experimental teaching activities (Phase II) and my analysis of how youth learned to counter-map their neighborhoods (Phases II & III). I also describe those teaching activities, how I recruited and worked with youth participants, and how we (the research team) gathered information that could be treated as data

for my questions about sense-making, engagement and learning.

A Social Design Experiment for Spatial Justice

What we know about the history of Woodbridge came from two sources. First, and before Phase I of the dissertation research, I worked for a youth-serving organization that provided services to teenagers in Woodbridge. Of particular relevance to this study, I developed a friendship and working relation with the leader of a Bicycle "Workshop" in which youth learned to build bicycles out of discarded or donated materials. That Workshop, which I describe in more detail below, was the setting for many activities in the second and third phases of the study.

Second, and Phase I of the dissertation research, we (Hall and I) conducted an ethnographic case study of participatory planning in the Woodbridge neighborhood (Taylor & Hall, 2011), for approximately one year before the experimental teaching case study with youth began. In that separate ethnography of participatory planning, we participated in and made recordings of public input meetings attended by city planners, neighborhood residents, developers, and activists. We interviewed different stakeholders in the planning process, and what we learned substantively influenced my plans for a social design experiment for spatial justice. Most importantly, I learned that the absence of youth voices in city planning contributed to spatial *in*justices in an area already fraught with a history of racial inequities (Woodbridge). I describe how my own history and the ethnography of participatory planning with adults informed the design study with youth before turning to other aspects of method.

Phase I: Ethnographic Observations of Participatory Planning in Woodbridge

Our ethnographic case study of participatory planning was part of a larger effort to compare practices of spatial analysis and modeling in settings of professional work (Hall & Leander, 2010; Taylor & Hall, 2011), with the eventual goal of designing experimental teaching activities for youth to learn new forms of spatial thinking and literacy. In our study of planning, we followed a group of city planners as they sought input from Woodbridge residents concerning future development in their neighborhood. During that study and in our analysis of video

recordings and interviews taken during planning meetings, three observations were important for this work. First, adults in planning conversations talked about Woodbridge youth as being either "at risk" or a source of "risk," but youth were never invited to give input on how the community could be designed to meet their needs as non-driving residents. From time spent in the community and my work at a local youth-serving organization, I knew that Woodbridge youth were active in the area, and expected their daily experiences and desires could be highly relevant for planning and design.

Second, Woodbridge was a predominantly African-American neighborhood in a city with a deeply contested, historical struggle for civil rights. The history of efforts to end racial segregation of public and commercial spaces in the city was widely remembered in the local press, yet the fragmentation of Woodbridge by an interstate highway project—which in the late 1960's cut a middle class, primarily African American neighborhood into disconnected pieces—was much less well known. Many of the older residents we met during our study of planning commented on this, and their stories drew our attention to problems of mobility. During our ethnographic study, most public comments that were consequential for planners involved issues of (im)mobility for Woodbridge residents. Residents reported on, and planners were receptive to, the difficulty of getting around Woodbridge, particularly for older residents who remembered walking in a neighborhood that once bustled with family businesses and street life. Now, even residents who owned a car complained that Woodbridge had become one of the city's food deserts, since neighborhood groceries had closed and national chain stores were hesitant to build in residential areas inhabited by families of the working poor. For residents without cars, Woodbridge was also seen as a "mobility desert" (a term first used by Cecil, the director of the Workshop with whom I collaborated on this project) that lacked a comprehensive infrastructure for independent mobility (e.g., bicycle lanes, bus routes, and accessible cultural/educational assets). I later learned that parents of the teenagers I studied agreed with this assessment, saying they wanted to get their kids out of the house, but they did not feel there was a safe way to get anywhere without a car.

Third, and particularly important for the design study, only some adult residents made

contributions during public meetings that planners found directly relevant for updating the community development plan. Based on observations and interviews with residents and planners, Hall and I suspected that through persistent participation, these residents learned to talk over the surface of maps in ways that closely matched the spatial thinking and relevancies of professional planners. Residents' successful contributions indexed talk about places, routes, and qualities of the neighborhood to graphical representations of particular locations in official maps provided by the city. Successful contributions also linked residents' accounts of past or present experiences to justifications for why the city should invest in new pieces of infrastructure (e.g., sidewalks or expanded facilities at community centers) or policies for the future of the neighborhood (e.g., requiring off street parking for new housing).

In contrast, highly critical, past time accounts of how the city neglected or even harmed Woodbridge (e.g., building an interstate highway through residential and commercial spaces) had little uptake in planning processes that were oriented towards analyses of existing conditions for future development. Residents and planners alike saw criticisms of government action in the past as legitimate. But future development required different kinds of contributions in the participatory planning meetings we studied. Successful contributions usually came from residents who interacted with planning staff over multiple cycles of plan development. Like other stakeholders (e.g., housing developers or food activists), they linked structural conditions in neighborhoods to concrete proposals for new development or policy. Informed by the ethnographic study, I came to think of counter-mapping as a practice conducted in thirdspace – at the interface between residents' and professionals' ways of knowing and acting on space to produce valued places for the future of the Woodbridge community.

In this dissertation, I focus on three contributions from three different adult residents. These contributions informed the way I thought about counter-mapping and designing activities for youth to engage in counter-mapping in Woodbridge with urban planners and local stakeholders. The first contribution occurred in the early months of the participatory planning process in a neighborhood break-out session and demonstrates how residents thought about space and place from a mobile epistemology (Chapter Four). The second contribution occurred at

a different neighborhood break-out session and exemplifies how residents constructed sense-scapes when counter-mapping (Chapter Five). Finally, the third contribution happened much later in the process and showed how persistent residents were able to take-up the tools and discursive practices of planners to make claims to resources for the future (Chapter Six).

The three resident contributions made in interaction with planners described in this dissertation provided materials for creating the grounded theoretical categories of counter-mapping. These categories also lead me to design conjectures for creating activities for youth in Phase II. Between Phase I and Phase II of this study, in preparation for an experimental teaching case with Woodbridge youth, I identified concepts and practices that should travel from the participatory planning process with adults to teaching youth. Important concepts and practices were as follows:

- Reflecting on personal mobility in relation to the urban infrastructure, or an *analysis of personal time geography*.
- Understanding and analyzing maps for accuracy based on lived experiences in that place, or *ground-truthing* maps.
- Understanding, interpreting, and creating new map layers based on personally relevant uses of space and place, or *building desire layers*.

Phase II: An Experimental Teaching Case for Woodbridge Youth to Learn Spatial Literacies

Woodbridge was home to a Bicycle Workshop that had been operating for three years when this study began. Cecil, a longtime youth advocate and cycling enthusiast, created the Workshop in the basement of one of Metro's most active, youth-serving community organizations. He saw the City as a mobility desert for non-driving adolescents living in an urban environment built for drivers and their cars. With help from adult volunteers, many working in bike shops around the city, Cecil held after school and weekend bike building workshops for teens from all areas of the City. He solicited donated or discarded bicycles as raw materials, which by the time of our study overflowed the basement space available for storage. The experimental teaching case study coincided with a typical, five-week workshop session for youth living in or around

Woodbridge.

Cecil worked with me for three major reasons. First, he hoped to learn new and better ways of teaching Workshop patrons how to read maps and choose appropriate routes for cycling before leaving home. Second, he hoped to see infrastructural changes in the neighborhood that would support youth on bikes, and he knew about our study of Woodbridge planning and ongoing relations with city planners. Third, Cecil wanted to know if his patrons were actually riding their bicycles once they took them home.

My purpose was to complement the Workshop by designing activities that would invite youth to learn and participate in practices of counter-mapping, and to engage with new forms of spatial literacy as they thought about how their personal mobility was supported or impeded by the infrastructure of urban space. With input from Cecil, I designed activities that would provide youth with experiences and tools to support new mobility on bicycles and, I hoped, to create an emerging practice of counter-mapping based on what I observed with adults in Phase I. These activities and supporting technologies were interspersed with bike building (completed by the third week), and increased in intensity towards the end of what, for Cecil and adult volunteers, was a typical instantiation of the Workshop. Across these activities, I asked the following research questions:

- *Sense-making*: How did youth make sense of the relation between their grounded, "on the move" experiences and more formal, mapped representations of their community? Making sense of this contrast was critical for new practices of counter-mapping I hoped to create with youth.
- *Engagement*: How did youth engage with the designed activities to identify personally-relevant aspects of mobility in their neighborhood, both for the present and for imagined, future activity?
- *Learning*: Did youth participation in emerging practices of counter-mapping lead to and benefit from new forms of spatial literacy (e.g., riding bicycles, analyzing personal mobility, and building map layers)? In what new ways did youth learned to think about and act on space?

My designed activities were re-mediations (Cole & Griffin, 1983) of youth mobility with older and newer technologies that included the following:

- Weeks 1 & 2: Youth told stories of their neighborhood activities, alternating between hand-drawn and computer maps (Google Maps™) of the surrounding area;
- Weeks 3 & 5: Youth used Garmin ™ handheld GPS devices both to draw on the surface of the city (see Lauriault & Wood, 2009; Chapter 5) and to complete a neighborhood geocache concerning the spatial history of buildings and parks in the Woodbridge neighborhood;
- Week 4: Youth compared commercial maps of the neighborhood with their experiences while biking from Woodbridge to a downtown park (a safety ride, described below), while adults recorded the activity using GoPro™ head cameras (Chapter 4);
- Weeks 3 & 4: Youth kept a written time-diary while carrying a GPS data logger (Trackstick™) to record personal mobility over two five-day periods, before and after building a bicycle, and they then analyzed personal time geography visible in these tracks (Chapter 4); and
- Week 5: Youth used internet mapping tools in Google Maps™ and Google Earth™ to build and present map layers of desired attributes (Chapter 6).

Experimental teaching activities were completed over a five-week period, but over subsequent months, youth made several presentations of their maps and arguments to neighborhood and city stakeholders (e.g., city and regional planners, representatives of the Mayor's office).

In this dissertation, I focus on four activities from the experimental teaching case study with youth. The first activity was a safety ride on completed bicycles that provided a way to ground truth new areas of the city (Week 4) to describe a mobile epistemology (Chapter 4). The second was a GPS drawing activity through the neighborhood (Week 3) to describe how youth constructed sense-scapes (Chapter 5). The third was a computer lab session for analysis of personal time geography using GPS records of mobility on the new bikes (also Week 4) to also describe how youth constructed sense-scapes (Chapter 5). The fourth activity was another computer lab session for building desire layers in Google Maps™ (completed in Week 5) to describe how study participants learned to leverage maps and mapping tools (Chapter 6). These designed activities provided youth with new experiences of and perspectives on their mobility in

the city on foot and on bicycles, both through embodied activity (e.g., the safety ride, GPS drawing) and through the use of new representational tools (e.g., track and desire layers, interactive online maps of the Woodbridge neighborhood). Youth-authored maps were culminating objects in an emerging practice of counter-mapping, like the desire layer and bike lanes presented by Carissa during Week 5 of the study (the episode that opens this paper).

Phase III: Woodbridge Youth Meet with Professionals and Local Stakeholders

Several months following the completion of Phase II, Cecil and I assembled a portion of the youth back together to present the maps they had created to professional cartographers, planners, and local stakeholders. These meetings in Phase III served three purposes. First, because counter-mapping requires an audience that is perceived as more powerful in issues regarding urban development, it was essential that the youth study participants had an opportunity to meet with representatives of state and local entities. Second, I wanted to create an opportunity for youth and urban planners (specifically, the same urban planners we worked with in Phase I) to come together so that youth could demonstrate the important contributions they were able to make to planning and development decisions. Third, I wanted to "report back" to youth some of the findings that emerged from their participation in the study by showing them the different artifacts they had created over the course of Phase II.

In the intervening time between Phase II and Phase III, Metro hired a cartographer to create a new bicycle map of the city with an emphasis on safe routes between important locations. Because he had become the face of bicycle activism with youth in Metro, Cecil was contacted by Bob Firth, the contracted cartographer. Firth was interested in talking to Cecil about the experience of children on bicycles in Metro. Cecil realized that the information would be more accurate coming from actual youth and contacted me to organize a meeting with Firth and our study participants. Three (out of six) youth from the study were able to attend that meeting with Firth, his assistant, a Metro government bicycle advocate, our university's GIS specialist, Hall, and Cecil. At this meeting, the attending youth shared the maps they had created and the experiences they had had from Phase II of the study. In the months following, Firth created the

Metro “Groove,” a bicycle route map that included safe routes to schools which was a recommendation from our youth.

The next meeting was an “Open House” at the local youth-serving organization where Cecil’s Workshop was located. This meeting was the culminating event of my original design so many months before, as it brought youth in contact with the urban planners Hall and I worked with in Phase I. The Open House was an opportunity for youth to demonstrate themselves as something more than at-risk or creating risk for others in the Woodbridge area. The meeting was also an opportunity for youth to report on a different experience of living in Woodbridge as a non-driving, non-employed, student versus the experiences of adults. Four of the six youth study participants were able to attend the Open House. Unfortunately, only one of the urban planners we worked with during Phase I was able to attend. She was accompanied by a regional planner, a Metro government bicycle advocate, the director of the youth-serving organization, Cecil, a Workshop volunteer who had recently taken a job in Metro government, and the parents of three of the youth.

The structure of the Open House enabled me to first report back to youth while showing the audience members what the youth had made, what mobile methods we used, and snippets of our experiences moving through Woodbridge. After the initial reporting back and show-and-tell portion, youth split into dyads and presented their maps to two different tables of audience members. At these tables, the youth fielded questions regarding their maps and made additional suggestions about how Woodbridge and the greater Metro area could be more conducive to independent mobility for teenagers. Finally, two parents of the study participants concluded the meeting with their reactions to the study and to youth mobility in Metro more generally.

In this dissertation, moments from these meetings in Phase III were especially important for understanding how professional planners, cartographers, and local stakeholders (especially parents) received the youth’s counter-mapping performances and their participation in the study. I will bring forward key episodes from the meeting with Bob Firth and the Open House in the Conclusions and Implications chapter (Chapter 7). Also, remarks made by parents of youth study participants will demonstrate how independent mobility for youth is an intergenerational family

issue as much as it is an effect of the built environment. Phase III was crucial in realizing many of the over-arching design objectives and supported the notion that youth could and should be an essential part of community and city planning.

In summary, I developed analytic categories and practices of counter-mapping in Phase I of the study that involved observing adult residents of Woodbridge interacting with urban planners and maps in participatory planning. I then decided what practices and concepts were important for designing an experimental teaching case study with youth in Woodbridge and developed questions about youth sense-making, engagement, and learning. Finally, I recognized that youth had to meet urban planners and professionals to *realize* counter-mapping, and to demonstrate what they had learned from the designed activities in Phase II.

In the sections that immediately follow, I will review some of the literature that is important for situating the key constructs of this dissertation study: mobility, children's geography, time geography, spatial thinking, ground-truthing, and counter-mapping. I will then describe the specific methods of data collection and analysis I used and paint an ethnographic picture of Woodbridge, the planning process, and the youth who participated in my study.

CHAPTER II

PERCEIVING, CONCEIVING, AND ACHIEVING SPA(ce)TIAL JUSTICE

Soja's (1996) "spatial trialectics" of perceiving, conceiving, and making space is useful in describing everyday and professional spatial practices, and the notion of spatial justice (2010). Perceiving, conceiving, and making space are never actually separate; all three are always happening and dependent on the other. This literature review will use spatial trialectics as an organizing frame to first discuss studies of youth perceiving space, professionally-conceived conceptions of space, and the potential of these working in tandem in participatory planning to achieve spatial justice.

Perceiving Space

Studies of how youth perceive space are an important part of the children's geography literature. These studies have been concerned with issues of young people's environmental experience and mobility, looking at how and where young people spend their time across the course of a typical day and what attributes of the geography are important to youth (e.g., Holloway & Valentine, 2000; Karsten, 2005). These studies typically look at issues of youth access spaces, and the ways in which young people produce liminal spaces when they are otherwise neglected or denied access. These studies clearly show that youth perceive and respond to the built environment, but they rarely include analyses of what young people learn from these experiences related to spatial literacy and civic engagement.

Roger Hart's (1977) study of "environmental cognition" among children was an exception. Hart demonstrated that children's mobility was self-directed in a rural community, and they learned about their environment by traveling through and negotiating how they would use it together. Children were notably involved in making places that invested the landscape with personal meaning. Hart asked children to draw maps of their neighborhoods and other important places from their typical daily experiences. These maps, interviews with children, and

ethnographic observations of their activity showed that children had a uniquely rich "time geography" of possibilities for activity given available modes of transit, time, and independent choice (Hägerstrand, 1970). These personal time geographies were dependent on children's gender, age, subordination to parental regulation, and the built environment in their community. Forty years later, I found much the same was true of adolescents living in Woodbridge.

Learning to Conceive Space for Civic Action

There have been fewer studies focusing on what youth need to know in order to translate their perceptions of community places to professionally-conceived and "formal" categories of space. Several studies agree that involving youth in this kind of translation is important (e.g., Dennis, 2006; Kingston, 2007; Sanoff, 2000). Bringing youth's first space practices – how they perceive space – in their daily lives could greatly inform the second space practices of urban planners. I agree with Moje, et al. (2004) that "these spaces can be reconstructed to form a third, different or alternative, space of knowledges and Discourses" (p. 41).

The interface where residents' embodied experiences in place meet planners' more abstract representations of space is a rich interactional space filled with tension but also with potential for positive change. For my own analysis and design for youth learning, I began to think of the interface as a thirdspace (Lefebvre, 1996)—a discursive and imaginary place for finding and producing new ways of thinking and acting in communities, but also as a means for changing relations between public activity and the built environment. I conceptualize counter-mapping as a thirdspace practice for contesting and building on professional conceptions of space by using endemic and sensuous experiences within the neighborhoods of Woodbridge.

Friedmann (1994) emphasized the notion of mutual learning in planning theory, where residents and professional planners learn equally from the other. However, little has been done in the way of describing how mutual learning takes place in participatory planning. Little research, if any, has instrumentalized how and what public participants, in particular, learn about planning and design (Laurian & Shaw, 2009) and how this learning informs and guides participation. Teaching and learning is central to the notion of democratic processes (an ideal characterization

of community development and public education) in that individuals or organizations must consider what students, clients, and/or publics know and what they need to know in order to adequately participate in society at large (Sanoff, 2000). Guiding and evaluating this type of participation has uniquely high stakes for the equitable development of community life.

With the rise of PPGIS, GPS, and other locative technologies, urban planners are increasingly interested in involving the public, including youth, in connecting on the ground, and on the move experiences to formal representations of place (Kingston, 2007). Therefore, even though there has always been a need for spatial thinking, being able to think spatially in coordination with geospatial technologies is a more recent and pressing demand in the realm of education as it relates to making civically engaged citizens.

Youth Neighborhood Mapping Initiative

To date, studies in the area of youth engagement in urban planning are weak on what children need to know in order to be catalysts of community understanding and change. While there are no extant studies that explicitly use daily mobility to teach youth about the relationship between everyday knowledge and formal spatial representations, there are some design studies that helped me think about where to begin. The Youth Neighborhood Mapping Initiative (YNMI; Santo, Ferguson, & Trippel, 2010) was an attempt to instruct youth on the relationship between their informal experiences of neighborhoods to updating and making formal representations of the same place. Youth-created maps were a means of communicating particular changes the teenagers wanted to see take place in their neighborhoods. Leveraging online GIS tools and GPS-enabled cameras and handheld devices, the designers asked fourteen teenagers from two low-income neighborhoods in Memphis, Tennessee, to make representations of their daily lives. The learning objectives of this instruction were outlined in the following excerpt:

> The exercises were designed to introduce teens to planning concepts and help them take a fresh look at their neighborhoods, to think in terms of geography, to see relationships between the built environment and how people feel about a place, and to recognize assets and liabilities. The youth participants also learned how to use technology to

collect and analyze geographic data, how to create maps with computers, how to work with community groups, and how to interact with community and government agencies (p. 56).

Driskell's (2002) guide to youth-planning, titled *Creating Better Cities with Children and Youth*, was the launching pad for many of the ideas for the training modules in the YNMI. However, YNMI wanted to update that approach with newly available geo-spatial technologies. Many of the activities, such as framing geo-referenced photos of neighborhood scenes and recording GPS routes, relied on youth moving throughout their communities and looked similar to methods used by researchers in children's geographies (mentioned above). These dynamic (and often fleeting) experiences of walking through one's neighborhood, nodding at or chatting with passers-by, smelling rotting garbage, and hearing dogs barking, were then translated to more static representations of photographs and GPS tracks, until finally ending-up on a flickr site and blogs. As a culminating activity, youth shared their GIS maps with the public at an open house. Their online maps allowed viewers to enable different layers (i.e., photos, historical markers, important place names, hyperlinks) and zoom in and out of geographic reference frames.

The YNMI is an example of designing instruction based on the interplay between informal experience of place and formal spatial representations of daily life. Part of the instruction asked students to move across multiple scales of experience and representation, from the most local – the body – to particular places like the mural on the side of the minimart, to the neighborhood. Each method of recording these dynamic experiences highlighted a particular scale. For example, framing photographs highlights the scale of the body or what can be immediately seen, while building maps in ArcReader, the GIS format they used, highlights the neighborhood scale. Finally, participants were instructed on what makes an effective representation of all of these multi-scale, multi-sensory experiences. In this study, third space practices that were relevant for a particular telos of community change – the second space of professional categories – were highlighted in the students' maps.

The YNMI study in particular helped me to think about youth generating, collecting, and analyzing their own data as a way of seeing their home neighborhoods differently, and to better

articulate learning objectives related to spatial literacies. I wanted youth to think about and use important spatial concepts like scale, accessibility, and connectivity[1] within the familiar context of their neighborhood. But more importantly, I hoped they would learn and use these concepts within the activity of imagining and advocating for a different urban arrangement that was more conducive to their lives as teenagers – for counter-mapping. Translating their desires for the future into the parlance of geography and planning might, I thought, bring them closer to realizing spatial justice for their home neighborhoods.

Seeking Spatial Justice? Says Who?

I was also guided by Soja's (2010) concept of "spatial justice" as a way to intervene in the spatial relationship youth had with their neighborhoods, so that they might imagine new, more equitable possibilities for that geography. Similar to Lefebvre's (1996) idea of the "right to the city," I understood spatial justice to be concerned with empowering those who were most negatively impacted by the urban infrastructure (e.g., inner city residents living in a mobility desert) to take a stance in reconfiguring the city. Harvey (2008) made a similar argument for spatial justice as a living human right:

> The right to the city is far more than the individual liberty to access urban resources: it is a right to change ourselves by changing the city. It is, moreover, a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization. The freedom to make and remake our cities and ourselves is, I want to argue, one of the most precious yet most neglected of our human rights (p. 23).

[1] I agree with Hall, Wright, & Wieckert (2007) that "concepts have meaning primarily as they are enacted in social practice" (p. 106), and I assumed that these spatial concepts would emerge in ways that were particular to the designed activities and the ways in which the study participants interacted with each other, their neighborhood, and the learning objectives. However, it was very helpful for me to begin with "working definitions" of these concepts when designing instructional activities for counter-mapping. For example, I thought about scale as an area we were discussing in relation to bigger or smaller areas, moving from the body, the household, the neighborhood, the city, the region, and son on. Accessibility was the opportunity for interacting with a location in relation to one's starting location, or other locations. I started with a meaning for connectivity that meant the directness of routes or pathways linking pairs of locations, and as a way of thinking about the strength or weakness of internal connections within an existing transportation network, like the one in Woodbridge.

Because many urban youth live in neighborhoods that provide little support for their mobility, I took seriously the notion that youth engagement might become essential in processes of city planning, and their contributions to emerging practices of counter-mapping could benefit their futures as well as those of their neighbors in ongoing cycles of urban development.

I have described a social design experiment for spatial justice, but I want to make clear there is no privileged position from which to identify what constitutes a more just arrangement of the urban environment for youth and their families in Woodbridge. Adult residents of the neighborhood, city planners, and local activists (e.g., Cecil and Workshop volunteers) all pursued interests that were personal and driven by deeply-held values about what was possible in the City. I also held values about youth-directed mobility and the possibilities of counter-mapping, and these shaped my design efforts. While I learned from our ethnographic study of planning, and co-designed with the Workshop leader, Cecil, the design was set before interacting closely with youth who volunteered for the study. Therefore, new interests, desires, and outcomes emerged because of their particular personalities, goals, and interactions with each other and myself.

Still, my experiences in the ethnography of planning and my ongoing relations of participation with study participants, their parents, and staff at the community center led me to feel confident that I was working on a problem that had considerable relevance for youth and the surrounding community. While there was still much for me to learn about youth mobility and spatial literacy, I started the study from a position of “strong objectivity” (Harding, 1993, pp. 5556), working with residents in the community on problems that were important for them. Taking the challenges of youth mobility in the Woodbridge neighborhood as my starting point, I worked with youth to find problems that were relevant for them, and Cecil and I sought to provide opportunities for them to learn about new forms of spatial literacy and getting around the city independently. As the study progressed, youth were consistently eager to come to our bi-weekly sessions, were highly engaged, and were disappointed to see the study come to a close.

Concluding from the literature and from my own observations of civic processes in Metro, I began this social design experiment for spatial justice from three basic understandings. First, teenagers are typically not included in processes that drive community change. This was true in

Metro and is a problem other researchers have been addressing nationwide. Second, the time geographies of youth are distinct from those of adults, and therefore, could contribute a new, valuable perspective to urban development processes. Children's geographies have told us as much as have my experiences working with youth in Metro. Finally, the literature has shown that youth are capable, interested, and adept at learning and employing the technical processes used by professional planners and mapmakers. These understandings informed my collaboration with Cecil and his Workshop and guided my design that re-mediated the physical mobility of youth, with bicycles and geospatial technology, to teach spatial literacies and practices essential for counter-mapping.

CHAPTER III

METHOD:

PLACES, PEOPLE, DATA COLLECTION, AND ANALYSIS

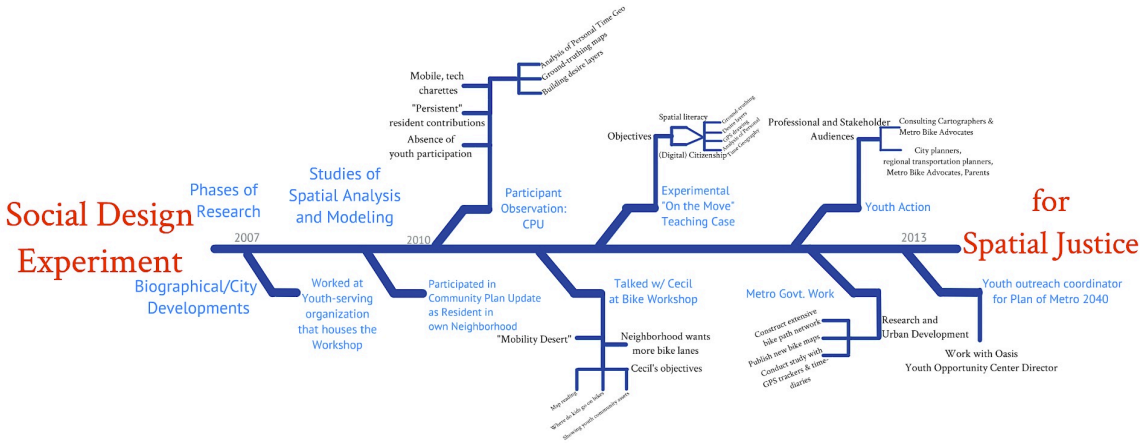

Figure 3-1. This image shows the various biographical, urban, and research phases and developments involved in this social design experiment for spatial justice.

This social design experiment for spatial justice has been six years in the making (developments and phases shown in *Figure 3-1*). I do not intend to take the readers of this study across this entire history. However, to expose the situated and historical nature of this work, it is important to note that my own biography and interests, changes at the city scale, and the phases of this research project have been mutually influential and working in tandem to create an emerging understanding of counter-mapping. As mentioned previously, my relationship with Cecil began from my own position at the local youth-serving organization where his Workshop is located. And our work with Metro urban planners began because I joined a CPU as a resident participant that was occurring in my own neighborhood. In both of these places, I conducted discourse and multi-modal analyses of interactions from video data under the supervision of Kevin Leander. These small-scale studies launched relationships with both of these entities around our larger focus on spatial analysis and modeling.

In the sections that follow, I offer a “thick description” (Geertz, 1973) of the significant places, people, and ongoing professional work for this design experiment. As a researcher who

highly values ethnography and the relationships with people and the community, I want to insure that those who have made this study possible receive adequate introduction. Following this description, I will then discuss my data collection and analysis around the research questions and concerns that were outlined in the opening sections of this dissertation.

Woodbridge, Phase I

Historically, Woodbridge has seen several changes from urban renewal processes, such as interstate and concentrated public housing construction (Kreyling, et al., 2005). Once a vibrant cultural and arts center and the nexus of the African-American Civil Rights Movement, the area is now plagued with high unemployment, low income, an aging population, and many vacant lots (Community Plan, 2008). The changes that Woodbridge has seen over the course of a century cannot be overstated. A place of multiple historic Black colleges and universities, Woodbridge has been the academic home to students like W.E.B. Du Bois, Nikki Giovanni, Diane Nash, and Marion Barry.

But what Woodbridge had in colleges, it matched in music clubs and venues. On Jackson Street, Woodbridge had a string of nightclubs that comprised the "Chitlin' Circuit." Jimi Hendrix played here, and Etta James recorded a live album in The New Era Club titled *Etta James Rocks the House*. Ray Charles, B.B. King, and Otis Redding were other Black performers who were known to play on Jackson Street periodically (musiccitymusiccouncil.com/historylive-music).

Today, notoriety seems to come in other forms for Woodbridge. On the local news and in other media outlets, Woodbridge is consistently cast as a dangerous area in Metro. Homicides and other violent crimes are the headlines that come out of Woodbridge today. Residents and planners often mentioned the tendency of the media to dramatize crime in Woodbridge while downplaying similar activity in other areas of Metro that had more White residents. In 2010, Woodbridge was ninety-three percent African-American while the whole of Metro was twenty-seven percent African-American. This image of Woodbridge as a predominantly African-American and dangerous area of the city in a place still fraught with issues of racism and racial

segregation precipitated an almost ten percent decrease in residential population over twenty years. This ten percent decrease was occurring in a city that was experiencing an almost ten percent *increase* in population over those same twenty year period (1990-2010, U.S. Census).

These current community plights in Woodbridge are largely socio-spatial issues. Jackson Street is now bisected by an interstate, so residents are isolated by an interrupted and barricaded street grid, and housing developments have been built in place of old homes. Following "desegregation" (this term is in quotes because desegregation is not the reality for many African-Americans who still attend segregated schools, churches, and businesses), many affluent Black families left Woodbridge for pricier suburbs, leaving an aging, lower socioeconomic population behind. In addition, Woodbridge has a large number of historically important churches that own several lots of land throughout the community. These lots are typically vacant (Woodbridge has a 12.4% vacancy rate) and unkempt, and have created a bombed-out, sparse feel to the area that should be dense considering its location immediately next to Metro's downtown business district.

The Logic of the Woodbridge CPU

Woodbridge residents mentioned all of these problems (e.g., the perception of danger, the problems of continued segregation) during the CPU, and planners were largely in agreement. While these issues were real for residents, they were sometimes difficult to fit into the process of the CPU, however, which followed a particular professional "logic" of urban development – the Transect. Duany (the American architect and urban planner who created the Transect model) and Talen (2002) wrote, "Based on ecological theory, the transect is a regulatory code that promotes an urban pattern that is sustainable, coherent in design, and composed of an array of livable, human environments satisfying a range of human needs" (p. 245). They went on to describe the "logic" of the transect as creating "an experience of immersion in any one type of environment by specifying and arranging the elements that comprise that environment in a way that is expected given the nature of the place" (p. 246). In other words, if an area is largely urban, one would expect to see buildings close together, no undeveloped land, and a mixture of businesses and residences.

The transect scheme that Metro Planners used was adopted in 2008 and followed a continuum from Natural (T1) to Rural (T2) to Suburban (T3) to Urban (T4) to Center (T5) to Downtown (T6) to District (D). All of the areas in Woodbridge were classified as either T3, T4, T5 or District. Each transect classification also had three to six corresponding "community character policies" that "provide guidance on how to plan, design, and create the appropriate rural, suburban, and urban form for each of four Community Elements – Open Space, Neighborhoods, Centers, and Corridors" (Community Character Manual, 2008; p. 2). Therefore, the recommendations for how a T3 suburban neighborhood and a T4 urban neighborhood should develop over time would be distinct (see *Figure 3-2* for a Transect to character policy flowchart).

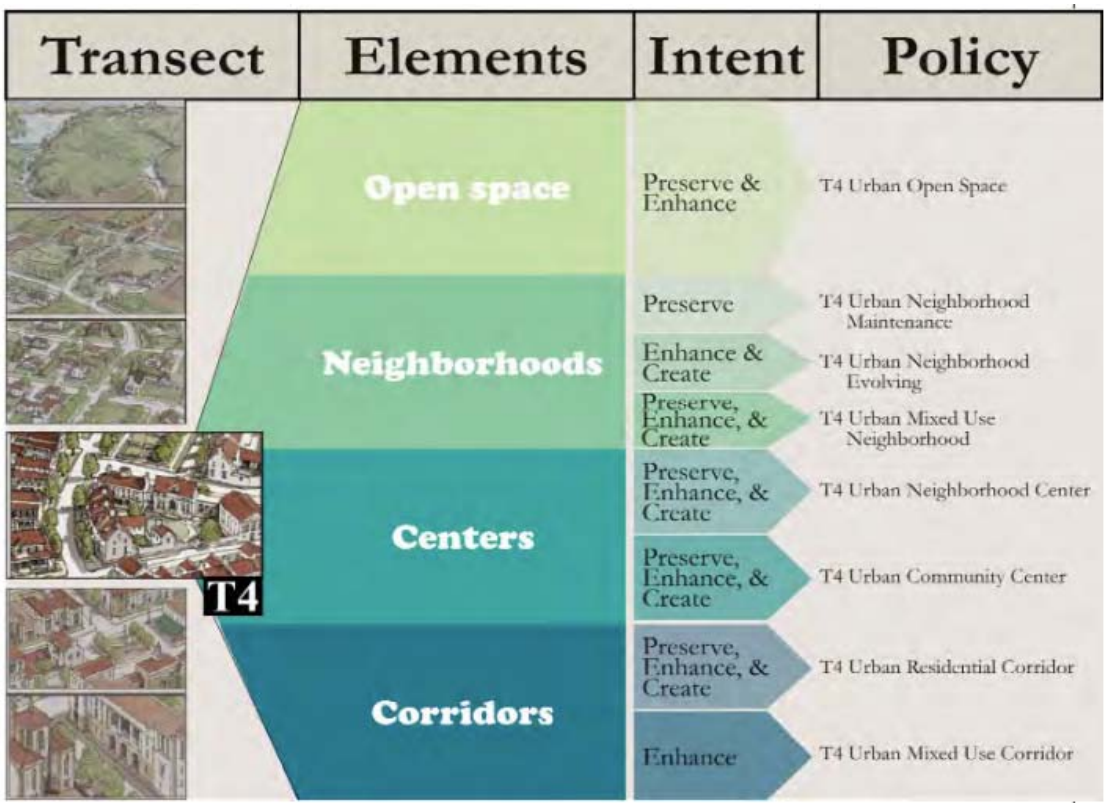

Figure 3-2. A flowchart showing a T4 (Urban) classification with the corresponding community elements and community character policies.

The Transect figured prominently in how planners received and used residents' comments during the Woodbridge CPU. The importance of the Transect to planners was a mediating factor in some of the interactions that will be described in the forthcoming Findings chapters for this dissertation. For the planners, meetings with residents and local stakeholders

during the CPU were occasions to apply and refine the community character policies to the study area – in this case Woodbridge. But for residents, participating in the CPU was an act of citizenship and representing a neighborhood and community faithfully for important ideals regarding home, family, and social life. Therefore, the technical complexity of "community character policies" and the Transect was often, to residents, an invisible driver of planners' questions, reactions, and comments, and representations.

While planners facilitate a CPU every seven to ten years in the fourteen different communities of Metro, this was the first time in Woodbridge that the Transect had been used as the organizing "tool" (how Metro Planners talked about the Transect) for the process. For this most recent iteration in Woodbridge, CPU meetings began in January and lasted until September of the same year. The public workshops and meetings had residents, business owners, and other stakeholders seated around a table-sized map that represented either the community at large, or smaller neighborhood clusters. The Metro Planning Department wrote the following in their planning manual regarding how participants were recruited for the CPU:

> To engage a broad audience, Planning Department staff undertakes several notification actions that are common for every planning community in [Metro]. Staff sends a postcard to every property owner in the study area (in the case of this community, this was a 4,824-piece mailing). Staff also contacts any known neighborhood associations, neighborhood watch groups and chambers of commerce or merchants' associations in the study area.

The CPU began with a "Visioning Workshop" that was open to everyone living, owning property, or working in Woodbridge. Weeks after this large Visioning Workshop, planners facilitated smaller, neighborhood meetings in local churches and community centers. Once all of the data from the five neighborhood meetings were compiled and mapped, there was a "Community Character Policy Workshop" and then an "Implementation Meeting." Finally, two more meetings were held for residents to review the draft plan document, especially the changes that had been made since the last CPU in Woodbridge. The actual Woodbridge Plan was not certified until June of the following year — eighteen months after the first Visioning Workshop.

The nature of each meeting was slightly different because the objectives evolved over time. However, each meeting looked similar – groups of people assembled around a table with a giant map over its surface. Residents pointed-out aspects on the map that concerned them and often told stories around these concerns. Planner/facilitators encouraged participants to draw or write on the map with a permanent marker to make desires for their community visible for the duration of the meeting. However, planners almost exclusively made notes on the map or in the margins.

As the meetings progressed over time, the table-sized maps became increasingly abstract. For example, in the Visioning Workshop and neighborhood meetings, the maps were satellite images with a street grid overlay so that residents could easily locate their homes and important community assets that would be important for discussion. These maps invited intense conversations about housing and neighborhood "character" (more on this is Chapters 4 and 5). However, in later meetings, the maps were quantitative, thematic maps with parcels colorized to reflect Transect and community character policies of particular areas. These maps retained a street grid overlay with street names labeled. Although I have not done an exhaustive overview of how interactions changed in relation to a changing map, it is safe to say that the more technical the map became, the less inviting it was for resident use. However, the more persistent residents were through this process, the more comfortable they were interacting with and responding to the more abstracted versions of the map (more on this in Chapter 6).

Important Residents and Planners

Residents. There were three CPU participants that were central for my own emerging understanding of counter-mapping, or how residents were making claims to resources for the future of their neighborhoods and community. Ms. Sanders, Ms. Kay, and Mr. Gray were vocal Woodbridge residents whose contributions made us carefully consider the nature of counter-mapping contributions and how urban planners responded. All of these participants were older than fifty and were longtime residents of Woodbridge. Therefore, they had extensive knowledge of the history of the geography — how the area had changed over time, the important actors

driving these changes, and how these changes had affected their own lives at the daily scale.

Each resident had her or his own values and ideals reflected in their future visions of Woodbridge, and brought these to each meeting. For example, from interview data and her persistent participation in meetings, we knew that Ms. Sanders valued a healthy Woodbridge – a place where residents could easily access fresh food at a full service grocery store. Her advocacy work around getting a grocery store in the area revolved around the impossibility of getting skinless, boneless chicken breasts at existing Woodbridge grocers (which were more like convenient stores and mini-marts). Ms. Sanders was persistently annoyed with the cuts of meat that were available to her in area stores and so drove miles across town to grocery shop in other areas.

Ms. Sanders co-lead a neighborhood association with another persistent resident I am calling Ms. Kay. Although they were good friends, Ms. Kay and Ms. Sanders had very different values for the future of Woodbridge. Both were interested in a healthier Woodbridge, but Ms. Kay's community advocacy work revolved around housing issues and reinstating a residential "feel" from the past. Ms. Kay wanted to bring back single-family homes to the area as opposed to increasing residential density with apartment buildings and duplexes. Her description of this ideal fit a suburban model of housing development that was incongruent with Woodbridge's location directly next to downtown Metro. Regardless, Ms. Kay persistently advanced her vision for the future of the community, and had learned (as I will show) successful ways of taking place in the CPU.

Mr. Gray was another (exceptionally) vocal resident in one neighborhood meeting we filmed. We did not get an interview with Mr. Gray, but from his contributions during the CPU, it was easily apparent that he had lived in Woodbridge his entire life (he said so during the meeting). Mr. Gray told rich stories over the map, many about being a young person in the area, and the changes that had occurred over that time. The changes he discussed were often directly related to the interstate coming through Woodbridge and associated mobility issues. We did not see Mr. Gray at multiple meetings, but it may be safe to assume that he had participated in meetings like this before from his comfort with the planner's questions and the map.

All of their contributions, imbued with particular values and ideal visions for the future, related to important issues presently facing the Woodbridge community. The importance of mobility as it pertained to health, accessibility, and equity was a resonant concern for all three of these residents, and was typical of what many locals talked about. These residents advanced my own thinking about working with Woodbridge youth. Their concerns mirrored that of Cecil and his notion of teenagers living in a mobility desert. At this point in the study, I did not yet know what youth participants would value in thinking about potential change for their neighborhoods, but I was convinced that, after building and riding their own bicycles in the Workshop, they would value a supportive urban infrastructure for independent mobility much like their adult counterparts.

Planners. Hall and I came to know many Metro planners over Phase I of this study. As a group, and as individuals, they were energetic and seemed to genuinely enjoy the work they were doing with Metro residents. Collectively, they valued "sustainable development" and anticipated an increasingly dense Metro as the population continued to grow. Typically, they looked forward to meeting with "the public" and considered themselves "the first line" of communication between residents and the city government. This reasoning was how they accounted for locals' tendencies to complain about sewer problems, trash, rabid unleashed dogs, etc. at participatory planning meetings. Metro planners expected this and were prepared to pass along this kind of information to the Metro Works Department.

The two planners that figure prominently in this dissertation both personified this enthusiasm for their work. The first, Sam, granted me a one-on-one interview and told me her story of working in planning. Sam was a White woman in her late twenties that lived in my neighborhood across the river from Woodbridge. I describe her home location to say that she was not as familiar with the on-the-ground characteristics of Woodbridge as the other planner in this study who attended a Woodbridge university. When I asked her what she knew about Woodbridge before the CPU began, she responded, "Not much." Sam talked about driving down Jackson Street before, and going to the business district to get her driver's license renewed. Other than that, she said, "I didn't know too much other than that it was an older, African-American neighborhood, and had a good, as far as urban design goes, block structure… it was

run down, but it had good bones."

Sam had a degree in landscape architecture and wanted to work at a firm in Metro. However, when the economy tanked because of the residential housing crisis, and everything seemed "so tenuous," Sam accepted a job at Metro Planning following a summer internship there. Sam described her only training for eliciting contributions from residents as occurring in her landscape architecture program where she had to "explain what you've designed" to an audience. The bulk of her experience at planning was researching the "form-based code" or Transect classifications for other neighborhoods throughout Metro.

Stephanie is the second planner that appears in this dissertation study. Roughly the same age as Sam, Stephanie was an African-American woman who had attended a state university located in Woodbridge for her undergraduate degree. She was still strongly affiliated with the university, attending homecomings and alumni events. Stephanie knew a lot about living in Woodbridge as she had spent considerable time there as an university student and was especially fond of the hot fish and chicken restaurants in the area. She no longer lived in Woodbridge but lived in a community in southern Metro. Stephanie was the lead planner for the Woodbridge CPU.

In terms of her training, Stephanie had a professional degree in urban planning which included experiences working with residents. In comparison to the other planners, Stephanie was a slight anomaly as she was the only person with extensive biographical experience in Woodbridge. Therefore, she consistently brought her professional expertise to bear on her endemic knowledge of Woodbridge and vice versa. This kind of professional/personal hybridity sometimes made her values hard to identify, especially since she was much more of a listener in participatory planning meetings than she was an explainer. She was most interested in seeing more student housing in the area and to see Jackson Street revitalized to its former state so that university patrons and residents would have shops and restaurants within walking distance.

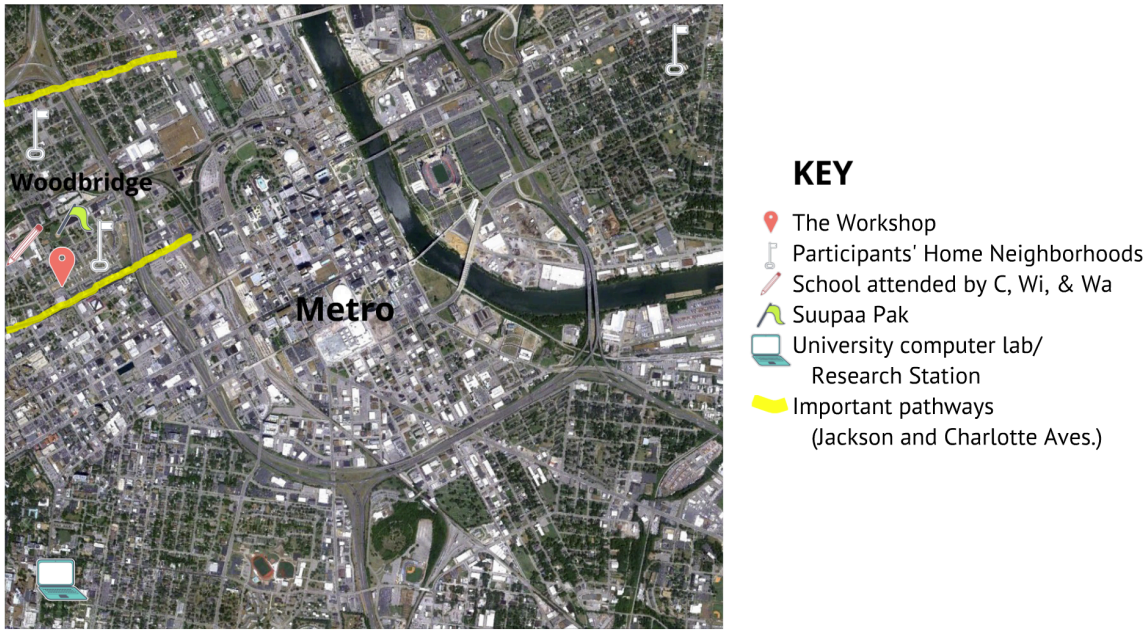

Figure 3-3. This image represents the most important locations and pathways for this research.

Woodbridge, Phases II & III

The Workshop

The Workshop is a basement, housed in a youth-serving organization in the "Suupaa Pak" (named by the youth participants) neighborhood of Woodbridge. In this basement, hundreds of neighborhood youth from throughout Metro have built bicycles "at the elbow" (Hall & Greeno, 2008) of volunteer mechanics from donated bicycle parts. The Workshop was the brainchild of Cecil, a thirty-year old artist and handyman with years of experience working with teenagers in various capacities. His vision was to get teenagers "on the move" in Metro so that they could become "transportation independent" — getting around without the help of an adult — and access cultural and educational resources.

This over-arching aim lead to Cecil's realization that once youth had bicycles, they did not necessarily know where to go, how to get anywhere, and did not feel safe and confident getting around on bicycles through Metro streets. This realization precipitated Cecil in wanting to incorporate a spatial literacy component to the program. Cecil was specifically interested in having youth read maps to discover Metro's assets, and discern and plan routes that were

suitable for bicyclists in a city built for car traffic.

The absence of young people in planning the future of their neighborhoods led me to partner with Cecil. Cecil saw the city as a "mobility desert" for non-driving adolescents living in an urban environment built for drivers and their cars. His Workshop had been operating for three years in an effort to improve accessibility for youth, by teaching them how to build, maintain, and ride bicycles to places of interest in the city. Cecil worked with us because he hoped to learn new and better ways to teach Workshop patrons how to read maps and choose appropriate routes for bicycles before leaving home. He also wanted to know whether his patrons were actually riding their bicycles once they took them home.

The Workshop was located in the Suupaa Pak (SP) neighborhood in the Woodbridge community. Charlotte Avenue, an important corridor for residents in the CPU, also figured prominently for Cecil and the youth since the Workshop was located there. Immediately across the street from the Workshop was a HOPE VI housing community. Children, youth, and parents from these homes frequented the Workshop space for informal bike fixes, bike locks, pumping-up flat tires, and lessons on patching tires, etc. Over his three years in this space, Cecil had developed a strong rapport with many local families, Woodbridge institutions, and Metro affiliates working in the area.

Youth Participants

Six teenagers volunteered to participate in this study. In ascending age order (12 to 15 years) they were Beth, Wallace, Fred, William, Leah, and Carissa. All were African-American youth attending Metro public schools. Beth, Leah, and Carissa lived in the HOPE VI community (a mixed-income housing development) across the street from the Workshop in the SP neighborhood. Of the boys, Fred lived two miles north of the Workshop, while William and Wallace lived six miles east and attended school two blocks from the Workshop. All six participants were already familiar with the SP neighborhood, though less so with the wider city environment in range for the bicycles they would build. Also, participants were acquainted with one another in various ways before our study began. William and Wallace were brothers, Fred

and Leah attended the same high school, and the respective parents of Carissa and Leah were so close to William and Wallace's mother that the teens referred to one another as "cousins." Spatial and social familiarity was an important design resource for interactions in and engagement with the spatial thinking and activity I invited, recorded, and analyzed in this group of teens. The activities intentionally used and leveraged their familiarity with the SP neighborhood and with each other.

Next, in the sections that immediately follow, I will describe each of the participants individually. I will describe where they live, their family and school situations, and how they depicted their neighborhoods on the first and last days of the study in a "free recall map" task. In looking at their maps, I asked how the maps changed after participating in the study: Did the perspective change? Did the scale change? Did the mapped attributes change? What other qualities changed? Answering these questions about their free recall maps, I think, gives insight into how they began to see and think about their home neighborhoods differently as a result of participating in the various activities in this study.

I will also try to re-create their personalities and positions within the group with some short, illustrative stories of my interactions with each of them, and interactions they had with each other (that I was able to observe). To give you a sense of the shape of their days and lives outside the hours of the group activities, I will also pull from some of their "time-diary" entries where they kept a log of activities both before and after getting a bicycle.

Carissa. Carissa was the oldest participant at fifteen years old, and already knew four other people in the study. She was very close friends to Leah from living in the same neighborhood, and considered William and Wallace "cousins," even though they were not related by blood. Carissa also knew Beth and her family, but was more of a mentor to Beth because of their age difference (three years). Carissa exerted her status as group "elder" by giving orders and consistently correcting the others of their ill-behaviors (from her perspective). She did so playfully, and the others were often happy to have her attention.

Carissa was a resident of the SP Neighborhood in which the Workshop was located. Her house was part of a HOPE VI development — a mixed-income housing plan created by the

United States Department of Housing and Urban Development. She lived there with her father who was well-connected to the other residents.

Carissa attended school at the math and science magnet school in the neighborhood. The school was located approximately a block away from her apartment. She walked to school, and would often walk to other places in the neighborhood, such as friends' houses located within the HOPE VI community. She was not yet familiar with the places she could reach on a bicycle.

On the first and last day of the study, all of the participants were asked to "draw their neighborhood" with crayons and paper. Carissa drew her unit at the far corner of a cluster of adjacent homes. In her depiction, all of the homes, including her own, faced an oblong-shaped island that was encircled by roads. In the post-study version of her free recall map, the island of green was surrounded by parking lots for cars, rather than a two-lane road. This "paved" area became much larger in her post-version drawing. She also marked her house with an address label and demarcated a spot on the green island with a star. In the second iteration, the handicapped parking spot symbol disappeared.

Like many teenage girls, Carissa was concerned about her health, especially as it related to her weight. Her concerns were instigated by her father who insisted that she had gained a significant amount of weight over the past school year. This concern was a motivating factor in Carissa's decision to join the bicycle workshop. She wanted to use her build-it-yourself bike for exercise. Carissa talked about riding her bicycle to city parks, and along the greenways. However, toward the end of the study, this discursive thread of exercise and fitness began to dwindle for Carissa, but was still strong for her father. On the last day of bike-building in the workshop, Carissa's father asked me if I would continue organizing group bike rides for the kids so Carissa would have continued motivation to keep exercising.

A couple of times during the study, Carissa talked about wanting to go somewhere on her bicycle, but being stymied by adults who did not follow through on an obligation. We got together for a study-day five days after the youth had finished building their bicycles and had taken them home. I asked the youth if they had traveled anywhere on their bikes over the past five days. Carissa reported to have had plans to ride to Leah's house to see the new baby (Leah's mom had

a baby during the study). However, Leah's mom was supposed to call to give Carissa the green light to come over, but she never called. Stories like these, of adults not following through on promises or restricting the teens' mobility because of worry, were common among all of the teens.

An upcoming trip to Costa Rica was another important event happening in Carissa's life during our time together. As part of the study, there was a lot of discussion and data collection around what the teens did at home and outside of "formal" activities. For Carissa, a lot of this time was populated with preparations for her trip to Costa Rica. She had to be driven by her father to doctors' offices and pharmacies for shots and prescriptions. She talked about shopping trips and packing to do. When we were in the university's computer lab, Carissa would take time to "fly" to parts of Costa Rica in Google Maps™ satellite view.

Figure 3-4. Carissa drew a picture of her neighborhood on the first and last days of the study.

Leah. Leah was a tall fourteen year-old with glasses. She adored Carissa, chided Beth, and also referred to William and Wallace as "cousins." Having a penchant for misspoken one-liners, Leah kept those around her laughing. In a personally favorite exchange, Fred was showing the girls his biceps to demonstrate his manly strength. Leah responded, "Man you're not strong. You need to go drink you an insurance." Everyone giggled, but only Carissa caught the mistake and corrected her with, "It's En*sure*." Un-phased, Fred continued displaying his muscles and Leah shook her head at him in disgust.

Leah also lived in the HOPE VI housing community in the SP neighborhood. She lived on the same street as Beth. Leah lived there with her mother and stepfather. By the end of the study, Leah had a new baby sister living in her apartment, as well, and often complained about the baby's crying. Leah's mom was enthusiastic about her daughter participating in the program, maybe because she was incredibly pregnant and tired (having said as much every time we spoke) and wanted her daughter out of the house. Leah's mom was also very good friends with Carissa's dad and Beth's mom, and all three parents kept track of the location of all three children, and had each other's cell phone numbers at the ready.

Leah attended a public high school seven miles away from her home in North Nashville. As a freshman without a car, she spoke of riding the school bus across town and all of the annoying occurrences on those early morning rides. She was not interested in riding the bike she was making in this program to school, though. Leah knew that, not necessarily the distance, but the pathway to school would not be compatible or safe for her to ride a bicycle to her school's location. She was interested in increasing her range of independent mobility around the community by getting a bicycle, though. Her mother supported her in this, too; she often spoke of the intense time demands involved in driving a teenager around, but did worry about the lack of bike lanes in the area.

In discussions of where Leah was going and what she was doing in the hours outside of school and the study, she talked about (and showed GPS track data for) spending a lot of time at her grandmother's house on the weekends located on the opposite side of town. She was also participating in a coming-of-age presentation/dance that required her to be driven around town in her mother's car to go dress and shoe shopping, and do hair preparations. All of these activities meant that Leah did very little bike riding around the SP Neighborhood once she had completed rebuilding her bicycle.

One such preparatory trip occurred on the very first day of our study, and therefore, Leah did not get to draw her neighborhood with everyone else. Therefore, I only have her colorful neighborhood depiction on the last day of the study. In this image, she marked her home with a star, and paid close attention to the variety of colors present on the houses and corresponding

mailboxes in the HOPE VI community. She was also very attentive to the size difference in the houses that exist in the development. The house in which Leah lived was much smaller than some of the houses directly across the street from her.

Figure 3-5. Leah drew a picture of her neighborhood on the last day of the study.

Beth. Beth was the youngest (at twelve years old), and the quietest of the group. I know more about Beth from watching video data post hoc than from personal interactions with her. In group discussions, she typically remained silent unless directly called on, and always deferred to the louder, older kids. The video shows that she genuinely enjoyed traipsing through the neighborhood with the older girls, however, and became dramatically more expressive in these "on the move" moments. Already familiar with Carissa and Leah, she stuck close to them throughout the study, and they sweetly included her, but not without the occasional, lighthearted teasing.

As mentioned previously, Beth lived on the same street as Leah. She lived with her mother and father in the HOPE VI development in the SP neighborhood. She also had a new baby sibling living with her and her parents in the house. I interacted with Beth's mom frequently, as she had asked me to escort Beth home after study sessions in the Workshop. I would chat with Beth's mom at the front door on such short trips; they lived a mere two blocks from the door

of the Workshop.

Beth attended a public school in Woodbridge and took the school bus to get there and back. Sometimes her mother would take her to school if Beth was running late in the mornings and did not get to the bus stop on time. Beth's mother was not prepared to let Beth ride her bicycle to and from school (she was still very young), but was looking forward to letting her ride around the immediate neighborhood as a means of self-entertainment.

On the first day of the study, when asked to draw her neighborhood, Beth took a *profile* view of here home. She drew the front of her house, sandwiched between two others, a sliver of blue sky peering through the adjacent exterior walls. Her street ran across the bottom of the drawing.

On the last day of the study, when asked to draw her neighborhood for a second time, Beth's perspective shifted from profile view to *plan view* as if she were looking straight down on her neighborhood. This view included several more city blocks. The second map highlighted attributes pertaining to mobility like speed bumps and a stop sign. Beth mapped neither of these attributes on the first day of the study. This shift in perspective, from profile view to plan view, was most probably due to our frequent use of Google Maps™ over the four weeks of the study and her increased range of mobility within the neighborhood, both through the designed activities and through building and taking home a functioning bicycle.

Beth's original objective for participating in the Workshop was to fix the broken bicycle she already owned. However, once she realized she could build a completely different bicycle, she quickly lost interest in the one she already had. On the very first day of the study, Beth, escorted by her mother, rolled her pink, dysfunctional bicycle into the workshop. She claimed to have ridden that bicycle a lot, but only up and down Capital Point, the street on which she lived. After starting work on a different bicycle, that pink bike remained propped against a workshop wall for the duration of the study. On the day of the "Safety Ride" (the first time the kids got to ride their rebuilt bicycles), Beth's account of riding her bicycle up and down Capital Point only may have been confirmed since she was extremely shaky on her new ride, especially going up and down hills.

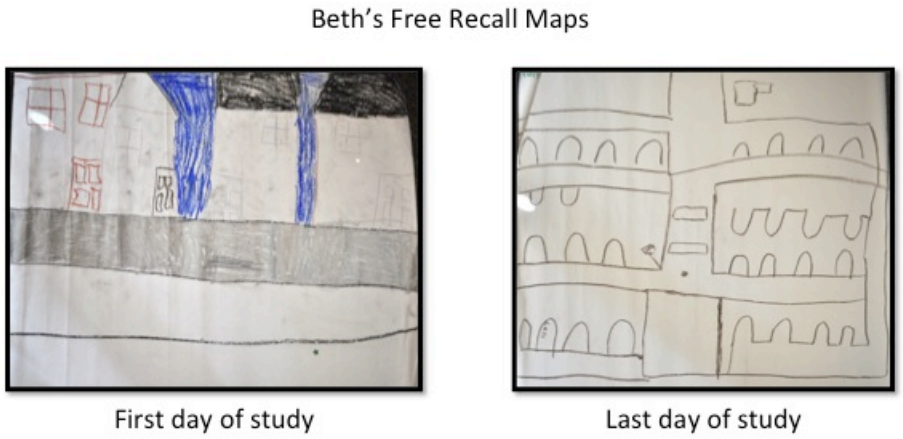

Figure 3-6. Beth drew a picture of her neighborhood on the first and last days of the study.

Fred. Fred was fourteen years old and had no pre-existing relationships with any of the other kids in the group. However, Leah and Fred recognized each other from attending the same public high school. If the fact that he was unfamiliar to the group bothered him, he did not show it in interaction with the others. He flirted with and teased Carissa (who dished it back), made fun of William and Wallace, and generally kept-up a running commentary in relation to the activities or the people with whom he was working.

Fred was a resident of Woodbridge, but lived roughly twenty city blocks north of the Workshop. He lived in a two-bedroom, one-bathroom house with his grandmother whom I never physically met but talked to frequently over the phone. Fred's grandmother had a car but did not like to drive. She wanted, almost desperately at times, for Fred to keep-up his participation in the program but was unable to drive him to the Workshop. Therefore, Cecil and I alternated driving to his home and picking him up, then dropping him off after the day's events were over. Fred greatly preferred being picked-up by me rather than Cecil because I drove a mean-looking black Grand Prix (complete with tinted windows and a spoiler), while Cecil always drove the Oasis Van that had brightly colored children painted on the side. He found riding in the van to be painfully embarrassing.

On these car rides, I got to know the sweeter, less too-cool-for-school Fred. We talked about his grandmother and her discomfort with driving, how he thought his school was too big,

and his trips out-of-state to visit his mother. I was also party to many a cell phone conversation between him and his girlfriend whom he called, "Sweet Pea." I would like to note that his relationship with Sweet Pea did little to dampen his flirtatious advances toward Carissa during their time together in the study.

As mentioned previously, Fred attended the same very large public high school as Leah that was located eight miles across town. Fred took the school bus to and from school, but not the same one as Leah. Although Leah and Fred were technically zoned to attend a smaller, ninety percent African-American high school in Woodbridge, new school zones and "parent choice/opt-out" programs in the public school system allowed them to go to this other, much more ethnically and racially diverse high school in a wealthier part of town far from Woodbridge.

Fred's free recall maps did not change too much over the course of the study. In retrospect, this minimal change in how he decided to illustrate his neighborhood is not at all surprising. Fred did not get out into his neighborhood much at all, and building a bicycle did little to change this. Over the course of the study, Fred took two bicycle trips: the Safety Ride with the entire group, and riding his bicycle from the Workshop all the way to his house immediately after the Safety Ride. Even though Cecil and I offered to give Fred and his bicycle a ride home, he chose to ride all the way on his own. Other than these two trips, Fred reported (and I believe him) not to have gone anywhere else on his (pink and silver) bike.

In this way, it is not surprising that Fred depicted his "neighborhood" as first, one house, and then two houses bordering a major road. Unlike the others, Fred did not feel connected to those living around him, and instead felt isolated. Having gone to Fred's neighborhood several times, I can report that it is a densely residential area, but does have a very busy highway bordering the west side of the area. There was also a train track that went by Fred's house that he mentioned to me as a landmark when driving to his home for the first time. However, he did not choose to depict that in an illustration of his neighborhood.

Fred was attending the activities at the bicycle workshop for something to do. He frequently commented that if he were not hanging-out with us at the Workshop, or walking around the SP Neighborhood, he would be sleeping or playing video games at home. Sometimes, he

would begrudgingly participate, saying that he would rather be sleeping or playing video games. However, when Fred was talking just to me, either in the car or in moments beyond earshot of the other teens, he would thank me for "letting" him participate because otherwise he would be bored. In the final interview, on the last day of the study, Fred described the workshop and the study as a way of staying out of trouble.

As a study participant, however, Fred was not a dream scenario. He did not complete any of the "at-home" GPS recordings or time-diary entries. He was insistent that I was most likely with the police since tracking people's movements via GPS data logger was associated with being on parole. But that was only one of several excuses for not doing these parts of the study. I did not penalize him, but offered the others, who did make good on their participant responsibilities, extra incentives like Sonic gift cards.

Figure 3-7. Fred drew his neighborhood on the first and last days of the study.

William (and to some extent Wallace). William was Leah's age at fourteen years old. William's big personality belied his small, unassuming frame. He had glasses and dreadlocks and always wore clothes that looked four sizes too big.

While William knew all of the other kids well (with the exception of Fred), he had an exceptional relationship with Carissa. These two were highly competitive with one another and often participated in discussions and activities with the objective of winning over the other or proving the other person wrong. The competitiveness was never malicious but did highlight the

different intentions of individuals as they participated in the designed activities. In the final interviews, both Carissa and William (separately) suggested that, if I were going to do a similar study another time around, the activities should be more competitive.

William and his younger brother Wallace were not residents of SP, but lived in a neighborhood of Metro that was northeast of SP, just over the river from downtown. They lived in a house with their mother and a new dog. When Cecil was picking-up Fred in the van, I was usually picking-up William and Wallace at their house and taking them to the Workshop (they lived just across a major highway from me). Their mother worked a lot, and also had an old car that was far from dependable. As with Fred, these car trips for me were a source of great conversation and an opportunity to get to know these youth much better.

The first time I picked-up William and Wallace at their house to take them to the Workshop, William told me a story about a contest at the public library he was entering, the winner of which won an iPad. The contest was to create an image that showed how reading was important. William's plan was to get Wallace to take a picture of him sitting at a table at the downtown public library. He would be holding a book, and would arrange a couple of mirrors around him so that his image was repeated. William would put a caption on the photograph that Wallace captured: "Reading takes you to infinity and beyond." After he told me this idea, William wanted to get my thoughts on how to transport a bunch of mirrors to the library. We decided his uncle was the person for the job.

William and Wallace knew their own neighborhood very well because they spent a lot of time walking the dog and going to the community park that was three blocks south of their home. Sometimes their mother would also allow them to do shopping errands for her on foot, or let them walk to the library branch on their side of town. They very much enjoyed these trips and alluded to them frequently.

They were also very familiar with the SP Neighborhood for two major reasons. First, both of them attended school in the neighborhood; William went to the same magnet high school as Carissa, and Wallace to the magnet middle school a block away from the high school. Secondly, William's (and Wallace's) mother was very close to Carissa's father. Because their mother did

not get off work until after five o'clock, the boys would often stay at Carissa's house until she was able to leave work and pick them up in her car.

To get to school in the mornings, William and his brother would take the city bus. Wallace reported that William had studied the bus route map extensively in preparation for getting to school. To take the city bus, they each paid a dollar per trip (Metro Schools gives reduced fare to students on free and reduced lunch, but not every student), so if they transferred, it was two dollars each to get to school. Transferring buses was starting to get expensive, so many times, William and Wallace would walk from the downtown bus depot to their respective schools in Woodbridge. If they decided (and their mother allowed it) to take the bus home after school, they would usually walk to the Downtown Public Library first, read or do other activities there, and then get on the bus bound for the northeast side of town.

William was participating in the Workshop because he wanted desperately to increase his range of independent mobility around town. He was excited about the prospects of riding his bicycle to the library on his side of town, and to the bigger park that was further from his house than the small park he commonly frequented. He was interested in riding his bicycle to school but thought his mother would not let him go that far. After William built and took home his bicycle, he did ride around the neighborhood and to the library. He also said that having a bicycle made him "get outside more." However, because of his dreadlocks, he had a difficult time getting a helmet to stay on his head. His mother would net allow him to ride further than the library without a helmet, especially since wearing a helmet is required by law for people under sixteen years old. On our very last day together, at the Open House at the Workshop during Phase III, months after the kids had taken home their bikes, William and Wallace's mother told the audience that she was still trying to find helmets that would stay on her children's heads.

On the first day of the study, William drew his neighborhood to look very much like a map — with streets, street names, some houses, and the location of the park and the community center. This kind of model did not change too drastically on the final day of the study. William's depiction of his neighborhood retained its map-like qualities with streets labeled, the park and community center shown, and his house labeled. However, there is much more attention paid to

the baseball field in the park the second time around. This careful depiction of the baseball field could be due to the extensive amount of time both William and Wallace spent riding their bicycles around the baseball diamond, and the perimeter of the fence. William's attention to color and neat labeling for his second version of the map is most likely due to the leisurely pace that was set for them. For the first drawing, on the first day of the study, William and Wallace were rushed along because they had arrived late and had to finish their drawings within a few minutes to move on to the next activity with the rest of the group.

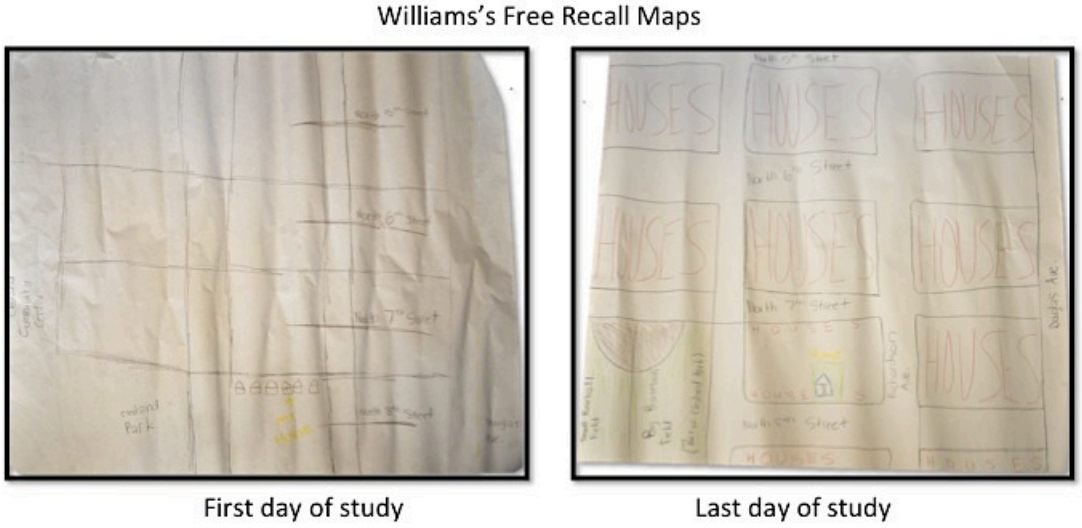

Figure 3-8. William draws a picture of his neighborhood on the first and final days of the study.

Wallace. Wallace was the next to youngest participant and was the brother to William. Even though William was two years older, Wallace outweighed William by several pounds. Similar to his brother, he had long dreadlocks, but these framed an oval face. If Wallace was intimidated by the older kids, he did not show it. Rather, Wallace was eager to respond to questions I, or other researchers posed, and was consistently enthusiastic about the activities.

Without being too repetitive, Wallace lived in the house with his brother and mother in northeast Metro, but was also very familiar with the SP Neighborhood because he attended school there. The location of his magnet middle school was four city blocks due west of the Workshop. Wallace and William would travel to school together on the city bus and often meet at Carissa's house after school to wait for their mother to pick them up in the car.

Like William, Wallace wanted to be a part of the Workshop so that he could have a bicycle with which to get around his neighborhood. He was keen on going to the library, too, and liked going anywhere that William wanted to go. Wallace, in particular, brought back GPS track data (after having his bicycle for five days) that showed him being playful with his bicycle and the GPS device. He "drew" dozens of concentric circles around and around the baseball diamond.

Wallace's free recall maps showed some interesting differences across the pre and post drawings. First, Wallace's first map paid careful attention to the sidewalks that lined the streets around his house. The second map, drawn on the final day of the study, has no sidewalks but Wallace decided to include the driveways in front of houses. While both maps take a plan view, there is greater spatial consistency in the second map with what is "on the ground." The box on the bottom right side of the image shows Wallace's second free recall map over a base layer, GIS map of his neighborhood. Comparing the two, you can see that Wallace has great spatial accuracy when depicting the streets in relation to houses in relation to the park. This accuracy could be a product of Wallace moving around his neighborhood even more than before he had a bicycle. Rather than being a mode of getting somewhere, in large part for William and Wallace, riding bicycles *was* the activity.

Another activity that was important for both Wallace and William during the last weeks of the study was Vacation Bible School. They would spend almost four hours there in the evenings. Wallace described this time in his time-diary as "learning about God and cooking food." Carissa was in the same VBS but did not attend as regularly as did the boys.

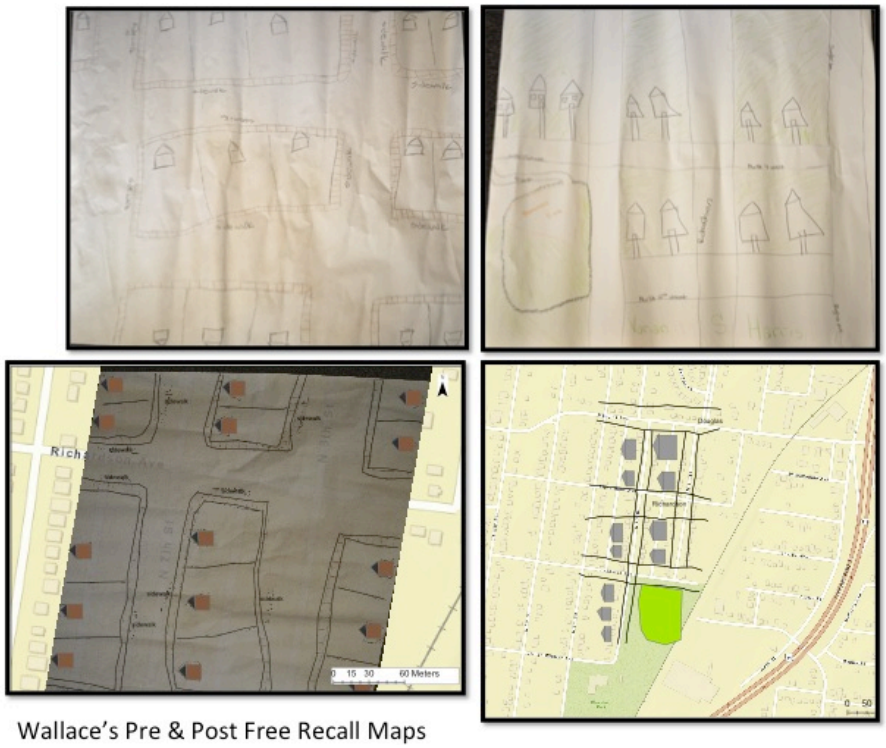

Figure 3-9. Wallace drew a picture of his neighborhood on the first and final days of the study. The bottom two images show these drawings geo-referenced to a base layer map of his neighborhood in Metro.

Data Collection

Across all study phases, the research team[2] and I made video and audio recordings of adult and youth activity during the CPU and in the bicycle Workshop. Interviews of focal participants were also conducted in both phases. All of the interviews were audio recorded. Some of the interviews were also video recorded if the participants were engaged in another activity during the interview (e.g., drawing a free recall map, making documents for an upcoming CPU meeting).

Data collection during the second phase of the study was much more extensive and physical to say the least. We video recorded youth while moving (on foot or bike) through the SP neighborhood. During on the move activities, one youth per group was also typically wearing a

[2] Please see the Acknowledgements. I am deeply grateful and indebted to all of the help I received from my co-researchers and collaborators. Collecting this data was, at times, a brutally physical and intense experience as we were traversing the neighborhood in extreme heat, sometimes rain, and through the Brood XIX cicada invasion.

head camera. During the ground-truthing activity on bicycles, however (Chapter 4), Otto (an adult volunteer) and I wore the head cameras as we rode bicycles with the youth participants. While the audio was not very good on these cameras, the view did provide an additional, “front seat” perspective on the dynamic activity underway. These head camera records were important for understanding the embodied experience of participating in these designed activities, especially as bodies were coming in contact with city buses, cicadas, looking down at maps and GPS devices, and sliding down steep hills.

I also asked youth participants to wear a GPS device for two five-day periods—once before and once after building and using a bicycle—while going about their normal activities at home. During or after many of the activities I designed, various members of the research team conducted semi-structured group interviews with youth (e.g., a debrief after their safety ride) in which we encouraged them to reflect on their experiences and explain to us the meaning of representational artifacts they had constructed (e.g., hand or computer-drawn maps). I collected these artifacts for later, more detailed analysis.

During the third phase of the study, when youth were meeting with professionals and stakeholders, there were two cameras capturing interactions. Typically, one camera was focused on the visual display that youth were talking about while the other camera was capturing the action of the speaker. These meetings were more like conversations, but began with youth displaying their maps and recommendations for the audience members. Audience members would then ask questions and provide feedback to what they heard youth saying and from what could be seen in their maps.

Analysis

This study started with a provisional, grounded theoretical understanding of what aspects of spatial literacy were important for residents to make consequential contributions at the interface between local and professional participation in community planning. That analysis, as was the case for analysis of video records of talk and activity in Phases II and III, used methods of video-based interaction analysis (Derry et al., 2010; Jordan & Henderson, 1995) and drew from

various traditions of more focused discourse and multi-modal analyses. For my work, these included methods of conversation analysis (e.g., Schegloff, 1992) and of multi-modal discourse analysis (e.g., Norris, 2004; Streeck, Goodwin, & LeBaron, 2011). Since I was interested in forms of spatial literacies that supported counter-mapping, I also attended carefully to the conceptual content of talk and action with tools or representational forms. Using these methods, my analysis was geared to explore how younger and older residents made sense of and used the relation between their sensuous experiences in place and more abstract concepts and representations of space in the service of counter-mapping. As my analysis proceeded over time, paying attention to the geographic scale of people's talk and interaction (Soja, 1989) with maps and technologies became an important insight into sense-making and engagement.

As with any design experiment, but in particular for the broader theoretical and developmental objectives of a social design experiment for spatial justice, I offer my progress in answering these questions as material for refining designs like this in future studies. To the extent that participants' efforts in these activities led to influences or changes that stakeholders valued, my findings also provide material for a theory of social change through new forms of spatial activity and thinking.

PART II: FINDINGS

This section of the dissertation explores the analytic categories of counter-mapping across the first two phases of the social design experiment for spatial justice. First, counter-mapping was an object of study during the CPU with adult residents, stakeholders, and urban planners. In the second phase of the study, counter-mapping was a cumulative learning objective for designing an experimental teaching case study with youth. Observations during Phase I informed the design conjectures for Phase II. There are three analytic categories of counter-mapping that were important in the Woodbridge CPU, and that were used as material from which to design instructional activities with youth familiar with Woodbridge. In the Introduction, counter-mapping was described as a thirdspace practice, and the three analytic categories were also outlined. As a summative recap, they are condensed and listed here:

- Counter-mapping makes space for a mobile epistemology to contact a grid epistemology.
- Counter-mapping makes space for constructing sense-scapes of lived experience and desire.
- Counter-mapping makes space for demonstrating spatial literacies.

In this Findings section, each of the three chapters (Chapters 4-7) will follow the same structure. Each chapter will begin with a description and analysis of an episode that was essential for making inferences about a grounded theory of counter-mapping, especially as it relates to one of the three analytic categories that emerged. Then, I will go on to describe how this illustrative case and others like it, informed design conjectures for the experimental teaching case with youth participating in the Workshop. Next, I will describe and analyze an illustrative case from Phase II of the study that is supported by and expands on the analytic category of counter-mapping that frames the chapter. Finally, I will address how these cases compare and build towards a greater understanding of counter-mapping as thirdspace practice.

CHAPTER IV

SPATIAL EPISTEMOLOGIES

How do you know a place? How did you come to know what you know about that place? What mediated the ways in which you came to know what you know about that place? These questions are essential in understanding spatial epistemology.

In this chapter concerning spatial epistemology, I will first describe what we learned about counter-mapping from the ethnographic and cognitive case with adult residents and planners participating in a Community Plan Update. To do so, I will highlight and analyze a focal episode of interaction that illustrates counter-mapping as making space for an "on the move" epistemology based on mobility (Creswell, 2006) to contact a "grid epistemology" (Dixon & Jones, 1998) on which maps are constructed. I will then talk about how close analysis of this episode informed design conjectures for the experimental teaching case study with youth participating in an after school bicycle workshop. Following these design conjectures, the text will move into a close description and analysis of a focal episode from the Workshop that demonstrates how youth saw and thought about their neighborhoods through different forms of mobility, and how this supported them counter-mapping their neighborhoods.

Lessons Learned in Woodbridge: "It's a Real Task"

As mentioned in the Introduction, there were several phases that comprised the Community Plan Update of Woodbridge. In the focal episode that follows, "Mr. Gray," a longtime resident of Woodbridge, had come to one of the neighborhood breakout meetings — the second phase of the Community Plan Update. These neighborhood breakout meetings looked very similar to other participatory planning meetings, in that small groups of five to eight (typically older) residents sat around a table with one urban as facilitator. Between them, was a giant map positioned across the tabletop. Pens and markers were strewn across the table, too, and residents had various pieces of paper before them, or tucked under edges of the map, that were

handed out at the beginning of the meeting. These sheets of paper listed the evening's agenda, and upcoming events. Almost all of the meetings in the Community Plan Update for Woodbridge occurred on a weeknight between the hours of 4PM and 7PM.

Neighborhood meetings were particular in many ways, too, however. Most importantly, the map, over which people were talking and interacting, was a satellite image of the specific neighborhood, rather than all of Woodbridge. The map had street labels, and other major features of the neighborhood demarcated. Throughout the meetings, residents "ground-truthed" these maps, sometimes at the bequest of planners and other times unsolicited. Ground-truthing moments were those in which residents would detect an inaccuracy in the map, call it out, and the planner would make a note of it. Many instances of ground-truthing occurred especially when the map/satellite image was not current.

Ground-truthing maps was very common during these neighborhood meetings, but it was not the real purpose of them. During neighborhood meetings, "stakeholders participated in a detailed exercise to gather information concerning the community elements of open space, neighborhoods, centers, and corridors." These comments were used to update the Woodbridge Concept Plan that detailed what residents wanted to see "preserved, created, or enhanced" (Plan, 2011, p. A-4). The "detailed exercise" was to use differently-colored star-shaped stickers to highlight various locations on the map that were mentioned by residents[3]. For example, if someone had a comment regarding the middle school in the neighborhood needing better facilities, the planner would place a blue sticker (for civic and institutions) on the representation of the school and perhaps make a note beside it in marker. The planning team adopted this practice of using stickers on the map during the *second* neighborhood meeting. In a recent email exchange with one of the planners, Stephanie, I asked her why stickers were not used in the first neighborhood meeting, but appeared in the second. She responded with a one-liner, "Yes, we were trying to get at different land uses" (personal communication, March 26, 2013).

[3] Green stars demarcated parks and open space, yellow stars demarcated single family housing, orange meant mixed housing, red represented commercial/mixed used, purple was industrial, blue referred to civic and institutional settings, and black lines made with marker delineated corridors.

Summary of Focal Episode

I chose this episode as a case from which to make inferences about a theory of counter-mapping. This case demonstrates how residents operated a spatial epistemology based on mobility rather than from knowing their neighborhood from ten thousand feet above. In support of Lynch's (1960) finding, this case shows that, "People observe the city while moving through it, and along these paths the other environmental elements are arranged and related" (p. 47). This episode also demonstrates how urban planners are *not* maps personified; their individual spatial epistemologies of the mapped terrain sometimes align more closely to that of the map and sometimes aligns more closely to that of residents, depending on how much experience they have moving around the study area. While the case contains all three analytic categories of counter-mapping that frame this dissertation, I am most concerned in this chapter with highlighting the ways in which two different spatial epistemologies came into contact during the interaction at the CPU.

In this episode, "Mr. Gray" was making a claim to a resource — an "upgraded" public library in the neighborhood — for the future of the community. With a little assistance from the planner at the table, "Sam," Mr. Gray used the table-sized map in front of him to "ground" his comments. Mr. Gray's talk and interaction showed that residents came to know and make sense of a place by being physical mobile, accessing important places and amenities. Rather than an overhead "grid epistemology," residents think across different forms and representations of mobility, and understand the affordances and constraints of a geography based upon what they can or cannot physically access from their homes or between nodes of personally relevant activity. Sam the planner, on the other hand, is not a resident of Woodbridge (she actually lives in my neighborhood across the river from Woodbridge), and demonstrated that her default way of knowing the neighborhood under discussion was from looking at the map or *seeing* it from above. This was not necessarily the case for all the planners, as some of them, especially Stephanie who made an appearance in the Prologue with Ms. Sanders, attended university in Woodbridge. At times, Sam moved toward a spatial epistemology of Woodbridge based on mobility when she recognized how particular streets in the area are very busy, but she felt much more comfortable

understanding Woodbridge from a mapped perspective.

This episode begins with an observation about a location, but quickly turns into a discussion about the accessibility of this location and how the urban infrastructure of the neighborhood is not conducive to being physically mobile. As evidence of this immobility, Mr. Gray gave an historical "analysis of personal time geography" from his years of being a teenager in Woodbridge. He compared this past time mobility with his present-day mobility in the area. In this analysis of personal time geography, Mr. Gray thought across and *created* a representation of his mobility with his right hand, leaving gestural traces (of where his body could and could not go) in the interactional space over the map. He showed, through his fluid gestures, that his conception of the neighborhood is one based on mobility — the embodied experience of dwelling within and moving throughout a geography rather than "sensing" it from above.

In listening to Mr. Gray, Sam made sure to carefully index each node (as opposed to pathway) of activity that Mr. Gray mentioned. In contrast to Mr. Gray's sweeping traces of mobility over the map, Sam anchored the pathway, "dropping pins" with her fingers to "produce a correct relational model of the terrain" (Harley, 1989; p. 4). Her interaction with the map during Mr. Gray's analysis of personal time geography mimicked the activity of plotting x,y coordinates on a Cartesian grid. But regardless of their differences in interacting with the map and, by proxy, Woodbridge, Mr. Gray and Sam easily communicated with each other. Their interaction took place in a thirdspace where local and professional ways of knowing came into contact and informed the other.

Description of Focal Episode

Mr. Gray was an older African-American retiree seated across from Sam, a young, White urban planner with a background in landscape design. There were five other residents seated around them — another older gentleman, a mother (I know this because she brought her daughter to the meeting) and government worker in her thirties, and two older women. Over the course of the meeting, Mr. Gray was decidedly more vocal than the other residents, although most, if not all of what he said was taken-up and affirmed by the others.

This particular neighborhood in Woodbridge, in which all of the residents at the table lived, was bordered by the interstate on three sides. Much of the talk around the table pertained to the area as being a mobility desert; residents were unable to easily and efficiently access community resources because of the way in which the interstate had isolated this neighborhood from the rest of Woodbridge and Metro. Once continuous corridors that connected neighborhoods to each other (making this area a "community") had become a series of dead end streets or had vanished entirely. In a strange, ironic twist, it was an urban feature that supposedly *increases* mobility — an interstate highway — that *im*mobilized this community.

Mr. Gray (MG in the transcript) began his counter-map performance by making a claim to an improved public library for the neighborhood's future. He described this particular library in contrast to the newer, much bigger and nicer downtown library, and categorized it as an attribute that needed to be "enhanced," (planner term) or in his words, "upgraded."

Excerpt 1[4]. Mr. Gray makes a claim to resources.

1	MG:	Here in Hadley Park, we have a library *((moves hand to map))*
2	Sam:	Yeah, um- ((*looks down at map))*
3	MG:	and-
4	S:	Well I guess it's this one. *((points to map with pen tip))*
5	MG:	Yes. ((*places sticker on map*)) And that library is-
6	R1:	((*laughter*))
7	MG:	need to be- I(hhhh) UPgraded because I (.) would much rather go downtown ((*points downtown in relation to map*))
8	S:	Hm-hm ((*writes note on map next to sticker*))
9	MG:	for the services there rather than to ((*points to location on map*)) because I don't think this is going to adequately serve me for my purpose. And I shouldn't HAVE to. I shouldn't have to.
10	R1:	'Cause they have some nice programs, and when they DO bring them there, it's no parking. ((*sweeps hand over area of library on map*))
11	MG:	Yeah, yeah, yeah, that's right.
12	S:	Ah-hah. ((*writes another note on map*))
13	R2:	Yeah, the parking's horrible.

[4] Transcripts follow a modified version of Jefferson's transcription convention (Atkinson & Heritage, 2006). Turns at talk are numbered for identified speakers. Continuous speech at turn boundaries is shown with =equal signs, while onset of [overlapping talk is shown with left brackets. EMPHATIC talk is shown in caps, and elong:::ated enunciation is shown with repeated colons. ((*Activity descriptions*)) appear within double parentheses and in italics, and >comparatively quick speech< appears in angle brackets. Breathing and laughter are indicated with (hh). °Comparatively quiet speech° is shown between degree symbols. Untimed pauses in speech are indicated by (.). Timed pauses are indicated by the number of seconds in parentheses.

Sam located Henry Park Library on the map immediately after Mr. Gray started talking about it (Turn 2) and held her finger there. As the planners often did, Sam tried to "ground" the remarks of residents into the map, making sure that people's comments had resonance to the representation around which they were all sitting. Mr. Gray's remark about the library was quickly taken-up by the woman resident seated directly to his right (R1) and others nodded in agreement. R1 added that there were good programs, but that if one decided to go to the library to patronize one of these programs, there would be no parking. Mr. Gray and another resident (R2) agreed with R1 that "the parking's horrible." R1's added contribution highlights the ways in which locals understand and imagine places as nodes in relation to pathways (Lynch, 1969); many residents understand that bringing the best cultural and educational amenities into Woodbridge would be for naught if there were no supporting transportation network. R1's comment served as yet another segue way back to the discursive thread of mobility and accessibility throughout Woodbridge. This time, it was Sam that brought the conversation back to mobility issues.

Excerpt 2. Sam and Mr. Gray converse about mobility and access.

14	Sam:	And then as far as getting ((*traces circles with bottom of pen*)) ACcessing the library. I mean, you've said over and over again that it's- ((*traces circles around the area east of the interstate*)) this area's very shut-off
15	Residents:	((*laughter*))
16	Mr. Gray:	Right, right.
17	S:	And obviously, ((*traces line on map*)) you're gonna either come down 28th ((*traces line on map*)) or Jackson ((*traces two lines on map*)) and both are pretty busy streets, so, ((*puts both hands on tabletop and leans forward*, *gazing up from map into residents' faces*)) I'm guessin' you're not walkin' to the library.
18	MG:	((*laughter*)) No, you can't- you can't
19	R3:	That's kinda tough.
20	MG:	You can't walk anywhere in the-in the ah, as we used to be able to do °I can remember° very easily.

Sam explicitly observed to the table of residents that they talked a lot about issues of mobility and access (Turn 14), even re-voicing the neighborhood as being "shut-off" — a good way of describing a mobility desert. Sam was also explicit about demonstrating to these Woodbridge locals that she was well aware of the few choices that the residents had in getting to the library. Not only did she name and trace the length of specific routes, but also characterized them as being "both pretty busy streets." In a tone of playful familiarity, Sam slapped both of her

hands on top of the map on the table and leaned into the residents with a sheepish but knowing grin on her face (Turn 17). She affected a southern, informal accent when she declared, "I'm guessin' you're not walkin' to the library." Perhaps it was Sam's candor and affected familiarity with the situation of the area that compelled some of the residents around the table, especially Mr. Gray, to uneasily laugh in response (Turn 18). This laughter was a way of dissipating the harsh reality of not just talking about, but living in an area that so negatively constrains one's body. Others around the table, especially the young government worker, did not respond as light-heartedly to Sam's familiarity with the situation. The young woman stared blankly, eyes wide, at Sam as Mr. Gray and R4 took-up a response to Sam's walking comment. Both of them — Mr. Gray and R4 — formed a response about mobility based on a historical account of living in the neighborhood as youngsters.

Excerpt 3. Mr. Gray does a historical analysis of personal time geography.

21	R4:	There's no such thing (.) walking the community anymore.
22	MG:	N(hhh)o(hh).
23	R4:	Right?
24	Sam:	Hm-hm ((*draws a circle and makes a note on the map*))
25	MG:	((*laughter*)) No more. That's outta-
26	R4:	Hm-hm
27	MG:	I could walk from, uh ((*points to map*)), twenty- 21st and Maroney, up here,
28	S:	((*puts finger on intersection*)) Hm-hm.
29	MG:	down to Henry Park
30	S:	((*puts other index finger of on Henry Park*))
31	MG:	very easily ((*waves R hand back and forth across that distance on the map*)) in my youth and feel- you know- but now that's not ss-I'd have to go a::ll the way around ((*circles map with hand*)) and think about going OVer ((*makes a hump with R hand over the interstate on the map*)).
32	Res:	((*laughter*))
33	Sam:	So- Well, I'm trying to think.
34	MG:	It's a real task.

Figure 4-1. "It's a real task."

For a few turns of talk, R4 and Mr. Gray took a stroll down memory lane together, R4 leaning forward and past R1 to catch Mr. Gray's eye. Mr. Gray chuckled and nodded at R4 and then launched into his own historical analysis of personal time geography. As he did so, he mimicked Sam's previous interaction with the map, and located particular routes on the map to ground his story in the representation. Mr. Gray's gestures to the map were not as accurate as Sam's, and when he pointed with his index finger toward the beginning of his pathway —"21st and Maroney" — Sam placed her fingertip directly on the intersection and held it there for the remainder of Mr. Gray's account. In beautiful contrast to Sam's rigidity and exactness, Mr. Gray's hands swept across, and up and over the surface of the map as he compared the ease with which he moved around in his youth to the difficulty of getting around the neighborhood and to Henry Park today. Because the interstate did not yet exist when he was a teenager, Mr. Gray was able to take a direct, straightforward route to the park. Now, with the interstate obstructing and creating dead ends of once continuous streets, he would have to "go all the way around and think about going over." It was once easy to be mobile in this neighborhood, but now "it's a real task."

Discussion of Focal Episode

Like many residents we saw in the CPU, Mr. Gray was building a claim to resources for the future of this community from a spatial epistemology of mobility. Mr. Gray's spatial epistemology was evident in his performance genre – his talk, gaze, interaction with, and gesturing over the map. With his right hand, Mr. Gray flowed through space and time as if broadly brushing paint on a three-dimensional canvas to show the traces his body left through the past and present day neighborhood. He swept his right hand parallel to the map from right to left and then back again to show the ease with which his body moved between the park and his home when he was a teenager. He looked up, gazing at his fellow residents as if collectively remembering this different time of physical freedom. He then flowed into the present, and continued making broad strokes over the map with his right hand to leave another trace of his physical mobility in interactional space. This transition marked a change in time, and a change in the effort exerted in his gestures to demonstrate mobility being "a real task." Rather than easily flowing back and forth as he did in his youth, Mr. Gray's hand made a wide sweep up and away from his body, parallel to the map and then "OVer" the interstate in the third dimension (Turn 31). Here, in his geographical imagination, the abstracted space in the map actually extended out into lived space, and Mr. Gray shows bounding over the highway, and how doing so is not just physically taxing but mentally as well — he would have to "think about going over." He continued looking up and out over the table, only catching Sam's gaze momentarily before looking out to his neighbors again. For Mr. Gray, the map served as a canvas on which to paint a changing account of mobility in relation to a changing urban infrastructure; the edges and outlines of the map confined what he painted, but did not control it.

While Mr. Gray demonstrated a spatial epistemology based on mobility, Sam moved closer to a grid epistemology, precisely locating places and attributes in abstracted space. Mr. Gray's flowing gestural traces of mobility were in sharp contrast to the Sam's performance genre. If Mr. Gray was painting brushstrokes of mobility traces across a three-dimensional canvas, Sam's gestures were like pinpoints, or plotting coordinates on an x,y grid. As she listened to Mr. Gray, Sam stared intently at the map, only looking up momentarily to nod her head and gaze at Mr. Gray. When Mr. Gray named places, Sam placed first her left finger on the corresponding

point on the map, and then her right finger, after careful consideration of the exact represented location. Sam kept a pen at the ready in her right hand in case she needed to make a note. (She eventually did soon after the end of this focal episode to mark a pedestrian bridge.) Her attention to the map pulled her body into the document, her shoulders hunching forward and her face close to the tabletop (see Figure 4-2). Rather than being driven by a lived history of changing mobility in the area, Sam was motivated by precision and attention to the abstracted space of this neighborhood and capturing segments of Mr. Gray's account that could be translated to map-able attributes. Whereas Mr. Gray's account extends out of and away from the map into lived space, Sam's understanding of this historical account of Woodbridge was to stay as close to the map as possible.

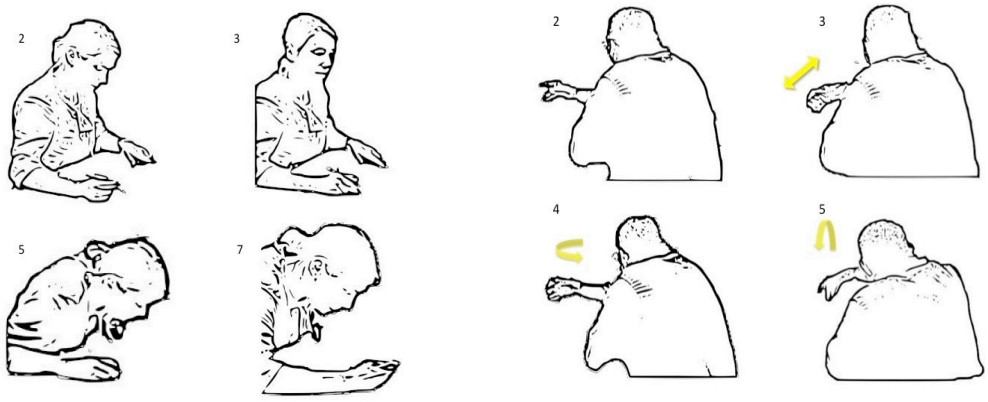

Figure 4-2. Comparative analysis of two performance genres from Sam (left image) and Mr. Gray (right image).

As Gray did in this focal episode, comparing changing mobility based on new constraints and affordances (be they modes of transportation or a different urban infrastructure) was important for designing activities for Phases II and III of this study with youth. Mr. Gray talked across two different embodied experiences of being in his neighborhood to make an argument about the inaccessibility of resources from his home. The fact that it used to be very easy to get from his house to the park in which the library is now located, powerfully illustrated the ways in which the built environment had *im*mobilized him where he used to be mobile.

As I transition to describing the experimental teaching case with youth, the interaction between Mr. Gray and Sam in this meeting, and others like it (some included later in this dissertation), served as a launching point for thinking about what was important for teenagers to learn for counter-mapping their neighborhoods. In the Workshop, I knew that youth would have experiences of mobility about which to consider, and their conceptions of place around their homes would be built from these mobile experiences. Mr. Gray, however, helped me to see that thinking across different modes and representations of mobility would give youth powerful comparative material with which to see and re-imagine the built environment in ways that were conducive to their desires. Mr. Gray compared walking as a child through Woodbridge to the impossibility of walking in today's Woodbridge because of infrastructural barriers. With the help of Sam, he used the map to highlight some of those barriers, like the interstate bridges. He and other residents mentioned the constraints of driving when there is no available parking and how even thinking about how to get around in Woodbridge required effort.

Having youth comparing the experiences of walking to biking to riding in the backseat of a car, I thought, would support an affinity for a particular type of urban experience in comparison to the others because of the different ways one gets to experience, think about, and produce place. For example, teenagers might prefer moving independently around the community on a bicycle rather than being dependent on an adult to drive them somewhere; in the first scenario sense-making and agency is in the hands of the teenager. These moments of independent mobility might lend themselves to mapping or translating to a map more easily than moments of dependent mobility, creating a thirdspace where two spatial epistemologies come into contact. Making and thinking about different forms (e.g., walking, being driven) and representations (e.g., maps, GPS tracks) of mobility were hoped to ignite a critical appraisal of the built infrastructure and an imagining of how the city could be better in personally relevant ways. This focal episode, and my own conjectures about youth mobility (especially the mobility of youth participating in a bicycle building and riding workshop) in relation to counter-mapping lead me to ask and design for the following research question: How did youth make sense of the relation between their grounded, "on the move" experiences and more formal, mapped representations of

their community?

Designing for a Mobile Spatial Epistemology

In designing activities with youth, I tried to leverage their physical mobility, or the notion that insiders learn about their home geographies by being "on the move." Locals come to know and understand their neighborhoods by moving through the area, not by seeing and "sensing" it from above. Taking cues from Mr. Gray, I tried to design activities that had youth doing their own analyses of personal time geographies, thinking across and making different modes (i.e., walking, biking, and riding in the backseat of a car) and representations (e.g., GPS tracks, hand drawn traces on a map, talk and gesture) of their own mobility so that they might eventually imagine a different spatial arrangement for the city. In other words, having youth think across and making mobility provided conceptual support to study participants for counter-mapping. I hoped that asking youth to do analyses of personal time geographies would help them see how the built environment in which they lived was wildly more conducive to car traffic than it was to walking or riding a bicycle. And since they were about to build and obtain a homemade bicycle to ride around their neighborhoods, they might care very much about this urban spatial arrangement, and want to make claims to particular resources for their futures as mobile bodies in the area.

Thinking across and making different modes and representations of mobility went hand in hand. In the overall design, there was redundancy, or several opportunities to do this kind of sense-making work. For example, ground-truthing, geo-caching, and GPS drawing were all activities that had youth walking or riding bicycles through the neighborhood, in coordination with a map or technical display (a GPS screen) of the area. Youth compared their on-the-ground, embodied experience of moving through the terrain with what the map represented or what the GPS device recommended in the geo-cache. They made new paths through the neighborhood and then represented them either on a map with pencil or using a GPS device as a kind of stylus. Youth also imagined different, ideal pathways that would afford their own bodies easy access to places they wished to go. They made these pathways in an online mapping application as colored lines.

These activities also prompted youth to move through the neighborhood and complete tasks that were in tension with the built environment and/or the abstracted map version of it. For example, in the second ground-truthing activity, the experience of planning a route to bike from the Workshop to a state park with a map felt much different than actually riding the route in lived space. The same tension between planning with a map and walking a planned route was apparent in the GPS drawing activity. In the ground-truthing/safety ride activity, consequential on-the-ground characteristics were missing from the map, such as broken glass in the shoulder, street grates that could catch your bike tire, and city buses that "shared (or hogged) the road" (as the safety slogan goes). Making sense of these tensions, I hoped, would ignite a new, more critical geographical imagination in youth that would support counter-mapping their neighborhoods and city. I also hoped that new forms of sense-making about place would emerge from these kinds of activities that I had not yet expected.

Ground-Truthing the Neighborhood on Bicycles

The first activity I will describe and analyze from Phase II of the social design experiment for spatial justice was a second iteration of a ground-truthing activity, this time on bicycles rather than on foot. Again, this activity, like others, was intended to support youth thinking across and making different modes and representations of their mobility. Youth were asked to *think* about the best route to take on bicycles from looking at the map. They then planned a route on the map and then *made* a pathway with their bodies on bicycles through the city streets. After making the pathway on bicycles, youth were prompted to think across the planned route of mobility on a map to the embodied, ridden route on the city streets. They were also prompted to think across previous experiences of walking the neighborhood with a map (as we did in other activities and as many of them did in daily life) to riding the neighborhood on a bicycle with a map. Making and thinking about different forms and representations of mobility were hoped to ignite a critical appraisal of the built infrastructure and an imagining of how the city could be better in personally relevant ways. My designed ground-truthing activity was a supplement to the Workshop's standard "safety ride" in which youth rode their new bicycles beyond the parking lot of the

Workshop for the first time.

Summary of the activity

Even though all of the designed activities were, to some degree, based on the first characteristic of counter-mapping — that locals operate a spatial epistemology based on physical mobility — I chose the ground-truthing/safety ride activity as one to highlight in this Findings section because it most closely relates to my first research question. I believe this activity most vividly illustrates how youth made sense of place across different modes and representations of their own mobility. This episode shows that youth "read" the city in order to "write" the city. In terms of reading the city, youth collectively interacted with maps of a familiar geography with a purpose; as they perused the map they imagined themselves mobile, on bicycles, taking a route to a marked destination. They then "wrote" the city on bicycles, making sense of this new form of mobility within the constraints of the urban terrain, and noticing the differences between reading a map and writing collectively on bikes. What emerged from this activity highlights the ways in which the geographical imagination is built from and made possible by on the ground, embodied experiences, and provides the material with which to counter-map the city.

After a tutorial, lead by Cecil, on how to ride bicycles together through the city streets, youth used a Google Map™ traffic map of the downtown area to select a route from the Workshop to a state park that was in Woodbridge. Having already conducted neighborhood ground-truthing on foot, I knew that wayfinding problems would arise, and expected that solving these problems would again highlight maps as partial and selective representations of the urban terrain. After selecting a route on the map, youth rode to a point, stopped to rest and drink water, then revisited the planned route and finished the ride. While cooling down in the park, they discussed their experience and answered questions posed by Caleb, an adult volunteer and GIS specialist, and me. As expected, the safety ride led to a critical reflection on the extent to which maps supported bike riding, but also to a discussion of whether the city, its roads, and cultural amenities were arranged in space to support mobility and access for youth on bicycles.

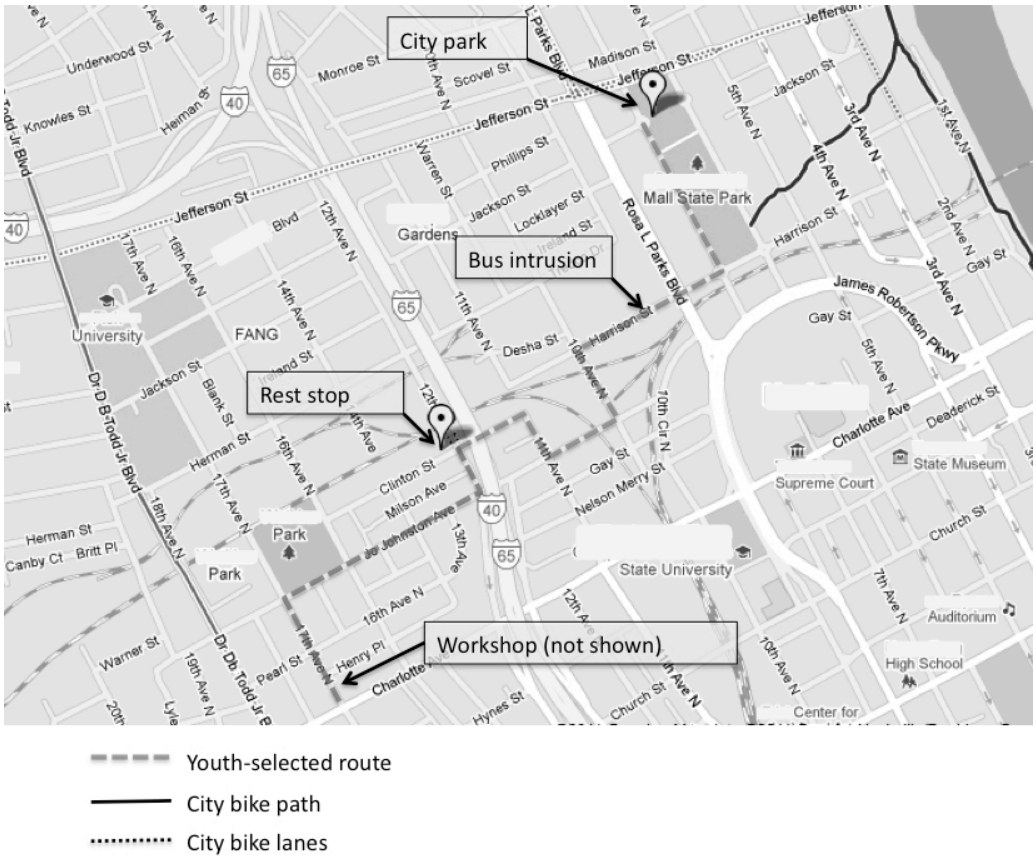

Figure 4-3. A commercial map used by youth to plan a route from the Workshop (shown here, but not on their original map) to a city park for the safety ride (a State Park). City bike paths and lanes were shown in the original map used by youth.

Description of the activity

Reading the city: Making sense of place with maps. Youth were given a map with a destination and resting place labeled (see Figure 4-3) during a bicycle safety tutorial and before setting out together on bikes. In the safety tutorial given by Cecil, the ride had rules and consequences, by analogy to a "final exam." The rules described a riding formation with adults in the front and rear. Youth were to stay between these adults. Hazards should be called out, so that other riders could avoid those hazards (e.g., storm drains could trap a bicycle wheel, sending the rider over the handlebars). Since the ride was downtown, it was illegal to ride on sidewalks. Instead, youth were told to use a bike lane, if available, or to stay to the right of the road in the shoulder and obey the same rules as a car. Cecil promised to withhold any participant's completed bike if they did not follow the rules and behave appropriately on the ride. Youth were

then asked to choose a route for the safety ride using the paper map.

This was the third time youth had seen and used this paper map, a Google Map™ traffic map. They had used a very similar version in the first ground-truthing activity on foot, and also during the geocache where they were asked to mark the locations of the caches on the map. Still, participating youth had widely different facility in reading conventional scale maps. Fred, for example, was unable to find the location of the Workshop on this map during the second ground-truthing activity, and most of them struggled to distinguish between streets that were passable by bike and other routes shown on the map (e.g., railroad lines and interstates). After intense discussion and tracing of routes around familiar, mapped landmarks in the Woodbridge neighborhoods, youth (mostly William, Wallace, Carissa, and Leah) eventually selected a route that was approved by the Workshop leader, Cecil. They did not notice or choose official bike paths (or bike friendly streets) shown in the map, though in fairness these would have taken the safety ride over a longer route than the one they chose.

With a route approved, youth folded and put away their maps and began massing in the Workshop parking lot. While our study group included six youth, a much larger group of youngsters had recently built bikes and came along for the ride. Including adult volunteers scattered through the riding formation, 17 riders set out for the state park. The safety ride covered 1.6 miles and took 21 minutes to complete.

Writing the city: Making sense of place through riding. By design, the safety ride also provided an opportunity to experience or read the city, by comparison with what was shown for drivers on the official map tucked away in riders' pockets. It is also important to point out that youth did not ride alone, but in a sizable formation that departed, somewhat chaotically, from the Workshop parking lot. I return to this idea of a riding formation after describing a predictable but still terrifying and dynamic intrusion during the safety ride (see Figure 3) that proved consequential in making sense of place.

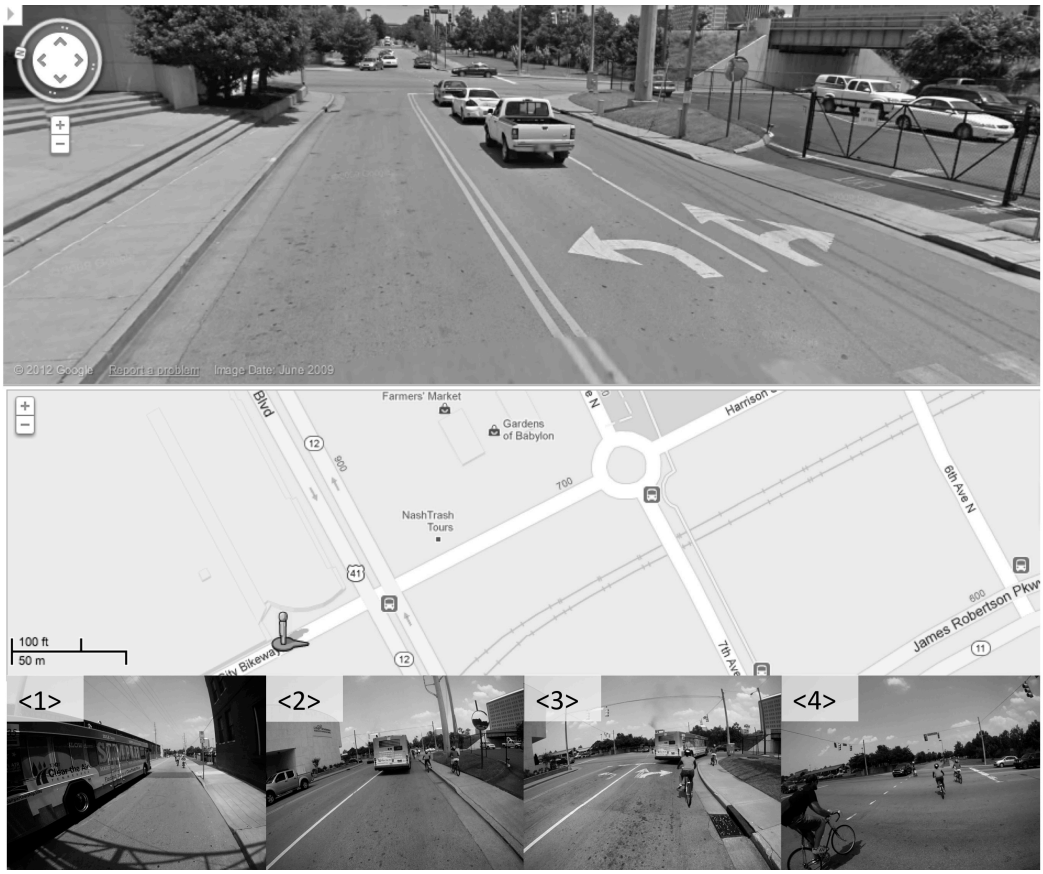

Figure 4-4. A city bus (bottom image sequence) intrudes upon the safety riding formation as they approach a busy intersection with a traffic light and protected turn lanes (top and middle images).

The route presented a series of challenges to the riding formation, not least being an initial hill that many youth found challenging to climb (some dismounted, while adults demonstrated how to shift into lower gears and traffic streamed by). Youth also had to negotiate different kinds of intersections along the planned route, including traffic lights with various configurations of turning lanes and 4-way stops. As any experienced rider would know, negotiating with cars or other vehicles at intersections is a constant challenge to riders in urban environments. As was clear just in leaving the parking lot, most participating youth did not know how to negotiate legal right of way with cars, so adult leaders actively shouted instructions forward and back along the formation, positioning their bicycles in ways that were highly visible to car drivers along the route.

In the following excerpt, a city bus overtook the riding formation from behind, resulting in an intrusion that was terrifying for youth and a challenge for adults helping to maintain the

formation as the entire mass—bikes, the bus, and cars at cross streets—arrived at an intersection with a traffic light and marked, turning lanes (Figure 4-4).

Excerpt 1. A public transit bus intrudes on the riding formation of the youth and adults

1	Otto:	BUS! ((*head cam looks back*))
2	Wallace:	[BUS! <1>
3	Katie:	[BUS! (2 sec) BUS!
4	Bus:	((*roars past Otto on left*))
5	Leah:	((*drives onto sidewalk as bus passes*)) <2>
6	Otto:	((*to Wallace*)) Bo::y those buses are scary! I tell you what. (4 sec) ((*looking ahead as bus passes girls*)) [Hah hah!
7	Bus:	[((*signaling right turn, begins turning in front of girls at intersection*))
8	Dirk:	((*in thru lane position, rides along right side of bus and enters intersection*))
9	Carissa:	((*stops, foot on curb*))
10	Dirk:	((*stops and stands bike in middle of intersection*))
11	Bus:	((*belching exhaust, accelerates through right turn*)) <3>
12	Carissa:	[Ah::! ((*screaming, wobbles into intersection*))
13	Leah:	[Ah::! ((*crosses intersection as light turns yellow, then red*)) <4>
14	Otto:	((*passing Dirk, who holds traffic against light*)) You ladies almost got PLOWed by that city bus!
15	Leah:	I was scared! I got up on the sidewalk.

As the intrusion starts, three adult chaperones already "enclosed" youth in the riding formation. Cecil was out in front with Dirk (both adults), I was in the middle, and Otto (along with another volunteer) was at the rear. Youth riders were spread between, with one brother (Wallace) at the rear (near Otto), Carissa and Leah together near me, and the older brother (William) ahead with Cecil. This formation of riders, with adults in bounding, protective positions, was stable as the bus roared up from behind.

On hearing the bus, Otto shouted, "BUS!" Just seconds later (before the bus was visible), the younger brother (Wallace) and I loudly repeated, "BUS!" for riders up the line. The riding formation with adult borders was operating as a system, as intended by Cecil and understood at some level by the participants making it up.

Ahead was an intersection with a green light and separated turn lanes (Figure 3). As the bus streamed past on the riders' left (image <1> at bottom of Figure 3), it signaled a right

turn at the intersection. As the bus slowed to begin a right turn (image <2>, directly in front of the girls), Leah steered up onto the sidewalk to avoid the bus (Turn 5). Neither of the girls nor I could see the intersection or traffic light, given the height of the bus as it waited to turn. Simultaneous with this, Dirk (a volunteer mechanic at the Workshop) rode deliberately along the right side of the bus, then into the middle of the intersection and stopped (Turns 8 and 10). This move made his intention to continue through the intersection clear to the bus driver, who waited for him to pass. But at Dirk's stopped position, he also was unable to see the girls or me from behind the waiting bus (image <3>).

After the bus completed a (legal) right turn, Leah hopped her bike off the sidewalk, then she and Carissa rolled, screaming (Turns 12 and 13) into the intersection, just as the traffic light turned yellow. Dirk continued holding cars on the busy cross street, while the remainder of the riding formation pedaled through the intersection against a red traffic light (image <4>). As they all cleared the intersection, Otto (also wearing a head cam) closed on the girls and announced (Turn 14), "You ladies almost got plowed by that city bus!"

Getting lost in the blazing sun, adjusting the route to pass under an interstate, and dealing with the dynamic intrusion of a city bus provided the kinds of experiences I expected of the safety ride. What appeared as a straightforward line on the map used for planning became considerably richer and more challenging for youth as they rode bicycles through the city for the first time. Remarkable even for adult Workshop volunteers, the bus intrusion required an interactive response from the riding formation, which for youth became a dynamic setting for learning to ride in the city. What seemed comical to youth before the ride, during the tutorial (i.e., they laughingly volunteered dogs and cars when asked what to watch out for) overtook them from behind as a form of trouble demanding immediate action. Dynamic responses by Dirk, Otto, and me provided a form of repair that maintained, over time and through space, a relatively stable version of the riding formation.

Discussion of the activity: An immediate analysis of a collective time geography

The bus intrusion (and repair) became a topic for animated conversation in a semi-

structured group interview we (Caleb and me) conducted in the park at the end of the safety ride. Immediately after the ride had finished, Caleb and I asked youth to do an analysis of their collective time geography. We asked them to reflect on what the experience of riding a bike was like — what were the constraints and affordances of being on a bicycle as a mode of mobility within this place, and how could the map have better prepared them for this purpose. Not surprisingly, the map could not have prepared them for the viscera of riding on the road next to a city bus.

Initially mentioned by Otto and Dirk, who grumbled that city buses saw them as "fire hydrants" and not legitimate vehicles, the bus was discussed intensely, as evidenced by the riders, as evidenced by their (and my) over-lapping talk.

Excerpt 2. The youth re-create the bus intrusion in the park.

1	Wallace:	That bus was tryin' to kill us!
2	Carissa:	It was! I was stuck in between the bus and the sidewalk, I was like, don't- don't move.
3	Katie:	Will you- will you tell- will you talk about that busss? What happened?
4	Carissa:	The bus driver was very ru:de. [He did not wait for all the bike riders to go by.]
5	Leah:	[He was ignant, he was ingnant, ingorant.]
6	Wallace:	So was that [van!]
7	Carissa:	[And he] forced all of us to go to the side [so he could go °and turn.
8	Leah:	[Yeah, and that truck that was behind us kept beeping and [uh ( )]
9	Katie:	[What was] the bus [trying to do?
10	Leah:	[trying to slow down.]
11	Carissa:	Turn to the right.
12	Katie:	Turn to the right, and you were on the right side of the bus, right?
13	Carissa:	°Hm-hm.
14	Katie	OK.
20	William:	Move out the way.
21	Carissa:	Yeah, he was like meh, meh, meh. ((*imitating honking a bus horn with left hand*))
22	Leah:	Excuse you.
23	Carissa:	Cause I was like, a:::::h! ((*scrunches shoulders up, opens eyes wide))*

As talk about the bus intrusion trailed off, Caleb and I asked how the map used by youth reflected

their experiences during the ride. The topic of bike lanes received sustained discussion. We asked if youth noticed bike lanes shown on the Google Map™ street maps they carried, and when the youth reported they had not, we asked them where they might like the city to create bike lanes.

After pulling out and looking at their folded and sweaty maps from their pockets, William and Carissa jointly described placing bike lanes in a way that offered both safety and rapid access to desired locations. At the beginning of the conversation, William adopted the stance of a rider, weaving his body (with linked gestures) to show a contrast between routes that turned "every which way" and those that used "a lot of straight streets." In the excerpt below, Carissa revisited this tradeoff, arguing that bike lanes should be created on busy streets for direct access to where people want to go.

Excerpt 3. Youth describe where bike lanes should go and why.

1	Carissa:	It's easier to ride on the=
2	William:	[where on the bigger streets]
3	Carissa:	=[ride on the less busy streets.]
4	William:	Yeah, it's less dangerous.
5	Carissa:	Where you need to get to certain places, it's more dangerous, so you need °bike lanes,° so that you CAN get through.
6	Caleb:	Pro:bably, do you think it's FASter to use the bigger streets?
7	Carissa:	[Yeah.]
8	William:	[Yes.]
9	Caleb:	OK. So you could stay straight on the bigger streets=
10	William:	=Um hm.=
11	Caleb:	=if you had a bike lane=
12	Carissa:	=Yes, [cause the st- the busy streets]=
13	Caleb:	[It would be safe AND faster.]
14	Carissa:	=seem to go everywhere important.
15	Caleb:	OK, right.
16	William:	And then like on the less busy streets are like weaving in and out °and stuff.

Without being prompted to talk about the encounter with the bus, Wallace exclaimed, "That bus was trying to kill us!" Even though he was several feet behind Otto, who was several feet behind the girls, Wallace positioned himself within the event of Carissa and Leah almost

getting nailed by a bus – the bus was trying to kill "*us*," not "you guys," or "you two." Wallace felt personally threatened by the bus, either from the proximity of it passing him in <1>, and/or from Otto telling him how scary buses are, and/or from witnessing the bus cutting-off Carissa and Leah up ahead in (<2> & <3>).

In their discussion about the bus as introduced by Wallace, the experience of being a body on a bicycle, surrounded by fast-moving vehicles (that seem disembodied from the perspective of a bicyclist) was processed by the group. Carissa responded to Wallace's remark: Carissa described being "stuck between the bus and the sidewalk," then she and Leah agreed the bus driver was "rude" and "ignant" (as mentioned previously when introducing the participants, Leah was playful in her talk). Shifting closer to their experiences on the move, Carissa, Leah, and William reenacted the intrusion, with Carissa making the sound of beeping horns (from surrounding traffic, not audible in the head cam record), hunching her body as if squeezed by the bus, and screaming—"Cause I was like, a::::h!"—as if riding through the intersection again (Excerpt 2, Turn 23).

In this instance for Carissa, no words could articulate what her body was experiencing in the moment of being cut-off by the bus. As expected, riding in formation through the city provided youth with experiences of routes that were (tenuously) passable for bikes, but they also experienced dynamic, interactive exchanges with other bike riders, drivers in moving vehicles, and a transportation grid designed and built almost exclusively for vehicular traffic. At the beginning of the safety ride, youth confused rail lines and an interstate with passable routes, suggesting that both city maps and cycling in the regions they represented were unfamiliar. Even after choosing city streets that were enthusiastically accepted by the Workshop leader, the safety ride provided youth with novel experiences and new ways of thinking about the urban environment. This was evident as the semi-structured interview continued.

Responding to our questions, the young riders reflected on their experiences at different levels of spatial and temporal organization, all of which coexisted in their understanding of the place through which they rode, and then neighborhood of which they were already familiar. These spatial and temporal levels ranged from intense affective responses to what they

perceived as mortal danger in the moment at an intersection (e.g., Carissa's original and reenacted screams of terror) to William's more contemplative comparison of streets that were relatively safe and quiet but slow for cycling because of "weaving in and out" with streets that were straighter and faster for riding but more dangerous because of traffic. Carissa's tradeoff—to build safer bike lanes on straight and busier roads because they "seem to go everywhere important" — was a discovery borne both of reading maps for riding and from writing the city on a bike. Equally important, her way of thinking about mobility as access to cultural assets in the neighborhood approximated conversations we found among planners and more persistent residents in Phase I of the study.

At Caleb's prompting, the youth were asked to explicitly reflect back on the map, or their reading of the city, after having written it for themselves on bicycles.

Excerpt 4. Revising the map.

17	Caleb:	Is there anything about the map that would be more helpful for a bike?
18	Carissa:	Landmarks.
19	Caleb:	A:::h, Ok.
20	Katie:	What kind-what kinds?
21	Carissa:	Like-like it if showed the farmer's market ((*points to market to her left)),* and then, like a big circle right there ((*points straight ahead of her to landmark*)) for that, just so you kne:w where you were ((*moves left hand up and down in front of body))* relative to (.) things you're around ((*raises right hand and makes a large circle with left hand around body*)).

Carissa readily made edits to the map after having ridden a route she helped choose. The example revisions she gave were those that were immediately within her field of view, now (then) standing in the location that she had just read about on the map, standing in the Workshop. Her two additions were indeed, features not on the map but were incredibly prominent standing there, on the ground[5].

Carissa and William, especially, began making contact with a grid epistemology on which the map in their hand was based. All of the youth were ready to analyze the pathway they had

[5] These attributes recommended by Carissa — the farmer's market and the circular landscape design feature in the park — were not visible at the scale of the map we used at the time of the study. Two years later, the map has been updated and zooming-in close to the ground will reveal these features as data layers.

just experienced on bikes, but Carissa and William were also eager to translate that pathway to the static map and to make inferences about how the map and the built environment could potentially change in the future. In contrast to Sam and Mr. Gray, William and Carissa's embodied performance of how they thought the map and city could change for bicycling was very far outside of abstracted space, and very much inside the lived space. After all, the youth were actually standing in the location that the map represented unlike the setting of the neighborhood break out sessions which were inside, at a table, with pens and papers. In the Discussion section that follows, I will go into more depth about these similarities and differences across the study phases after addressing the first research question that guided Phase II.

Discussion

In thinking about how youth made sense of the relation between their on the move experiences and more formal, mapped representations, I must first provide evidence that youth did indeed have many experiences across different modes of mobility, from walking to biking, to riding in a car or bus. I should also highlight how they scrutinized, and made different representations of their mobility, either with a pencil on a paper map or with GPS data loggers and handheld devices, the traces of mobility from which they viewed in Google Earth™. Asking youth to do analyses of their personal time geographies in various forms gave me, as the researcher, occasion to hear about, record, and witness their different modes of making and representing physical mobility.

I know, from their sustained participation in all of my designed activities, that youth had extensive experience walking through the Woodbridge neighborhood in which the Workshop was located; they did so in the first iteration of ground-truthing maps, the geocache, and for the GPS drawing activity. In terms of *transportation independence* — or being independently mobile — William and Wallace were by far the most transportation independent before the study began and during the study. From developing an ethnographic account of each of the participant's lives through interviews, informal, conversations, and their participation in activities, I knew that the brothers were more likely to travel places on foot than the others. Before and during the study,

from personal stories and from their time-diaries, William and Wallace were frequent pedestrians around their own neighborhood in northeast Metro. They walked to the public library or Wal-mart, for example. In a story that William told during Phase III of the study, he described to a planner and local stakeholders a walking trip with his two older cousins to get garlic bread and spaghetti at Wal-mart. He talked about being really tired after the walk, and wishing he could have ridden his bicycle. However, as William reported, even the thought of riding there made him scared. He said, "And I WOULD have rode my bike there, and got it, but I was sorta like, sorta ssscared that I would get hit, because Dalia (the street he took) is sorta busy." (I will return to this story again for further analysis.)

As mentioned in the section that introduced each participant in the Methods Chapter, Leah and Carissa were pedestrians in the SP neighborhood. But by comparison, William and Wallace covered more territory on foot than the older girls. The girls stayed immediately in the HOPE VI development. Beth, the youngest, was much more restricted in her mobility because of her age. Fred told me he never went anywhere other than school, let alone walk somewhere. His GPS track data and time diary did nothing to disprove this.

Youth made more representations of their walking mobility than any other mode of travel. They were frequently asked to keep track of their walked pathways on paper maps so that they could reflect on why they chose the routes that they did, and how they used the map to plan for taking these routes. These exercises (for the mind *and* body) allowed youth to see the neighborhood in relation to and in tension with the map and their own sensuous experiences. For example, one on-the-ground feature, a steep hill between the Workshop and the rest of the neighborhood, was an attribute that consistently put the map in tension with the body. The girls, in particular, were struck with the omission of elevation on the map, and yet how elevation had such consequences on the moving body. This hill never failed to elicit complaints and shortness of breath for all parties involved, including adult volunteers, but more importantly, insight into the incompleteness and purpose-driven nature of maps.

While I was not able to follow their subsequent use of bikes closely (following the second ground-truthing activity), I have ample evidence that most youth gathered a bulging portfolio of

relevant experiences and skills for solo and formation riding (choosing routes that connect, getting through intersections of different types, using gears to climb hills, dealing with buses). William and Wallace did a robust job of collecting data on their own bicycle riding with the GPS data loggers and the time-diaries (more on this in Chapter 5), showing that they spent hours and hours on their new bikes. Unfortunately, Carissa's bicycle was stolen two weeks after taking it home from the Workshop, so her desires for exercise on the bike she built were short lived. Cecil did give her another bike to work on and ride shortly after her first bicycle was stolen, but her bike-riding thereafter was, by that time, outside of my purview. Beth rode her bicycle up and down the street she lived on, and was able to ride through the neighborhood once she got better going up hills. Leah rode her bike from home to the Workshop. Fred was (characteristically) much more vague about the amount of time he spent using his new bike, having neither the personal stories, the GPS data, nor the time-diary entries to show much riding time. Although, as mentioned earlier, Fred rode his bike all the way home from the Workshop immediately after the Safety Ride, and he did have observations to share about that trip. He mostly remarked that there were several places on the ride that were scary because of vehicular traffic being so close to him.

Regarding making and analyzing representations of their bicycle travel, youth collected GPS track data on their home use of their bicycles and viewed it in Google Earth™, a virtual globe and geographic information program. Seeing traces of their bicycle mobility, as collected by (oftentimes faulty) GPS data loggers, allowed the teenagers to see the range and scale of their travel across the city. Youth talked and made sense across the scale of bicycle travel versus the scale of car travel. (Much more on this in Chapter 5.)

For a social design experiment for spatial justice based on youth mobility as the material and outcome for my emerging concept of counter-mapping, GPS tracks, time-diaries, and conversations helped me understand if youth were actually changing their mobility. In other words, I had to know where they started in order to know if they were becoming more transportation independent. Youth told me repeatedly, and showed me in GPS track data and time-diaries, that they spent a considerable amount of travel time in adult-driven automobiles.

This finding was far from surprising and provided further support for Cecil's program to help youth become transportation independent. I was not expecting, however, to find that car trips were frequently far from home. These trips also included multiple family members or family friends. For example, when Leah traveled roughly eight miles to her grandmother's house, her mother and cousins were with her in the car. William and Wallace made a trip into another city north of their homes to go to the movies; their mother, a cousin, and a friend of their mom's traveled with them in the car.

On further reflection, however, there are no major shopping centers, movie theaters, or restaurants (besides fast food) in or close-by any of the youth's neighborhoods. Therefore, frequently driving upwards of ten miles or more to desired locations should not be considered unusual, and getting a bicycle would probably not change this travel tendency. The neighborhoods in which youth lived needed to change first, to have more resources and amenities worth traveling to. This observation was not necessarily new for youth but was essential material for youth counter-mapping their neighborhoods in Phase III.

Making sense of place

I hoped that the activities in this study would give youth occasion to think about the differences between these modes of travel and how these different modes mediated the ways in which they thought about place, and what was important about place. Made evident in the talk during the debriefing of the ground-truthing activity on bicycles, youth began to notice aspects of place that were much more spatially nuanced than what their map-reading showed prior to the bike ride. Following the bike ride, they talked about aspects of the street grid that supported (or could support) and impeded bike and pedestrian travel. They made distinctions between the *feeling* of travel and the *efficiency* of travel, noticing that these two characteristics of mobility may work against each other because of the urban arrangement. Like Mr. Gray, the youth understood that just because it may be possible to get somewhere on a bicycle, for instance, it could still be "a real task" for the body to actually take an available pathway. For the youth, and for Mr. Gray, too, who had to "*think* about going over" the interstate, the effort of getting from one place to the

next was not only taxing on the body, but could be mentally taxing as well; when there are no direct paths of access to locations of import, there is a lot of problem-solving and planning that must occur in order to arrive at one's desired destination. As William and Carissa described, it may feel better to take the less busy streets, but the complexity of planning a route that is winding and indirect is a drawback.

William, in his spaghetti story, highlighted the ways in which the youth, by Phase III, had grown accustomed to thinking about place across different modes of travel and the ways in which place affects the body and mind. On the final day of the study, William was eager to articulate an argument about a particular place — an intersection with Dalia Avenue and a highway — and how it was barely conducive to walking, let alone bike-riding. This place was also, by William's account, scary, confusing, and tiresome for his feet. William began to understand this particular place in terms of its spatial complexity for modes of travel other than driving:

> And then there's this one part where you go UNder a highway, and then, when you go, um, when you come out from under that highway, there is FOUR lanes and there's two lanes right here, and then there's--no there's three lanes. And this one lane goes this way, and then these two lanes go out, so you have to watch for people, you have to watch for people TURNing this way, you have to watch for people turning this way, and then you have to watch for people coming out…

As William continued, he made it clear that being on the ground as a pedestrian gave him the means to think about this place differently than had he been in a car. This experience also allowed him to imagine what it would be like to ride a bicycle there, and how scary and confusing it would be — "a real task," indeed.

Making use of place

Examining the characteristics of study participants' performance genres was helpful in understanding how adults and youth made use of real and abstracted space. When being asked to explicitly use or talk back to the map, it was common for both adults, as Mr. Gray demonstrated, and youth to glance at the map, and then quickly *back* out of it into lived space to

make their point (you will continue to see this phenomenon as the Findings Chapters progress). When Carissa and William gave suggestions after the safety ride as to how the map could be better for bicyclists, they both glanced quickly at the map, but then used the landscape around them to make suggestions, pointing to streets and other landmarks. Like Mr. Gray, Carissa made sweeping, broad, brush strokes around her body to paint her geographical imagination so that it might be visible for those listening. I began to think of this tendency as a kind of *interactional ground-truthing*; adults and youth used not only the on-the-ground resources around them to add to and critique the map, but also the shared experiences and space of the people around them. Both groups, adults and youth, took-up the resources around them, including what others in the interaction could see, feel, hear, and even remember, in order to bolster their claims through lived space and critique abstracted space.

When invited to, youth were also eager to imagine new uses of place. Not surprisingly, for the young study participants, places were ripe with bike-riding opportunities had they bicycle lanes. However, they did not put bicycles lanes everywhere in Woodbridge, when they were asked to suggest new routes. Instead, William, Carissa, Wallace, and Leah, especially, placed bicycle routes on those major, efficient corridors "that seem to go everywhere important." Leah and Carissa were also eager to make places teen-use-only, especially in the public park located in the SP neighborhood. A teen-only mall and a teen-only water park were a few of the imaginative uses of place that they envisioned when making their own desire layers in a web-mapping application. Similar to Mr. Gray's "upgraded" library, the youth enthusiastically entered-in to the exercise of imagining how places could be better and more personally-conducive to their desired uses. As Harvey (2008) suggested, the right to the city – the freedom to change and imagine changes for the city and, by proxy, change ourselves – is a fundamental human right. A right that youth, when given the opportunity, willingly and excitedly claim.

CHAPTER V

CONSTRUCTING SENSE-SCAPES

How do you describe a place that you know intimately? How do you show that you know a lot about a place? How is talk and interaction different in or about a familiar place as opposed to an unfamiliar one? How do different perspectives on and objectives within that place change how you describe a familiar place? These questions are essential in understanding how insiders or locals of a geography make place differently than representations.

In this chapter about constructing sense-scapes– the second analytic category of counter-mapping –I will describe what was learned from the CPU with adults. In doing so, I will repeat the structure of the previous Findings chapter. First, I will highlight and analyze a focal episode of interaction from the CPU that is illustrative of counter-mapping as making space for storytelling from sensuous, historical, and lived experience to simultaneously understand and disrupt a disembodied, abstract narrative represented by a map. I will then describe how analysis of this episode, and others like it, informed design conjectures for Phase II of the study. After talking about the design conjectures, I will move into another close description and analysis of two focal episodes from Phase II that occurred in the Workshop with youth. Analysis of these focal episodes will show how youth constructed sense-scapes of lived experience and desire throughout the designed activities in the experimental teaching case study. Focal episodes will also speak to the research questions that guided the experimental teaching case. Finally, I will conclude this findings chapter with a discussion regarding who learned what and analytic connections between adults and teenagers as they worked toward counter-mapping their communities.

Lessons Learned in Woodbridge: "Walk-around Space"

The episode from the CPU I chose to highlight for this chapter was important for my emerging understanding of sense-scapes (Grasseni, 2009), or how residents gave spatially-

indexed accounts that built on the senses of the body, one's sense of place, and how they were making sense of the map and proposed recommendations for the future of their community. Sense-scapes occurred through talk, gesture, and interaction with each other and the map, and often spanned past, present and future, time. Over the course of the CPU, particular sense-scapes became more sustainable and significant the more they were repeated, the greater their duration, and the more closely aligned they were to the geographic scale of the map (Eckstein, 2003). Some of these sustainable sense-scapes in Woodbridge related to the fabric of the community being interrupted by the interstate, living in a food desert, and the lack of bicycle lanes throughout the area.

The focal episode in this chapter also occurred in the second phase of the CPU — the neighborhood breakout sessions — where residents of contiguous neighborhood clusters met with urban planners to discuss what attributes should be "preserved, created, and enhanced" within these areas. This particular meeting occurred two weeks *before* the meeting in which Mr. Gray participated. Planners were not yet using a system of colored stickers to demarcate places on the map that had story-able qualities from the perspectives of the residents seated around the table. Instead, planners were making notes in the margins of the map and next to places that people were narrating and ground-truthing (pointing-out mapped inaccuracies and amending the inaccuracies from their experiences living "on the ground"). As a reminder, the map used in these meetings was a satellite image of the area with streets and other major neighborhood features labeled.

Compared to the previous episode with Mr. Gray and Sam, this next exchange between Sam and another resident, Ms. Kay, was more technically complex. Sam was proposing a classification change to the residential zoning in the neighborhood so that more single-family homes could be located on one residential lot. Sam's recommendation was in line with the Transect "logic" (Duany & Talen, 2002, p. 246) and community character policy for the neighborhood (Transects and community character policies are described in detail in Chapter 3). The neighborhood under discussion was classified by the planners as T4 or urban. Under this classification, houses should be very close together, next to the street, with little yard space, and

could be multi-family residences.

Ms. Kay, a “persistent” resident (she attended most of the meetings within the CPU sequence that we observed), was proposing just the opposite. Ms. Kay wanted a downzoning of the residential classification so that it would be guaranteed that only one, single-family house would exist per lot and that each home had ample yard space. Sam and Ms. Kay had respective objectives when recommending these types of zoning changes in the neighborhood. Sam believed that dense housing stock would attract businesses into the area (that was struggling economically); Ms. Kay insisted, perhaps more vehemently than Sam, that one *single-family* house per lot was in character with the history of the area and would attract new, young families to her neighborhood (that was growing older) as it has once done.

Summary of the Focal Episode

I chose this episode because it was crucial in my developing a grounded theory of counter-mapping that involved residents constructing sense-scapes. The following is an example of counter-mapping because it involved an “insider” making a claim to resources for the future, was based on an epistemology of movement, constructed a sense-scape, and demonstrated spatial literacy. For this second findings chapter, I am focusing on the second analytic category of counter-mapping — how this performance genre creates opportunity for story-telling from sensuous, historical, and lived experience to simultaneously understand and disrupt a disembodied, abstract narrative represented by a map.

To summarize what will follow, Ms. Kay made a claim to the residential zoning classification so that the future character of housing in Woodbridge might resemble that of her own past. This claim was in direct opposition to Sam who was proposing greater housing density to fit the urban character of the area. Ms. Kay’s desire was to entice young families into the area, rather than businesses.

Ms. Kay’s sense-scape of this place — the area in which she had spent almost all of her life — problematized the economic narrative of urban development that was so dominant throughout the CPU of Woodbridge. The place that the map represented was, to Ms. Kay, much

more than a satellite photograph with layers of street labels and line data. The abstracted space was a place of storied layers built on sensuous experience, her sense of place, and her sense-making of the map and what was being recommended for the future. By her account, "the area" was a past time story of families living in houses with "lots of yard space" where people could "breathe." By her account, this place was a future-oriented story of possibility — the possibility of bringing families back to inhabit the area. This place was a sense-scape of memory, a biography, of advocacy work, of family ideals, and of middle class values. All of these senses of place worked toward making a personally-relevant claim to the area for her future and for the future of Woodbridge.

Sam's account of this place was rich, too, but was informed and perpetuated by a professional aesthetic and categorization scheme. By contrast to Ms. Kay, Sam had little sensuous or biographical experience in Woodbridge to go on, and was fueled by a more general sense of place that created "an experience of immersion in any one type of environment by specifying and arranging the elements that comprise that environment in a way that is expected given the nature of the place" (Duany & Talen, 2002; p. 246). From her position as a professional, Sam recognized that this neighborhood under discussion was classified as urban (T4) and residences in the area should therefore adhere to particular design principles. From the *Community Character Manual* (2008) used by these planners, these design principles would include the following:

> Massing of building results in a building footprint with moderate to high lot coverage. Buildings are oriented to the street or to an open space. Setbacks are shallow and regular, providing some distinction between the public realm of the sidewalk and the private realm of the residence…There is minimal spacing between buildings. Buildings are 1 to 3 stories in height (p. 160).

In her proposal to the table of Woodbridge residents, Sam brings forward her own ideals for the area that progress an "immersive" urban environment. Ms. Kay is quick to recognize the difference in ideals and counter-maps a future for Woodbridge imbued with affect and personal relevance.

To set the scene, seated around the table were nine women: two planners (Sam and Stephanie), a community activist, a faculty member of one of the local universities, a residential developer (who was also a resident), and four residents, three of whom were seniors. As a way of beginning, the planners asked everyone to go around the table and introduce themselves. Immediately, Ms. Kay positioned herself as an advocate for a middle-class suburban ideal of living in a single-family home with a yard. She stated, "I am here because, um, I still believe that people enjoy having their own home and having their own yard space, and that's what I remember in this area." Ms. Kay went on to accentuate her dedication to this ideal of living when she remarked, "I want to do whatever I can to bring that vision to the area." As an initial utterance, Ms. Kay began constructing her sense-scape; she quickly developed her sense of place and spanned her own history and memory living there and her vision for the future.

Description of the Focal Episode

Cottage courts for increased density. Sam began the focal episode by describing and drawing a planning concept known as a "cottage court development," where several "single family homes" are located together on two or three residential lots. This concept had a long history in our own ethnographic observations of the planners and was mentioned by at least two other planners on different occasions prior to this meeting. (The image of cottage courts that Metro planners used in their Community Character Manual is below, Figure 5-1.) A housing concept used in cities across the country to increase density and create infill, the Metro planners had borrowed the idea and were now championing it as, according to Sam, a way "to add some sometimes needed density to the area so that… businesses might be more likely to come in."

Figure 5-1. On the left, an image of a cottage court development from the perspective of standing in the shared open space. On the right, an image of a cottage court development from the street. These two images were used in the Community Character Manual as possible housing types in urban (T4) neighborhoods.

The team of planners, that included Sam and Stephanie, had proposed this concept in completely different Metro neighborhoods before, and had received significant resistance in those places. Before Sam attempted to teach the concept of cottage courts to the residents around the table, she acknowledged Ms. Kay's concern regarding housing density that had been brought-up earlier in the meeting. Sam began, "Can I ask a question, and-you know, I absolutely understand where you're coming from, talkin' bout single family DEtached housing and really wanting that to come back to the revitalize the neighborhood." Sam's acknowledgement of this sentiment then propelled her to propose an alternate scenario to the typical single family detached housing familiar in suburbia – the cottage court. As she explained this new housing concept, Sam drew a sketch of how the houses would be arranged on three lots (see Figure 5-2 below). In the margin of the map, Sam drew eight houses around an open space in the center, stressing to Ms. Kay that the homes were single-family houses and were detached from one another.

Excerpt 1. Sam describes the housing concept of cottage courts to the table.

1 Sam: ((*1 minute, 40 sec* later)) One thing that we have gone into >OTHer neighborhoods and talked with them about< are, um, COTtage COURT developments where there are- they're all actually single-family houses but if you took-um a lot that was um- ((*moves pens off of the map to make space*)) or if you took say three- what WOULD've been three ((*starts drawing in margin of map*)) lots along the street (.) and you put in ((*draws squares*)) single family BUILDings where f- >maybe four of them face the street and so they're in line with the rest of the character aLONG the street< but then behind, you get (.) four MORE houses and they all front this OPen space. And it's a wa:y to add some- sometimes NEEDed density to the area so that, ya know, businesses might be more likely to come in. ((*25 s*) So I guess what we're trying to gauge is is it the crazy HEIGHT and the weird CHARacter of these buildings or is it the DENsity? Which- which is it that the neighborhood's really opposed to?

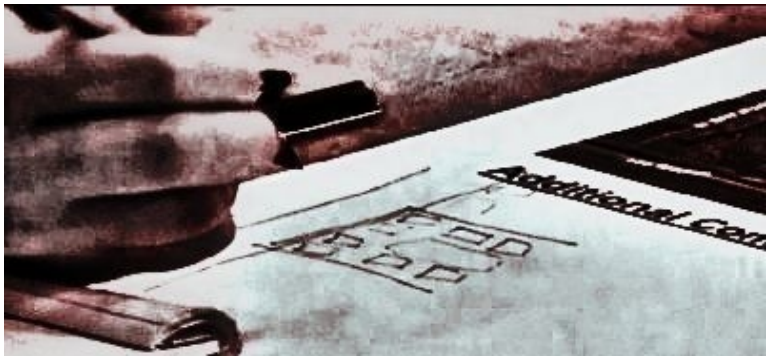

Figure 5-2. Sam sketches a model of a cottage court development in the margin of the map.

As she concluded her minute and ten second lesson on cottage court developments, Sam posed a question to the residents seated around the table: "So, I guess what we're trying to gauge is, is it the crazy height and the weird character of these buildings, or is it the density? Which is it that the neighborhood's really opposed to?"

Sam's question to the residents was one about the form and character of this concept. Her gaze moved up and out across the table to meet the gaze of Ms. Kay. At the end of Sam's prompt, Ms. Kay sat up straighter, and Ms. Sanders (red blazer, Figure 5-3.), another persistent resident and friend of Ms. Kay, leaned into her neighbor, inviting her to respond. Ms. Kay, already having positioned herself as the advocate on local housing issues less than twenty minutes before, accepted the invitation and was the first to answer Sam's query (the underlined words indicate a corresponding graphic frame showing gesture and gaze):

Excerpt 2. Ms. Kay responds to Sam concept of cottage courts with her own concept of walk-around space.

2 Ms.Kay: Families need space (.) and when you put people toGETHer, and they have no- no walk-aro:und space (.) outside, it creates pro:blems, [and]
3 Ms. Sanders: *((Nodding))*
4 Sam: *((Nodding throughout))*
5 Ginger: [((*laughter*))]
6 Ms.Kay: It do::es!
7 Stephanie: Hm-hm.
8 Ms. Kay: People need to be=
9 Ginger: =ten[sion]
10 Ms.Kay: [they- they need walk-around space
11 Sam: *((Nodding))* Hm-[hm.
12 Stephanie: [Hm-hm.
13 Ms.Kay: Just to bre::athe.

Figure 5-3. "They need walk-around space… just to breathe."

Walk-around space. Ms. Kay countered Sam's concept of the cottage court with her own endemic concept of walk-around space. Her emotive performance of the concept was sharply contrastive to Sam's map and model version of the cottage court housing development. Sam talked about the mathematical and spatial properties of cottage courts, as she drew boxes within boxes, around boxes, keeping her nose down and her shoulders hunched forward to the margin of the map as she talked. Ms. Kay, in contrast, almost regally held her chin up, arms pushing and pulling gracefully through the space in front of her to talk about how a home, and the space around it, should *feel* both physically and mentally. She gazed around the table, making

eye contact with most of those around her, and almost everyone reciprocated with either mutual gazes, nods, or audible “hm-hm”s. (However, minutes later in the meeting, the housing developer and resident takes a stance against Ms. Kay’s vision.) As she described this ideal that she was conjuring from her past, Ms. Kay held a smile on her face, looking whimsical about the possibility of living “walk-around space” once again.

Ms. Kay took an agentive stance in relation to the geography that was her neighborhood, but more specifically, in relation to a proposed future for that place. First, Ms. Kay narrated her vision or alternative future — a future contrary to one that included cottage courts — for a kind of resident mobility. Speaking on behalf of families who lived in this neighborhood, Ms. Kay promoted walk-around space as a concept that was in direct opposition to the seemingly cramped and constraining homes in Sam’s cottage court drawing and explanation. According to Ms. Kay, her proposed form of resident/family mobility would offer families peace and diffuse anxiety, but need not necessarily do much else. Unlike the concept of cottage courts that fundamentally valued density in the name of immersing one in a place slated to conform to an urban ideal, Ms. Kay’s concept was one that valued *feeling* — being outside in fresh air, taking a deep breath, filling one’s lungs with calming, clean air, and then exhaling up into the sky (as she demonstrated in Frame <4>).

Ms. Kay swept her arms across the tabletop, covered by the map of the neighborhood, as if this domain were her own. Quite literally, through her gestures, gaze, and her words, Ms. Kay was “taking place” back from the professional Transect classification that recommended an urban aesthetic for the future of this Woodbridge neighborhood. She pulled-in the space above the map toward her chest, re-arranging it, and then pushing a new, *more expansive* version back out for people to view. From an observer’s perspective, Sam and Stephanie seemed either nonplussed by Ms. Kay’s vision for the area or enchanted by this ideal of wide open spaces surrounding single family homes to which parents and children can seek refuge. Sam’s almost continuous nodding and Stephanie’s eager affirmations were at least conciliatory gestures intended to placate an impassioned resident.

Discussion of the Focal Episode

Ms. Kay's gestures, talk, and gaze served as a new, albeit ephemeral layer of oldtimer/resident experience and desire over the planner-created map and housing recommendation drawn in the margin. Upon initial analysis and for purposes of designing activities for youth, I thought of these interactional layers over the representation that made claims for the future of the neighborhood as *desire layers*. Building desire layers became important for what youth would work toward in Phases II and III of this study. Upon further retrospective analysis, Ms. Kay's contribution over the map was more than persuasive and emotive gesturing of her desires for the future of Woodbridge. Ms. Kay's contribution was a sense-scape – an alternate narrative to the mapped and categorized landscape that was built on her sensuous experiences of being in neighborhoods, her value-laden sense of place, and her own sense-making of the map and the professional recommendations that were being made for her community.

The very idea of walk-around space was a concept that was founded on the senses of the body – about feeling healthy and free, outside in open space. For Ms. Kay, walk-around space was essential to the most fundamental function of a living body; having yard space close to one's house enabled one to *breathe*. As she talked, Ms. Kay's hands and shoulders, especially, demonstrated the difference the body feels between living-in a cramped (or urban) neighborhood and living with walk-around space surrounding one's residence (or suburban neighborhood). Her shoulders and hands transformed from a tight and tense arrangement (these mimicked Sam's boxes she drew in the margin, Frame <1>) to an expansively open and flowing one (Frames <2> -<7>). But while Ms. Kay erected a new spatial formation with her hands and words, she was also directly responding to the same geographic scale drawn by Sam in the margin of the map. Just as Sam's drawing of a cottage court development was scaled to three residential lots, Ms. Kay scaled her own contribution to match. Like Mr. Gray painting brush strokes of mobility over the map, Ms. Kay also confined her traces of freedom and breathing, this time to the yard surrounding the house. Her ability to align the concept of walk-around space to the geographic scale covered by the concept of cottage courts was an important discursive turn that legitimized

her claim to the official processes of zoning, and otherwise categorizing land use.

From a lifetime of living in Woodbridge, Ms. Kay had developed a particular sense of place that had developed over an entire biography. Her sense of place was imbued with a middle class family ideal of living and mobility, and reinserting this ideal back into her Woodbridge neighborhood was important. She had become an advocate for these ideals and repeated her interest in seeing the neighborhood "down-zone" and become more family-friendly several times throughout this one meeting. Ms. Kay (and Ms. Sanders who you met in the opening excerpt) took a strong agentive stance toward affecting change that advanced a particular sense of place. Unlike other residents we observed in this process who felt disempowered by the antagonistic history between the local government and Woodbridge, Ms. Kay demonstrated just the opposite. Immediately positioning herself as an advocate of a "vision," Ms. Kay's statement that she would do "whatever [she could] to bring that vision to the area," and her systematic and sensible opposition to a planning concept, commanded authority.

Judging from her firm and emotional opposition to Sam's proposal of denser residential development, Ms. Kay did not think of this neighborhood as an urban neighborhood with apartment and duplex living. Nor was this an urban neighborhood with multiple single-family houses occupying two or three residential lots. Instead, she imagined this place as a kind of suburbia, where nuclear families each have their own house surrounded by a big yard, as it used to be. In the language of the Transect, Ms. Kay was proposing a T3 (suburban) classification for her neighborhood. According to the *Community Character Manual* (2008), the character of a suburban neighborhood is described as follows: "Massing of buildings results in a footprint with low to moderate lot coverage. Buildings are oriented to the street, with moderate and consistent setbacks, providing large yards and moderate spacing between buildings" (p. 102). The difference between Sam's claim and Ms. Kay's claim for the future of Woodbridge is represented below in Figure 5-4.

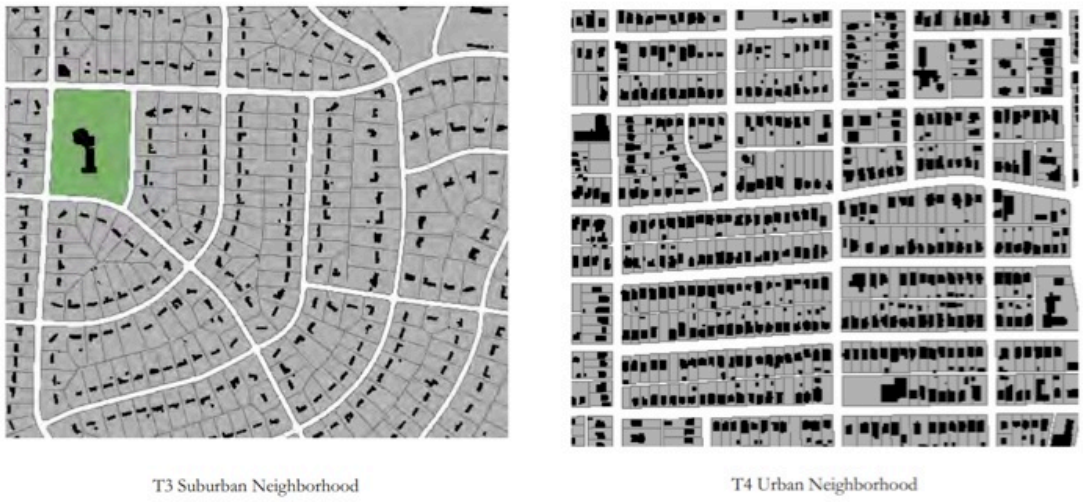

Figure 5-4. Two images from the Community Character Manual (2008) used by Metro's planners to show the difference between a T4 Suburban Neighborhood and a T4 Urban Neighborhood.

There is no doubt that Ms. Kay had made sense of Sam's cottage court recommendation to mean more urban. Her sensibilities toward urbanity evoked feelings of tension and creating "problems." But for Sam, urban meant vibrancy through business and economic development facilitated by residential density. Sam had found this vision realized in her own neighborhood where she lived across the river and imagined a similar fate for Woodbridge, were residents willing to try.

While some planners would say that Ms. Kay's vision for the future is not forward-thinking (especially since she herself described this vision as one that attempts to reinstate a past suburban form of Woodbridge) or sustainable, she was ultimately persuasive; the cottage court concept was not moved forward in that neighborhood, although it does exist in the one predominately White, wealthy neighborhood in Woodbridge. Ms. Kay's contribution could be viewed as antithetical to progress, especially according to the "logic" of the Transect. But the interaction between Sam and Ms. Kay highlights how particular residents formed sense-scapes to simultaneously understand and disrupt a disembodied, abstract narrative represented by a map and/or a professional, idealized classification system like the Transect. This is not to say that Sam did not also make sense of the Transect in her own way, as did Stephanie (they were not planning robots, after all), but Sam did not have the extensive biographical history and sensuous experience in Woodbridge that was so essential (and persuasive) for Ms. Kay counter-mapping

her neighborhood.

In Eckstein and Throgmorton's (2003) book about making space for story-telling in participatory planning, Eckstein writes, "The will to change…has to come from a storyteller's ability to make a narrative and physical space in which to juxtapose multiple, traditional stories so that they enrich, renarrate, and transform that space rather than compete for ultimate control" (p. 38). What Eckstein described, I argue, is a thirdspace practice, and what we observed transpire between Ms. Kay and Sam. These women created an opportunity for two fundamentally different stories of urban and family life to meet head-to-head, to renarrate the other, and neither one to have "ultimate control." Ms. Kay would have been unable to counter-map Woodbridge without Sam, without the technical classification of the Transect, and without this venue for citizenship and civic advocacy for one's community.

Designing for Lived Relevancies for Youth

From observations of adults participating in the Woodbridge planning process, like Ms. Kay and Mr. Gray, I was able to understand more about the spatial literacy practices that were important for this particular process of civic engagement, and how citizenship was fundamentally related to the on the ground realities of the community. Citizenship looked very different for residents, living in an underserved, racially segregated, and economically marginalized neighborhood. As someone who participated in a CPU process (as a citizen first, then as a researcher) in my own neighborhood (that had easy access to grocery stories, parks, and other daily and cultural amenities) before studying Woodbridge, I realized just how different resident contributions and concerns looked. For example, in my community, NIMBY (not in my backyard) concerns were exhaustively common while bigger (in terms of scale) economic and social issues concerned participating Woodbridge residents. In this way, the *scale* of the concerns mentioned by residents in Woodbridge was more conducive to counter-mapping; contributions of residents during the CPU more commonly fit the professional relevancies and scale of planners' concerns – planning for a *community*, increasing connectivity across *neighborhoods*, thinking about areas as immersive environments, etc. Again, sense-scapes became more significant and more

sustainable the more they were repeated, and the more closely-aligned they were to the geographic scale of the map. Being able to think of familiar daily activities and issues as *spatial phenomena* was important for my own designs with youth participating in the Workshop.

Ms. Kay, in particular, was essential in understanding that my designed activities should have two important components. First, the activities would not be relevant if they did not occur in a *place* that was already rich with meaning and history for my study participants. I understood, as a designer, that young people needed to build upon the daily, embodied experiences they already had in an intimately familiar geography. If they were learning the geography anew, while participating in my designed teaching and learning activities, they would not be able to draw upon an historical wealth of experience in place that was personally relevant to them, and would not have any vested interest and *perceived agency* in imagining a better future for this place (and themselves within it).

This last point is related to the second understanding I gained from observations of Ms. Kay. I understood her contributions at the table with planners to be an embodied and agentive response to the categories and maps "officially" representing her neighborhood. She made sense of this representation and the values imbued within it before disrupting it with her own sense of place. In similar ways, I wanted youth to exercise creative agency in response to, and in collaboration with the representations and technologies used by professional planners and cartographers while remaining true to the values they held for their own neighborhoods and imagined futures within those places.

Because my study participants were adolescents, they did not have biographical experience within this geography at the same historical scale as Ms. Kay and the other adult residents participating in the CPU. However, this project is partly based on my belief that even though youth do not have as extensive of a spatial history as adults because of their age, the experiences they do have are distinctive and valuable to thinking about how neighborhood spaces should change in the future.

With my own values in mind, all of the designed activities took place in and throughout an intimately familiar and important neighborhood for the youth. As a reminder, Carissa, Beth, Leah,

and Fred lived in Woodbridge. William and Wallace went to school there and spent considerable time after school there, staying at Carissa's apartment. Carissa, Leah, and Beth all lived in the SP neighborhood immediately adjacent to the Workshop. As a consequence, all of the participants knew people in the area and stories about the place from their own experiences and from stories told to them. Of course, I did not know what these particular stories were before I designed the study, and I did not know how these stories might emerge and/or inform participation.

For me, the decision to create meaningful activities in direct relationship to the geography of Woodbridge, and to youth, posed some problems; I was not a resident of this community, nor did I know much about its physical layout as an outsider. I am also not a teenager, and had to imagine, from previous experience working with and teaching youth, what "emplaced" activities would be relevant to this age group, and so on.

I was privy to the range of issues that faced the area because of ethnographic observations with planners and adult residents, and from living in the greater Metro area. But transportation issues facing Woodbridge youth were of the most concern to Cecil and me for the designed activities and the purposes of the Workshop. I knew that once youth imagined themselves and began riding bicycles around their home neighborhoods, this would be a very life issue for them as well.

In summary, the activities I designed were fundamentally emplaced and enmeshed in and throughout the urban fabric of Woodbridge and built upon the experiences youth already had and were about to have (in terms of riding a new bicycle) in the area. I wanted youth to think about scale as a salient concept of daily spatial practice, to creatively engage with representations and geospatial technologies, and build upon sensuous experiences of the body and their own sense of place to make claims for the future of their neighborhood. The older and newer technologies (i.e., bicycles, the street grid, GPS devices, interactive mapping applications) supported youth in scaling their stories and desires for the future of Woodbridge to the relevancies of professional planners. What emerged from youth participating in these activities further developed my understanding of locals constructing sense-scapes from lived experiences

and desires.

In the analysis that follows, I will describe and analyze focal episodes from two different activities: a GPS drawing activity and an "analysis of personal time geography" activity in the university computer lab. Both of these activities occurred in the fifth week of the study, GPS drawing on Tuesday of that week and the analysis of personal time geography session on the Thursday of that week. These two activities will highlight my design objectives of creating activity structures that occurred in familiar places for the youth, and tried to support technological agency and the expression of affective attachment to these places. However, these objectives were sometimes muddled by the technology that I used to re-mediate their mobility and affected the ways in which youth accounted for and produced place across their own mobility and representations of that mobility. Unlike my observations during the CPU with adults, in the Workshop, I was able to see the difference between youth *doing* the mobility and youth *viewing* the mobility.

GPS Drawing: Producing Place and Pathways with Geospatial Technology

As the first piece of empirical material from the Workshop for this chapter, I analyze GPS drawing — a new kind of "walk-around space" — as a sociotechnical activity system in which two groups of three youth drew or wrote an image or word over the terrain of the neighborhood by walking a planned route with a handheld Garmin™ GPS device. When powered-up and triangulated via satellite communication, the GPS device will record and store where the user travels through space, and these "tracks" can be uploaded as a map layer in a GIS. Study participants, in collaboration with each other, geospatial technology, and maps, authored a completely new pathway, or *lifeline*, that elicited spatial problem-solving, their histories in the neighborhood, and identifying the limits of their bodies' capacities for mobility. In GPS drawing and in this designed activity, the function of the device was re-purposed by inserting it into a new form of activity that layers personal meaning over the map. This activity was yet another differently mediated form of mobility intended to show youth that geospatial technology could be a representational tool to inscribe and exercise creative agency on a familiar place. I also designed

this activity so that youth could put their embodied experiences, the map, and the GPS device in tension with one another to experience each one of these as different forms of mediation to the built environment, and to see how youth produced spaces in a novel activity type.

Summary of the Activity

Several new phenomena emerged from doing GPS drawing in a familiar (to the youth participants) neighborhood. First, like Ms. Kay and other adult residents participating in the CPU, youth produced place as a co-presence of stories within the framework of the activity and the geographic terrain. These sense-scapes, or spatially-indexed narratives were frequently the viscera of being on the ground; stories were grounded in the body's response to particular features of the neighborhood, such as steep hills, wet grass, or the smell of dog poop. Many times, in the CPU, adults also recounted stories like these – there is always a funny smell at an intersection, or the trains are so loud at particular locations in Woodbridge. For adults and youth, the viscera of being "in the dirt" were intricately layered with stories of memory, familiarity, pop culture, and projections into the future.

Secondly, while youth were planning and producing a new kind of walk-around space, they were immensely immersed in spatial problem-solving. Youth had the difficult task of negotiating their planned route at a two-dimensional map scale with the three-dimensional, embodied experience of walking the route at the neighborhood scale. They had anticipated this tension in the planning phase, but were still surprised by what lay ahead of them in the built environment (that was not built for GPS drawing).

Third, GPS drawing gave youth occasion to collaboratively write a new pathway into the neighborhood that was imbued with emergent meaning. I initially decided to call these pathways *storylines* since the youth were telling stories the whole time they walked these routes. However, pathways created during GPS drawing were just as much about the body and staying together as a formation as they were about stories of friends, neighbors, or pop stars. Therefore, I decided to call these pathways *lifelines* because of the ways in which the routes they walked served as the impetus for story-telling and as the connective tissue that pulled all of these stories, bodies, and

technologies together in a sensible, coherent way. Lifelines held these participants, and the researchers with them, together in a cohesive formation of coordinated activity. When someone left the lifeline, as Carissa did when she left the group to get her cell phone from her house, the activity came to a standstill until she returned to the group.

Finally, the *scale of doing*, or walking the planned route on the ground, produced radically different forms of engagement than the *scale of viewing*, or when the youth were looking at their GPS drawings post hoc in a university computer lab. At the scale of doing, engagement was lively and ebullient. The youth resourced each other and the neighborhood for stories and humor. Youth engagement looked much more like what Leander and Boldt (2013) described as "not primarily as efforts toward generating signs or meanings, but rather as generating intensity and the excitement of emergence." At the scale of doing, the endpoint of making the word or image was present at times, especially when Carissa exerted her dominance, but so was "forming relations and connections across signs, objects, and bodies in often unexpected ways" (p. 26) in the present moment.

At the scale of viewing, the openness to emergence that existed in the neighborhood was closed from fear of inaccuracy, ugliness, and frustration with the technology. The debrief and re-presentation of what they had drawn was reduced to a line on a satellite photo for the authors or the audience to critique. The complexity and multi-dimensionality at the scale of doing became a critical appraisal of performance at the scale of viewing where errors, and being right or wrong, took precedence over the stories of how these lines came to life in the first place.

GPS drawing consisted of four phases and lasted three hours. The four phases occurred across three "research sites" or places — the Workshop, the neighborhood (outside), and a university computer lab. Fred, William, Wallace, Carissa, Beth, and Leah were joined by five researchers (three of whom were operating cameras), and two adult Workshop volunteers throughout the four phases.

The first phase of the GPS drawing activity was a tutorial in which I introduced the concept of GPS drawing by showing the youth images of Jeremy Woods' inscriptions in Brighton, Las Vegas, at the University of Warwick, and Oxford (see Figure 5-5). Laurialt and Wood (2009)

described his drawings this way:

> [Wood] narrates personal cartographic stories visually, where he, code, places and GPS are the protagonists. In a sense, when drawing he becomes a geodetic pencil. He plots points and connects these while riding his bicycle, walking, or as a passenger in boats or planes. Geography is the precept mediated by the communication infrastructure. His canvas – places and spaces, determine the routes, are the medium within which his body moves and the settings where he performs his tracts (p. 360).

While I encouraged youth to affectively annotate this place, there were some technical and spatial issues to discuss first. In the tutorial, youth talked about what tools and modes of mobility Jeremy Woods used to make the inscriptions and were asked to imagine themselves doing this in the immediate neighborhood. Importantly, this imaginative conversation elicited issues of efficiency, scale, and accuracy when drawing with a GPS device.

Figure 5-5. A selection of Jeremy Woods' GPS drawings I showed to youth participants as a way to introduce this novel activity.

The second phase of the activity was a planning phase where youth broke into two groups of three people (a girl group and a boy group). With a Google Earth™ satellite map and a Google Maps™ traffic map of the neighborhood, youth used markers, and their existing knowledge of the infrastructure to plan what they were going to inscribe with the GPS device. The girl group planned to write the word "LOVE" over a five-block area of the neighborhood. The boy group planned to draw an hourglass with sand dripping through it that weaved back and forth across the neighborhood park (the equivalent of two city blocks). The hourglass was the backup plan after Fred characteristically made fun of William and Wallace for wanting to draw Spongebob Squarepants. During this phase, I asked each group to plan quietly so as not to reveal to the other group what image or word they were planning to inscribe. I hoped this "suspense" would encourage the youth to anticipate an audience for their drawings once they were revealed in the final phase.

The third phase of the activity consisted of the two groups of youth going outside to write or draw their planned word or image. Typically, one person held the GPS device, and was the "scribe." Another group member held the map and lead the way through streets, backyards, and the park to create the inscription in a way that was true to the plan they made with the map and markers. One person in each group was also asked to wear a GoPro head camera to catch the action from the perspective of a group member. Each group was accompanied by at least two adult researchers, one of which was carrying a camera. As we headed out of the Workshop, it was raining and a couple of youth were also carrying umbrellas. About fifteen minutes into the walk, the rain stopped and Carissa, especially, was eager to get rid of her umbrella. Kris carried it the rest of the way.

Once groups returned to the Workshop after finishing their drawings, we loaded into a van, and Cecil drove us to the university computer lab. In this fourth phase of the activity, youth participants viewed each other's GPS drawings in the computer lab. "Tracks" (a GPS device term) from the GPS devices were uploaded into Google Earth™ by Kris, one of the researchers. Because youth could not see their inscription *in situ* (parts of the inscription could be seen on the GPS device screen, but not the entire sketch and not over a base layer map), the image that

flashed onto the screen was the first time they were able to see what they had created. During this phase, I asked the youth to talk through how they planned and created the inscription, what challenges they faced, and how planning with a map compared to actually walking the inscription through streets, sidewalks, yards, trees, parked cars and over hills.

As the adults in the CPU demonstrated, being able to sensibly layer embodied, affective, and biographical experiences over top a map was an important component of counter-mapping. Having these experiences commensurate with the scale of the map or the technical classifications was important for being understood by planners. GPS drawing asked youth to engage in embodied and biographical layer-construction, but also provided them with a geospatial tool with which to author a representational layer that had to match the scale of the map. This novel, sociotechnical activity was another thirdspace practice where concrete and abstract experiences of space were contacting and informing the other.

Description of the activity

During the tutorial phase, I stood around the Workshop table surrounded by Beth, William, Wallace, Carissa, Leah, and Fred. Dirk, an adult Workshop volunteer, was lingering around the group and would sometimes interject ideas he had that pertained to the activity. For example, he pointed out to the group that the city of Washington, D.C. was planned from the plan, or overhead, view. Cecil was also in and out of the interaction, but mostly out since he was busying himself with cleaning-up the Workshop before we left to go outside and then to the computer lab. Everyone was standing, except Carissa, who was perched on a stool pulled-up to the table.

Scaling talk and bodies. After I had passed out maps and markers for planning, William asked if his group could make multiple images or words — three to be exact. Carissa attributed this question to William wanting "to be complicated." But to me, the question helped me realize that the teens probably did not understand the scale to which they would have to inscribe their word or image in order for it be recognizable as some *thing* to a viewer once the tracks were uploaded into interactive mapping application.

In a comparatively "schooled" excerpt that follows (we were inside, relatively stationary, and I was facilitating a discussion around paper maps), I launched into an exploration of this scale issue in relation to inscribing with a GPS device that has a margin of error of +/-five meters. This excerpt was the first time during the GPS drawing activity that youth engaged in spatial problem-solving; planning to make a drawing necessitated that they *scale* their physical mobility *relative* to three other scales: the neighborhood (and its various obstacles), the map (and its various omissions), and to the constraints of the GPS device (this margin of error problem). In my analysis, and as Soja (1989) has suggested, I attended to the geographic scale of the youth's responses as a way to understand their production of meaning in relation to maps, geospatial tools, and their own mobility through the neighborhood. The youth highlighted or paid attention to one scale over another in their responses to my question. Individual preference demonstrated how participants could preference the scale of the body over the map scale or vice versa, but as a sociocultural activity, how processes of sense-making operate at and leverage multiple scales.

As the excerpt begins, Carissa and Leah have already gotten down to the business of planning what they are going to make in a side, but audible conversation. They have entered into the space of my questioning by Line 9.

Excerpt 3. The youth and I explore being "accurate" when drawing with a GPS device.

1	Katie:	Well, OK, let's talk about this. [What-
2	Carissa:	[OK, so what are we gonna do?
3	Katie:	[Use-
4	Leah:	[I love you.
5	Katie:	OK, so we're gonna use the GPS devices, [right?]
6	Carissa:	[How] can [we make] that in a path like that?
7	William:	[Hm-hm.]
8	Leah:	[Like that.] ((*Draws path with finger on map that Carissa is holding)*)
9	Katie:	Is [it going to be]- is it gonna be more accurate, if it's BIGger? If it- if tha scale is bigger, like you use more of the neighborhood? Or is it gonna be more accurate if it's smaller do you think?
10	W,W,,L:	Smaller.
11	Katie:	Why?

12	Leah:	'Cause it's easier. Like if- ((*steps away from table, puts feet together and draws a box around her feet*)) if it was like this big, you'd just go like that ((*takes two steps forward))*. Which, if it's huge ((*turns to her right and takes four steps))* you gotta walk all the way up here ((*turns around and comes back to table))* and it's [too complicated.]
13	William:	[And you might get] lost.
14	Katie:	Oka:y.
15	Wallace:	And forget.
16	Carissa:	And then there's a chance you might kinda drift off [to the side a little bit ().]
17	William:	[Like if you could- if you were gonna write "I,"]
18	Katie:	Uh-huh.=
19	William:	=((*Traces lines with index finger on map of neighborhood*)) You could go up here and then turn, and turn on THIS one instead of going all the way up here, and doing all that.
20	Katie:	((*Holds two Jeremy Woods drawings in hands))* Look at this scale. Is this a big scale or a small scale?
21	William:	[Big.
22	Leah:	[That] is a [hu:ge sca]le.
23	Carissa:	[Big scale.]
24	Fred:	That's hard. ((*Smirking*))
25	William:	That's a [big scale.]
26	Fred:	[()]
27	Leah:	[That took forever.]
28	Katie:	[Is that multiple city] blocks, or-
29	William:	Multiple.
30	Katie:	Yeah.
31	Leah:	Dang, that-

Figure 5-6. Leah answers (Turn12) my question about drawing at large or small scale and its relation to accuracy by drawing a box around her feet, taking small steps forward, and then turning to her right to walk across the room.

Carissa and Leah were already imagining how to write, “I love you” through the neighborhood. In the first nine lines they both had their heads down, looking at the map to determine the feasibility of walking and writing those three words. Carissa was skeptical of Leah’s suggestion. Although they were talking over me, their eagerness to get started with the planning phase demonstrated a real sense of engagement and excitement toward this novel (some might say strange) activity. It should also be noted that having done this same activity with several different groups of young people and students, Carissa, Leah, Beth, Fred, William, and Wallace were the only group of kids who did not ask me, “why would anyone do this, anyway?” With the Workshop teens, and in the context of a study that had already involved ground-truthing, geocaching, and carrying around a GPS tracker, skepticism was replaced by a willing enthusiasm to try something new.

Over the girls’ conversation, I introduced the idea that accuracy and scale are related (Turn 9). Had I thoughtfully planned a discussion on scale beforehand, I probably would not have used the word “accurate” as emphatically as I did. In retrospect, focusing on scale as a

concept in the Woods drawings first, and then talking about how the issue of scale related to walking around with a GPS device to draw or write, would have helped me better understand how they were using scale before and after doing this activity. But, as it was, at least William, Wallace, Carissa, and Leah (the camera did not pick-up audio from either Fred or Beth here) seemed to agree that walking and writing at a small scale would produce a less "complicated" word or image. Leah and Fred seemed to agree, too, that the smaller the inscription, the less effort it would require. Leah's logic behind this answer was given first (Turn 12). If Leah's response was representative of the group, the youth thought, like in drawing a straight line, there was less chance for error, or veering off course, if you made the line very short.

Leah's response was logical and leveraged her experience of drawing with pen at paper scale to drawing with a GPS device at the neighborhood scale. But her answer was remarkable for a different reason. The way Leah answered the question demonstrated how, even in a comparatively more "schooled" moment of interaction, a norm had been established by this point in the study (our seventh meeting) that bodies were very much a part of what we were doing. The scale of the body was just as important and legitimate as that of the map. Bodies were even part of answering questions. While Ms. Kay and Mr. Gray used their bodies (i.e., hands, gaze, talk) around the map to build claims for the future of Woodbridge, they never got up to *show* mobility away from the map. Leah leveraged her own body to make a sensible response to the question I posed. She showed us what she meant by walking a very short line forward in two steps (simple and accurate) versus walking across the room in four steps (complicated and inaccurate). She focused her gaze on the ground and her feet, rather than referencing the map that was inches from her face. Leah's words alone were sensible, but they could not stand alone, separate from the action she was performing with her body. The "this" and "that" to which Leah was referring could only be indexed to the box she drew around her feet and the steps she took toward the table.

Leah produced a small-scale walk-around space in the Workshop, already imagining herself outside writing/walking with a GPS device. But while Leah demonstrated a small, effortless, and accurate drawing, William, at Turn 13, touched on a different problem that is not

present in the familiar activity of writing with pen. William (and Wallace in other parts of the interaction) was concerned with the *invisibility* of the trace they would be making on foot, and how this invisibility could easily cause problems related to accuracy. They "might get lost." Unlike Leah who scaled her response to walking-scale and ignored the map, William returned back into map-scale to provide further explanation. William scaled his answer and the mobile body to the map, tracing an imaginary pathway with the tip of his finger to show a simpler version of a more complicated way to write/walk the letter "l" (Turn 19).

I followed suit, and continued to ask the teens to return to and consider the scale of the map when building a case for inscribing a large or small image or word. At Turn 20, I invited them back into the scale of Jeremy Woods' drawing of the dollar sign through Las Vegas (shown below), the base layer of which was a satellite photo. In asking them to consider this as either "a big scale or a small scale," they immediately and synchronously identified the scale as "big" or even "huge" (Turn 22). Fred and Leah quickly temporalized and embodied (drawing at this scale would require an enormous amount of physical exertion) the meaning of "big scale" in relation to this activity by saying, "that took forever" (Turn 28) to walk. I asked them to further scale their responses to "city blocks," an attribute that was easily visible on the map of the neighborhood they were holding. But city blocks are also a common measure of distance for urban pedestrians. Though not intentional at the time of this discussion, using city blocks as a scaling device was a way to bring the scale of the body to both the scale of the map and the walkable neighborhood.

From this point, I transitioned into talking about the margin of error that precluded the GPS device from locating a person in their *exact* location at all times. Either this explanation made sense to them, or the realization that Jeremy Woods' drawings were so huge caused all of the participants to change their stance on drawing at a small scale. Judging from their planned images, the youth emerged from this discussion with an understanding that bodies, mediating representations, and technologies support and operate at particular scales and these scales are relative to each other. For example, one's body might prefer to walk at a small scale because of the heat, because feet get tired, and because the cicadas are out in full force. GPS devices function better at a larger scale than what one's body might prefer to undertake. But these scales

can also meet to make something new and emergent.

Making the V: GPS drawing as lifelines. The walk through the neighborhood was dense with talk and stories. Topics included, but were not limited to, cicadas, the lack of sidewalks, running out of breath, being hot, being tired, the rainy weather, music videos, cute boys living in the neighborhood, bad drivers, drinking soda, a girl in "booty shorts," and dozens more. But the paths they created on foot were more than *story* lines. These routes they walked held their bodies together in coordinated activity with technology, elevated their pulses, fleetingly brought neighborhood residents into the interaction, sent them careening down hills on their bottoms, and elicited reactions from all the senses (yes, even taste as some of the teens carried sodas or excitedly found forgotten snacks in their pockets). Even though the mobility of the "scribe," or the person wearing the GPS device, was the only mobility that *actually* mattered for the creation of the image or word, all of the teens walked the planned routes together. Not one group decided to send the scribe down a dangerous, slippery slope alone or walk up a steep hill while the others stood back and watched, or took the easy way around. Therefore, I am calling these newly intentioned, collaborative pathways through a familiar landscape, lifelines because of the ways in which whole bodies were engaged and were held to one another in a place already teeming with action, memories, and sensation.

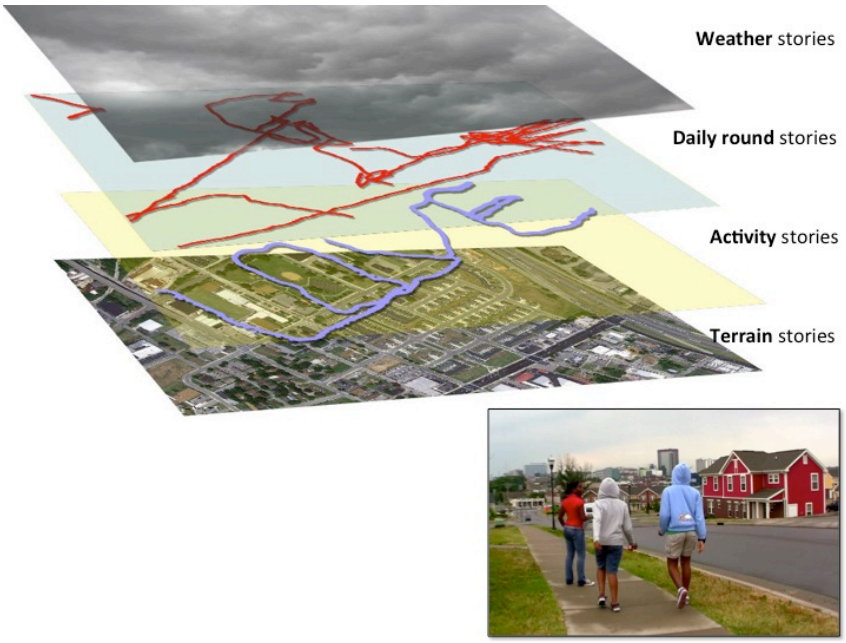

Figure 5-7. As the girls walked the word "LOVE" through the neighborhood, they constructed layers of stories related to the activity, stories indexing the neighborhood, stories from their typical daily round, and stories pertinent to the conditions of the time, day, and season. This rich layering came together in a lifeline visible in the inscribed word.

While both groups created and sustained lifelines, their manifestations on the ground, and thus recorded by the GPS device, took different forms. Leah's original suggestion to write "I love you" was shortened to just the word "LOVE." The boys drew an hourglass with sand dripping through it over the park. For this analysis, I follow the girl group to show how lifelines emerged from the activity, and how maintaining the lifeline motivated participants to quickly repair moments of trouble through spatial problem-solving or through peer regulation.

In planning with the map, the girls decided to write "love" over five city blocks, beginning a block north of the Workshop. Leah wore the GPS device on her wrist and a head camera on her forehead. Carissa carried the map with their plan on it, drawn in marker, attached to a green clipboard. Beth carried her soda can.

Immediately before the excerpt that follows, Carissa had just returned to the group after having run up to her apartment to get her mobile phone. The rest of the group — Leah, Beth, Kris, Jo, and Rogers — stood at the bottom point of the letter "V." When Carissa left to run this unexpected errand, the activity of writing over the neighborhood came to a complete stop. The lifeline was momentarily broken (as was the audio feed to the camera since Carissa was still

wearing the lapel microphone when she ran out of transmission range to her home), and the other participants stood around making small talk in a manner that significantly departed from the activity of GPS drawing (as was barely audible from the head camera that Leah was wearing).

When Carissa returned from her apartment, running down the hill back to the group, she was panting, short of breath from her quick trip up and down inclines. Without much pause, the girls picked-up writing/walking where they had left off, to make the right arm of the "V." Characteristically, Carissa regained her position in the lead with Beth taking-up a spot close to Carissa's arm. Leah lingered in the back, huffing and grumbling about the device she was carrying, the head camera she was wearing, and being generally tired (also typical of Leah). As they moved up the hill to make the right arm of the letter, Carissa continued to find her breath.

Excerpt 4. The girls make the right arm of the letter V in the word LOVE.

1	Carissa:	That's a big hill! Oh, man. ((*breathing heavily*))
2	Kris:	You didn't see THAT in the map, did ya?
3	Carissa:	No.=
4	Leah:	=Uh-uh, we need to get there, then- nah, 'cause that ain't gonna look right. Ugh. I told you you shoulda [let us-
5	Beth:	[This is a slippery hill!=
6	Leah:	=We can go straight, [it will still be a V.
7	Carissa:	((*running down hill*)) [AHHHHHHHH
8	Beth:	((*falls on bottom and slides down hill, laughing*))
9	Jill:	O[oo.
10	Rogers:	[Hahahaha]
11	Jill:	[Careful.]
12	Kris:	[You alright,] Beth?
13	Leah:	Beth, you always fallin'. Oh, I gotta be the one to- ((*squats and slides down hill*)) Ugh, ugh.
14	Beth:	((*continues laughing*))
15	Jill:	((*laughter*))
16	Leah:	That was terrible=
17	Beth:	=That was slippery.
18	Carissa:	Ok. ((*still breathing heavily*))

Figure 5-8. The girls walk the right arm of the letter "V" as shown from two camera views: The researcher's camera, and the head camera worn by Leah. Frames are numbered to match the turns of talk.

In making the V in "love," the girls ran into unanticipated trouble caused by the three-dimensionality of the terrain. Neither the map, nor the line they drew in the planning phase, considered hills and slippery grass as Kris pointed out (Turn 2) to Carissa. Carissa's shortness of breath was the most audible consequence of this variability in the terrain since she was wearing the lapel microphone; her heavy breathing was a constant rhythm in the video record. Once Leah saw the steepness of the hill that lay in their path, she did some quick problem-solving. Leah suggested an alternate route that would still, in her estimation, produce the right arm of the V (Turn 6). Carissa could not be deterred, however, and, with Beth at her side and clipboard in hand, marched forward (or down) on their planned course. Even though the only person's mobility that actually *mattered* for the GPS drawing was Leah's, all three girls put the cleanness of their backsides in peril by traversing down the slippery slope of the V. This decision proved most consequential for Beth who fell and slid a few feet on her bottom down the hill with soda can still in hand (Frames <8> -<13>). Even though Beth did little more than giggle, the reaction to her fall from the rest of the group (laughter and concern) ensured that this event would be an occasion for remembering later in the computer lab.

Leah considered the fall typical of Beth (Turn 13) but quickly realized that she had to traverse the same path and might meet the same fate, too. Even though she wanted to go around the flatter part as she suggested earlier, the lifeline that connected her to the other girls

pulled her down the hill (Frame <13>). As she begrudgingly and noisily followed the path, Carissa and Beth turned back to watch and wait on her to catch up (Frame <16>) and fall back into formation. (Dirk made a similar move under the stoplight at the intersection where Carissa and Leah "met" the bus.) When the three adult researchers violated the lifeline, Leah was quick to call them out for it (Turn 19 below).

Excerpt 5. The lifeline is broken by the adults, but is repaired and continues to emerge.

19	Leah:	((*looking at adults*)) Ah, and [they get to walk around.]
20	Rogers:	[Y'all did great. Keep it] up!
21	Jo:	((*laughing*))
22	Beth:	Hold up! I gotta walk [around] the poop! ((*laughing*))
23	Carissa:	[U::gh.] Leah give me tha thing!
24	Leah:	I got it.
25	Carissa:	'Cause you-
26	Leah:	Oh, I'm sca::red.
27	Carissa:	Huh. ((*still breathing heavily*))
28	Beth:	((*squeals*))
29	Carissa:	((*walking up hill*)) Huh.
30	Leah:	I am not trying to die before I go (.), [before I le:ave]
31	Beth:	[Uh, there's dog] poop over here! ((*laughing*))
32	Leah:	I can die when I come back, but not right now.
33	Beth:	Ah, here she go. Let's ask her for them- for free- some freeze pops.
34	Leah:	She doesn't even sell those things no more. It's been like three years.
35	Beth:	((*giggling*))
36	Leah:	It has!
37	Beth:	I know.

With sarcasm in his voice, Rogers acknowledged how they, the adults, violated the lifeline by walking around the steep hill rather than going down and then back up again as the girls had done. Jo laughed as a co-conspirator (Turn 20). Carissa, however, was too busy worrying about the task at hand to let the adults moving around the hill bother her. Beth was circumventing dog excrement, trying to keep-up with Carissa.

Throughout the walk, the presence of the GPS device repeatedly re-surfaced as yet

another agent co-producing this lifeline. As a party connected to, and to some extent, controlled by Leah's wrist, the device caused much ire between Carissa and Leah. Throughout the trek, Carissa doubted Leah's commitment to her job as the scribe. On several occasions, Carissa demanded Leah give her the GPS device so that she could be in charge of what was being written over the neighborhood. For example, a few minutes before making the V, the girls passed a family in the driveway of a house that the girls knew well. The parents and an older man stood outside the car and two kids that were close to Leah and Carissa's age were sitting in the car. Leah left the formation to stop and chat with the kids in the car, and Carissa began regulating the position of Leah's body to fall back into the formation of the lifeline. Carissa exclaimed dramatically, "Hey! No detours! Leah! Leah!" Carissa walked-up behind Leah, grabbed a handful of Leah's sweatshirt, pulled her away from the car, and yelled, "You have the GPS machine! Let's go!" Each time, Carissa scolded Leah, or demanded the GPS device (e.g., Turn 23), Leah refused her (Turn 24) and fell back into the lifeline to do her job.

While going down the hill posed its own trouble for the girls' bodies and the validity of the V they were drawing, going up the hill created a different set of issues. The upslope was just as steep as coming down. Beth tried to use both of her hands to pull her up the hill (but one hand was holding a soda can). Trying not to fall on one's face on this incline caused Leah to hyperbolically fear for her own life, while Beth squealed over the threat of stepping in dog refuse. Again, pulses went up, and the labored breathing of Carissa on the researcher's camera, and of Leah on the head camera she was wearing, became dominantly audible.

But as soon as perceived threats to the body dissipated, spatially-indexed stories and memories resumed. After the girls topped the steep hill, Beth looked over to her left and recognized the apartment they were passing as the residence of a familiar person. Her spatial association was one related to a woman who used to sell "freeze pops" to the neighborhood kids. Beth even suggested, probably jokingly, that the girls should stop and ask for one. Leah remembered the woman, too, but insisted that she had not sold "those things" in "like three years" (Turn 34). Beth giggled and eventually agreed with Leah that she was right.

Following this excerpt (turns not shown), the conversation quickly turned back to

excrement and the sensations of the body as Carissa asserted that the predominate smell permeating the air “smells like baby poop.” Beth disagreed and said it was dog poop. Kris laughingly agreed with Carissa saying, “It *does* smell like baby poop.” Leah went on to talk about residents’ cars parked in the lot they were passing through that she recognized.

Making the word “love” was much more than walking a planned route through the neighborhood. Instead, the girls, and the researchers that were with them, produced a new, dynamic trajectory of stories, memories, bodily sensations, fear, surprise, technological cooperation, and familiarity. Some places on this trajectory, or lifeline, were places they had been many times before. Other places were new because they had never walked this particular route to get to frequented locations. For example, why would anyone walk up and down this steep ravine to get to the “freeze pop” house when you could just walk around as the adults had done? This particular activity created an occasion to take this novel route, and produce a brand new layering of stories that spanned the past and present. An orientation to future time was much harder to distinguish in talk and interaction as the youth traversed “love” over the neighborhood. Youth desires for the future emerged in other activities, and were more typically responses to adults questioning or explicit tasks asking them to contemplate urban change.

Discussion of the Activity: Lifelines to Errors

The next and final phase of the GPS drawing activity was to view and discuss what the groups had made in the university computer lab. This phase of analysis was dramatically different from the phase of making. Compared to the (literally) liveliness of the planning and making phases, the analysis phase seemed void of life. Once viewed on the overhead projector in the computer lab, the lifelines that emerged on the ground (sadly, to me) transformed into a litany of errors and *inaccuracies* for the youth once in the computer lab. Leah no longer enthusiastically used her body to respond to adult queries and lead conversation, but instead obsessed over the errors that the GPS device left in the record of their movement. Even though the word “love” was easily visible (and I would argue, beautifully done), both Leah and Carissa were hyper critical of their inscription. While the girls wanted to express in the GPS drawing the

love they felt for their neighborhood, they felt very little of that toward the device itself in the viewing phase. The boys were not even willing to show their creation, feeling embarrassed about their efforts after seeing what the girls had made. (We made them show their drawing following the girls' presentation.) The layering of stories, feeling, memory, embodied responses, collaboration, and group cohesion that existed on the ground was reduced to a critical self and technological appraisal of performance, as viewable and measurable by the track data on top of a satellite image of the neighborhood.

Seated in the computer lab, Leah excitedly volunteered to display the girls' GPS drawing first. Leah's excitement quickly dissipated when Kris, one of the adult researchers, uploaded the track data into Google Earth™ and pulled it up onto the overhead projector. Seconds after "love" came into view, the room erupted into exclamations, and even applause, of praise. But the first words audible from a youth participant were from Carissa, which were a cutting critique of the girls' V (Turn 5 below).

The adults and the youth took very different stances toward this activity of analysis. The adults in the room tried to resurrect the liveliness and the accomplishment of the making of the GPS drawing; Leah and Carissa critiqued *and* defended their drawing against the device falsely representing where their bodies were in the neighborhood. The girls' dislike of the devices lasted throughout the study, even re-surfacing as comments on the final day of the study during wrap-up interviews. These two stances toward viewing and analysis were only fleetingly reconciled in this phase of the activity.

Exceprt 6. The girls' GPS drawing is displayed before their peers and the adults.

1	Dirk:	Alright.
2	Katie:	Swee:t.
3	Pete:	Wow, you guys.
4	Rogers:	Ya:::y!! I'm feeling the love now!
5	Carissa:	Our V looks really retarded, though
6	Off-cam:	((*someone claps)*)
7	Leah:	How did we get that little blue spot? Like, I don't remember going there.
8	Cecil:	Who did-who did that?
9	Pete:	The top of that V?

10 Leah: Yeah, I don't remember doing that?

11 Pete: Other than that, it looks awesome.

12 Leah: We never went over there!

13 Carissa: Yeah, ((*laughing)*) I'm not understanding that.

14 Leah: We didn't never go over there!

15 Rogers: That V looks pretty good, doesn't it?

16 Katie: Yeah, that looks great.

17 Rogers: Remember going up those hills?

18 Leah: Something's wrong with that thing. We never went that way.

Figure 5-9. LOVE was displayed on the screen and people responded differently.

Across the *scale of doing* to the *scale of viewing*, drastically different ways of engaging in the activity of GPS drawing were produced. At the scale of viewing, the interaction was reminiscent of school. Youth were in a computer lab, seated at desks behind computers, putting their products on display for a historically competitive and critical peer audience. Active, engaged bodies were replaced by analytic, doubting minds. And, unlike the adult researchers in the room who had several years of experience with the mistakes and inaccuracies of GPS technology, the youth were just discovering for the first time that they were given an untrustworthy instrument with which to draw. To some extent, Pete, and especially Rogers, were probably exuberantly relieved

to see that the devices worked at all, validating all of that physical exertion of walking through the neighborhood. Leah and Carissa, on the other hand, felt betrayed by the device; all of their planning, thinking on their feet (quite literally), and physical exertion had been unfaithfully recorded and represented.

Leah was most troubled by the errors of the device because she was the scribe after all, and her dedication to this role was frequently questioned by Carissa. She felt personally responsible and violated by the device saying she was at a place where she knew she did not go. The most troublesome example of this to Leah was the top right arm of the V that showed the girls having walked through or on top of buildings. While the rest of us were admiring the entire composition of the word "love," Leah could not talk about anything else other than the V. Upon repeat viewings of this video for transcription and analysis, I was reminded just how annoyed I was, as the facilitator of the discussion, toward Leah's obsession with what seemed to me minor, inconsequential device errors. After all, the word was perfectly and beautifully legible and clearly showed how they negotiated with the neighborhood terrain to write a lovely message. In the moment, I tried to move on to discussing the on-the-ground challenges that were not visible on the map during the planning phase (Turn 19), and Carissa was with me (Turn 20). But Leah was insistent in pursuing a vehement indictment of the GPS device. In an effort to get her to stop harping on the device errors by giving her the floor momentarily so she felt adequately heard, I called on her to go up to the front of the room and show us what she was so upset about (Turn 24).

Exceprt 7. Leah is upset by the errors created by the GPS device.

19	Katie:	OK, so you-you guys, tell me-tell me, uh, what were some challenges you faced going from planning on the map to actually walking it in the neighborhood=
20	Carissa:	=the V=
21	Leah:	=We never went that way.
22	Carissa:	((*laughter))*
23	Leah:	I SWEAR we never went that way.
24	Katie:	Hey, uh, Leah. Why don't you g::o, s-stand next to Kris and letsss-tell her where to- where you want to point the mouse, or you use the mouse and show us what you're talking about.

25	Leah:	((*Gets up from desk, walks over to computer and grabs mouse.))* That little piece right here- ((*moves mouse over the top of the V))* that little triangle piece, we never went over there.
26	Katie:	Ok.
27	Leah:	I don't know why it did that.
28	Katie:	So that's just an error, you think?
29	L&C:	Yeah.

Carissa wanted to answer my question about the challenges from planning to making, but the lifeline that held the girls and adults together at the scale of doing was no longer present at the scale of viewing. Even though Carissa was setting one course of analysis (Turn 20), Leah forged ahead with her own agenda of indicting the GPS device and proving that she did not go the way that was shown on the satellite image of the neighborhood (Turn 21). After Leah pointed out the erroneous "little triangle piece," I attempted to diffuse Leah's anxiety around the issue of device errors. At Turn 28, I somewhat flippantly suggested that this straight-edged triangle was probably an error, and the girls agreed with me in unison.

This diffusion tactic worked momentarily as Leah was able to move on to answering my next question about the physical challenges of making the drawing. It also gave Carissa some interactional space to talk about how making the V was difficult on her body in terms of the hilly terrain. But this resurrection of life to the activity was short-lived when Kris zoomed-in closer to the letter V in an attempt to elicit a rich story about Beth falling-down on her bottom. Instead, this zooming only had the affect of perturbing Leah more and she returned to an errors analysis.

Excerpt 8. Leah and Carissa respond to challenges on the ground before Leah is shocked once again to find more errors.

30	Katie:	Ok. Ok. So what's a challenge that you guys faced?
31	Leah:	That uh- that E. Cause we had to go- we had to cross- oh.
32	Katie:	Yeah, show us on tha-
33	Leah:	((*Moving mouse around to highlight places on the screen))* We had to cross over right here, then we had to go back, and go down, over, come back, go down go over, come back. And then-
34	Katie:	So, was something in your WAY, is that what you're saying?
35	Leah:	No, it was just a lot of walking.
36	Katie:	Oh, it was a lot of walking? ((*looks over to Carissa who has her hand raised and points to her))*Yeah, Carissa.

37	Carissa:	Um, the hardest part that I thought it was was the V 'cause, of course on the map, everything looks all flat, but then when you start walking up there, there's a bunch of [hills and houses and-
38	Kris:	((*zooms in to arm of V))* [so what happened here?= ((*moves mouse over a dip in the line))*
39	Carissa:	=And all that. Um, see yeah, that was a big hill right there that we had to go up=
40	Leah:	=There go some more errors! We never went through them trees!

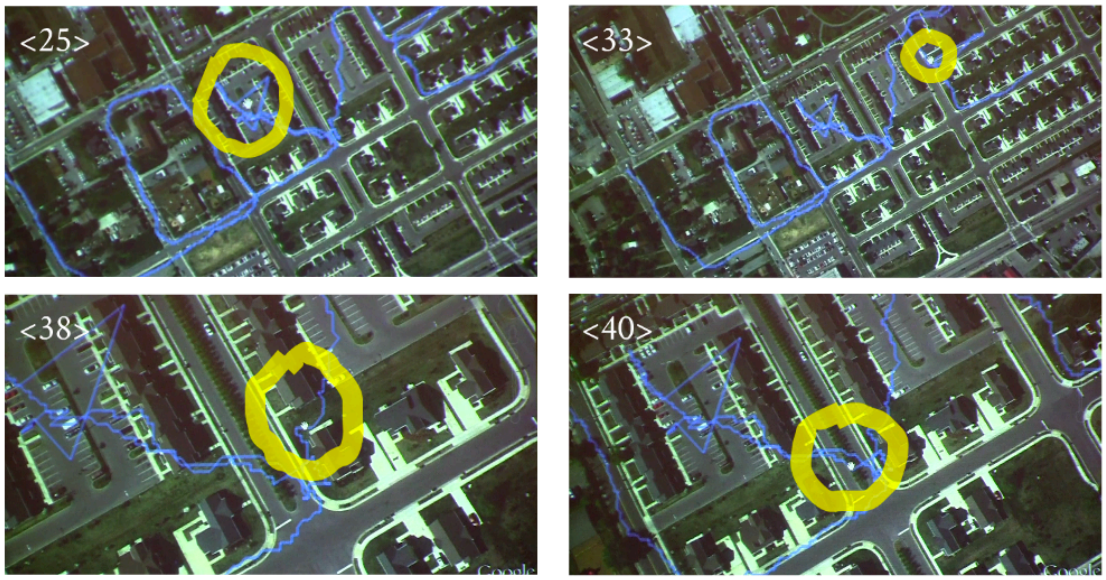

Figure 5-10. Each image is a screen shot corresponding to a numbered turn of talk (numbers in the upper right corner). Areas of each frame are highlighted with a yellow circle to show where Leah was attending to errors in the GPS record.

The girls began describing the capacity of their bodies for either a lot of mobility or hilly mobility. Leah described drawing the E as "a lot of walking" because of all the backtracking they did over the lines they had already walked once. When zoomed-in to a particular scale, the GPS drawing made it apparent that they had traced the same route twice because the lines were not directly on top of each other. Carissa reported that her most challenging experience was drawing the V rather than the E because of going up and down the hilly terrain. Kris wanted to provide support for this narrative, probably remembering the dramatic slipping and sliding down that was described in Figure 5-8, Excerpt 4. Kris moved the cursor over a sudden dip in the track data, and asked the girls to report on "what happened" there. Kris's conversational move could have provided entrée to a vibrant story of Beth falling down, the adults cheating the lifeline, and Beth

having to avoiding a mess of dog poop – all on-the-ground experiences that the map could not show. Carissa's recollection may have been approaching these story-able qualities (at Turn 37 and 39) but was interrupted by Leah finding more errors in the display.

Out of Leah's fourteen turns of talk in this excerpt, eleven of these turns dealt with technical errors. Beth barely said anything, and if she did, it was completely inaudible in the film record. The girls' playful and loving banter also subsided during this phase of the activity. At the scale of viewing, there were no more cicadas, no shortness of breath, no cute boys to talk about (even though Fred wished he was the target of that kind of attention from Carissa), no more music videos or ladies selling freeze pops. At the scale of viewing, the smell of diapers vanished, as did the (hyperbolic) fear of death. At the scale of viewing, what was immediately visible on the screen – GPS track data layered on top of a satellite photo – directed youth talk. Even though the adults in the room kept pushing and searching for stories that emerged from walking "love" through the neighborhood, the youth were making sense of what was going on with the device and why it was showing what it was. At the scale of viewing, talk was much more like reporting and comparing fact with fiction than it was constructing a sustainable sense-scape.

Being able to tell and scale stories over these novel representations of maps (construct sense-scapes) layered with track data was a learned skill, and the youth got better at this after GPS drawing (in the next episode that follows). Seeing traces of one's mobility over a satellite image with an audience proved to be a novel and engaging experience for the participants, but something that took time to make sense of. As compared to the Jeremy Woods' GPS drawings that I used to introduce this activity, the GPS drawings created by youth were not as elaborate. However, to those of us in the room who knew the persnickety and "lying" nature of these geospatial tools, the teens' creations were beautiful, eliciting emotional responses. Over time, as will be shown in the next episode, youth lost their naiveté with not just maps, but with the tools that make maps, as well, and began to expect and use these inaccuracies as fodder for playfulness and imagination. This was not the case at the scale of viewing in GPS drawing, but became so the following week.

As an analyst, the richness of this activity occurred in the Workshop and on the ground,

in contexts that resembled school the least (and resembled and contacted "real life" the most). Youth inscribed a new kind of walk-around space that told their own story, not about middle class suburban life or cottage courts, but about love and the sands of time (remember the boys drew an hourglass with sand dripping through it right next to where they attended school). The teens made their own sense of this Woodbridge landscape that assembled their bodies and biographies around maps and geospatial tools not entirely unlike the conversations at the tables in the CPU. Sam and Ms. Kay also inscribed their desires (assembled from sensuous experience, biographies, and values) over the surface of Woodbridge, Sam with a pen and Ms. Kay with her hands.

Analysis of Personal Time Geography:
Telling the Daily Round Across Spatial and Temporal Scales

The second episode from the Workshop for this chapter about constructing sense-scapes comes from an *analysis of personal time geography* session in which youth looked at their own mobility, captured by a GPS device (a TrackStick™), after taking their new bicycles home. The analysis of personal time geography session is important for this chapter because this session looked similar to the activity of viewing their GPS drawings, but differed in some important ways, too. These differences demonstrate how, just two days later, youth had become more accustomed to seeing their mobility from this unusual, overhead perspective. Their talk over top the GPS track data was more playful, creative, and youth had moments of moving past the concern with device error to narrate how this representation was not just of their mobility, but of their spatial identity, too. Lifelines materialized once again, this time in the lab, bringing the youth together in "generating intensity and the excitement of emergence" (Leander & Boldt, 2013, p. 26) around technically-mediated pathways. As youth became more familiar with this technology, and seeing their mobility on top of a map of the neighborhood, they were able to scale and tell stories of place without having to be *standing* in that place. Even Leah was able to find moments of playfulness amidst persistent device errors.

Like the viewing of the GPS drawings, the analysis of personal time geography session

also occurred in our university computer lab. This meeting was our last for several months, so I was conducting individual, wrap-up interviews in a separate room while Kris facilitated the discussion of everyone else's track data. All participating youth, Cecil and Dirk from the Workshop, and researchers were present for this session.

Summary of the Activity

Youth were asked to carry a GPS device with them at all times during two, five-day intervals—once *before* and once *after* completing their bicycles. I expected the resulting set of tracks (longitutde, latitude, time and speed) would provide a partial record of their *daily round* – patterned traversals through the city directed towards purposeful activity – in their neighborhoods. As the youth kept these GPS data loggers with them for five days after getting their bicycles, I also asked them to keep a written record of what they did, where they went, how they got there, who they were with, and how much they enjoyed that activity in a folder I called a time diary. The youth knew that when they returned to the workshop, I would gather their tracks, lay them over the surface of an interactive digital map, and ask them to look at and analyze their data in relation to what they remembered, what they recorded in their time diaries, and what the base layer mapped showed.

I had several reasons for designing this activity. Cecil, the director of the Workshop, wondered if youth mobility changed after going home with a bicycle. Related to this, I wanted to know what sense youth would make of GPS devices and the data layers they provided for spatial analysis and modeling. I hoped that capturing, displaying and making sense of personal mobility over multiple days, and with different means of transportation (walking, biking, or being driven), would lead to changes in how youth understood their relation to the city and its assets and make them more comfortable with spatial information. I also expected that representational reflections over their daily lives would provide youth with opportunities to imagine different activities and arrangements of the built environment in the future (i.e., materials for counter-mapping).

Asking youth to capture, display, and interpret a record of their on-the-move selves was a dramatic, technical re-mediation of their everyday activity and an invitation to engage in novel

forms of spatial activity in thirdspace – their concrete, embodied experiences through places were meeting abstracted space. Looking at and talking about this record would further support the idea that representations—even paths captured by "God's Perfect Sight" devices – were partial and selective accounts of daily life through the urban terrain. During the analysis of personal time geography, youth were asked to publicly make sense of their movement over time, captured from a perspective they had never literally experienced (i.e., entire days, seen from ± 15,000 feet above the surface of the earth). Displacing personal experience into spatial forms (e.g., track layers over aerial photographs) provided youth with a new way to experience the relation between their lived world and cartographic representations of human activity. I wondered if youth might make sense of this new relationship through constructing sense-scapes as the adults had done in the CPU.

The entire analysis of personal time geography session lasted forty-two minutes and was introduced by Kris as "We're going to be looking at where you've been, so we're gonna be all up in your business." Displayed as continuous lines by the software, the track points were layered over the top of a scalable, satellite image of the city. These were projected on a screen at the front of the computer lab. While this display was novel for participating youth (and for the Workshop adults), I conjectured that a densely detailed record of place over time would provide rich materials for exploring the relation between personal experience on-the-move (e.g., riding around a city park) and a more synoptic, map-like view of how those activities fit into the scale of the neighborhood and surrounding city. I also thought the activity would provide a novel setting for constructing sense-scapes. Since sense-scapes are built crucially out of a sense place, sensuous experiences of the body (Grasseni, 2009), and a desire to make sense out of the abstracted landscape, this activity presented participants with a novel invitation to understand and disrupt the representation of their own mobility. Youth engaged the activity with great interest, though critical reactions by peers also presented challenges to constructing a sustainable sense-scape.

Of the six participants, five youth returned track records, with Fred refusing to use the device after his grandmother suggested the police would have access to resulting data[6]. William and Wallace collected the most track points (3,181 and 2,298, respectively). Among participating girls, Carissa had the most track points (849) followed by Leah (668) and Beth (206).

Description of the Focal Episode

I chose to analyze the presentation of the two brothers, William and Wallace, and the ways that Leah and Carissa responded to this presentation. The brothers' data were the second and third sets of GPS tracks displayed in the session, and by comparison with the first display (Beth), their relatively massive sets of connected points provided a stark visual contrast of youth mobility on bicycles. I also selected the brothers for close analysis because their track data sparked a playful discussion about discrepancies between mobility patterns displayed on the screen and their claim to have "stayed together the whole time" while carrying GPS devices. Playful peer criticism of stories told about the daily round involved delicate aspects of creating sustainable sense-scapes as well as new forms of spatial thinking.

Recording, displacing, and reclaiming bodies in motion. The track data, displayed over an official map of city neighborhoods, was a displacement of lived experience for participating youth. The track display simultaneously captured much less than their experience of the neighborhood (e.g., locations over time provided no information about places desired or avoided by participating youth), but also much *more* about their comings and goings than would typically be available to memory or in stories told of past time activity. As I will show, youth made sense of these track displays by re-inserting lived bodies and their own sense of self in place into narratives that spanned multiple scales of the daily round and stood up to concerns with recovering "the truth." These sense-scapes were often co-constructed, layering together the presenter's selective memories of recent days with shared, sense-making efforts to build plausible, sustainable narratives for traces of personal mobility shown on the screen. Analyzing one's personal time geography placed the technical capabilities of the devices (and their users) in

[6] The study protocol, signed by all participants and their parents or guardians, clearly ruled out this possibility.

tension with the possibility of being perceived either as a person who did not get out much or as a couple of "busy bodies" (Carissa's assessment of William and Wallace in the excerpt, below).

By comparison with other participants, William and Wallace's track data were visually stunning when displayed in Google Earth™ (see Figure 5-11), with paths tracing over twenty miles of urban terrain. Once Wallace's tracks were displayed alongside William's, track lines shown for one but not the other were noticed quickly and discussed by peers. While the brothers clearly were adept at using the devices (and creative, as we discuss later), their capacity for turning so many GPS track lines into a coherent account of the last five days was another matter.

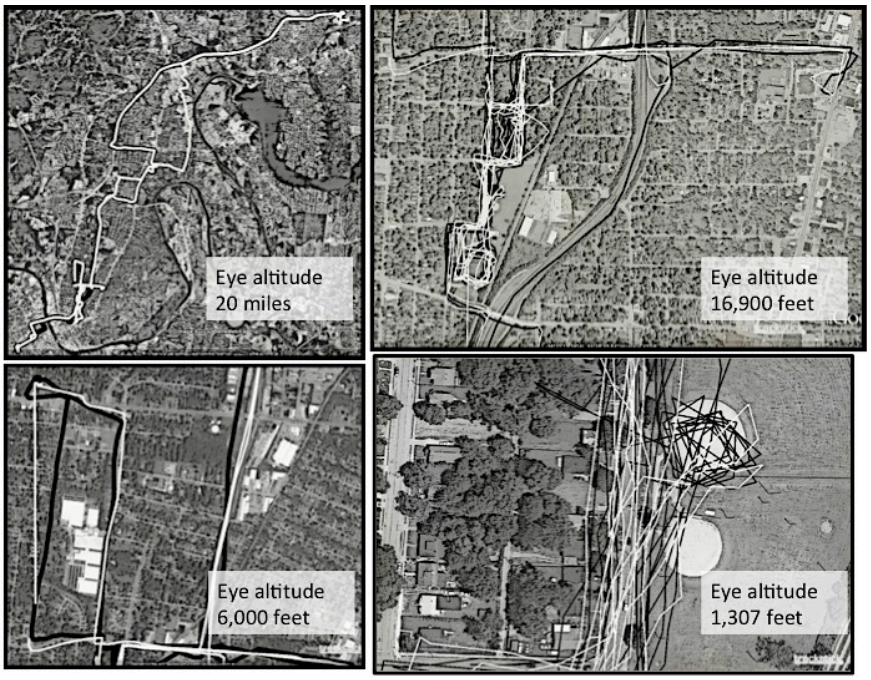

Figure 5-11. The brothers' track data displayed at various altitudes over the course of the interaction.

At William's suggestion, Kris colored the brothers' tracks red and white. Displayed over a greenish satellite image, the red and white lines made it easy to see where their paths diverged. The moving bodies of two teenage brothers across a seamless photograph of the city quickly became a topic of conversation.

Excerpt 9. Discrepancies between showing and telling about moving bodies.

1 Kris: Alright, so, William is white and Wallace is red.
2 Wallace: ((*softly, smiling*)) How did I go around there?

3	Kris:	So Wallace, you didn't go as many places as William?
4	Wallace:	Um…
5	William:	Maybe the track thing just wasn't working.
6	Wallace:	Yeah, there's-
7	Kris:	It coulda not worked.
8	Wallace:	It says, it- We were in the same car when we went to the movies, but [it says-
9	William:	[Yeah, we stayed together the whole time.
10	Wallace:	I went around this way, and he went around this way. ((*points at screen, traces two paths*))
11	Kris:	So there's this over here, and then there's this over here. ((*cursor traces different red then white track lines to movies*))
12	William:	Yeah, I went both ways some how, and he only went one.
13	Kris:	Hm-hm.
14	Carissa:	Yeah, that's a little strange.
15	Leah:	((*laughing*))
16	William:	Even though [the whole time we were- We were together the whole time.
17	Carissa:	[They were in the same car.

Represented as traces over a seamless, aerial photograph, the brothers' physical similarities (e.g., dreadlocks, huge smiles) and differences (e.g., William is skinny and Wallace is not) were invisible. The rich, connected histories of these two bodies as brothers, traveling through life side-by-side, could be restored only through considerable spatial and narrative work – sense-scape construction. Particularly where color-coded paths diverged, an alternate narrative reality for stories about brothers as avatar-like characters opened up in conversation. GPS routes, satellite imagery, multi-party talk, and gestures linking talk to the display screen were layered together to tell what "apparently" (as Carissa liked to say) happened, but also to account for the character or identity of the brothers as young people.

Wallace stared with a surprised smile at the tangle of red and white lines before him. Puzzled by an apparent discrepancy in the display, he asked softly, "How did I go around there?" (Turn 2). As the conversation unfolded, it became clear that at this map scale—an "eye altitude" (a Google Earth™ term) of 20 miles above the surface of the earth—Wallace recognized a car trip he had taken with his brother to the movies. However, GPS track data showed diverging

paths for what appeared to be segments of the return trip (Turns 10 and 11). Wallace's body had apparently done something he did not remember, and this was typical of many youth participants in this session. Track paths as a record of the daily round held an uncertain relation to memory for or storytelling about personal experience. Kris also saw the discrepancy (Turn 3), as did Carissa and Leah (Turns 14 and 15). Perhaps in defense of his brother's credibility, William proposed the "track thing" (GPS device) might not have been working. With some laughter, the brothers and Kris arrived at what might have been a satisfactory explanation. What the GPS device "says" (Wallace animated the device as a party to the storyline) was probably a technical error, when compared with the brothers' assertion that "they were together the whole time" (Turn 16).

As seen before, one way to account for discrepancies when producing a spatial narrative was device error, as Leah reminded us over and over again. As a consequence, they began to question what these devices *said* as being at odds with their experiences, actions, and perceptions in the world. As they came to understand technologies for mapping more fully, they also began to question what was shown (and not shown) on maps. For example, while building layers of desired attributes (like Carissa's bicycle lanes at the beginning of this dissertation), the brothers puzzled over polygons shown in Google Maps™ of the area around their school, eventually discovering that these were outlines of a housing project that had been torn down years before this study began. Questioning the completeness of official maps, by comparison with what youth perceived or experienced on a daily basis, contributed to emerging practices of counter-mapping as the study progressed.

Finding mobility patterns by zooming across scales. Participants also made sense of their daily round by telling spatial stories across different scales of the urban terrain. Youth were quick to understand and use the "zooming" function of the software to reveal patterns at different scales within their tracks. Constructing a narrative across scales led youth to ask questions about what was visible at one eye altitude and then drill down to find answers at closer eye altitudes. Changing spatial scales was particularly useful with William and Wallace's track data, since they had a few trips far from home and then much more compressed mobility within their

neighborhood. At higher eye altitudes (e.g., 20 miles up), the red and white tracks followed roads across dozens of miles of the urban terrain. At lower eye altitudes, between 1,000 and 17,000 feet, track lines were more elaborately tangled, following residential streets, visiting familiar homes, and tracing circles in neighborhood parks (see Figure 5-11).

From roughly twenty miles up in the sky, the projected image showed the brothers' tracks crossing a river, spanning the city from the west to the east, following a major interstate north, and ending-up in an entirely different city. But Wallace also noticed "a cluster" of activity that looked interesting to him closer to home (Turn 18, below).

Excerpt 10. Zooming to find new mobility patterns.

18	Wallace:	What about [that little cluster, right there. ((*pointing at screen*))
19	Carissa:	[Apparently not. Someone's lying. ((*news anchor voice*))
20	Leah:	((*laughing*))
21	Kris:	This one here?
22	Wallace:	Yes.
23	Kris:	Wanna take a look at it? [Zoom in? ((*pans and zooms in on large rectangle*))
24	Wallace:	[Yes. Oh, that's when I drove all the way around, all- on my bike you know. [I went all the way around there. ((*laughing*))
25	Carissa:	[Man, you all are some busy bodies. (What were you doing with) all those li::nes?
26	Kris:	Where did you- you rode on your bike? Show [me where you rode on your bike.
27	Wallace:	[That big rectangle at the top.
28	Kris:	Up here?
29	Wallace:	I rode my bike all the way around there.
30	William:	You did?
31	Carissa:	((*to William*)) So did you, apparently.
32	William:	((*to Carissa*)) No, I didn't.
33	Wallace:	Oh, wait, no, no, no. It might have been the other way around.
34	Leah:	I was gonna to say, 'cause that's pretty far.

As Kris reached a closer eye altitude with the zoom function, Wallace began a new narrative about riding his bicycle "all the way around" a multi-block rectangle that emerged out of the cluster of track points (Turn 24). At this altitude, on-the-ground activities on foot or bike were

visible in more detail. Thin gray lines were recognizable as neighborhood streets, large green spaces could easily be parks, and a grid pattern emerged. While the higher altitude scale showed multiple cities, this scale showed *areas* of the city, including several different Woodbridge neighborhoods. At the scale of areas, the boys' tracks looked like knots of string littering the streets and a park.

Kris asked for more information about Wallace's bicycle riding (Turn 26), even as his story about riding a newly visible rectangle came under critical scrutiny by Carissa and Leah. Carissa began what sounded like a news report of false testimony (Turn 19), and then upon closer viewing, she positioned the brothers as "busy bodies" (Turn 25), once she could see their tangle of track lines on the map. Following on, Leah wondered (Turn 34) if the trip was even possible on a bicycle. Even William, who corroborated his brother's account of riding together in a car earlier during the presentation, wondered about riding the rectangle (Turn 30). But Carissa was not ready to let him separate from his brother's possibly exaggerated story of bicycle mobility (Turn 31). Despite the girls' joking skepticism, the rectangle claimed by Wallace was only 2 miles in perimeter, while the safety ride completed by the entire group was 2.8 miles round trip.

As the conversation continued (Turns not shown), Wallace decided the "rectangle" was actually a car trip to a relative's house (Carissa and Leah's skepticism was confirmed). But he again noticed a cluster of points (Turn 1, below; bottom right image in Figure 5-11), and after Kris zoomed closer to the ground, Wallace described his plan to draw circles while riding around in a baseball field in the brothers' home neighborhood.

Excerpt 5. Drawing circles by riding the perimeter of a baseball field.

1	Wallace:	Ok. What is all them clusters? ((*points, laughing*))
2	Kris:	How 'bout down here?
3	William:	That's where we live.
4	Wallace:	Oh, [that's- I think that's when I was riding in circles.
5	Leah:	[Um-hm::::
6	William:	Yeah, he was- he was mad, and I was (inaudible)
7	Wallace:	Oh, there, it's right there! Look.
8	Kris:	Here?

9 Wallace: Right - [go down.

10 William: [Oh, that red s- cluster. He was riding [a little ball (on the baseball diamond).

11 Wallace: [That's a little ball right there. I was riding in circles around the baseball field.

12 William: It was a baseball field.

13 Kris: Do you [wanna- do you wanna come and point to it?

14 Leah: [((*laughing*)) He [rode in a big circle.

15 William: [That cluster.

16 Carissa: Oh, I [see.

17 Wallace: [((*pointing, walking to computer*)) The red circle up there.

18 Kris: Up here?

19 Leah: That itty bitty circle.

20 William: [He's riding in circles on the baseball field.

21 Wallace: [Yeh, right there. ((*standing by Kris at computer*))

22 Kris: Oh, so you went around- ((*traces William's locations on side of field*)) William was like, I'm just gonna hang out over here, and you just went crazy around here? ((*traces Wallace's lines around baseball field*))

23 Wallace: Yeah.

24 Kris: Cool.

25 Carissa: And then he got angry.

At this still closer eye altitude (1,307 feet, bottom right image in Figure 5-11), a baseball field in the brothers' neighborhood was clearly visible, and there was no question that Wallace had set out to do something creative with his new bike and a GPS tracking device. As the conversation continued (Turns not shown), he and William also shared a shape they created by riding the perimeter of a running track, and they described other neighborhood activities like attending Vacation Bible School. In spite of their earnest pleasure in sharing their time together with new bikes, the girls continued with assessments that were humorously dismissive of the boys' creative efforts with a new means of mobility (Turns 5, 14, 16 and 25). As the brothers' presentation of personal time geography ended (also not shown), concerns about the boys riding on interstate highways were resolved by checking speeds listed with each track point, leading to a discovery (with great hilarity) that their aunt was guilty of speeding while driving them to the movies.

Synthesis of Designed Activities So Far

Telling the daily round in this novel representational form led to playful criticisms of youth presenting their activities to peers. For William and Wallace (similarly for other youth presenting their track data layers), what they remembered as pleasurable movement on new bicycles could also be held up for public scrutiny as exaggerated or perhaps even fabricated stories from a couple of "busy bodies." While we designed the analysis of personal time geography activity to make relations between lived activity and representations of that activity in the city visible, we found this activity also invited critical yet playful forms of identity work. Making sense of the daily round from 20 miles up in the air involved new forms of spatial thinking—zooming, unpacking clusters to find mobility patterns, and creating plausible stories about activities that could produce these records. This required that youth recover their own and others' bodies in representations that were dramatic abstractions from everyday life. Youth struggled to restore experiences with friends and family, in cars and on bikes, in movie theaters and on the baseball field, to create new spatial and temporal perspectives on familiar activity in their neighborhoods.

In an effort to bring together all three Workshop activities written about so far, I offer a comparison of how these relate to one another for the ultimate purpose of counter-mapping. Analysis of personal time geography inverted the relation between doing and representing what youth experienced during the safety ride as a form of ground-truthing. While riding in the city provided a way to discover problems with standard representations of the urban environment (i.e., traffic maps), zooming in and out of traces of one's activities in the analysis of personal time geography provided youth with a chance to see their activity from a novel perspective both in space (i.e., from one half to twenty miles above the surface of the earth) and in time (i.e., tracks were sequenced over as many as five days of activity). Making sense of the tension between the experience of one's daily round in city neighborhoods and a cartographic representation of that activity again provided youth with material for thinking about the adequacy of map-based representations and the layout of the city for their sensuous activities (e.g., playfully inscribing circles and rectangles by riding around neighborhood parks).

Analysis of personal time geography also inverted the relation between representing and

being represented in terms of how the GPS device was mediating the physical mobility of youth. While GPS drawing through the neighborhood, *youth* intentionally used the geospatial tool to produce an affective representation of and in a particular place. In the analysis of personal time geography activity, the *GPS device* used youth mobility to record and represent a layer of longitude, latitude, and time data over a base layer map. The tool was used to capture a (noisy) Cartesian version of traversing official space. At first blush, the *author* or agent within these two activities seems drastically different, first youth then the device writing the city with meaning. However, the APTG activity and the GPS drawing debrief demonstrated that there is very little meaning in the inscriptions of the GPS device without accounts of daily activities and playful imaginings of what was or what could have been in that space. In order for the abstracted landscape to have meaning, sense-scapes must be constructed.

All three activities were thirdspace practices where perceptions through space were meeting official representations of space to produce new, meaningful places. To play on the language of spatial *literacy*, youth were differently reading the neighborhood for re-writing the city. Youth engaged with and thought about familiar places in new ways with older and newer technologies (i.e., paper maps, bicycles, the street grid, GPS, and GIS). These new readings of the neighborhood supported them in authoring new pathways representing youth intent, excitement, and desire in the city. At times, youth participation was much less about agency and intentions and much more about the emergence of play and excitement. However, biographies, values, and desires for the future were never too far away. Different readings for writing the city of the neighborhood provided material and motivation for the final activity described in this dissertation – youth counter-mapping the neighborhood (Chapter 6).

Discussion

Like adults, youth eventually constructed sense-scapes to simultaneously understand and playfully disrupt the representation. However, the nature of youth sense-scapes was different than those constructed by adults because they had fundamentally different experiences of being in the city. By definition, the youth in my study were non-drivers. They were non-

employed, compulsory students. They were regulated by parental and guardian rules. They were also *teenagers* and therefore, identified differently to the study area and had different values than adults who have lived in Woodbridge for four, five, or six decades. Youth had not witnessed firsthand the ways in which Woodbridge had been carved-up by an interstate during the period of urban renewal, and were therefore, less critical of the "ways things were" on the ground of their neighborhoods as compared to the past. However, youth *were* critical, and became increasingly so, of the lack of teen-only or teen-friendly establishments in Woodbridge, and the absence of bicycle lanes and continuous sidewalks that would support their mobility. These criticisms were part of spatially-indexed accounts about the neighborhood that only youth would tell – girls in booty shorts, parents being strict, aunts driving too fast while they were in the backseat of the car.

Most importantly for this design study was, however, how youth produced places differently after maps and mapping tools were incorporated into more commonplace spatial practices, like walking to someone's house or riding a bicycle to the park. For youth, stories were readily available at the scale of doing. Moving through the neighborhood with map and GPS device in hand did not hamper how youth interacted with space and how they produced place as a rich layering of stories. In fact, at the scale of doing, GPS technology gave youth the opportunity to produce *another* layer of story-able, creative material: the girls wrote "LOVE" over the neighborhood to annotate a place for which they felt a strong affinity and attachment; Wallace drew dozens of over-lapping circles in his neighborhood baseball field while riding his bicycle and carrying a GPS data logger. In this sense, mapping technology afforded youth with a new way of telling a brand new or a familiar story.

Initially surprising to me, there was a stark contrast between how youth engaged with maps and mapping technology at the scale of viewing as compared to the scale of doing. Because youth had to first make sense of the traces their bodies left with GPS devices across abstracted space and over time, they were slow to construct sense-scapes. This finding supports the notion that "persistent" residents learned to artfully scale and tell stories over the map to eventually counter-map their neighborhoods after repeated exposure to and interaction with the map and the Transect. In the computer lab, and at the table in the CPU, sensuous experiences

were distant from the interaction at the scale of viewing, and had to be re-inserted through stories. But unlike the CPU, bodies were at least *visible* in the APTG where individuals were shown as white, red, or blue strings. Still, the resources of the body – what one could hear, smell, taste, and feel – were completely removed and youth were limited to building spatial narratives from what they could see on the screen and what they could remember. Losing these resources, as in any learning or sense-making endeavor, can be crippling not just for co-constructing knowledge, but for engagement, as well. But even though the body's senses were no longer available in the computer lab, their level of engagement in making sense of the representation was high.

Although youth were engaged in spatial reconciliation (across the scale of the body to the scale of the representation) in all three activities I have reported thus far, there was, I believe, a change in how youth engaged with the geospatial technology from GPS drawing to the analysis of personal time geography. Where analytic talk about the GPS drawing seemed stilted, in the APTG session the group was much more interactive and playful. Try though we might during the GPS drawing session in the lab, the adults (me included) were clearly unable to engage the youth at the level of creativity, playfulness, and excitement they demonstrated *on the ground* when making their inscriptions. But two days later, the youth had grown more accustomed to this novel perspective on their physical mobility – sense-making was happening faster, and device errors were expected. Carissa sarcastically attributed blatant device errors to someone lying, and joked that a mess of GPS tracks was indicative of Wallace getting angry. In the analysis of personal time geography session, the youth casually asked Kris to zoom in and out of the map to get clarity on particular areas of the track record, a function of interactive mapping applications with which they had significant practice by this point in the study. As the scale of the viewable area changed, the nature of observable spatial phenomena changed, too.

Becoming more comfortable with older and newer technologies was essential for building spatial narratives of home life, activity, and identity that were commensurate with representations of the community. These technologies supported youth in being able to scale their biographical, sensuous, dynamic experiences and desires to the relevancies of professional planners. Youth

gained more experience with the street grid (recall Carissa and William's observations about busy and less busy streets), became familiar with paper maps of the neighborhood, and battled and played with GPS devices and tracks. Even very early on in the study, youth had no trouble culling experiences in and observations from the neighborhood to produce places rich with meaning and desire. But *translating* these on-the-ground experiences with what maps and mapping technologies could show was beginning to emerge. By the end of the study, described in the next and last Findings chapter, youth were able to do this translation process – telling and scaling spatially-indexed stories – essential for counter-mapping. Youth articulating desires for the future of Woodbridge was not necessarily part of every designed activity, and typically occurred in response to adult prompts or from the structure of debrief moments or work in the computer lab. However, the teens enthusiastically entered into this thought experiment, especially when potential changes involved issues of mobility. In the next Findings chapter, I will attempt to show and argue that youth were adept counter-mappers in their presentations to local and regional planners, adult stakeholders, professional cartographers, and bicycle and pedestrian advocates.

CHAPTER VI

LEVERAGING "OFFICIAL" TOOLS AND DISCOURSES

What is the most powerful way to show what you know about a place? In what ways will your knowledge of home be the most sustainable? How do you translate what you know about your neighborhood or community so that it is pertinent to processes that drive urban development? These questions are essential in understanding how *insiders* or locals can *take place* in participatory planning processes.

In this chapter regarding the third characteristic of counter-mapping — that locals leverage official tools and discursive practices to make their claims to resources for the future — I will first describe what was learned from the CPU with adults in Woodbridge. This third Findings chapter will repeat the same organizational structure of the previous two chapters. I will highlight and analyze a focal episode of interaction that demonstrates a resident leveraging the tools and discursive practices of planners as part of counter-mapping the neighborhood. I will then describe how careful analysis of CPU episodes supported design conjectures related to tools and discourses for instructional activities with youth participating in the Workshop. After talking about the design conjectures, I will move to another description and analysis of a focal episode in the Workshop and discuss how youth were counter-mapping their neighborhoods by the end of the study.

Lessons Learned in Woodbridge: "My Usual Question"

The third episode I share from the Woodbridge CPU occurred during a "Community Character Policy Workshop." This meeting occurred three months after the neighborhood breakout meetings took place. In the interaction I describe and analyze here, I follow "Ms. Sanders," another longtime resident of Woodbridge. We saw Ms. Sanders at almost every meeting we attended, and we came to know her as another "persistent resident." Ms. Sanders was good friends with Ms. Kay.. We found them seated next to each other at the Hadley Park

Neighborhood Meeting, and we know from interviews and informal conversations that Ms. Sanders and Ms. Kay co-lead the Henry Park neighborhood association.

The Community Character Policy Workshop was a chance for the planners to show residents and stakeholders how the Community Character Policies – codes guiding zone change requests –looked after having received public input over these many months. The planners wanted to especially highlight the changes to the community character policies that had occurred in this draft as compared to the latest Plan Update in 2002. Similar to prior meetings, several tables were scattered across a large conference room. Each table was staffed by a planner and was covered by a large map. But very *unlike* the neighborhood meetings seen before, the map that covered the tabletop was not a satellite image of the area with labels. This map was of all of Woodbridge and was much more abstract. Contiguous areas were color-coded in pastels to reveal different transect and character policy classifications (e.g., Urban Neighborhood Evolving). (See Figure 6-1 for the map.) Major streets, or "corridors," were labeled. However, major streets (e.g., the interstate) were the only attributes that were demarcated and might be easily recognizable by an "insider" to Woodbridge. Parks, community centers, schools, and libraries, for example, were no longer shown on the map.

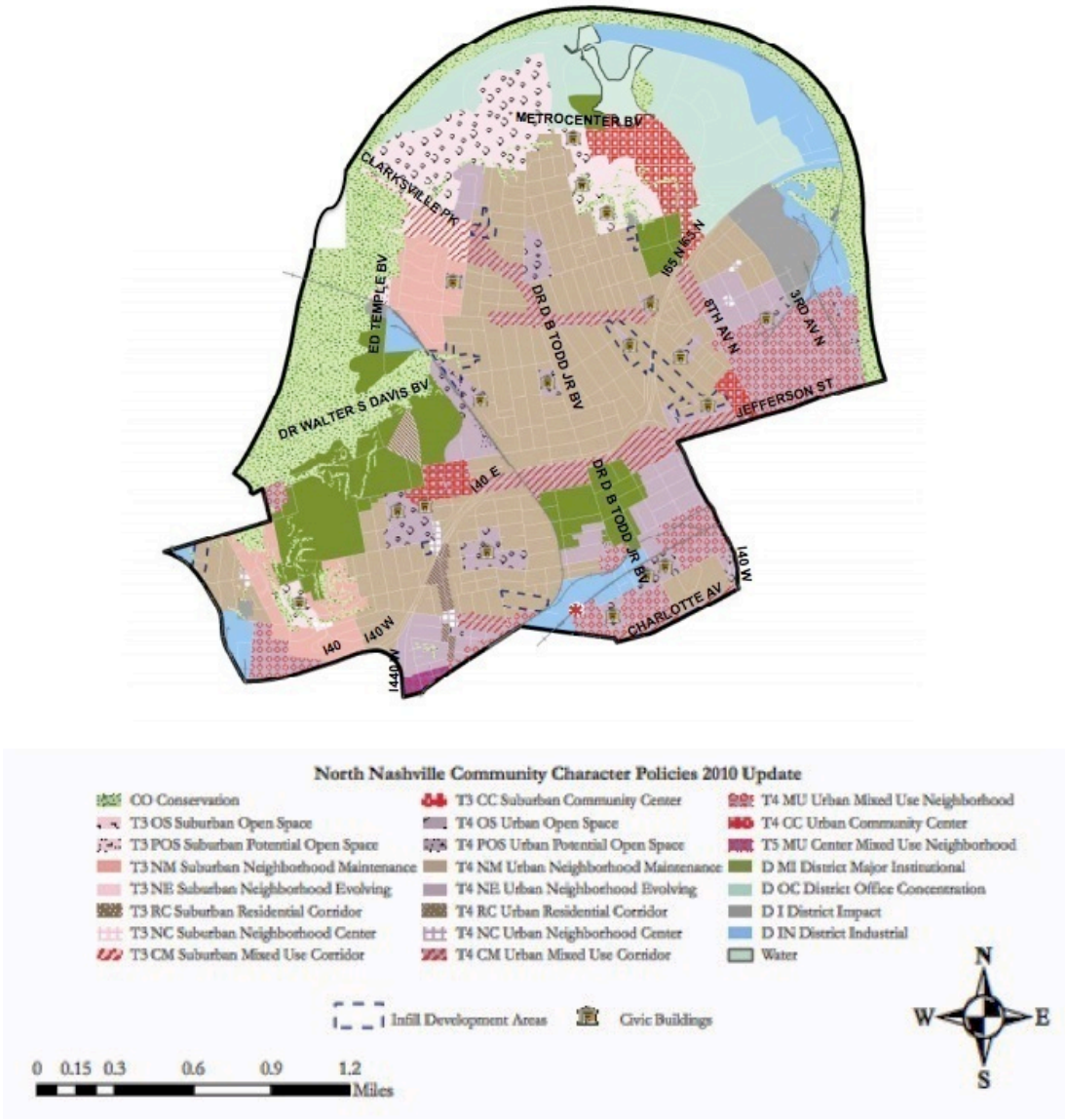

Figure 6-1. Woodbridge map showing transect and community character policies.

This meeting was also distinctive from the other two other meetings described in this dissertation because each table had a particular geographic focus. For example, one table looked closely at issues in the plan draft document regarding the Deacon University area; another table looked closely at issues pertaining to the Henry Park and surrounding area. (Hall and I filmed two of several tables.) People milled about freely, stopping to look at the map and listen to the ongoing conversation. Others would hear or see something of interest, and then make contributions. Therefore, in comparison, this meeting had the atmosphere of an “open house”

rather than a workshop or “design charette.”

At this Final Community Meeting, planners were asking attending residents and local stakeholders if they required any clarification on what the map showed or what the text in the document described. The nature of planners’ questions in this meeting was distinctive in that new “visions” for the future of Woodbridge were no longer being elicited. At this meeting, I saw planners making line edits to the Plan Draft based on residents’ comments and drawing question marks around the boundaries of Woodbridge. As described below, sustainable sense-scapes, like living in a food desert, reemerged as relevant material to considering the Transect classifications.

Summary of Focal Episode

The focal episode in this chapter is exemplar of the third characteristic of counter-mapping — a resident using and leveraging official tools and discursive practices to take place in Woodbridge, as a form of spatial literacy. As introduced in the first chapter of this dissertation, I mean spatial literacy to refer to a conceptual framework (like mathematical literacy or scientific literacy) in which a person is able to understand the surrounding world organized around spatial properties like scale, density, situation, and so on (NRC, 2003). The interaction that I chose to analyze occurred at the table dedicated to discussing the Deacon University area. Although the people seated and standing around the table discussed a range of topics, the location of a grocery store was one issue that received a lot of uptake. Seated here was a grocery store developer, “Nancy” who was a food security activist (both of whom did not live in Woodbridge), two female residents, and Stephanie the planner. These were the people seated at the table when we began filming. However, the focal episode begins when Ms. Sanders gracefully approached (in her way) the table to enter the ongoing conversation. Wearing a light blue suit, she had obviously just come from work, but also made a commanding impression in her business attire. The conversation that had been taking place came to a stop upon her arrival. Stephanie directed all of her facilitative authority and attention toward Ms. Sanders, and Ms. Sanders responded.

Ms. Sanders began by making a claim to an “open space” on the border of the study area

along a major “corridor” called Charlotte Avenue. Her desire was that this open space should be developed by a “large footprint grocery store” because of its ideal location between Woodbridge and the downtown area. We know from interview data (not shown here) that Ms. Sanders was tired of having to drive far outside of Woodbridge to get healthy, fresh food, particularly skinless, boneless chicken breasts. But what was so stunning about the empirical material that follows is the way in which Ms. Sanders *translated* her needs and desires from her daily life to spatial concepts that demonstrated a sophisticated understanding of urban phenomena.

Ms. Sanders’ contribution involved several aspects of spatial literacy. She leveraged spatial concepts like spatial orientation, situation, and accessibility in her talk and *extensive* interaction with the map. Her use of the map (that she had not seen until walking up to the table) was so fluid that it became hard to tell where the tips of her fingers ended and the surface of the map began. Ms. Sanders also used concepts and discursive practices more specific to professional planning in a way that we rarely saw with other residents or stakeholders. “Open space,” “rooftops,” “large footprint,” and “corridor,” were words and phrases that planners used often. These were not words, however, frequently used by residents to make their claims to resources for the future of their community.

Figure 6-2. Six people were seated or standing around the map. All of the speakers in the excerpts are labeled in this image: from left to right, Nancy (Nan), Resident 1 (R1), Ms. Sanders (MS), and Stephanie (Step).

Description of Activity

Orienting to Abstracted Space. Ms. Sanders walked toward the table, and those standing or sitting around seemed to snap to attention. Stephanie immediately directed her gaze and attention to the tall, thin lady in the light blue suit. Without so much as a hesitation, Stephanie asked Ms. Sanders what her questions were pertaining to the Fisk/Meharry area, the southernmost area of Woodbridge and the closest to downtown. The southern border of this area is defined (by planners) as Charlotte Avenue, a busy four-lane corridor that runs from downtown west through the entire city. Ms. Sanders pulled her glasses down, placed both of her palms on the tabletop, and leaned forward to peruse the area of the map that Stephanie had just highlighted with her left hand (Turn 1).

Excerpt 1. Ms. Sanders orients herself to the map.

1	Stephanie:	Did you have any questions about ((*rubs left hand along map))* the Fisk/Meharry area?
2	Ms. Sanders:	((*puts both hands on table, leans forward to map))* Well, I'll ask my USual question.
3	Stephanie:	OK.
4	Ms. Sanders:	Um (.) something that would service (.) this- ((*rubs map with right hand))* all this area. Wh->where is Charlotte Avenue?<
5	Stephanie:	Charlotte is- ((*traces Charlotte Ave. on map with pen in right hand))*
6	Ms. Sanders:	Something that would service all of this going *((pushes left hand along map twice))*- is this going back downtown?
7	Stephanie:	Hm-hm.

Ms. Sanders quickly established herself as having experience with this kind of activity, as if standing around, staring at, and talking at the edges of a giant map were commonplace. Her self-referenced "USusal question" (Turn 2) made it apparent to everyone at the table that she was not new to this process, and that she had an agenda of her own, similar to Ms. Kay's walk-around space. Before she launched into the meat of her claim, Ms. Sanders made sure she knew exactly how she was positioned at the table in relation to abstracted space — the map covering the tabletop.

Looking briefly at the map and noticing the area that Stephanie had highlighted, Ms. Sanders moved her own hand on top of that same area. She took great pains and interactional time and space to make sure she understood the spatial orientation of the map relative to her

own body. Ms. Sanders demonstrated her understanding that her comments would not carry the same status if she did not understand and leverage the map to support them. This attention to spatial orientation was not typical in other residents' contributions. Many times, if a person had a comment about a particular place, he would simply make the comment, not taking the time to understand how the comment might appropriately fit the map, or even be supported by it.

Situation. Situation is an important geographic concept that relates to understanding one's location relative to other places, and how the characteristics of a location are similar or different to that of other locations (Gordon, 1980). In the next turns of talk, Ms. Sanders built her argument for Woodbridge being a food desert, especially in comparison to other areas of the city (Metro) west of Woodbridge that have two or three grocery stores at one major intersection.

Excerpt 2. Ms. Sanders considers the situation of Woodbridge in comparison to other communities in Metro.

8	Ms. Sanders:	Uh, because out here is uh a Kroger *((puts right hand on westernmost point of Charlotte Avenue on map))*, you know, uh, now we have the Publix in North- in-in Metro West *((puts hand off the map at the edge of table to show far west))*. Uh, the Kroger at Charlotte and =
9	Nancy:	=White Bridge.
10	Ms. Sanders:	White Bridge=
11	Nancy:	=That's the one I shop in. It's not so great.
12	Ms. Sanders:	So, [it's like along Charlotte]
13	R1:	[*((laugther))* She said 'it's not so great.']

Ms. Sanders annotated areas on the map (but outside of the study area), and areas off of the map (on the tablecloth), that had grocery stores. She moved around abstracted space to show that there were several locations *with* grocery stores, but none of these locations were within Woodbridge. In this way, the *situation* of Woodbridge — a food desert in a city full of grocery stores — was one that could be easily represented by a map. This particular map, however, did not show locations of grocery stores until Ms. Sanders demarcated them with her outstretched fingers.

The others around the table kept their attention fixed on Ms. Sanders, further underscoring the authority this longtime resident of Woodbridge had in this particular interaction.

Nancy, a well-known food security activist in the area, followed Ms. Sanders' argument, adding her own personal accounting for the Kroger on White Bridge and Charlotte (Turn 11). However, Ms. Sanders was not here to talk about the quality of that Kroger, and she plowed ahead over top the laughter of another resident that was responding to Nancy. Ms.
Sanders leaned forward into the map again, returning her attention and index finger to Charlotte Avenue (Turn 12).

Leveraging planning concepts and practices. In a way unlike any other resident we observed, Ms. Sanders leveraged the discursive practices of professional planners to *take place* in official processes of community development. Not only did Ms. Sanders use the map in ways that resembled planners (recall Sam's extensive and particular use of the map in her exchange with Mr. Gray in Chapter Four), but she also took-up concepts that were frequently used by planners to build her case for a grocery store. Ms. Sanders' use of concepts like "open space" and "corridor" were not a parody of planners on the part of a resident. On the contrary, Ms. Sanders *translated* her own endemic and extensive knowledge of Woodbridge into categories and descriptors typically used in the planning profession. This process of translation was not only striking for its novelty, but became a signifier that Ms. Sanders, a resident, had been participating in processes like these for so long, she had experienced dramatic conceptual change in the ways she saw and thought about her community.

Excerpt 3. Ms. Sanders uses planning concepts to advocate for a grocery store.

14	Ms. Sanders:	there's uh *((rapidly moves right index finger over small area of map))* some open space?
15	Stephanie:	*((nods))* Yeah ( )
16	Ms. Sanders:	that's been for sale for a long time?
17	Nancy:	That's what this other gentleman was talking about-
18	Stephanie:	*((leans forward, extends arm and hand across the map to draw a red box around the open space and makes a note))* Yeah.
19	Nancy:	that um-
20	Ms. Sanders:	it's like a-at 28th, uh, 31st. (.5) Places where large footprint grocery stores could come to?
21	R1:	With a lotta parking.
22	Ms. Sanders:	And [you know, you] know
23	Nancy:	[A- and the-the]

24 Ms. Sanders: it's like some of the complaints that we've- I shouldn't say complaints. Some of the concerns that we've heard from uh, large-scale developers like, Hill, and that kind of thing, that locating a grocery store IN here, both ROOFtops and as well as being able to sustain itself as a full service grocery store, putting it along this CORridor, this neighborhood could access it, TSU could access it

Ms. Sanders had not only identified a problem in Woodbridge and proposed a vision for making it better, she even had suggestions for a specific parcel of land that would directly fix the problem. Having passed by this piece of "open space" many times before, Ms. Sanders called-out the numbered cross streets to Stephanie with care (Turn 20). Although it was unclear at the time that this particular location along Charlotte Avenue was actually classified as "open space" in the planners' Transect scheme, the sentiment that the area was vacant and undeveloped had been received. (Following this exchange, I checked the Plan for the community directly south of Woodbridge that showed this area identified as "open space" by Ms. Sanders was actually classified as "T4 urban mixed use corridor." This classification meant that a grocery store could indeed be developed on this parcel of land if a developer were interested.) By Ms. Sanders' accounts, this parcel would be an ideal location for a large footprint grocery store to open its doors.

Ms. Sanders' had several reasons for locating a grocery store on this parcel of land, all of which fit nicely into an ontology of development shared by planners. Having met with grocery store developers on her own, Ms. Sanders was all too familiar with the reasons why big box stores were unwilling to open-up shop in Woodbridge. The planners were familiar with these reasons, too, and Sam's promotion of cottage courts (in the previous chapter) was one way of speaking to these reasons — more rooftops bring higher residential density which means more shoppers which would increase the likelihood for businesses to move in. At Turn 24, Ms. Sanders' talk on its own could be mistaken for Sam or any other planner. The structure of her argument — that there are plenty of potential customers within living and driving distance to support a big box store —followed the same logic that Sam shared with Ms. Kay and Ms. Sanders at the Henry Park Neighborhood Meeting some three months before.

Accessibility on Behalf of Community Members. As mentioned in other sections of

this research, the concept of accessibility was an exceptionally important one for the residents of Woodbridge since it is "a direct expression of mobility." In geography, accessibility is considered to be a person's ability to get to important services and employment locations (Farrington, 2007). Given more context, when a small portion of people are unable to easily and efficiently access healthy food in a city overflowing with grocery stores (in particularly affluent areas), the geographic definition of accessibility seems insufficient.

The real irony of Woodbridge was that roads were everywhere. But these roads actually had the affect of immobilizing residents, cutting through the street grid, dead-ending other roads, and interrupting quiet neighborhood streets with speeding cars on interstates. Ms. Sanders was not the only resident we observed speaking to this daily experience of immobility and inaccessibility. However, Ms. Sanders' contribution was significant for her capacity to translate the reality of not being able to get skinless, boneless chicken breasts in her neighborhood to the geographic concept of accessibility for a whole community of people.

Excerpt 4. Ms. Sanders paints a scenario of accessing a grocery store.

25	Nancy:	Ms. Sanders, did you know that HG Hill owns this property?
26	Ms. Sanders:	Yea.
27	Nancy:	And that they- they have three more houses to buy.
28	Ms. Sanders:	So it's like, I'm sorta wondering, it's like, what- has anyone said that they would be willing to put a grocery store, like Key, like right here, where we could GET to it?
29	Stephanie:	No, not yet, but we haven't finished- 'cause even it is outside of the study area, we understand that Charlotte is that major
30	Ms. Sanders:	It's a major thoroughfare, people coming out of downtown, people who are living downtown and don't go to the- uh- Kroger at 8th- *((stands up straight and points around the room))* Where am I?

Ms. Sanders provided further evidence that she understood the concept of a "corridor" and its relationship to accessibility. Even though Charlotte Avenue is outside the "study area," (Stephanie pointed this out at Turn 29), Ms. Sanders recognized this boundary as arbitrary. Instead, Ms. Sanders further insisted that this location on Charlotte Avenue, at Turn 30, was an ideal spot for a grocery store for residents living in her neighborhood, people who were working

downtown and commuting home to either Woodbridge or further west, and for people who were living downtown (another widely recognized food desert). While her comments were discursively congruent to the practices of planners, Ms. Sanders was still able to persuasively speak on behalf of her fellow residents and other people living out of range of a suitable grocery store.

For the first time in this interaction, Ms. Sanders completely pulled out of the interactional (and directional) space she had created on the surface of the map. At Turn 30, she stood fully upright and, using both her hands, began pointing in different directions around the room toward the location of the Kroger at Eighth Avenue. Once she left the map, she became lost, as she was no longer at this moment spatially oriented to lived space. Her uncharacteristic arm flailing and uncertainty with the question, “Where am I?” brought laughter from those around the table. In comparison to Ms. Kay who scaled her contribution to a transect classification and a variation of resident mobility around the home, Ms. Sanders was “in the map.” This dichotomous shift from knowing and taking place in the map to being lost in lived space further highlighted Ms. Sanders’ almost native comfort within abstracted space.

Discussion of Focal Episode

For Ms. Sanders, there was no mystery in the map that the planners created for this meeting. Although this particular map was a much more abstracted version of Woodbridge than maps around which residents had talked in prior meetings, Ms. Sanders was still able to understand and leverage this representation to bolster her claim for the future. While she was a local of Woodbridge, Ms. Sanders quickly became a native of the abstraction of Woodbridge, too, almost pouring her body into the space that covered the tabletop. With her upper body hovering over the pastel-colored representation of her community (see Figure 6-3), Ms. Sanders punctuated abstracted space with points, lines, and polygons (remember Sam?) with first her right hand then her left. Her glances up and away from the map to Stephanie served as an invitation back into mapped space and into the new interactional and embodied layers Ms. Sanders had built. Not surprisingly, Stephanie responded with drawn polygons around the places that Ms. Sanders had gesturally noted. Stephanie also wrote notes in the margin of the map

summarizing Ms. Sanders' remarks, proving further that this "local" contribution was congruent to planners' discursive practices.

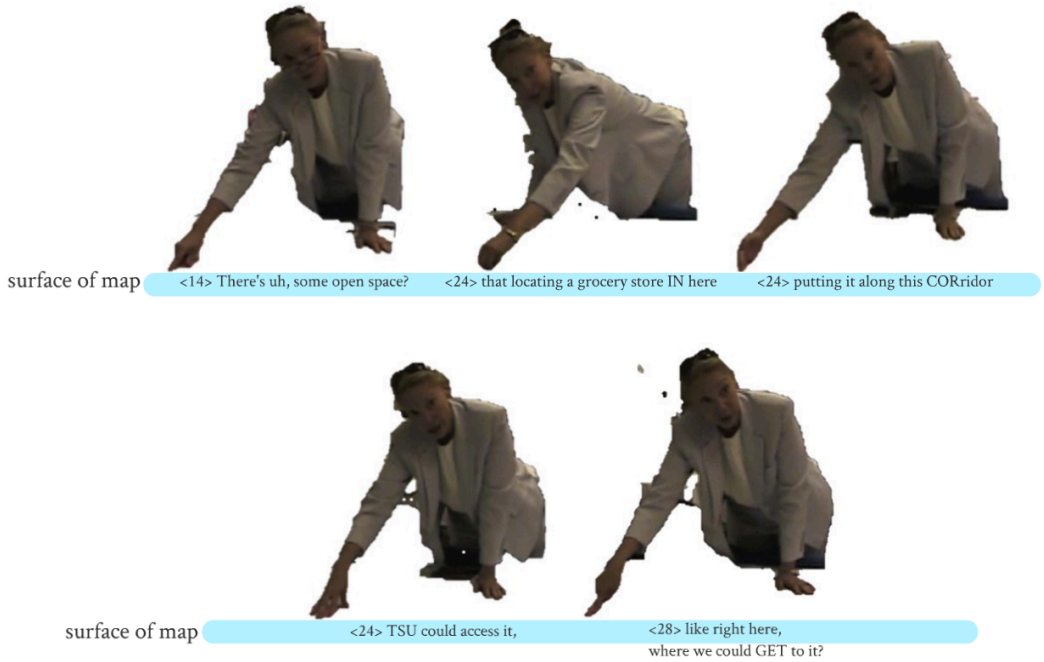

Figure 6-3. Ms. Sanders' body position, gestures, and gaze in relation to the surface of the map. Corresponding turns of talk are below each frame of action.

The others around the table took their cues from Ms. Sanders, too, gazing at the map when she did, looking-up into her face when she brought her own gaze out of the map. One of the residents seated at the table actually looked stunned by the sheer force, confidence, yet raw honesty enacted by Ms. Sanders. While Ms. Sanders replicated a planner in many senses, there was an urgency and awareness to her contribution that only a local of Woodbridge — talking about Woodbridge —could portray.

Even though Ms. Sanders' contribution was distinctive for many reasons, her way of speaking *for* the community was similar to what we saw time and again with other residents. As mentioned previously, having been a participant, myself, in a CPU in another area of Metro, the tendency for residents to speak on behalf of the *entire* community was a characteristic particular to the Woodbridge planning process. In many ways, the *scale* of people's comments was often at that of the community. People were less likely to talk about how building a sidewalk would impact the property value of their own residential lots, or how allowing a business into the neighborhood

would negatively impact the “curb appeal” of individual homes (NIMBY concerns).

Speaking at the scale of the community was much more congruent to the planners’ ontology of development, too. The planning process has little to do with private property, but more to do with a collective vision for how an entire area should develop. Especially when resident comments, like Ms. Sanders’, were oriented toward the future (rather than toward damage that had been done to the community in the past), planners were more likely to engage. Therefore, Ms. Sanders came to understand the temporal and spatial *footing* of planners and she used this realization to her advantage. Rather than dwelling on the fact that interstates had been built years ago that impeded her range of accessibility to city resources, she stepped into a future “design scenario” (a planner term) of her own making that offered a solution to a local problem. This analysis is not to say that planners did not appreciate and regret what had been done to Woodbridge during the years of urban renewal (they often lamented the interstate system, especially in terms of how it hurt Woodbridge); planners did, however, view their job as helping people envision and plan for a better future rather than fixing past transgressions.

Finally, a characteristic that was distinctive in Ms. Sanders’ contribution, but similar to Ms. Kay’s, was that in thinking about the future, and coming to this table and map, she demonstrated agency in creating change in and for Woodbridge. Speaking on behalf of others, revealing her own plan for a piece of open space, and co-opting planning concepts and discursive practices for her own agenda of getting a grocery store into the area, Ms. Sanders was an agent — a force, really — of change. Contrast this contribution above to complaints about litter in the parks, teenagers grinding edges on the steps of the local church, or recycling service being inconsistent (comments I heard in my attendance at many community meetings), and the agency of Ms. Sanders comes sharply into focus.

Counter-mapping, as we saw it enacted here, involves locals taking place from processes of urban development with the very tools and discursive practices that define said processes as being “official.” Not surprisingly, Ms. Sanders was a resident that greatly informed how I thought about designing activities with youth in Woodbridge. The next section describes how I thought about teaching youth spatial literacies, especially as they pertained to taking place in processes

of urban development.

Designing for Taking Place with Geospatial Tools and Technologies

In designing activities with youth in Woodbridge, I wanted to highlight the importance of certain aspects of spatial literacy that seemed essential for adults participating in urban planning. It became obvious that residents who demonstrated particular aspects of spatial literacy were more effective at counter-mapping. Ms. Sanders' contribution at the table with other residents and planners was extremely helpful in understanding particular concepts and practices that seemed essential in making claims to resources for the future of her community. First, I knew I wanted to design activities that put young study participants in frequent contact with maps; maps were the centerpiece of meaningful interactions for planners and residents and were the records of "successful" comments by locals going forward. Secondly, being able to translate everyday experiences and observations to spatial concepts (e.g., connectivity, accessibility, and situation) was an important component of counter-mapping. Significantly, these concepts had a direct analog to what could be represented on a map in points, lines, and polygons. Mr. Gray and Ms. Sanders demonstrated how their own hands, working over the map, created a desire layer of these map-able attributes.

Putting youth in frequent interaction with maps was a central characteristic of this study designed to encourage youth to counter-map their neighborhoods. But I was interested in more than having youth interact confidently with maps to make claims to resources for their futures. I wanted study participants to *make* new maps from their own desires using some available mapping technologies. (Obviously, this was *not* something we saw residents doing, although teaching locals how to use mapping tools and technologies is an important part of the Participatory GIS literature.) Therefore, they needed to understand some of the ways in which maps are made, and the opportunities to represent particular aspects of daily life in a spatially organized way. This design objective was a consistent thread throughout the activities. Youth interacted with and learned how GPS technology locates a person on the surface of the earth in geocaching (not written about here), GPS drawing, and the analysis of personal time geography

session. Youth also interacted with and learned how to build points, lines, and polygons in Google Maps™ during sessions in the university computer lab when they built desire layers (described in depth in the next section of this chapter). I do not pretend that building layers in Google Maps™ requires near the same level of spatial and technical sophistication as constructing a new map in ArcMap. However, Google Maps™ (a virtual map) did serve as a suitable platform for the learning objective — being able to spatially organize, index, and represent desires for the future of the built environment over the terrain of the neighborhood.

As an essential part of learning about maps and mapping technologies, I hoped youth would begin to see themselves as knowledgeable *agents* of change — using representations and technologies for their own purposes and visions for the future. Without ample experience with these "official" tools, there would be little chance that youth could be critical of what the map showed and how they could make the map better. I provided evidence in the previous chapter that youth creatively engaged with GPS technology, and became more comfortable doing so over time. In the empirical material that follows, you will see (again, but in more depth) an example of a teenager taking an agentive stance toward community development with the map as her aid.

Ms. Sanders, as you have seen, was exceptionally adept at using the concepts (verbatim) of planners (e.g., "corridor," "rooftops," density). As a designer, I was not as concerned with youth taking-up these terms in their talk about their community. However, I did want youth to be able to see urban phenomena as *spatial* phenomena. For example, I wanted youth to be able to think about locations, pathways, and accessibility; locations are connected to one another by pathways, and some of these pathways impede accessibility rather than facilitate it. Also, I hoped youth would come to think that a particular location has characteristics that are similar and different to other locations, and think about the reasons why this might be so (recall that this concept is know as "situation" in the geography literature). I hoped study participants would also be able to think about the distribution of cultural resources and amenities and the reasons affecting this distribution citywide.

In the ground-truthing episode on bicycles, youth were thinking along these lines (pun intended) as a reaction to their new form of mobility. You will see more of this kind of spatial

literacy in the material that follows. In the next section, I will more closely analyze Carissa's counter-map performance, based on the desire layers she made with Leah, in front of her peers, the adult researchers and Cecil and other Workshop volunteers. William's counter-map performance will also reappear as another example of youth becoming more spatially literate by the conclusion of this study.

Counter-mapping Performance: Desire Layers for a Future Neighborhood

As the culminating event of this study and of this writing, I describe and analyze youth counter-mapping Woodbridge. This dissertation opened with Ms. Sanders and Carissa's counter-map performances, and I return to these events to conclude this Findings section. The final part of the Findings is a close analysis of Carissa presenting her desire layers in Google Maps™ to an audience of her peers, the adult researchers, Cecil, and a couple of Workshop volunteers. All of the youth in the study presented their desire layers on the final day of the study, but not all of these presentations demonstrated the spatial literacies that I was designing to teach. Carissa, Leah, William, and Wallace showed the most growth in learning to think spatially in their presentations, but they were also much more vocal than Beth and differently engaged than Fred. These four youth also had more opportunities to present their desire layers to local stakeholder and professional audiences in subsequent occasions several months later. Beth and Fred were unable to attend activities in Phase III.

Summary of the Activity

The presentation of "desire layers" — attributes study youth wanted to see become a reality, that they mapped over a base layer of Woodbridge — occurred during our eighth and final meeting of the five weeks of the experimental teaching case. However, youth had been preparing for this final activity since our fourth meeting when we created three different lists (see Figure 6-4) from observations the teens made during ground-truthing and geo-caching through the neighborhood on foot. The first list was a compilation of inaccuracies they had discovered on the Google map they had been using during these activities in relation to what they found on the

ground (e.g., incorrect street names, an outline of a public housing development that had been demolished long ago). The second list was a compilation of attributes that were on the ground but were not shown on the map (e.g., the baseball field, tennis courts, the track). And the third list was a compilation of places or attributes that were neither on the ground nor on the map, but places or amenities that youth wished existed for reasons that were pertinent to their interests and how they imagined their own future uses of the city.

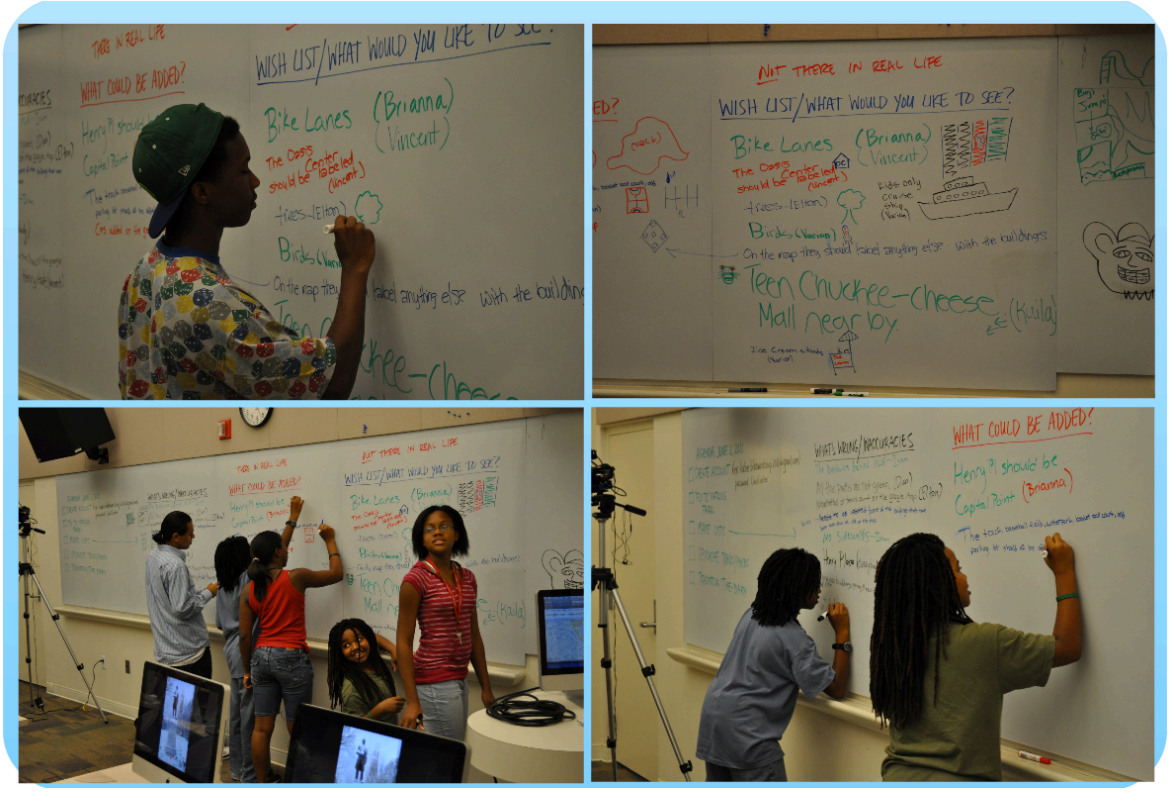

Figure 6-4. Youth made lists in the computer lab from observations they had made about maps and the attributes on the ground during ground-truthing and geo-caching.

For our final meeting, I transferred these teen-generated lists to large pieces of paper and posted them on the whiteboards at the front of the room. I did this so the youth could reference these lists they had made (now two weeks ago) as they were creating their desire layers in Google Maps™ at their computers. The teens were able to work in pairs or by themselves. If working in pairs, they used the "Collaborate" function in Google Maps™ so they could live-edit each other's maps online.

I will focus on Carissa's counter-map performance because it vividly demonstrated the

spatial literacies for counter-mapping that I tried to teach throughout the designed activities. Typically, youth desire layers consisted of bicycle lanes, teen-only establishments, more parks and trees, and labeling attributes that Google Maps™ did not show (for example, William labeled the Workshop with a bicycle icon and wrote, “I love this place we build bikes and learn how to read maps.”) Carissa interacted with and used the map to build her argument for what she thought should exist on the ground in her imagined future for Woodbridge. Her talk and interaction with the map created a technical object called the desire layer. Furthermore, her counter-map performance also made evident her developing view of the city as a constellation of locations connected by important corridors. Expanding on her thinking during the safety ride debrief in the park (Chapter 5), Carissa mapped potential bicycle lanes onto existing traffic routes that would offer her straightforward access to places of import. A finding that emerged from this activity, for which I was not necessarily designing, was the way in which Carissa *identified* with these routes as indicative of her future, imagined self as a college student living and riding in the city. In this way, the potential bicycle lanes she mapped were *identity corridors*, transporting her and her audience’s imagination to a future version of Carissa — a college student riding her bicycle through the city.

Description of the Focal Episode

Carissa and Leah stood in the university computer lab in front of a digital projection (on a large screen) of a map layer they had designed. Their map layer was constructed over a fully functional Google Maps™ street map of Woodbridge and the surrounding area. In a presentation facilitated by Kris, Carissa described places and routes that she hoped the city would build for non-driving residents of the neighborhood but also for herself in an imagined future. While some of the mapped attributes in her “desire layer” were fanciful (e.g., a “teen mall” with ice cream stores), others were more personal and practical. She began her presentation by describing a bicycle lane she mapped along the length of Charlotte Avenue.

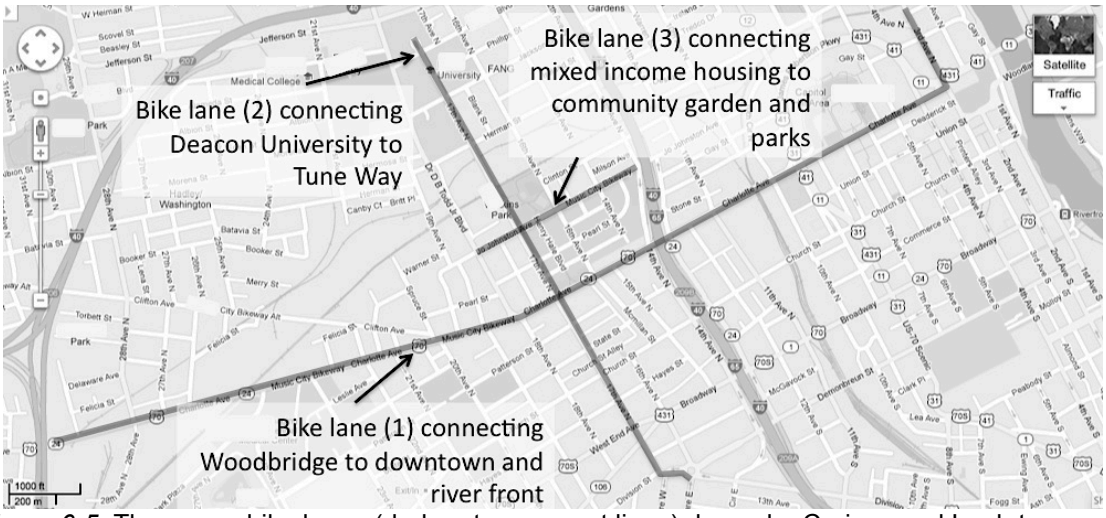

Figure 6-5. Three new bike lanes (darker, transparent lines) drawn by Carissa and Leah to connect Woodbridge neighborhoods to the surrounding city.

Using a yardstick to trace routes on the projected map, Carissa described three bike lanes she hoped the city would build (Figure 6-5)[7]. The first connected the entire Woodbridge community to downtown and riverfront areas of the city, running west to east along a major traffic corridor. The second bike lane ran north to south, connected an historic landmark in Carissa's neighborhood (an historically Black university, Deacon) with a well known area for music publishing and recording in the city (Tune Way). While the first bike lane made accessible a range of stores and neighborhood assets along a busy driving corridor through the center of Woodbridge, Carissa's second bike lane was more personal, shaped strongly by her aspirations as a teen who would soon be a young adult in the city.

Excerpt 5. Carissa shows her suggested bicycle lanes.

1	Carissa:	Then I have, um (3 sec) uh, a bike lane going from Deacon University, >which is my future college, by the way<
2	Leah:	°Boo
3	Kris:	OK=
4	Carissa:	=((*to Leah*)) Be quiet. Going [down to this] main road here, °Tune Way West. ((*uses yardstick to trace movement south, from Deacon to Tune Way*))
5	Rogers:	[((*laughing*))]
6	Kris:	So WHY is it important that it goes all the way to there?

[7] Figures are simplified versions of interactive maps used by study participants so that maps are legible in print.

7 Carissa: Because… I'm going to go there, and I would like there to be bike lanes.
8 Kris: Alright, so those are places that you'd like to be able to go on your bike.
9 Carissa: Yes::=
10 Kris: =Ok.

Carissa's image of herself as a young adult "took place" in the city by marking up the desire layer of her map with a bike lane that allowed a future-time, college student (herself as a young adult) to ride a bike from her university campus, past her current neighborhood, and into an area of the city that was the center of music publishing and recording. Tune Way remained difficult to access from Woodbridge after a long history of racial and economic segregation in the city. As Carissa explained to Kris, "I'm going to go there, and I would like there to be bike lanes." While her second bike lane cut across history in the city and was for her own future, Carissa's third lane was more immediately useful for her and her neighbors.

Excerpt 6. Carissa describes her third bicycle lane.

11 Carissa: And then, I had another one, oh, on Jo Johnston, right here, going from DB Todd down to this interstate right here. ((*uses yardstick to trace from home neighborhood to edge of interstate*)) Sixty-five, I think.
12 Kris: ((*laughing*)) Why do you have it going all the way to the interstate?
13 Carissa: Um, because you can't really drive on the interstate. So like this, like, a lot of people, there's a lot of things right here, that people go to, ((*traces south of proposed bike lane*)) like the places, the park, and the community garden, here. But then not everybody over here has cars,=
14 Kris: [Ok]
15 Carissa: =[so I] want there to be bike lanes so they can get from here to there, ((*traces from home neighborhood to edge of interstate*)) and not have to walk.

Carissa's tracing and narration of new bike lanes in a desire layer, built with her partner, Leah, illustrated counter-mapping as a new form of technically-mediated practice for youth participants in this study. Carissa described, with playful comments from her peers, a form of mobility and range for purposeful activity in the city that came into being during the study. Prior to building and using bikes of their own, youth moved between home and school on foot or were driven in automobiles by their parents or other adults.

The routes and activities Carissa described in this excerpt were new, both in spatial

range and in the mode of transportation used by Carissa and her peers. As you have seen in previous chapters, Carissa and the other teens in the study were just learning to get around on bicycles, while also learning what the proximal community had to offer youth on bikes (e.g., community gardens, parks, and shopping opportunities not accessible on foot). Carissa's presentation also involved a newly constructed technical object, the desire layer, as an attribute map made by youth while learning to use a suite of online mapping tools. Carissa illustrated how counter-mapping engaged technologies (biking, the city street grid, user-extensible maps) in ways that were also linked to the identities of youth as they transitioned into adulthood.

Discussion of Youth Counter-mapping

Carissa's counter-map performance was strikingly similar to Ms. Sanders' contribution at the table with Stephanie and her fellow residents and food activist. Carissa paid close attention to issues of accessibility, not just for herself, but other residents living in her neighborhood – especially those without cars. She demonstrated her extensive knowledge of the places and people living in Woodbridge by describing the urban amenities that are popularly patronized by the locals.

Also, like Ms. Sanders, she organized her talk and interaction with the map around major corridors that would get her to important locations. Carissa began by describing a bicycle lane she mapped on the very same Charlotte Avenue that Ms. Sanders had described as a "major thoroughfare" for residents of Woodbridge and downtown. Even though Carissa was a non-driving teenager, she demonstrated her knowledge over and over again that particular corridors facilitated easy access to many of the important locations in the city.

These corridors were more than avenues of access, however, for Carissa and Ms. Sanders. Charlotte Avenue, and Seventeenth Avenue North for Carissa, were *identity corridors* that symbolized important characteristics of how these two women imagined their future trajectories going forward as residents in Woodbridge. For Ms. Sanders, who identified as a health-conscious consumer and an advocate for an equitable distribution of resources, Charlotte Avenue was an identity corridor to her imagined future shopping at a full-service grocery store

almost directly across the street from her neighborhood. Charlotte Avenue and Seventeenth Avenue North were both identity corridors for Carissa's imagined self as a college student riding her bicycle between Woodbridge and other culturally-rich areas of the city.

In this way, counter-mapping involved much more than translating desires for one's community into spatial concepts that were congruent to the professional practices and discourses of urban planners. Counter-mapping for locals involved projecting one's self and identity into the future of the city. The urban terrain and the self came together in ways that were at times difficult to disentangle. Watching young and old residents take place back from the official map and governmental processes of urban development brought Harvey's words about "the right to the city" into focus:

> The right to the city is far more than the individual liberty to access urban resources: it is a right to change ourselves by changing the city. It is, moreover, a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the processes of urbanization. The freedom to make and remake our cities and ourselves is, I want to argue, one of the most precious yet most neglected of our human rights (p. 23).

Youth study participants had two more occasions to counter-map Woodbridge in meetings with professional planners, mapmakers, and local stakeholders. These meetings occurred four months after the last day of the experimental teaching case when Carissa shared her desire layers in our university computer lab. At each of these subsequent meetings, youth sharing their desire layers looked similar to what they did and said in the computer lab. However, at the final meeting, in which Stephanie was in attendance, youth infused more stories into the reasons why they chose to map particular desire layers. William talked about a trip on foot to Wal-mart with his brother and cousins to get spaghetti and garlic bread to cook for dinner, and how this experience informed his recommendation to *remove* bicycle lanes along that street. Wallace described his grandmother following them in her car as they walked through the neighborhood to illustrate the challenges of being independently mobile when adults are constantly fearing for the safety of youth. These place-based stories from endemic experiences within the city highlighted

the ways in which youth study participants were truly counter-mapping their neighborhoods in the way that only locals can.

In the Conclusions section, I will return to this idea of how the spatial practices and thinking of youth changed because of their participation in this social design experiment for spatial justice. But I will also argue that spatial practices at the city-level changed, too. New ways of incorporating the lives of adolescents in city planning emerged as a result of this study. I will frame these across individual youth participants to processes occurring at the level of the city as productive tensions across first, second, and thirdspace practices (pace Henri Lefebvre).

PART III: CONCLUSIONS

This dissertation was about observations of and designs to support people engaging in spatial practices that relate and build to counter-mapping. Counter-mapping in this dissertation was shown to be a thirdspace *performance genre* (Stevens & Hall, 1998); locals, young and old, learn to translate their embodied experiences of daily life to concepts and categories that can be mapped in the service of imagining something new and better for the community. Because counter-mapping is, by my definition, a type of performance genre by people living within the place that will be abstracted for official processes of urban development, they are fundamentally different from maps and classifications of space created by parties and technologies from outside the area. When residents counter-map their community, they operate a mobile epistemology rather than a grid epistemology where a place is known from above and/or remotely (Chapter 4). Secondly, residents construct sense-scapes as a way of both understanding and disrupting the official representation of their community (Chapter 5). Third, counter-maps demonstrate spatial literacies, leveraging concepts, maps, and mapping technologies used by professionals to make claims to resources for the future (Chapter 6).

Observations of, design conjectures for, and emergent findings from adults and youth counter-mapping relate to the "trialectics of space" — how people *perceive* space throughout their daily activities, how professionals *conceive* of abstracted spatial categories, and how, in thirdspace, the embodied experiences of daily life meet the abstract categories of space to *imagine* something new (Lefebvre, 1991; Soja, 1996). Based on my observations with adults participating in community planning, I formed research questions related to how youth experiences in places that are familiar and important to them can build upon these *productive tensions* happening in thirdspace for seeking spatial justice in their communities. Related to the tension between how people perceive the environment in which they live and work and how maps represent that environment, I wanted to know *How did youth make sense of the relation between their grounded, "on the move" experiences and more formal, mapped representations of their community?* Related to the tensions between embodied ways of knowing and doing and

abstracted ways of knowing and showing, I wanted to know *How did youth engage with the designed activities to identify personally-relevant aspects of mobility in their neighborhood, both for the present and for imagined, future activity?* Finally, and related to tensions between the concrete practices of daily life for youth and the adult conceptions of daily life, I wanted to know *Did youth participation in emerging practices of counter-mapping lead to and benefit from new forms of spatial literacy (e.g., riding bicycles, analyzing personal mobility, and building map layers)?*

This chapter will first explicitly address the research questions based on the findings from all three Phases of this research design, and how these findings have developed an emergent and theoretical understanding of counter-mapping. Next, I will return to each youth participant and describe how they found participating in this study, based on what they told me in their final interviews. I do this in an attempt to provide an (albeit incomplete) ethnographic account of the six participants, especially since Fred and Beth did not figure as prominently in the preceding focal episodes. Obviously, each teenager made sense of and engaged with the activities differently, and so I will try to provide a more individualized account. Finally, I will describe how some findings and methods from this study "leaked" into the community and city, providing evidence that learning and change did not just occur at the level of the individual participant or at the level of the group, but at a more collective level, too.

CHAPTER VII

COUNTER-MAPPING AS A THEORY OF SOCIAL AND SPATIAL CHANGE

Productive Tensions in Thirdspace

My analysis looked closely at focal episodes from three different CPU meetings with adult residents and planners and four different designed activities (i.e., ground-truthing on bicycles, GPS drawing, analysis of personal time geography, presenting desire layers) from the experimental teach case with youth. Analyses of "successful" residents and planners interacting over maps of Woodbridge supported my designs for engaging youth in counter-mapping. Successful residents were targeted for my analysis because they indexed talk about places, routes, and qualities of the neighborhood to graphical representations of particular locations in official maps provided by the city or to specific land parcel classifications (i.e., transect and community character policies). Successful contributions also linked residents' accounts of past or present experiences to justifications for why the city should invest in new pieces of infrastructure or policies for the future of the neighborhood. These contributions were *scaled* to the professional relevancies of planners and were, therefore, taken-up in conversations by the planners facilitating the sessions.

Activities and focal episodes from the experimental teaching case were demonstrative of how designed re-mediations of adolescents' physical mobility within a familiar setting provided youth with opportunities to engage in productive tensions in thirdspace. Youth moved between sensuous, dynamic experiences on the ground to abstracted, static representations of the neighborhood and their mobility from overhead. They moved between qualitative stories of place to more quantitative accounts of space (although both are imbued with value and meaning). Movement within these tensions supported youth participants in seeing their worlds as more than dichotomous "truths" or experiences. Instead, working at the interface helped youth to see the potential from perceived opposites coming together to know more about one's place, and the ways to *take place* in ongoing processes of urban change.

In more concrete terms (to fall back into oppositional language), from observations with adults participating in a Community Plan Update with professional planners in Woodbridge, I was convinced that youth would not be able to counter-map their neighborhoods without some scaffolded, instructional activities that helped them think about and see the city differently. But they also needed purpose for *wanting* to imagine a better city, as the adults had in the CPU, from years of watching processes of urban renewal harm their community. Therefore, the Workshop was an ideal setting for youth to get a glimpse into a new, more independent form of mobility, and to realize that the built environment (and other people using it) did not necessarily facilitate all forms of mobility. The Workshop also provided a catalyst for youth to understand that representations of their neighborhood did not always show the features of the landscape that were the most pertinent to their daily lives nor the most relevant to the ways in which they wanted to use the city. This assumption – having the opportunity to differently move around the city with maps and/or mapping technologies would compel youth to advocate for changes to maps and the urban infrastructure —was a hugely important design conjecture, and was informed by Cecil's three previous years of working with Woodbridge youth around bicycle building and riding.

In thinking across the spatial practices contained across the three phases of this dissertation study, and generalizing to theory, I found the notion of spatial trialectics helpful in understanding how adults and youth learned to and engaged in counter-mapping. While there were over-lapping spatial practices across all three study phases (i.e., ground-truthing maps, analysis of personal time geography, building desire layers), my designs in Phases II and III more explicitly and intentionally played-on the tensions between personal and professional ways of knowing and doing; my designs were intended to scaffold youth in learning spatial literacies mediated by geospatial tools and technologies while this was not an explicit objective in the CPU. Designed activities built on the spatial practices occurring in the CPU while leveraging older and newer technologies to re-mediate youth mobility. For both adults and youth, however, working at the interface of professional and personal spatial knowledge produced productive tensions for learning and counter-mapping.

Productive Tensions in Ground-truthing

One spatial practice that was material for counter-mapping was ground-truthing, or identifying the tensions between what one actually experiences in familiar places and what can be shown and approximated in representations. For adults and youth, meaningful disruptions at walking, driving, or biking scale (e.g., the interstate construction, a bus intrusion) created problematic but productive observations that brought the "completeness" of the map into question. But equally as important, ground-truthing *maps* made occasion to differently perceive problems *on the ground*. These new perceptions from almost simultaneously seeing and doing mobility and daily life supported youth and adults in *conceiving* of concepts like accessibility, connectivity, and distribution. These concepts were, in turn, used to advocate for a different, more equitable urban arrangement.

In ground-truthing maps, either at the table at the CPU or on bicycles, residents, young and old, told illustrative stories about issues on the ground. Mr. Gray told a past time story about walking Woodbridge during his youth; young people excitedly engaged in re-creating the bus intrusion and their efforts to pass safely through a Woodbridge intersection. These accounts, and others that occurred during the study, provided the speakers and the audience members with a stark insight into how city streets could be more or less conducive to multiple modes of mobility. These pathways, some of them no longer in existence, will always have significant and personal meaning attached to them for those who experienced and heard about terrifying and disruptive moments there. These pathways were "a real task" for getting around.

Productive Tensions in Inscribing the Neighborhood

In a second designed activity described and analyzed in this dissertation —GPS drawing — I followed how youth differently perceived and produced a familiar place in the context of a novel activity structure. GPS drawing was the furthest spatial practice from participatory planning, but gave youth the opportunity to creatively use a kind of mapping technology for collaboratively producing map layers of affective attachment to place. GPS drawing was a new kind of walk-around space where values and ideals for the neighborhood were explicitly scaled to the

neighborhood as constrained by the geospatial tool. Whereas Ms. Kay and other adults in the CPU produced interactional layers of affect over the map that were scaled to the professional relevancies of planners, youth were explicitly scaffolded to do so by design. In contrast to the way in which GPS technology is usually used for way-finding, and was used in our geo-caching activity (not described here), GPS drawing demonstrated that youth playfully, yet thoughtfully, engaged with inscribing the neighborhood with new, collective meaning.

Participants perceived the neighborhood based on new objectives of moving through the area to create a kind of text. With my direction, they began thinking seriously about scale, and scaled their bodies and their imaginations in relation to the constraints of the technology. At neighborhood scale, hills, fences, trees, parked cars, and houses became real impediments for physical mobility/inscription. At the *scale of doing*, youth engagement looked much more like what Leander and Boldt (2013) described as "not primarily as efforts toward generating signs or meanings, but rather as generating intensity and the excitement of emergence." At the scale of doing, the endpoint of making the word or image was present at times, but so was "forming relations and connections across signs, objects, and bodies in often unexpected ways" (p. 26) in the present moment.

These in-the-moment, on-the-ground relations (or lifelines) vanished, however, once in the computer lab. At the *scale of viewing*, the text that was generated with the GPS devices was of the utmost importance; bodies, objects, signs, hills, parked cars, soda cans, dog excrement, all but vanished. The representational dominated once again. Leah and Ms. Kay, especially, showed how affective intensities arise in response to the real and perceived mistakes of the representational. Inaccurate or incongruent re-presentations of lived experience and place-based values can incite an emotional motivation for correcting the map and professional classifications. These types of affective responses to the representational became further material for counter-mapping.

Productive Tensions in Analysis of Personal Time Geography

Insiders readily engaged with making sense of their "naturally-occurring" mobility from an

overhead perspective, or from plan view. These accounts of constraints and affordances on daily activity made occasion for thinking about concepts like accessibility and situation personally relevant. For youth viewing their GPS tracks in the lab, the perspective on personal mobility was the *inverse* of ground-truthing on bicycles. Rather than actually moving through their neighborhoods, they were seeing their movements post hoc and from above. Maps and mapping technology (i.e., table-sized maps of Woodbridge, viewing GPS tracks in Google Earth™) supported young and old residents in translating a mobile epistemology of knowing place through living, to a grid epistemology of knowing place through seeing.

In Phase II of the study, two days following the GPS drawing activity, the youth demonstrated how they had become more comfortable with this perspective on their personal mobility. While they still struggled to make sense of where their bodies had been, as shown by the data logger, they were more eager to reinsert the *scale of doing* back into the *scale of viewing*. They told spatially-indexed stories from the past five days and playfully riffed on each other's accounts. This kind of playful engagement was virtually absent in the lab portion of GPS drawing (though it was central in the walking portion through the neighborhood). The narratives that were built in the analysis of personal time geography session were dependent on the scale of the area that was viewable. Youth quickly came to understand that changing the scale of the representation through "zooming" hid portions of the daily round while highlighting others.

William and Wallace, in narrating their GPS tracks, also showed how they had taken-up the practice of creatively inscribing the earth with GPS traces, this time on bicycles. Creativity with mapping technology and imagining new instantiations of physical mobility was another thirdspace practice, where the real and the imagined came together. This new way of seeing and imagining representations and bodies moving through place was essential for counter-mapping – articulating a different urban arrangement for the future that was scaled to the possibilities of what the map could show.

Productive Tensions in Building Desire Layers

Adults and youth built and presented new map layers of future activity in the city. As

illustrated in Carissa's proposal for bike lanes, youth were able to make sense of and use comparisons of different forms of mobility (i.e., walking, biking, and being driven) and different temporal and spatial perspectives on their time geography. This sense-making was a joint accomplishment, requiring sustained engagement with different ways of experiencing, representing, and reflecting on mobility in the city. Based on the desire layers they created at the end of this study, youth thought of and talked about their neighborhoods and the city in new ways; they thought about Woodbridge as a place for bicycle lanes, about personal mobility as access to cultural assets, and about representational technologies (e.g., GPS devices) as fallible and maps as both incomplete and extensible. These new forms of sense-making and engagement with geospatial technologies culminated in the construction and presentation of map layers reflecting youth desires that were both practical and fanciful.

In presenting their desire layers to audiences of urban and regional planners, bicycle advocates, professional cartographers, and local stakeholders, youth engaged in counter-mapping their neighborhood. They made claims to resources, or took place, for their own futures and for the future of the community. As adults had done in the CPU, youth participated in counter-mapping as a "performance genre — a set of specific forms of embodied action" (Stevens & Hall, 1998; p. 108) with each other, tools, and representations. When youth were presenting their desire layers to these audiences, they gesturally indexed talk about places, routes, and qualities of the neighborhood to graphical representations of particular locations in "official" maps (see Figure 7-1). Their gaze was frequently focused on the map, inviting others into the representation. They also linked their own accounts of past or present experiences to justifications for why the city should invest in new pieces of infrastructure, like bicycle lanes, sidewalks, and libraries. Like Mr. Gray, Ms. Kay, and Ms. Sanders had done, youth scaled their desires to the needs of the community, rather than to the individual. Although these young people shared personal stories as evidence for the need for urban change, they described a more general experience of living in Woodbridge that involved issues of (im)mobility and (in)accessibility.

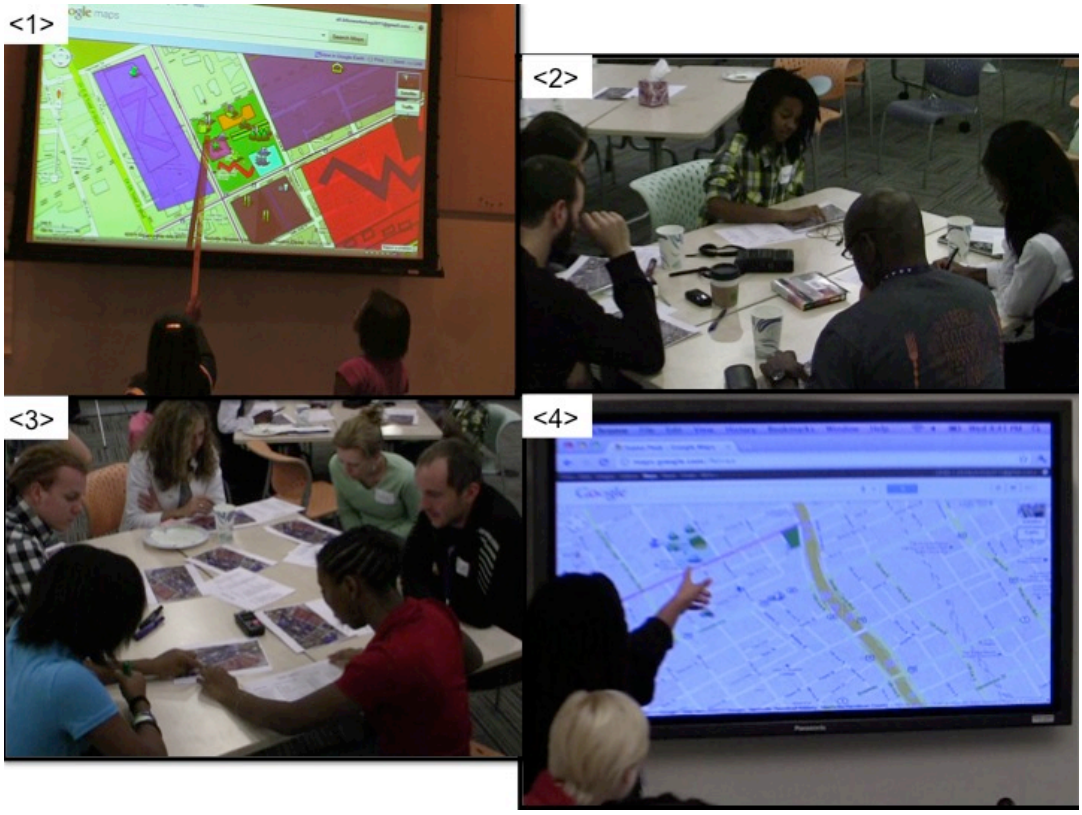

Figure 7-1. Youth participants counter-map their neighborhoods. <1> Carissa and Leah in the university computer lab. <2> William talking to Stephanie the planner, a Metro government bicycle advocate, Cecil, and a local stakeholder. <3> Carissa and Leah talking with a regional planner (green sweater), a director of a Woodbridge non-profit (white jacket), Dirk (black jacket), and a GIS specialist. <4> Wallace presenting his map to the professional cartographer hired by Metro (not shown in frame).

Youth Sense-making, Engagement, and Learning: In Their Words

In concluding the story of how youth made sense of, engaged, and learned in the designed activities (that re-mediated their physical mobility with older and newer technologies for the purpose of counter-mapping), I want to report and summarize what youth explicitly told me on the final day in individual or dyad interviews. Fred and Beth do not figure as prominently in the focal episodes, and they should also have a "say" in what this design experiment meant to them. I value ethnography, and attempting to provide a cohesive account for each one of these six participants is important to me. Therefore, I will provide a synopsis of each post-participation interview before describing how counter-mapping provided a new theory of social action and spatial change through the findings and methods of this design experiment "leaking" into the

community and city.

Beth

I chose to interview Beth by herself since she was typically so quiet and deferred to the older teens when I posed questions to the group. This choice proved to be positive because Beth talked to me more in those twenty-five minutes than in all the previous seven meetings combined. Although she remained soft-spoken and concise, and kept her gaze down at the free recall map she was drawing, Beth expressed her enthusiasm for the activities in which she participated.

For Beth, being able to go new places in her neighborhood that she was typically not allowed to go on her own was the most important part of the study. When I asked Beth what she had learned, if anything, from participating in this study, she told me, “how to use technology and how to build a bike and learned different places to go.” The range of her own mobility, and that of others, was a notion that surfaced in many of her responses to my questions. When I asked her about her favorite activities, she mentioned the geocache because she “went to places that I wouldn’t be able to go because they’re too far” to go by herself. I asked her to name or describe some of those places. For her, going “up to the train tracks” was a far border that she was impressed to have reached on foot. In response to being asked if these activities were similar or different to things she had done in other settings, she responded, “different because we used technology and went different places.” Related to mobility and gaining a new perspective on one’s range through technology, Beth also liked spending time on the computer in the university lab “and look at other tracks that people did.” She was taken with getting “to see how far people went.” Like me, she was impressed with how far William and Wallace had traveled and she hoped to do the same someday on her bicycle. (Knowing her mother, it was incredibly doubtful that Beth would be allowed to ride her bicycle that far on her own once the study was over.)

Beth mentioned other parts of the study, too, as being important. However, nothing was as salient to her as being able to explore her neighborhood on food and bicycle, and see how others did the same. Beth also reported learning how “to use GPS and how to find maps on the computer.” Being in a university computer lab was fun for her, but so was learning to build a

bicycle, and taking photos with a camera during the geocache and ground-truthing expedition. Once the study was over, she hoped to be able to get around her neighborhood independently on her bike, and know how to fix her bicycle if "it breaks down."

Fred

I also chose to interview Fred by himself since he was prone to let the others talk over him. (In retrospect, I was not good at opening-up interactional space for Fred to engage in particular ways since I found the contributions from the others to be so consistently impressive.) In our interview, Fred was characteristically coy, squirming a little as the sole person in front of the camera. His responses were short; Fred demonstrated that any "conceptual change" he experienced as a result of this study was not the same kind I was intending. Fred reported still being uncomfortable with using a map, but did like interacting with "a hand GPS." When I asked him to elaborate on his persistent uncertainty with a map use, he responded, "It would be confusing, but I could figure out the pieces… like which way to go and how many miles."

Like Beth, Fred was most excited about going around the neighborhood to different places, especially through the geocache activity. He liked "searching for stuff, using new things, that's new I just experienced." However, if he were the designer, he would have extended the range and distribution of caches to include "like storage places, food, restaurants, and churches, far destinations to make it more complicated." He also told me that doing many of the activities on bicycles would have been preferable.

Fred found additional value in this study that none of the other youth reported to me. As mentioned earlier, Fred saw participating in this study as an opportunity to stay out of trouble. "Most kids my age don't get involved in stuff like this," he said. "But I think it's a positive thing to do. It's the best way to say outta trouble, doing stuff like this." Ideally, I would have taken these words at face value, but Fred was the kind of teenager that constructed "made for TV" remarks for adults (especially me) in seemingly high stakes moments. I believe Fred thought this to be true to some extent. However, I could also hear the voice of his grandmother (a voice with which I was very familiar from multiple phone conversations) looping through the mouth of this teenage

boy who just wanted to sleep, eat, and play video games a lot of the time.

Out of the six participants, Fred's engagement and learning was the most complicated. While he probably did not *learn* the objectives for which I set-out to design activities, he did find meaning in participating. Like the others, he adored Carissa, trying alternatively to impress her (with his muscles) or make her laugh. He looked-up to Cecil, always trying to find moments of playful conversation with him. William and Wallace were fun, affable targets for his jokes and teasing. In the moment of doing this study, Fred was a challenge for me. In analyzing and writing this research, he was also a challenge for me because I realized that most of his contributions did not fit the narrative of this dissertation. However, I can sincerely report that this experience would have been lacking without Fred's *own way* of engaging with the activities and with the others in the study. While his absence in the empirical materials (obviously) bothers me, I have the authority to now write that he was an essential character in the ethnographic accounting for what happened.

Leah and Carissa

I interviewed Leah and Carissa as a dyad for time efficiency and because they were always so comfortable speaking with and in front of (or over top) the other. As always, Leah and Carissa were exuberant and playful with one another, talking over one another and finishing each other's sentences. These two girls had participated in the entire study as a duo, so it felt perfectly natural to have them conclude the study together in an interview setting.

Motivation was a dominant theme that persisted through the interview with Leah and Carissa. From the onset, Carissa described liking the geocache because of its competitive element; Leah talked about the importance of awarding prizes to those participants "for doing responsible stuff" like not losing the GPS devices and keeping time-diaries at home. (I actually did award prizes for the best maintained time diary, which Leah did not win.) Leah's main reason for enjoying the geocache was because of its competitive nature when she said, "I liked the geocache, too, because it was fun when we ran into the other group, we had to get past them to get the other one [cache]." Carissa's suggestion for a next iteration of the study was to make *all* of

the activities somehow competitive, incentivizing speed and accuracy. Leah chuckled at this suggestion, and remarked, “that’s ‘cause you’re so competitive.” Leah did not consider awarding prizes to the “best performers” as introducing an element of competition, but as just an extrinsic motivator like a grade in school. Even though I subtly introduced elements like these by framing the geocache as a race, awarding Sonic gift cards to the teens with the “most complete” time diaries, and asking them to hide their GPS drawing plans from the other group, the girls did not find these efforts sufficiently motivational.

Leah and Carissa spoke a lot about the affordances and constraints of the mapping technology and the maps. Not surprisingly, both of the girls had grievances against the GPS devices and data loggers, “because they were off,” as Carissa reported. They agreed that “working with the maps” (as stated by Carissa) was preferable to using GPS. Carissa described a way of *managing* the perceived erratic nature of the device during the GPS drawing activity by using the straightness of the street grid to write the word “LOVE.” She explained, “It was easier to do the word LOVE because it went along with the roads. It was easier to use the roads to know that you were going in a straight line.” However, the maps were often wrong, too. During the portion of the interview when Carissa and Leah were describing the superiority of the map to the GPS technology, Carissa noted how the building layer of the Google Map was out of date but the street layer was basically correct. “It will show a building going through a street, and it’s not true,” she stated. “It’s not updated, that’s how it looked before.” Leah agreed and added that street labels were often wrong, too. In Leah’s seemingly careful consideration of the map in relation to her daily experience living in her neighborhood, she also learned something new about the major corridor that borders her community, Charlotte Avenue. “Charlotte was a long street! I didn’t realize it until we were looking at the map,” she reported.

The collaborative nature of the activities was important for Leah and Carissa, too. They both talked about working in groups as something that went well. They exchanged stories about Beth not pulling her weight at times, or working with the boys. For Carissa, she wished the groups were “mixed up” more often so that the boys and the girls had more opportunity to mingle (most obviously because she liked the attention she received from Fred). At this suggestion, Leah

piped-in with an unflattering remark about Fred. Carissa shot back, “I don’t mind Fred. Fred’s funny, even though he keeps hitting on me.” This exchange quickly reminded me that these “study participants” were still very much teenagers. My social design experiment for spatial justice was not immune to the jealousies, flirtations, attractions, and insecurities that stereotypically define the age of adolescence. Instead, this research was just another part of these social goings-on and benefitted from this youthful, excited energy.

Wallace and William

As in life, the brothers participated in the final interview side-by-side. Unlike Leah and Carissa, William and Wallace patiently waited for the other one to finish a thought before beginning to speak. They maintained their level of enthusiasm and insight at this final checkpoint, and continued to impress me with their ability for reflection and analysis on the activities. The least self-conscious of all the participants, William and Wallace spoke directly and substantively to my questions, again demonstrating their almost unfathomable maturity for two teenage boys.

The brothers found a lot of value in using and making maps. William really said it all (literally) when I asked what they learned from participating in the study: “Even though I already knew how to read a map, I learned how to read it in more detail, I guess. And like, not all maps are correct. And, uh, there’s a difference between maps. Like some maps are small scale, and some maps are in large scale.” Characteristically, Wallace agreed with his brother and added that, “all maps should be updated when anything is changed.” Like Leah and Carissa, they then spoke about the outdated building layer on the Google Map that was in conflict with what was on the ground in the neighborhood, and the up-to-date street layer. Wallace was especially in tune with map layers. He reported his appreciation for creating desire layers in Google My Maps. When I asked the boys what their favorite activity was over the course of the study, Wallace responded, “…making the maps, like in the computer lab, and putting the different things like what should be added, what we would want, the bike lanes, that was fun to me, ‘cause you got to do what YOU wanted to do instead of following, like, certain guidelines and rules to make a map.”

While William was enthusiastic about his ability to see maps differently, Wallace was

equally enthusiastic about seeing the built environment differently because of being on a bicycle. He was suddenly aware of features that could cause harm to either his bicycle or his own body. "When you're riding a bike, you feel, it's like you're more aware of your surroundings… You worked hard on your bike, so you don't want anything to happen to it, so you're looking for different things that could like, pop your tires, stuff that you could crash into and like damage your bike so you're watching out for everything and you're looking real closely." In another part of the interview, Wallace also described a new awareness for "broken glass, gutters on the street, the different signals you would need to use to ride a bike" to prevent a collision with a driver. Even though these new realizations seemed wrought with anxiety, Wallace also reported the pleasurable parts of being on a bicycle like having a breeze blowing on your face on a hot day. "It's more fun to ride a bike," he concluded.

The brothers were the only participants who ardently endorsed the use of GPS devices in the activities. William spoke specifically about using the GPS device in the context of the geocaching activity.

> It was fun using tha, um, the GPS, 'cause it told you where to go and how far you were from it, and you were like, like when it told you how close you were gettin', you got sorta anxious, like there wasn't anyone that told you, like, when you were right on it and you passed it and it told you to go back and you just start looking around.

For the boys, the imprecision of the technology added an element of mystery in the geocache, especially. To William and Wallace, the device was offering "hints" about the location of a question or artifact.

Emergent Themes

Across all the interviews, there were several common themes. First, and a testament to Cecil's vision to have a Workshop, all of the youth wanted to do more activities on bikes. An important component of this suggestion was to do more activities on bikes together, in a formation. William and Carissa were especially adamant about riding to different locations together, using the geocache structure, to have the opportunity to collectively figure out the best

routes of travel. Wallace thought an activity like this would have value because there would be a "critical mass" (my words) of bicyclists that would cause drivers to pay attention. Beth wanted to go further from home on her bicycle, and the only way her mother would allow her to go far would be with a group. Undoubtedly, the youth were excited about their new form of mobility. However, I sensed that they were still slightly uncomfortable riding solo alongside vehicular traffic and wanted to create opportunities for more *riding formations*, where more experienced adults could orchestrate dicey intersections and could trouble-shoot mechanical problems.

All of the youth expressed to me in this interview setting some kind of appreciation for or change in the way they saw, read, and interpreted maps from participating in this study. They began to see maps as layers of information that could include an individual's personal mobility, out-of-date shape files, or important landmarks for wayfinding. Seeing personal mobility from ten thousand feet, as a map layer, was particularly striking for Beth and Leah.

But I argue that this new perspective on maps and personal mobility also affected the ways in which youth saw the city. Viewing representations as layers of, not just data, but *experience* that coexist in the built environment, brought youth closer to viewing the city as a palimpsest — "the accumulated and figurative iterations of site interventions over time and place" (Iversen, 2011). By using palimpsest metaphorically, I mean that youth were starting to see their neighborhood and community, as an accumulation of historical events, stories, attachments, experiences, and feelings, pieces of which were always visible if you *knew how to see, feel, and hear them*. This metaphor aptly describes how adult residents talked about Woodbridge, and how they saw and felt remnants of a past, more vibrant community in their present, daily lives. The urban planners we studied and spoke to were masters at standing in a location and imaging a future for the place based on what could be seen, heard, and felt. While youth did not have years of observing the dynamism of a city run (and community ruined) by capital, I believe some of them were able to look at or stand in an area and interrogate its past, and imagine its future, based on what was observable in the present. These imaginings, for adult residents, planners, and youth, were intricately tied to personal identifications with places and projecting a particular outcome for one's future.

Counter-mapping as a New Theory of Social Action and Spatial Change

I started out to reverse the nearly complete absence of youth perspectives or voices in participatory urban planning. I designed activities and novel uses of technology that, I thought, would engage Woodbridge youth in new ways of experiencing, thinking about, and using urban spaces in and around their neighborhoods. These activities included making and using maps of existing neighborhood spaces, building and using a bicycle to experience a broader range of elective mobility in the neighborhood, using location-aware technologies to capture and analyze personal mobility in the neighborhood over time (i.e., GPS tracking), and using map-making tools that would allow youth to create and present their desires for the neighborhood in the future.

What I did not expect was how particular recommendations from youth counter-mapping their neighborhoods and methods used during Phase II of the study would "leak" into the community. Cecil and I arranged two venues in which the youth presented their work to city planners and other representatives of Metro's government. This broader circulation of youth counter-maps was possible for several, related reasons. First, the Workshop was increasingly visible in the local press, and Cecil had become something of a local celebrity, asked to contribute in a push by the Metro Mayor's office to redesign the downtown transportation grid to move towards a healthier urban environment. At the same time, ongoing relations with urban planners, that started during our ethnographic study of participatory planning, helped to make my design study at the Workshop visible in other areas of city government. Cecil, Stephanie, and I especially pushed to create opportunities for youth to present their maps and spatial arguments to other stakeholders, including representatives of the Mayor's office and consultants they had hired to re-design bike lanes in City neighborhoods.

Once my analysis and writing about this study began, designed activities and methods "leaked" into the surrounding community in ways I had not anticipated. The route chosen by Carissa, William, and their peers was independently built, named, and published in a bike map contracted by the Mayor's office, including other routes ridden or proposed by youth in the study (as well as by Cecil, leader of the bicycle Workshop). Regional transportation planners, whom I invited to serve as an audience for youth counter-maps, adopted my methods of gathering GPS

tracks and using time diaries to conduct larger scale surveys with households in a surrounding, five-county planning study area (even my own house was selected and participated in that survey). Similarly, urban planners opened their next round of participatory planning by facilitating youth design charettes at three local high schools, and this approach to youth involvement in planning is now a central part of an effort to create a 25 year plan for the City (I was selected to help coordinate youth participation in the plan). While the diffusion of this work (and that of many others) into the community required interest and deliberate effort from many different stakeholders, I feel it is reasonable to argue that substantial learning occurred also at a collective or social level of analysis. I hope to keep this flow of changes in spatial literacy and activity moving, organized around a model of youth counter-mapping that can be further refined through expanded use.

Counter-mapping created a new social space for learning and interactivity for both professionals and younger and older residents. This new space brought together cognitive maps of neighborhoods (e.g., free recall maps), professional classifications (e.g., the Transect), value-laden feelings of place, older and newer technologies, and immediate embodied responses for learning and imagining new and more equitable spaces for daily life. While spatial literacies were important for residents in communicating their future visions to professional audiences, these contributions were incredibly important to updating and refining the work practices of professionals. As St. Martin (2009) proposed at the very beginning of this dissertation, counter-mapping brings forward different and sometimes drastically varied intentions for places that are contrastive to capitalist aims. Many of these intentions value the physical and mental health and well-being of the community and the individual.

I conclude with an account of an exchange between youth participants in this study and a cartographic consultant, who was hired by the Mayor's office. This consultant was hired to create a biking map for Metro similar to designs he created for bike-friendly maps of cities across the United States. After listening to Carissa and the brothers describe how they created desire layers based on their new experience of biking in the city, the consultant and his team commented on how similar their work was to what youth had described. As he put it to youth in our study:

Like sometimes you have all these experts running around with fancy words and fancy plans, and what you guys were doing was way beyond that. Nothing beats getting your feet dirty and your hands dirty and getting into the mud, finding out what's there in person, and just reacting to it. And that is, really, the highest science (Bob Firth, personal communication).

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